

Final report

For [redacted]
represented by [redacted]

Replacement crops :
[redacted] and [redacted] evaluation
applied on Winter wheat and assessed
(triticum aestivum)
on Sugar beet, Potatoes and Flax
(Beta vulgaris, Solanum tuberosum, Linum
usitatissimum)
2009-2010
Location : Fricourt, Somme, France (North)

Protocol : **FR-BMP-09-04**
Internal trial code : **FRM-09-H46**
Trial code : 14185009
Coleor Code : FMAK 097865
Tested products : [redacted] ; [redacted]
Date of this report : 3rd of August 2010
Study director : [redacted]
Author : [redacted]
Service supplier : [redacted]
[redacted]
[redacted]
Sponsor : [redacted]
[redacted]
[redacted]
Sponsor representative : [redacted]
[redacted]
[redacted]
Sponsor Monitor : [redacted]
[redacted]

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GEP – CERTIFICATE



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Objet : Décision d'agrément

Paris, le 20 11

Conformément à l'article R. 253-11 du code rural et à l'article 6 de l'arrêté du 25 avril 2007 relatif aux essais officiels et officiellement reconnus pour l'évaluation des produits mentionnés à l'article L. 253-1 du code rural, et après examen du rapport d'évaluation établi par le Comité français d'accréditation (Cofrac) en date du 09 janvier 2008, votre organisme est agréé pour réaliser des essais officiellement reconnus selon le périmètre suivant :

UNITE(S)	SECTEUR(S) D'ACTIVITE
	- Grandes Cultures

Cet agrément est délivré pour une durée de cinq ans à compter de la date d'aujourd'hui. En application de l'article 5 de l'arrêté susmentionné, une nouvelle évaluation aura lieu dans un délai compris entre vingt-quatre et trente-six mois à compter de cette même date.

Pour le ministre chargé de l'agriculture et par délégation
Le Directeur Général de l'Alimentation
Pour le directeur général de l'alimentation et par délégation
Le sous-directeur de la qualité et de la protection des végétaux


JOEL MATHURIN

Copie Collée



GEP- STATEMENT

I hereby confirm that this report constitutes a true and accurate record of the procedures employed and of the results obtained in this Good Efficacy Practice -study (GEP).

The study was conducted under our supervision and in compliance with the principles of GEP.

Furthermore, all data and facts of this study – including all raw data – are compiled in field note-books.

[Redacted]	[Redacted]	08-2010
Study director	Signature	Date (dd-mm-yyyy)

SUMMARY

This selectivity trial on next crop after winter wheat sets out to compare the following herbicides:

TREATMENTS	1	2		3		4		5	
PRODUCTS (L /ha)	Untreated check	██████████	4	██████████	8	██████████	3,6	██████████	7,2
TIMING		A		A		A		A	

The experimentation was set up in the department of the Somme (France), in the district of Fricourt. The winter wheat variety, SELEKT was implanted on the 20th of October 2009, on land previously containing wheat.

Thus, the study has allowed us to display selectivity characteristics on the tested herbicides:

- Four assessments were planned and realized after the herbicide application and the seed of replacing crops: sugar beet, flax and potatoes.
- None of these revealed phytotoxicity symptoms. Each product and each rate appeared as totally selective of studied crop.

Thus, it can be concluded that all products were selective during this study, because no herbicide damages to replacing crops were noted. We can conclude that while a growing accident on winter wheat, the studied product ██████████ and ██████████ are selective to sugar beet, flax, and potatoes.

1. Method objective: studying the selectivity

This trial sets out to evaluate the phytotoxicity effects on replacing crops, in the field of certain weed killers used in the weeding of winter wheat.

This one is designed to assess possible phytotoxicity (visible symptoms) to crops in the absence of weeds, and include the specified rate for the intended use and a greater rate (rate specified x 2). The compounds tested are applied at tillage of winter wheat and assessments done on following crops implanted for winter wheat replacement (flax, sugar beet and potatoes). Methodology CEB n° 096 was used in this test to conduct and report this study.

Winter wheat was destroyed on 6th of April 2010 at BBCH 23 crop stage in order to simulate a growth accident.

Winter wheat was destructed by mechanical grinding and tillage had combined vibrating cultivator plus rotary harrow.

Tillage made between winter wheat destruction and replacing crop implantation was done in a same single direction for every tillage tool on each replicate so as to minimize soil displacement and to make it homogeneous.

Tillage type was divided in two parts in this trial: replications n°1 had a rotary harrow on 5-7 cm depth, followed by a vibrating cultivator for sugar beet and potatoes and direct seeding for flax; whereas replication n°2 got plough on 20-25 cm depth. These two parts were performed in order to study tillage type effect.

Planting dates of replacing crop are available in Table 2, on the next page.

2. Efficacy of the preparations

2.1. Experimental conditions

The trial was set up in the department of the Somme (France), in the district of Fricourt. The crops description and their implantation are summarized in the table below. The trial maps and treatment randomization are equally available in Appendix 2.

2.1.1. First crop implanted and site description

Table 1: Site description and implanting

Trial Code	FRM-09-H46
City	Fricourt
Farmer	
Variety	SELEKT
Planting Date	20/10/2009
Planting Rate	130 Kg/Ha
Planting method	Seeded
Row spacing	16 cm
Previous crop	Sugar beet
Trial map	Randomized complete block
Replications	1
Plot (width x length)	5 m x 10 m

2.1.2. Replacing crop:**Table 2: Replacing crops description**

Crop	Sugar Beet
Variety	BELLINO
Planting Date	03/05/2010
Planting Rate (kg/ha)	135 000 plantes/Ha
Planting method	Seeded
Previous crop	Winter wheat
Crop	Flax
Variety	HERMES
Planting Date	04/05/2010
Planting Rate (kg/ha)	127 Kg/Ha
Planting method	Seeded
Previous crop	Winter wheat
Crop	Potato
Variety	DESIREE
Planting Date	16/04/2010
Planting Rate (kg/ha)	40 300 plantes/Ha
Planting method	Seeded
Previous crop	Winter wheat

2.2. Treatments

The trial consists of 5 treatments including the untreated check.

Table 3: Treatments

Trt No.	Type	Treatment Name	Rate	Rate Unit	Appl Code	Appl Description
1	CHK	Untreated check				
2	HERB		4	l/ha	A	3 leaves to tillering
3	HERB		8	l/ha	A	3 leaves to tillering
4	HERB		3,6	l/ha	A	3 leaves to tillering
5	HERB		7,2	l/ha	A	3 leaves to tillering

2.3. Treatment realization

Table 4: Application conditions

	A
Application Date:	30/11/2009
Time of Day:	11h30
Application Method:	SPRAY
Application Timing:	POEMCA
Application Placement:	BROFOL
Air Temperature, Unit:	8 C
% Relative Humidity:	90
Wind Velocity, Unit:	0 KPH
Dew Presence (Y/N):	N no
Soil Temperature, Unit:	6 C
Soil Moisture:	NORMAL
% Cloud Cover:	100

It is to be noted that no problems arose in the mixing and spraying of all the preparations.

Table 5: Application equipment

	A
Appl. Equipment:	DP 2,5
EquipmentType:	SPAIBL
Operating Pressure, Unit:	1,8 BAR
Nozzle Type:	Teejet
Nozzle Size:	80015
Nozzle Spacing, Unit:	25 cm
Nozzles/Row:	12
Band Width, Unit:	250 cm
Boom Length, Unit:	250 cm
Carrier:	WATER
Spray Volume, Unit:	250 L/ha
Mix Size, Unit:	3 Liters

Table 6: Crop stage at each application

	A
Crop 1 Code BBCH Scale:	TRZAW BCER
Stage Scale Used:	BBCH
Stage Majority, Percent:	13

2.4. Observations and assessments

Phytotoxicity effects may be observed during growth. After the winter wheat destruction and the seed of replacing crop (sugar beet, potatoes and flax), several assessments (emergence, 4-6 leaves, flowering...) were done: these visual assessments estimate the phytotoxicity effects in relative percentage of the untreated check. The effects are rated in percentage, which estimated in each treated plot, in reference to a scale where each treated plot is compared to the untreated check plot.

2.5. Statistical analysis and result interpretation

2.5.1. Variable elaboration

The observations allow us to obtain one variable:

- Phytotoxicity in relative % of untreated check

2.5.2. Result validity

The implanted trial can provide us with useful data because the infestation of weed and their development in the untreated check is insignificant.

2.5.3. Statistical analysis

These observations's types aren't subjected to a variance analysis.

3. Discussion and conclusion

3.1. Selectivity

3.1.1. Selectivity on LIUUT

Table 7: Summary of phytotoxicity on flax plough part

N°	Products	Rates	Timing	PLOUGH Part							
				02/06/2010 A+184d		14/06/2010 A+196d		28/06/2010 A+210d		16/07/2010 A+228d	
				PHYGEN %UNCK		PHYGEN %UNCK		PHYGEN %UNCK		PHYGEN %UNCK	
				LIUUT	BBCH 16	LIUUT	BBCH 31	LIUUT	BBCH 65	LIUUT	BBCH 69
1	Untreated Check										
2	████████	4 l/ha	A			0	0	0	0	0	0
3	████████	8 l/ha	A			0	0	0	0	0	0
4	████████	3,6 l/ha	A			0	0	0	0	0	0
5	████████	7,2 l/ha	A			0	0	0	0	0	0

Table 8: Summary of phytotoxicity on flax harrow part

N°	Products	Rates	Timing	HARROW Part							
				02/06/2010 A+184d		14/06/2010 A+196d		28/06/2010 A+210d		16/07/2010 A+228d	
				PHYGEN %UNCK		PHYGEN %UNCK		PHYGEN %UNCK		PHYGEN %UNCK	
				LIUUT	BBCH 16	LIUUT	BBCH 31	LIUUT	BBCH 65	LIUUT	BBCH 69
1	Untreated Check										
2	████████	4 l/ha	A			0	0	0	0	0	0
3	████████	8 l/ha	A			0	0	0	0	0	0
4	████████	3,6 l/ha	A			0	0	0	0	0	0
5	████████	7,2 l/ha	A			0	0	0	0	0	0

No phytotoxicity symptoms appeared during the flax growth.

3.1.2. Selectivity on SOLTU

Table 9: Summary of phytotoxicity on potato plough part

N°	Products	Rates	Timing	PLOUGH Part			
				02/06/2010 A+184d	14/06/2010 A+196d	28/06/2010 A+210d	16/07/2010 A+228d
				PHYGEN %UNCK	PHYGEN %UNCK	PHYGEN %UNCK	PHYGEN %UNCK
				SOLTU BBCH 15	SOLTU BBCH 25	SOLTU BBCH 40	SOLTU BBCH 65
1	Untreated Check						
2	██████████	4 l/ha	A	0	0	0	0
3	██████████	8 l/ha	A	0	0	0	0
4	██████████	3,6 l/ha	A	0	0	0	0
5	██████████	7,2 l/ha	A	0	0	0	0

Table 10: Summary of phytotoxicity on potato harrow part

N°	Products	Rates	Timing	HARROW Part			
				02/06/2010 A+184d	14/06/2010 A+196d	28/06/2010 A+210d	16/07/2010 A+228d
				PHYGEN %UNCK	PHYGEN %UNCK	PHYGEN %UNCK	PHYGEN %UNCK
				SOLTU BBCH 15	SOLTU BBCH 25	SOLTU BBCH 40	SOLTU BBCH 65
1	Untreated Check						
2	██████████	4 l/ha	A	0	0	0	0
3	██████████	8 l/ha	A	0	0	0	0
4	██████████	3,6 l/ha	A	0	0	0	0
5	██████████	7,2 l/ha	A	0	0	0	0

No phytotoxicity symptoms appeared during the potato growth.

3.1.3. Selectivity on BEAVA

Table 11: Summary of phytotoxicity on sugar beet plough part

N°	Products	Rates	Timing	PLOUGH Part			
				02/06/2010 A+184d	14/06/2010 A+196d	28/06/2010 A+210d	16/07/2010 A+228d
				PHYGEN %UNCK	PHYGEN %UNCK	PHYGEN %UNCK	PHYGEN %UNCK
				BEAVA BBCH 12	BEAVA BBCH 16	BEAVA BBCH 31	BEAVA BBCH 35
1	Untreated Check						
2	██████████	4 l/ha	A	0	0	0	0
3	██████████	8 l/ha	A	0	0	0	0
4	██████████	3,6 l/ha	A	0	0	0	0
5	██████████	7,2 l/ha	A	0	0	0	0

Table 12: Summary of phytotoxicity on sugar beet harrow part

N°	Products	Rates	Timing	HARROW Part			
				02/06/2010 A+184d	14/06/2010 A+196d	28/06/2010 A+210d	16/07/2010 A+228d
				PHYGEN %UNCK	PHYGEN %UNCK	PHYGEN %UNCK	PHYGEN %UNCK
				BEAVA BBCH 12	BEAVA BBCH 16	BEAVA BBCH 31	BEAVA BBCH 35
1	Untreated Check						
2	██████████	4 l/ha	A	0	0	0	0
3	██████████	8 l/ha	A	0	0	0	0
4	██████████	3,6 l/ha	A	0	0	0	0
5	██████████	7,2 l/ha	A	0	0	0	0

No phytotoxicity symptoms appeared during the sugar beet growth.

3.2. Conclusions

During the trial, no problems arose in the mixing and spraying of the different preparations.

TREATMENTS	1	2		3		4		5	
PRODUCTS (L/ha)	Untreated check	██████████	4	██████████	8	██████████	3,6	██████████	7,2
TIMING		A		A		A		A	

Thus, the study has allowed us to display selectivity characteristics on the tested herbicides:

- Four assessments were planned and realized after the herbicide application and the seed of replacing crops: sugar beet, flax and potatoes. None of these revealed phytotoxicity symptoms. Each product and each rates appeared as totally selective on studied crop.
- It has to be noted that the two tillage types showed no differences between them and no phytotoxicity symptoms too.

Thus, it can be concluded that all products were selective during this study, because no herbicide damages to replacing crop were noted. We can conclude that while a growing accident on winter wheat, the studied product ██████████ and ██████████ is selective of sugar beet, flax and potatoes.

Moreover with ██████████ and ██████████ application, no differences appeared on the two tillage type preparations before the next crops implantation.



4. APPENDIX

Appendix 1 - a) Weather data (October, November, December 2009)

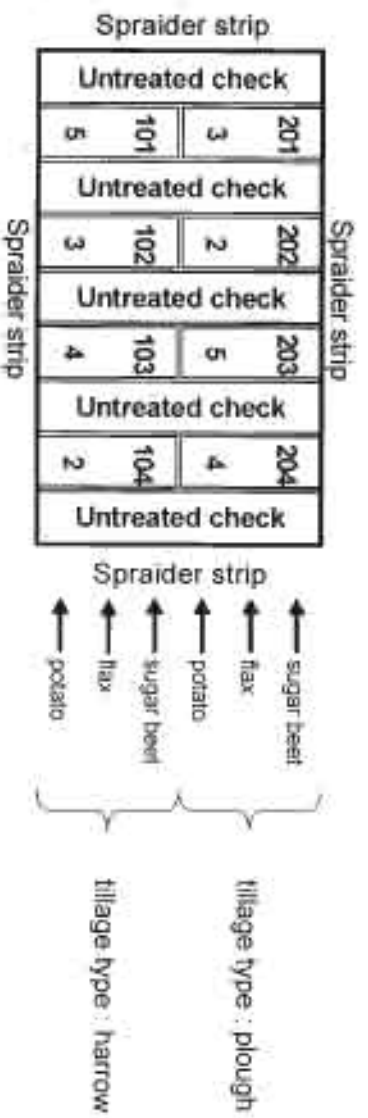
MARTINPUICH / DEPARTMENT 62 / PAS DE CALAIS (alti. 158m)											
2009											
October				November				December			
Day	Precipitation mm	T. Min °C	T. Max °C	Day	Precipitation mm	T. Min °C	T. Max °C	Day	Precipitation mm	T. Min °C	T. Max °C
1	.	9,3	17,9	1	23,0	11,1	15,4	1	0,6	4,3	6,4
2	.	5,7	16,0	2	1,2	5,2	11,0	2	6,3	3,5	8,5
3	.	7,3	14,8	3	21,5	3,9	13,0	3	4,7	2,5	8,9
4	6,2	11,2	13,7	4	5,9	6,2	8,8	4	4,4	0,3	6,7
5	14,7	11,2	16,2	5	10,3	5,6	9,6	5	4,4	4,6	10,7
6	21,8	12,7	18,9	6	7,1	4,4	10,6	6	4,4	5,3	11,2
7	28,6	15,5	20,1	7	1,5	3,3	9,4	7	6,2	4,0	8,8
8	0,3	11,7	17,6	8	0,9	2,5	7,1	8	10,0	4,8	8,4
9	3,8	9,1	15,4	9	0,3	2,2	9,6	9	12,7	6,6	11,8
10	1,8	11,3	17,2	10	1,5	4,2	8,9	10	0,3	4,2	11,0
11	9,4	10,4	14,4	11	2,9	2,7	8,1	11	.	3,4	6,5
12	.	8,7	15,7	12	8,0	3,3	12,1	12	.	1,3	4,4
13	.	7,8	13,6	13	0,3	11,0	15,8	13	.	-1,4	1,6
14	.	3,0	11,1	14	5,0	9,4	14,2	14	.	-4,3	-0,3
15	.	0,0	11,4	15	1,8	8,4	13,1	15	.	-6,5	-1,1
16	2,4	5,2	13,1	16	.	8,7	14,7	16	.	-6,4	-1,7
17	3,2	5,0	12,7	17	.	7,2	11,4	17	.	-3,1	-1,8
18	0,3	2,5	12,6	18	.	7,5	12,8	18	.	-7,2	-2,2
19	.	3,4	10,9	19	.	6,3	11,8	19	.	-7,6	-3,8
20	.	2,4	12,8	20	4,4	7,6	14,2	20	.	-7,5	0,0
21	20,1	10,0	13,6	21	9,7	10,2	16,1	21	.	-7,5	0,3
22	.	8,5	12,8	22	6,5	7,2	12,6	22	5,6	-0,4	0,9
23	2,1	7,8	12,3	23	17,4	7,3	12,2	23	2,4	-2,6	0,9
24	8,3	9,3	16,2	24	2,9	7,4	13,0	24	22,4	-1,2	1,8
25	.	8,7	15,9	25	2,1	7,3	11,4	25	0,6	-0,2	3,5
26	0,6	9,1	15,4	26	4,7	6,3	10,5	26	.	0,0	3,4
27	.	6,3	14,1	27	0,9	5,6	8,3	27	3,8	0,9	5,8
28	0,3	7,0	15,7	28	7,4	4,7	10,0	28	0,3	-1,2	3,1
29	0,3	7,4	14,6	29	4,4	4,9	9,8	29	11,2	-0,7	8,7
30	.	4,0	11,5	30	1,8	3,6	6,4	30	1,5	5,6	9,1
31	0,3	6,7	13,8					31	1,2	-0,5	5,8
Decade 1	77,2	10,5	16,7	Decade 1	73,2	4,9	10,5	Decade 1	56,0	4,0	9,0
Decade 2	15,3	4,6	13,3	Decade 2	22,4	7,2	12,3	Decade 2	0,0	-3,9	1,5
Decade 3	32,0	7,7	14,1	Decade 3	57,8	6,5	11,3	Decade 3	49,0	-0,7	3,6
Month	124,5	7,7	14,6	Month	153,4	6,2	11,4	Month	105,0	-0,2	4,5

Appendix 1 - b) Weather data (January, February, March 2010)

MARTINPUICH / DEPARTMENT 82 / PAS DE CALAIS (alti. 158m)											
2010											
January				February				March			
Day	Precipitation mm	T. Min °C	T. Max °C	Day	Precipitation mm	T. Min °C	T. Max °C	Day	Precipitation mm	T. Min °C	T. Max °C
1		-2,7	0,8	1	1,5	-3,0	3,1	1	0,3	0,6	6,5
2	0,6	-2,8	0,5	2	23,0	-3,5	5,8	2		0,0	9,5
3		-5,9	0,2	3	5,0	3,1	5,8	3		-1,0	6,8
4		-6,2	-3,6	4	4,1	3,5	9,0	4	0,3	-0,3	5,8
5		-6,2	-0,6	5	6,5	3,6	10,0	5		-2,1	4,9
6		-6,8	-1,7	6	0,9	2,2	6,6	6		-1,7	4,1
7		-10,1	-2,9	7	0,9	0,5	3,3	7		-4,1	2,3
8	0,3	-9,2	-3,7	8	1,2	-1,6	3,0	8		-4,8	2,2
9		-4,8	-1,7	9		-4,0	-1,9	9		-3,5	3,5
10		-2,3	-1,4	10	0,3	-4,4	-0,5	10		-3,1	6,8
11		-2,4	-0,8	11		5,2	-2,0	11		-1,4	4,7
12		-2,8	-0,7	12		-6,9	-0,3	12		0,8	5,9
13	2,9	-2,9	1,1	13		-4,6	-1,8	13		1,7	5,2
14	0,3	-0,3	3,1	14	0,2	-6,7	1,8	14		2,9	9,0
15	0,3	-0,5	1,7	15	0,2	2,6	1,0	15		2,5	10,9
16	20,7	0,4	1,9	16	0,3	-2,9	2,4	16		1,8	11,7
17		2,8	7,9	17	0,6	4,0	2,6	17		2,0	14,6
18		1,8	4,0	18	1,2	-0,4	6,0	18		3,5	18,2
19		0,3	2,5	19		0,5	4,0	19	5,3	10,4	17,4
20	1,2	-0,8	0,5	20	1,5	-1,1	4,7	20	3,2	11,9	15,6
21	3,2	0,0	3,3	21	7,4	-1,3	4,5	21	0,3	3,1	13,2
22	0,9	0,4	4,4	22	17,7	2,3	9,3	22		0,8	13,0
23	10,3	1,1	3,4	23	10,9	3,2	7,7	23		5,6	15,3
24	2,1	1,2	4,3	24	6,8	3,8	10,4	24		6,9	18,4
25	0,9	-0,7	2,8	25	10,0	7,0	9,3	25	13,0	6,7	15,2
26		-4,0	-0,8	26	4,1	3,0	9,2	26		6,7	12,2
27	1,8	-7,0	1,7	27	16,5	2,8	11,4	27	0,6	4,8	10,7
28	2,7	1,0	3,8	28	18,3	3,8	10,6	28	8,3	6,8	10,5
29	5,9	-0,4	3,9					29	3,9	9,5	15,1
30	0,3	-3,2	0,8					30	6,5	4,7	11,5
31	0,3	-4,3	2,9					31	10,0	1,1	7,2
Decade 1	0,9	-6,0	-1,8	Decade 1	43,4	-0,5	3,0	Decade 1	0,5	-2,0	5,4
Decade 2	25,4	-0,4	2,1	Decade 2	4,3	-3,5	1,3	Decade 2	8,5	3,5	10,5
Decade 3	28,4	-1,5	2,6	Decade 3	91,7	3,9	8,5	Decade 3	44,6	5,1	13,2
Month	54,7	-2,5	1,2	Month	139,3	-0,5	4,8	Month	53,7	2,3	10,0

Appendix 1 - c) Weather data (April, May, June, July 2010)

MARTINPUICH / DEPARTMENT 62 / PAS DE CALAIS (alti. 158m)															
2010															
April				May				June				July			
Day	Precipitation mm	T. Min °C	T. Max °C	Day	Precipitation mm	T. Min °C	T. Max °C	Day	Precipitation mm	T. Min °C	T. Max °C	Day	Precipitation mm	T. Min °C	T. Max °C
1	1,2	1,1	9,6	1	3,5	6,7	15,1	1	9,1	9,7	14,1	1		14,5	31,0
2	6,2	2,6	8,8	2	0,6	6,8	13,4	2		10,8	20,8	2		19,0	33,6
3	9,4	4,4	10,5	3		4,9	8,8	3		7,5	23,2	3		16,3	21,6
4	1,5	2,9	8,5	4		3,9	10,6	4		11,0	26,8	4		12,4	24,0
5		0,9	12,0	5		1,6	11,6	5		12,8	28,2	5		12,5	22,4
6		2,4	16,9	6		3,1	14,0	6	22,7	13,4	21,7	6	3,5	11,2	23,1
7		5,3	17,4	7		3,3	12,1	7		11,3	20,6	7		11,3	27,8
8		4,6	12,5	8		1,9	14,8	8	0,6	13,0	21,4	8		14,6	31,6
9		2,7	16,2	9		4,6	14,7	9	3,0	14,4	19,2	9		19,6	30,7
10		3,6	13,9	10		5,2	13,9	10	4,7	15,4	20,3	10		16,9	29,6
11		1,8	11,0	11	2,4	4,1	7,3	11		14,2	24,3	11		17,0	30,5
12		2,2	13,3	12	0,3	4,2	8,5	12		10,3	19,1	12		17,6	20,4
13		4,9	16,1	13	1,2	4,4	9,4	13		6,6	19,4	13	5,0	12,0	23,0
14		4,1	13,9	14		4,2	12,8	14		10,6	19,6	14	1,5	14,0	24,0
15		3,6	15,9	15		2,3	14,8	15		10,6	18,9	15		16,1	23,2
16		3,5	11,4	16		5,7	15,7	16		8,0	21,4	16		15,2	21,8
17		1,8	15,9	17		8,2	17,1	17		11,2	20,8	17		12,1	21,6
18		3,1	18,9	18		4,6	17,4	18		11,2	19,0	18		7,7	24,8
19		2,8	17,3	19		3,8	19,0	19	1,8	8,6	15,0	19		11,7	30,6
20		3,8	13,6	20		5,7	21,1	20		8,4	13,8	20		15,1	30,3
21		1,2	13,7	21		9,1	22,1	21		8,5	16,6	21	1,2	13,2	24,6
22		0,3	13,5	22		8,4	22,6	22		7,1	23,1	22	0,6	12,8	24,6
23		1,3	17,2	23		8,5	26,4	23		11,5	26,6	23	0,6	13,6	22,0
24		3,7	22,2	24		12,5	27,0	24		12,4	25,8	24		10,8	22,4
25		8,8	19,0	25	17,1	11,2	26,9	25		11,7	26,6	25		14,1	20,4
26		6,7	13,7	26	14,2	9,5	16,4	26		14,1	28,6	26	1,8	15,8	21,2
27		4,1	20,0	27		8,9	16,9	27		14,6	30,3	27	0,6	15,0	23,7
28		7,2	23,3	28		6,3	17,8	28		15,6	30,2	28	0,2	16,0	24,2
29		10,1	25,4	29	3,0	6,3	18,3	29		15,8	26,2	29	1,2	14,2	19,6
30		8,9	14,9	30	0,6	10,3	16,6	30		15,4	27,9	30		13,7	23,9
				31	0,6	7,9	13,6					31		16,0	25,9
Decade 1	18,3	3,1	12,5	Decade 1	4,1	4,2	12,8	Decade 1	40,1	11,9	21,8	Decade 1	3,5	14,7	27,3
Decade 2	0,0	3,2	14,8	Decade 2	3,9	4,7	13,6	Decade 2	1,8	10,0	19,8	Decade 2	6,5	13,9	25,0
Decade 3	0,0	5,2	16,3	Decade 3	35,5	9,0	20,5	Decade 3	0,0	12,7	25,1	Decade 3	6,2	14,1	23,6
Month	18,3	3,8	15,3	Month	43,5	6,1	16,0	Month	41,9	11,5	22,3	Month	16,2	14,2	25,1

Appendix 2) Plot and map randomisation

FINAL REPORT

BIOLOGICAL EFFICACY EVALUATION OF

[REDACTED] AND [REDACTED]

AGAINST THE PARASITE,
CYDIA POMONELLA (L.), ON APPLE

TRIAL 2006

Confidentiality: The information included in this report must be considered as confidential and should be transmitted without modifications to registration authorities. When the information in this report is used for other purposes, the sponsor commits himself to utilise the results with respect for general scientific deontological rules.

BY ORDER OF THE SPONSOR :

[REDACTED]

REALIZED BY:
PROEFCENTRUM FRUITTEELT v.z.w. (pcfruit)
DE BREDE AKKER 13
B-3800 SINT-TRUIDEN

2007 APRIL 13TH

Ref. 20070413 718 BE 578 GEP

FINAL REPORT

BIOLOGICAL EFFICACY EVALUATION OF

[REDACTED] AND [REDACTED]

AGAINST THE PARASITE,
CYDIA POMONELLA (L.), ON APPLE

TRIAL 2006

Confidentiality: The information included in this report must be considered as confidential and should be transmitted without modifications to registration authorities. When the information in this report is used for other purposes, the sponsor commits himself to utilise the results with respect for general scientific deontological rules.

BY ORDER OF THE SPONSOR:

[REDACTED]

REALIZED BY:

PROEFCENTRUM FRUITTEELT v.z.w. (pcfruit)
DE BREDE AKKER 13
B-3800 SINT-TRUIDEN

2007 APRIL 13TH

Biological Efficacy Evaluation of
[REDACTED] and [REDACTED]
against the parasite, *Cydia pomonella* (L.), on apple
Trial 2006

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LIST OF ABBREVIATIONS

°C	Degrees Celsius
a.i.	Active ingredient
ANOVA	Analysis of Variance
Abbott	Abbott formula for calculation of efficacy
Arc sin	Arc sinus
BBCH	Biologische Bundesanstalt, Bundessortenamt und Chemische Industrie
CAS-number	Chemical Abstracts Service-number
cm	Centimetre
CS	Capsule Suspension
d	Day(s)
DAT	Days After Treatment
DC	Dispersable Concentrate
EC	Emulsifiable Concentrate
EPPO	European and Mediterranean Plant Protection Organisation
EW	Emulsion, oil in Water
g	Gram
GAP	Good Agricultural Practice
GEP	Good Experimental Practice
GL	Guideline Level
GLM	General Linear Model
GLP	Good Laboratory Practice
GR	Granules
GV	Granulose virus
h	Hour(s)
H	Height
ha	Hectare
HT	Henderson-Tilton formula for calculation of efficacy
IGR	Insect Growth Regulator
IOBC	International Organisation for Biological Control
IPM	Integrated Pest Management
ISBN	International standard book number
ISSN	International standard serial number
IW	Instructions technical Work manual
kg	Kilogram
l	Litre
L1, L2, L3,...	Larval growth-stage 1, 2, 3, ...
LC ₅₀	Lethal Concentration, median
L:D	Light:Dark
LD ₅₀	Lethal Dose, median; dosis letalis media
log	Logarithmic
LWA	Leaf Wall Area
m	Metre
M	Mean
m ²	Square metre
m ³	Cubic metre
Max	Maximum
METI	Mitochondrial electron transport inhibitor

mg	Milligram
min	Minute(s)
Min	Minimum
ml	Millilitre
mm	Millimetre
MSDS	Material safety data sheet
npo	Non profit organisation
OD	Oil Dispersion
ppp	Plant protection product
RH	Relative Humidity
RSF	Research Station for Fruit Growing
rpm	Rotations per minute
s	Second
SC	Suspension Concentrate
SD	Standard Deviation
SE	Suspo – Emulsion
SL	Soluble Concentrate
SO	Standard Orchard
SOP	Standard Operating Procedures
sq	Square root
TH ₃	Townsend-Heuberger with 3 as highest infection degree
WG	Water Dispersible Granules
WP	Wettable Powder
wt	Weight
yr	Year

1. STATEMENT OF COMPLIANCE AND RELEASE OF DATA

The documented study is conducted in compliance with Good Experimental Practice (GEP).

The current report is drawn up according to the GEP requirements. The report can be used for registration purposes. The certificate of GEP is added in Annex.

dr. B. Gobin
Head of the Zoology Department

ir. P. Creemers
Study director

2. IDENTIFICATION TEST SUBSTANCES

2.1. TRADE NAME : [REDACTED]

- 1. Code number : -
- 2. Content formulation : [REDACTED]
- 3. Formulation type : SC
- 4. Info on the active substance
 - 4.1. Code number : -
 - 4.2. Chemical name : -
 - 4.3. Common name : [REDACTED]
 - 4.4. CAS number : -
 - 4.5. Class : biological insecticide

2.2. TRADE NAME : [REDACTED]

- 1. Code number : ALS 06I118
- 2. Content formulation : [REDACTED]
- 3. Formulation type : SC
- 4. Info on the active substance
 - 4.1. Code number : ANS-118
 - 4.2. Chemical name : [REDACTED]
 - 4.3. Common name : [REDACTED]
 - 4.4. CAS number : [REDACTED]
 - 4.5. Class : [REDACTED]

3. IDENTIFICATION REFERENCE SUBSTANCES

3.1. TRADE NAME : [REDACTED]

- 1. Code number formulation : AMS 13501
- 2. Content formulation : [REDACTED]
- 3. Formulation type : SC
- 4. Info on the active substance
 - 4.1. Code number : RH-2485
 - 4.2. Chemical name : [REDACTED]
 - 4.3. Common name : [REDACTED]
 - 4.4. CAS number : [REDACTED]
 - 4.5. Class : [REDACTED]

3.2. TRADE NAME : [REDACTED]

1. Code number formulation : -
 2. Content formulation : [REDACTED]
 3. Formulation type : SC
 4. Info on the active substance
 4.1. Code number : -
 4.2. Chemical name : -
 4.3. Common name : [REDACTED]
 4.4. CAS number : -
 4.5. Class : biological insecticide

3.3. TRADE NAME : [REDACTED]

1. Code number : -
 2. Content formulation : [REDACTED]
 3. Formulation type : SC
 4. Info on the active substance
 4.1. Code number : -
 4.2. Chemical name : -
 4.3. Common name : [REDACTED]
 4.4. CAS number : -
 4.5. Class : biological insecticide

4. SURVEY OF THE TRIAL

ASSESSMENTS	TRIAL
<ul style="list-style-type: none"> - Percentage of codling moth infested fruits (stings + entries) on the tree - Percentage of infested fruits on the ground - Percentage of fallen fruits per plot on the ground after June fruit fall 	06ZCYDIPOGOLDMELVGEP-30

5. ENVIRONMENTAL DATA

5.1. CLIMATOLOGY 2006

Winter 2005-2006 started very late and persisted for a long time, but it was relatively mild. In total 61 frost days (minimum temperature $\leq 0^{\circ}\text{C}$) were registered (normally 70). The mercurian column went 9 times below -5°C . 5 winter days (maximum temperature $\leq 0^{\circ}\text{C}$) were registered. For the months January till April 2006, 53 of the 61 frost days were registered and in November and December 2005 only 8. In March, another 17 frost days, and 1 winter day were registered. The lowest temperature was measured on 28 January and amounted to -7.6°C under thermometer shelter. On 25 January it froze to -11.8°C at the ground. The ground was covered with snow from 25 till 27 January, from 31 January till 4 February, on 10 and 13 February and 1, 6 and 7 March. The highest snow layer of 2 cm was measured on 1 March.

In January 23 frost days and 1 winter day were registered. The average temperature was 0.8°C under the mean value. Especially in the last decade of the month, temperatures were relatively low. Rainfall was limited to 14.7 l/m^2 (54.0 normally). Also the number of rainy days only came to half (9 versus 19 normally). The number of sunshine hours was almost double of normal (96h55 versus 49h24 normally).

In February the mean temperature corresponded with the normal value. The lower average maximum temperature was compensated by higher minimum values. February was a wet month with 62 l/m^2 in 19 days (43 l/m^2 in 16 days normally). Rainfall was situated mainly between 10 and 20 February. The amount of sunshine hours was limited to only 32h20 versus 71h48 normally.

The low temperatures of end February continued in the first 2 decades of March. 17 more frost days were registered of which 2 with temperatures below -5°C . The phenological development was completely inhibited. In the last decade there was a total change of temperature, which made the mean temperature result in only 0.3°C lower than normally. Phenology got started very late for the same reason. On 27 and 28 March the phenological stage "buds elongating" (BBCH 51) was registered for the pear variety Conference respectively for the apple variety Jonagold. In comparison with normal, pear was almost 5 weeks behind. There was 55.5 l/m^2 of rainfall in 17 days. The sun shone 125h15 versus 112h42 normally.

In April, another 2 frost days were registered. The mean temperature was 1.3°C higher than normally. A part of the arrears in phenology was caught up with. For Jonagold the stage "pink bud" (BBCH 57) was reached on 27 April, which is 7 days behind versus normal. For Conference the stage "white bud" (BBCH 57) was reached on 25 April, 14 days later than normally. April was quite dry with 22.4 l/m^2 in 16 days versus 48 l/m^2 in 15 days. The number of sunshine hours was completely comparable with normal (157h20 versus 156h48 normally).

In May the average minimum temperature was 3.6°C higher than normally. Especially in the first decade high temperatures were registered with 3 summer days (maximum temperature $\geq 25^{\circ}\text{C}$). The arrears in phenology were almost completely caught up with. For Jonagold flowering lasted only 11 days (19 days normally), for Conference 9 days (13 days normally). The amount of rainfall was more than double of the normal situation (133.2 versus 62 l/m^2 normally). 23 rainy days were registered versus 16 normally. Due to this the number of sunshine hours stayed largely below the normal value (160h15 versus 201h18 normally).

In June too temperatures remained above the normal value (1.8°C and higher). Already 10 summer days were registered of which 3 tropical days (maximum temperature $\geq 30^{\circ}\text{C}$) in the second decade. This was the first heat wave (5 successive summer days of which 3 are tropical days). Rainfall was

limited to 29.2 l/m² (71 l/m² normally). The high temperatures were accompanied by plenty of sunshine (257h55 versus 195h48 normally).

In the month of July all records were broken for temperature and number of sunshine hours. The average maximum temperature was 6.6 °C higher than normal (28.9 versus 22.3 °C normally). The average minimum temperature was 4.2 °C higher (15.9 °C versus 11.7 °C normally), as a result of which the average temperature was 5.4 °C higher than normal. 29 summer days and 9 tropical days were registered. There were 314h40 sunshine hours versus 197h18 normally. Rain fell during the first and last decade. The amount of 47.9 l/m² was to a large extent insufficient to set off the extreme drought.

The second month of the summer holidays literally was a washout. No less than 26 rainy days were registered (15 normally). The total amount of rain came to 181.5 l/m² (73.0 l/m² normally). However, the 1992 record of 211.5 l/m² was not broken. In 8 days there was more than 10 l/m² and in 1 day more than 20 l/m². In some places yet much higher amounts of rainfall were measured. Temperature was normal although it didn't feel like that because of the high amount of rain. The maximum temperature was 0.8 °C below average but the minimum temperature was 2°C above it, which made the average come still to 0.5 °C higher than normally.

September was also a month with extreme values. The mean temperature was on average 3°C higher than normal (18.4 versus 15.4°C normally). This was not an absolute record but the values of 1999 were equalled. Another 10 summer days were registered and even 1 tropical day. That brings the total number of summer days in 2006 to 55 and the number of tropical days to 13 (normally 31 respectively 6). The high temperatures at night were not favourable for the red colouring of Jonagold. Rainfall remained restricted to 6.4 l/m². After 1959 (5.1 l/m²), this was the driest month since the beginning of the observations.

Autumn stayed very warm in October and November. The average temperature was in October 4.7 °C higher than normal (14.5°C versus 9.8°C normally). On 25 October, still a temperature of 23.6°C was registered, an absolute record. During the second decade of October, rainfall was low, which gave a deficit of 20 l/m² (41.3 against 61.0 l/m² normally). 13 days were registered with rainfall. The sunshine duration reaches the normal value.

In November, the average temperature was 3.5°C above the average, distributed equally over day and night (9.4 °C versus 5.9 °C normally). The second decade was very wet with 43.8 l/m² in 9 days. The total rainfall amount was 68.2 l/m² against 58 l/m² normally. Sunshine duration was 40 % above the average (79h20 against 56h40 normally).

The soft weather continued in December. The average temperature was 3.3°C higher than normal (6.1°C versus 2.8°C normally). Only 4 frost days were registered (normally 12) and the lowest temperature measured was -0.8°C. The rainfall amount was slightly higher than the normal value (62.5 against 56.6 l/m² normally).

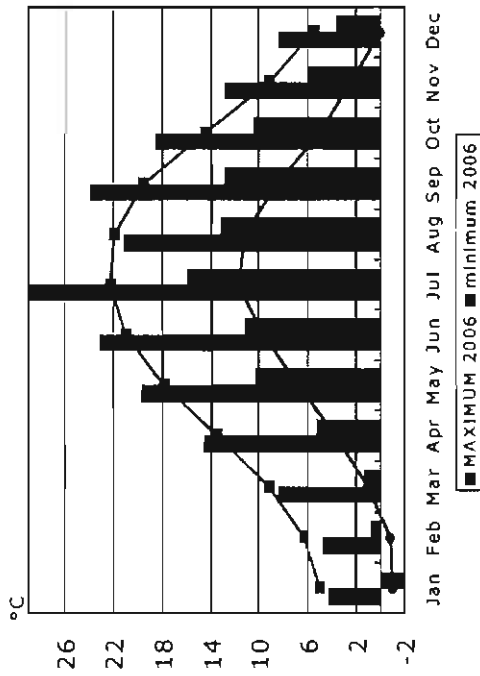
Although the rainfall amount showed abnormal heights over the different months, the total rainfall amount in 2006 was more or less normal (724.8 l/m² in 178 days versus 713 l/m² in 190 days normally). In spite of the long winter period in 2006, the average temperature was more than 2.3°C above the normal value (11.6 against 9.3°C normally). So, it is clear that in our region, the global warming of the earth is becoming apparent. The last 10 years (1997-2006) the average temperature was 11.2°C, in the period 1987-1996 it was 10.4°C and between 1951 and 1987 the average temperature per decade varied from 9.3°C until 9.6°C.

Just as it was for the rainfall amount, the total number of sunshine hours showed abnormal heights in June and July and important deficits in February and August. Despite this, the total number of sunshine hours was almost 42 hours above average (1669h55 against 1528h00 normally).

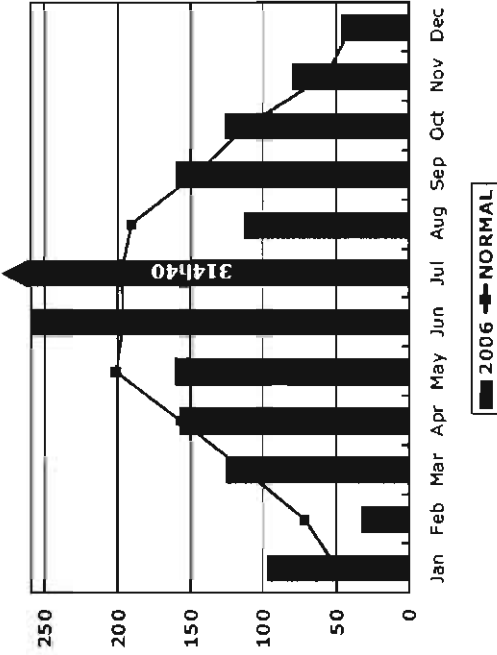
Month	Temperature		Rainfall		Sunshine
	Max	Min.	mm	days	hours
<u>January</u>					
1st decade	3.8	-1.9	0.0	0	27h05
2nd decade	6.3	0.0	13.4	6	25h30
3rd decade	2.8	-3.7	1.3	3	44h20
month	4.3	-1.9	14.7	9	96h55
M (30 years)	5.0	-1.0	54.0	19	49h24
<u>February</u>					
1st decade	3.6	-0.3	11.1	7	8h00
2nd decade	7.2	2.9	40.4	9	4h24
3rd decade	3.1	-0.5	10.5	3	19h55
month	4.7	0.8	62.0	19	32h20
M (30 years)	6.3	-0.8	43.0	16	71h48
<u>March</u>					
1st decade	5.8	-0.1	18.0	8	30h25
2nd decade	5.6	-1.9	0.6	1	55h50
3rd decade	13.5	5.6	36.9	8	39h00
month	8.4	1.4	55.5	17	125h15
M (30 years)	9.2	1.1	44.0	17	112h42
<u>April</u>					
1st decade	12.1	3.8	7.7	5	62h45
2nd decade	14.9	6.0	10.1	6	36h00
3rd decade	16.4	6.2	4.6	5	58h35
month	14.5	5.3	22.4	16	157h20
M (30 years)	13.5	3.7	48.0	15	156h48
<u>May</u>					
1st decade	22.6	10.2	18.5	5	64h15
2nd decade	20.8	11.0	46.2	7	56h15
3rd decade	16.1	9.9	68.5	11	39h45
month	19.7	10.3	133.2	23	160h15
M (30 years)	17.8	6.7	62.0	16	201h18
<u>June</u>					
1st decade	20.1	7.8	2.5	2	90h00
2nd decade	26.8	13.7	26.0	2	97h40
3rd decade	22.4	12.2	0.7	2	70h15
Month	23.1	11.2	29.2	6	257h55
M (30 years)	21.0	9.7	71.0	14	195h48

Month	Temperature		Rainfall		Sunshine
	Max	Min.	mm	days	Hours
<u>July</u>					
1st decade	27.9	16.3	19.6	4	99h20
2nd decade	29.0	13.3	0.0	0	121h10
3rd decade	10.9	7.8	13.1	1	94h10
Month	28.7	15.3	32.7	5	314h40
M (30 years)	22.3	11.7	77.0	15	197h18
<u>August</u>					
1st decade	22.1	14.6	53.7	8	37h15
2nd decade	21.3	12.9	57.5	10	35h05
3rd decade	19.9	12.1	70.3	8	40h50
month	21.1	13.2	181.5	26	113h10
M (30 years)	21.9	11.2	73.0	15	190h06
<u>September</u>					
1st decade	23.3	12.7	0.0	0	62h05
2nd decade	25.3	13.2	4.9	3	63h40
3rd decade	23.0	12.6	1.5	3	34h05
month	23.9	12.8	6.4	6	159h50
M (30 years)	19.5	8.5	64.0	13	146h06
<u>October</u>					
1st decade	18.7	10.9	19.3	4	40h05
2nd decade	19.0	9.2	3.4	3	50h55
3rd decade	18.0	11.1	18.6	6	35h10
month	18.5	10.4	41.3	13	126h10
M (30 years)	14.5	5.0	61.0	14	110h42
<u>November</u>					
1st decade	11.3	3.0	12.3	4	33h35
2nd decade	13.0	7.9	43.8	9	12h50
3rd decade	14.3	6.8	12.1	5	32h55
month	12.8	5.9	68.2	18	79h20
M (30 years)	9.2	2.5	58.0	18	56h24
<u>December</u>					
1st decade	11.7	6.3	33.6	7	16h50
2nd decade	7.9	3.5	19.3	3	20h20
3rd decade	6.0	1.5	9.6	5	9h35
month	8.4	3.7	62.5	15	46h45
M (30 years)	5.5	0.0	58.0	18	39h36

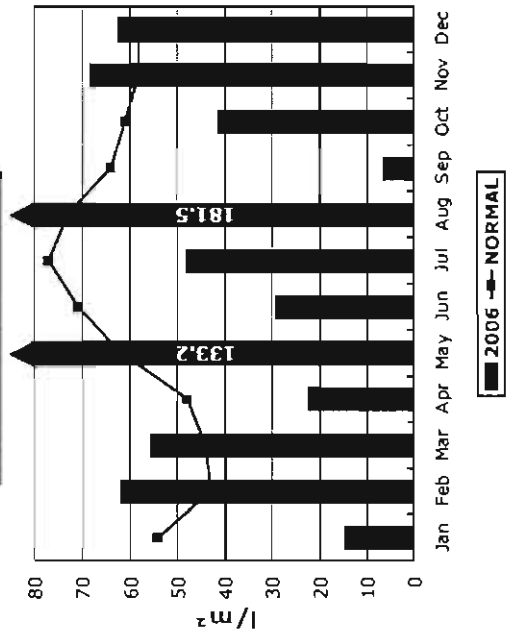
TEMPERATURE 2006



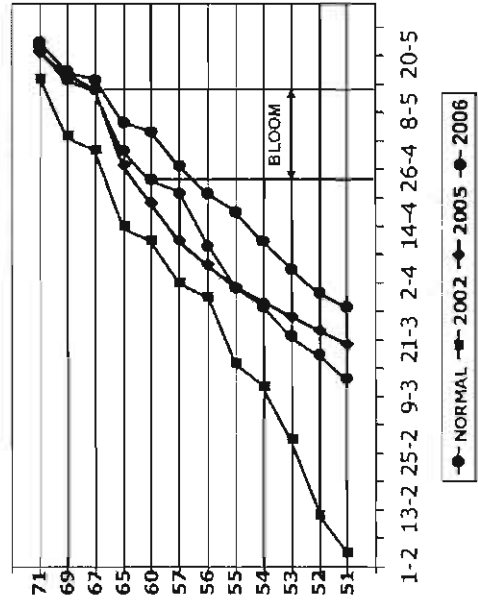
SUNSHINE 2006



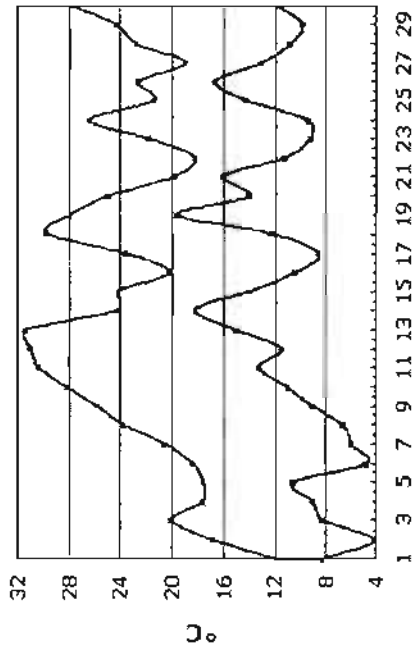
RAINFALL 2006



PHENOLOGY JONAGOLD 2006

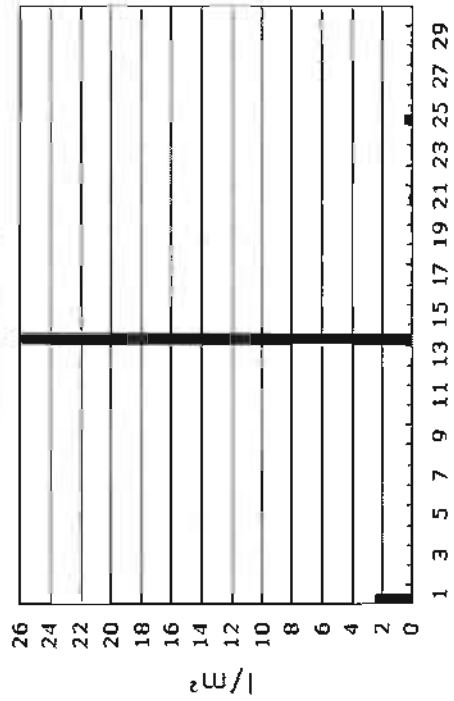


TEMPERATURE
June 2006

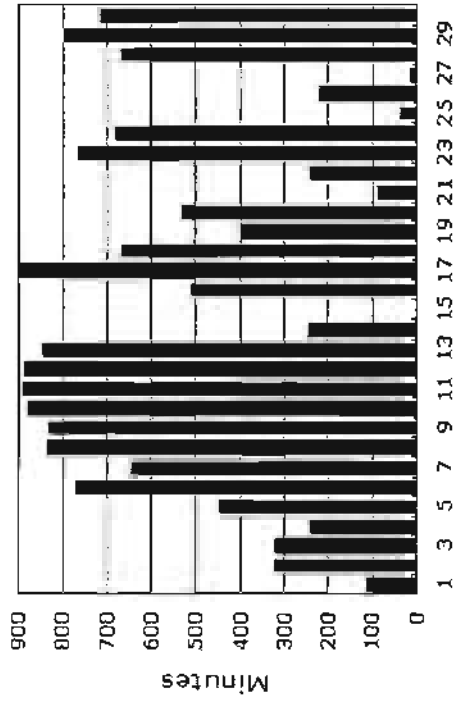


Maximum ← minimum

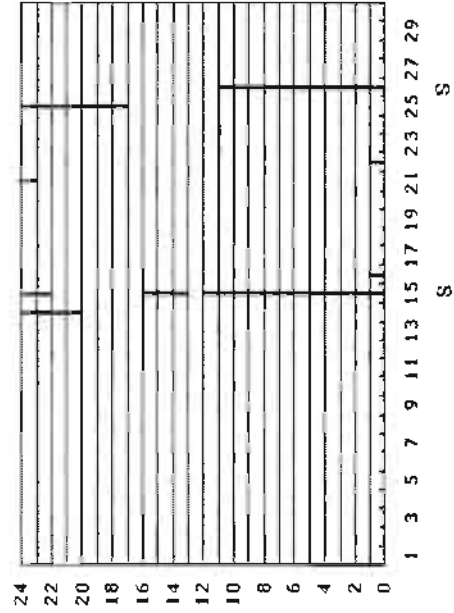
RAINFALL
June 2006



SUNSHINE
June 2006



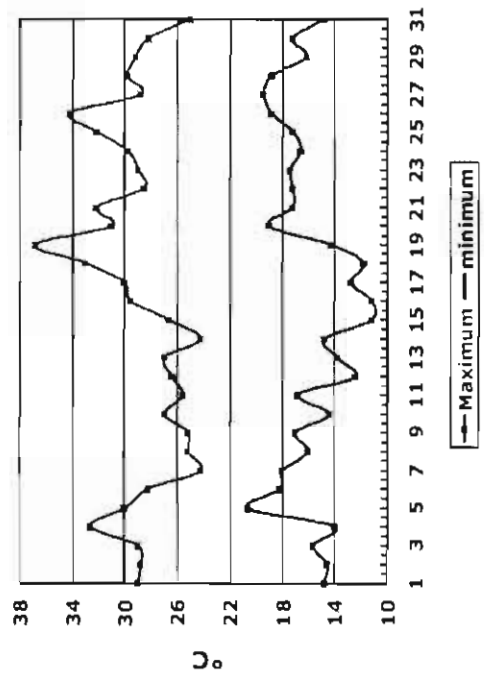
LEAF WETNESS
June 2006



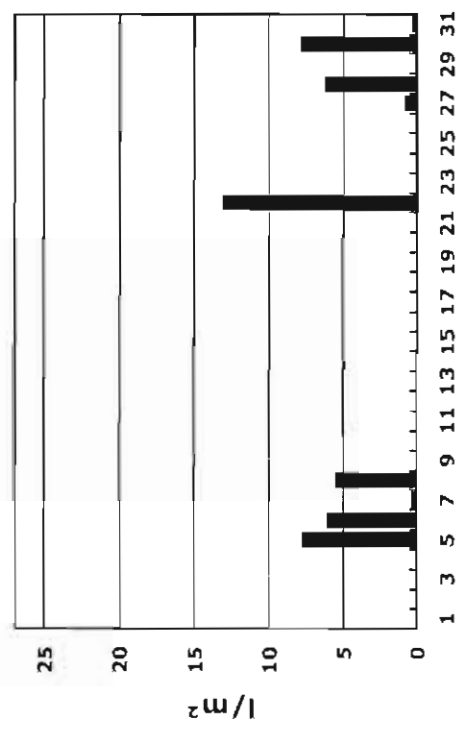
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July 2006



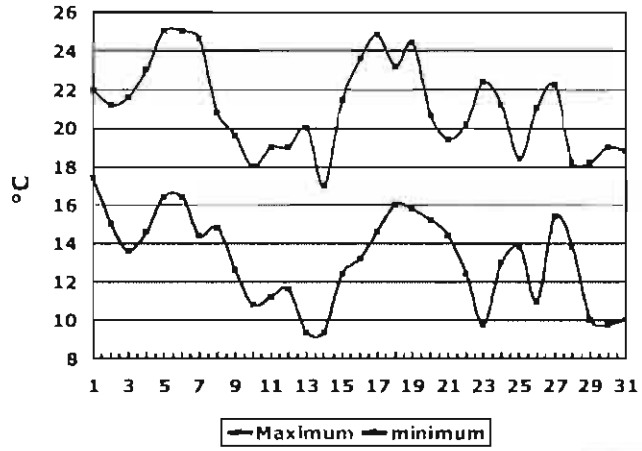
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July 2006



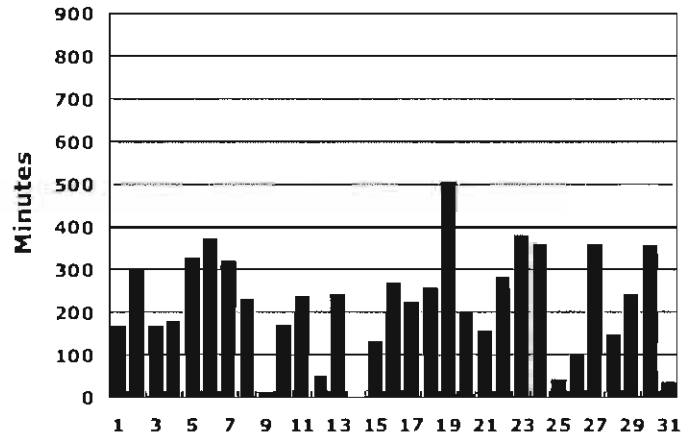
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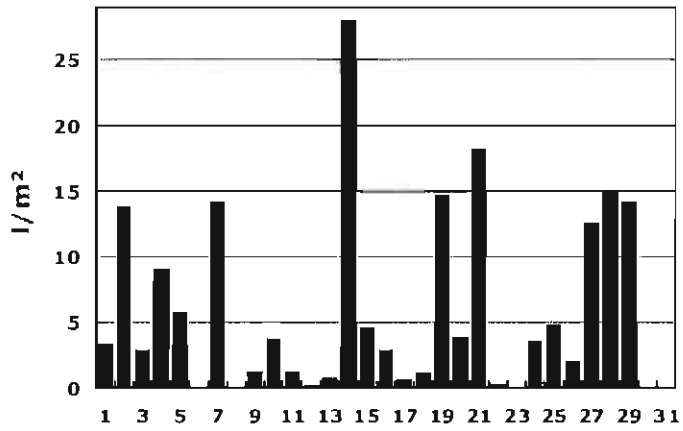
TEMPERATURE
August 2006

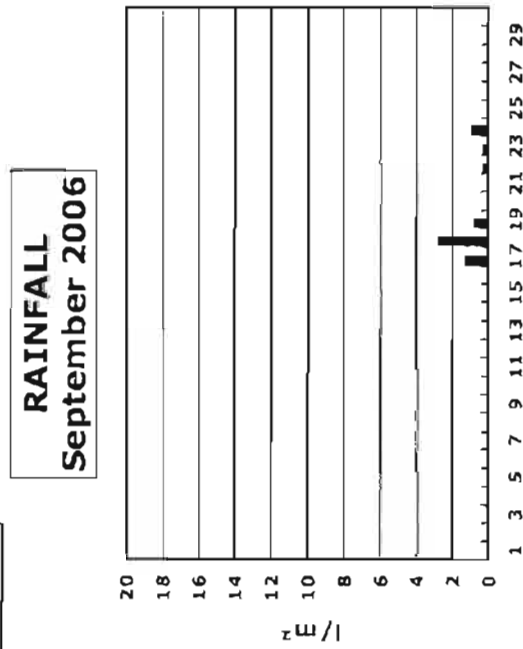
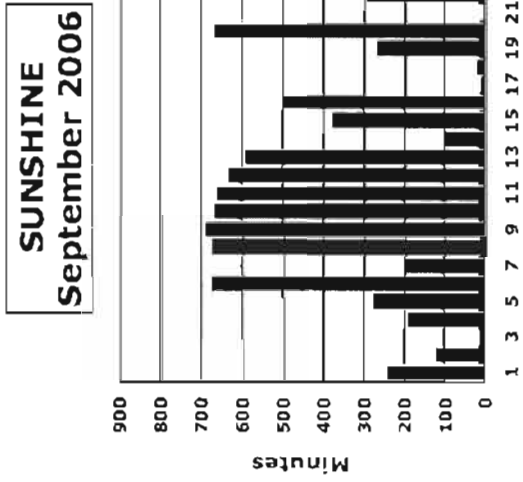
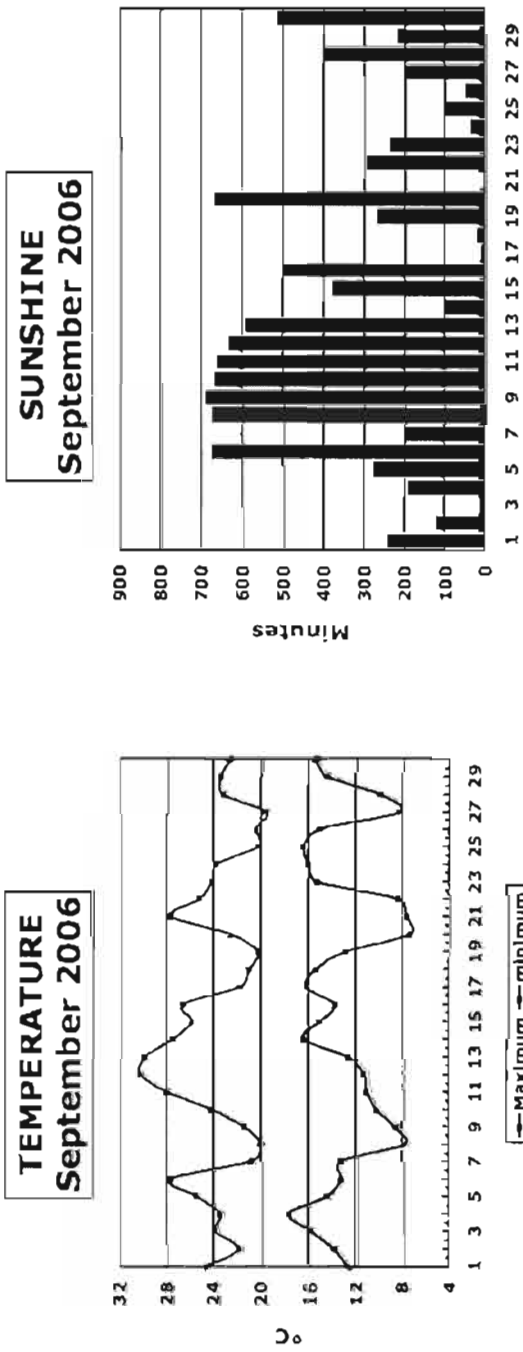


SUNSHINE
August 2006



RAINFALL
August 2006





5.2. PHENOLOGY

5.2.1. Explanation phenological stages in apple and pear

BBCH	Dutch	French	German	English
00	Winterrust	Repos hivernal	Winterruhe	Dormancy
51	Schuivende knop	Elongation du bourgeon	Austrieb	Buds elongating
52	Zwellende knop	Gonflement du bourgeon	Knospenschwellen	Swelling
53	Openbrekende knop	Eclatement du bourgeon	Knospenaufbruch	Bud burst
54	Muizenoor	Oreille de souris	Mausohr	Mouse ear
55	Groene kluster	Feuilles différenciées	Grüne Spitzen	Green cluster
56	Groene knop	Bouton vert	Grüne Knospen	Green bud (Prepink or prewhite)
57	Roze (Appel) of witte knop (Peer)	Bouton rose (Pomme) ou blanc (Poire)	Rote (Apfel) oder weiße (Birne) Knospen	Pink bud (Apple) or white bud (Pear)
59	Bloemen in ballonvorm	Fleurs forment des ballons creux	Blüten im Ballon Stadium	Balloon stage
60	Eerste bloemen open	Les premières fleurs sont ouvertes	Erste Blüten offen	First flowers open
61	Begin bloei (10% van de bloemen open)	Début de la floraison (10% des fleurs ouvertes)	Beginn der Blüte (10% der Blüten offen)	Beginning of bloom (10% of flowers open)
65	Volle bloei (50% van de bloemen zijn open)	Pleine floraison (50% des fleurs sont ouvertes)	Vollblüte (50% der Blüten offen)	Full bloom (50% of flowers open)
67	Bloei loopt ten einde (meeste kroonblaadjes gevallen)	La floraison s'achève (la plupart des pétales sont tombés)	Abgehende Blüte (Mehrzahl der Blütenblätter abgefallen)	Flowers fading (majority of petals fallen)
69	Einde bloei (bloemenrui, niet bestoven bloemen vallen af)	Fin de la floraison (chûte des fleurs)	Ende der Blüte (Nachblütefruchtfall)	End of bloom (fruit fall after flowering)
71	Vruchtdikte 10 mm	Diamètre du fruit de 10 mm	Fruchtdurchmesser bis 10 mm	Fruit size up to 10 mm
72	Vruchtdikte 20 mm (hazelnootvruchtdikte)	Diamètre du fruit de 20 mm	Fruchtdurchmesser bis 20 mm (Haselnussgrösse)	Fruit size up to 20 mm
73	Begin vruchtrui	Début de la chute des fruits	Anfang Fruchtfall	Beginning of fruit fall
73	Einde vruchtrui	Fin de la chute des fruits	Ende Fruchtfall	End of fruit fall
81	Begin vruchtrijping : 1 ^{ste} ontwikkeling specifieke kleur van het ras	Début de la maturation: début coloration spécifique de la variété	Beginn der Fruchtreife : sortenspezifische Aufhellung der Grundfarbe	Beginning of ripening : 1st appearance of cultivar-specific colour
85	Gevorderde vruchtrijping met toename soort- specifieke vruchtkleur	Maturation avancée: coloration bien développée de la variété	Fortgeschrittene Fruchtreife: zunehmend sortentyp. Intensität der Deckfarbe	Advanced ripening: increase in intensity of cultivar-specific colour
87	Oogstrijpe vruchten met goede bewaarbaarheid	Début récolte : conservabilité optimale	Pflückreife: Früchte sind ausreichend entwickelt, gute Lagerfähigkeit	Harvest : Fruit ripe for picking
89	Einde oogst: optimale smaak, bewaarbaarheid beperkt	Fin de la récolte : qualité de consommation optimale	Ende Ernte -Genusreife: Früchte haben sortentypischen Geschmack	End of harvest : Fruit ripe for optimal consumption
93	Begin bladval	Début de la chute des feuilles	Anfang Blattfall	Beginning of leaf fall
97	Einde bladval	Fin de la chute des feuilles	Ende Blattfall	End of leaf fall

5.2.2. Phenological stages in apple - 2006

These observations were made by the Proefcentrum Fruitteelt in the experimental fields, located at the Fruittuinweg in Sint-Truiden (Belgium).

BBCH code	51	52	53	54	55	56	57	59	60	61	65
Cultivar											
Alkmene	28/03	30/03	04/04	11/04	16/04	20/04	25/04	26/04	27/04	02/05	04/05
Idared	27/03	28/03	30/03	04/04	15/04	20/04	25/04	27/04	28/04	02/05	03/05
James Grieve	28/03	30/03	01/04	10/04	16/04	20/04	26/04	27/04	02/05	03/05	04/05
Cox	30/03	04/04	11/04	16/04	20/04	24/04	27/04	02/05	03/05	04/05	08/05
Gloster	30/03	04/04	06/04	11/04	17/04	21/04	28/04	02/05	03/05	04/05	07/05
Elstar	30/03	04/04	10/04	14/04	19/04	21/04	28/04	02/05	04/05	05/05	06/05
Braeburn	28/03	30/03	04/04	07/04	18/04	20/04	27/04	02/05	03/05	04/05	06/05
Golden	30/03	04/04	10/04	15/04	20/04	24/04	29/04	03/05	04/05	05/05	07/05
Delbard Estival	28/03	30/03	03/04	05/04	16/04	20/04	25/04	27/04	02/05	03/05	04/05
Boskoop	27/03	31/03	03/04	10/04	16/04	21/04	26/04	27/04	03/05	04/05	05/05
Early Golden	27/03	28/03	30/03	04/04	15/04	20/04	27/04	02/05	03/05	04/05	05/05
Gala Must	28/03	30/03	04/04	06/04	16/04	20/04	27/04	02/05	03/05	04/05	06/05
Granny Smith	30/03	04/04	10/04	15/04	19/04	24/04	02/05	04/05	05/05	06/05	07/05
Pinova	27/03	30/03	04/04	12/04	18/04	21/04	27/04	01/05	02/05	03/05	05/05
Kanzy	27/03	30/03	01/04	04/04	16/04	20/04	26/04	27/04	30/04	02/05	04/05
Greenstar	30/03	01/04	04/04	14/04	17/04	21/04	02/05	03/05	04/05	05/05	06/05
Jonagold early 2002	04/02	12/02	28/02	11/03	16/03	30/03	02/04		11/04		14/04
Jonagold mean	12/03	16/03	21/03	27/03	01/04	10/04	20/04		23/04		29/04
Jonagold late '85	03/04	05/04	07/04	15/04	17/04	20/04	09/05		14/05		16/05
Jonagold 2006	28/03	31/03	05/04	11/04	17/04	21/04	27/04	02/05	04/05	05/05	06/05
BCH code											
	67	69	71	72	73	73	87	89	93	97	
Cultivar											
Alkmene	14/05	15/05	20/05	12/06	07/06	04/07	24/08	30/08	14/11	09/12	
Idared	10/05	15/05	17/05	05/06	07/06	04/07	15/10	25/10	16/11	06/12	
James Grieve	16/05	18/05	20/05	05/06	07/06	04/07	18/08	30/08	16/11	06/12	
Cox	15/05	18/05	25/05	14/06	26/06	10/07	15/09	20/09	12/11	09/12	
Gloster	14/05	16/05	28/05	15/06	26/06	12/07	15/10	25/10	17/11	16/12	
Elstar	15/05	18/05	23/05	14/06	26/06	12/07	04/09	15/09	16/11	09/12	
Braeburn	14/05	17/05	22/05	14/06	22/06	07/07	20/10	31/10	16/11	09/12	
Golden	16/05	18/05	30/05	15/06	23/06	10/07	25/09	05/10	12/11	09/12	
Delbard Estival	13/05	15/05	22/05	06/06	26/06	05/07	21/08	30/08	12/11	06/12	
Boskoop	17/05	18/05	22/05	05/06	07/06	04/07	22/09	30/09	14/11	09/12	
Early Golden	12/05	16/05	21/05	12/06	06/06	04/07	21/08	31/08	14/11	04/12	
Gala Must	11/05	15/05	25/05	14/06	06/06	04/07	08/09	15/09	14/11	09/12	
Granny Smith	17/05	27/05	28/05	22/06	26/06	12/07	25/10	31/10	17/11	18/12	
Pinova	13/05	15/05	24/05	05/06	07/06	10/07	30/09	10/10	14/11	09/12	
Kanzy	11/05	16/05	21/05	13/06	07/06	05/07	29/09	13/10	14/11	09/12	
Greenstar	12/05	16/05	23/05	14/06	26/06	10/07	13/10	20/10	17/11	12/12	
Jonagold early 2002	30/04	03/05	15/05		30/05	21/06					
Jonagold mean	12/05	14/05	21/05		31/05	24/06					
Jonagold late '85	24/05	26/05	28/05		03/06	04/07					
Jonagold 2006	15/05	17/05	23/05	16/06	23/06	10/07	25/09	12/10	14/11	16/12	

5.3. PEST SITUATION 2006

A short overview of the development of major pome fruit pests in 2006 is given to indicate specific patterns for this growth season in comparison with the averages of previous years. All observations were made by pcfruit.

5.3.1. *Psylla pyri*

Psylla pyri, the pear sucker, is the most important pest in pear. *Psylla pyri* over-winters as adults and mating takes place as soon as the adults regain activity, when the average temperature reaches at least 10 °C for two successive days. The mean date for the start of activity is February 7th, soon followed by egg laying. Eggs are 0.3 mm long and initially white, but turn to yellow and then orange as they age. At about the 3rd of April, the first larval stages emerge in the field. Larvae are orange-red to brown-black, and over time become less mobile and secrete more honeydew. Larvae develop through 5 instars into a winged imago stage. This cycle is repeated several times per year, resulting in 3 to 4 successive generations. Temperature has a large effect on the development rate. At an average temperature of 10 °C, it takes almost 100 days to complete its life cycle. At an average temperature of 23 °C, development takes only a month.

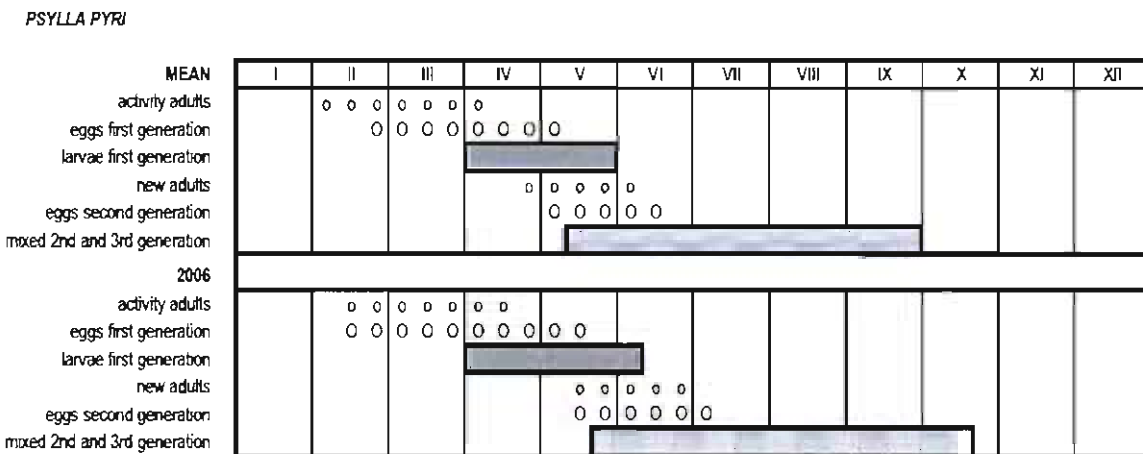


Figure 1. First and second generation of *Psylla pyri*. Mean observation dates (1963-2006) for the different development stages, compared with observation dates in 2006.

When *Psylla pyri* becomes active in spring, they first feed on flowers and young leaves. In summer they mainly feed on new shoots. Direct feeding damage such as growth inhibition and leaf malformation are less important than the secondary damage caused by secreted honeydew which stains the fruit and branches black. In addition they transmit viruses and weaken next season's flower buds. Only the fall generation has an important effect by weakening next year's flower buds.

In 2006, *Psylla pyri* activity started one week later than average, on the 14th of February. However, the first eggs were present on the 18th of February, one week earlier than mean. The first new larvae were present at April 8th (a few days later than average) and the first new adults were only found the 10th of May, two weeks later than mean. First summer-eggs were found on 15/5 and

larvae of the 2nd *Psylla pyri* instar were observed around the 30th of May. Due to the lower temperatures end of May, the life cycle development was relatively slow and both egg-laying and egg-hatching period were delayed and expanded. The first L3-larvae and the first *Anthracorhis nemoralis* larvae were found around 14/6. In July, the mixed summer population caused together with the high temperatures and the lack of rain high infestation with lots of honeydew and black branches and fruits. In contrast, only few *Psylla* were found during the wet August. The fall generation of *Psylla* was less severe than in 2005.

5.3.2. *Cydia pomonella*

Cydia pomonella, the codling moth, is a pest that causes considerable losses, especially in apple production but also in pear. Damage to the fruit is caused by the larval stage (caterpillar). Adult moths occur from the end of April until late-August and even late September if temperature remains high (night temperature above 15° C).

The codling moth over-winters as a mature larva in a silken cocoon. Over-wintered larvae pupate inside their cocoon the following spring and adult moths start emerging from the cocoon around May 17th. Female moths start laying eggs 3 to 6 days after emerging, if the temperature is at least 18° C. First eggs are usually found around the 2nd of June. After 5 to 20 days, mean June 16th (depending on climatic conditions), a caterpillar hatches from its egg and moves from the leaf to penetrate a fruit. The mean date when top flights take place is June 23rd. One caterpillar can damage several fruits. After feeding inside the fruit for about 3 weeks, caterpillars leave the fruit and find a place for cocooning (fissures on trunk or branch, fence posts). Larvae either pupate and emerge (2 or 3 weeks after cocoon formation; 2nd generation) or enter diapause in their cocoon until next spring (over-wintering, no pupation). The second generation starts at mean the 13th of August and continues till mean the 1st of September.

In 2006, flights started on the 8th of May, 9 days earlier than mean. Because of the cold and rainy weather in May, in that period, less moths were caught in the traps and conditions for mating were rather bad. First eggs were observed on the 29th of May and hatching started at the 6th of June. Top flights started around June 12th, and lasted throughout the second decade of June, when the first heat wave of 2006 took place. The end of flights, or the end of a second generation that started around August 3rd, was situated at the end of September. In some orchards, due to the higher temperatures, *Cydia pomonella* males were caught till half October.

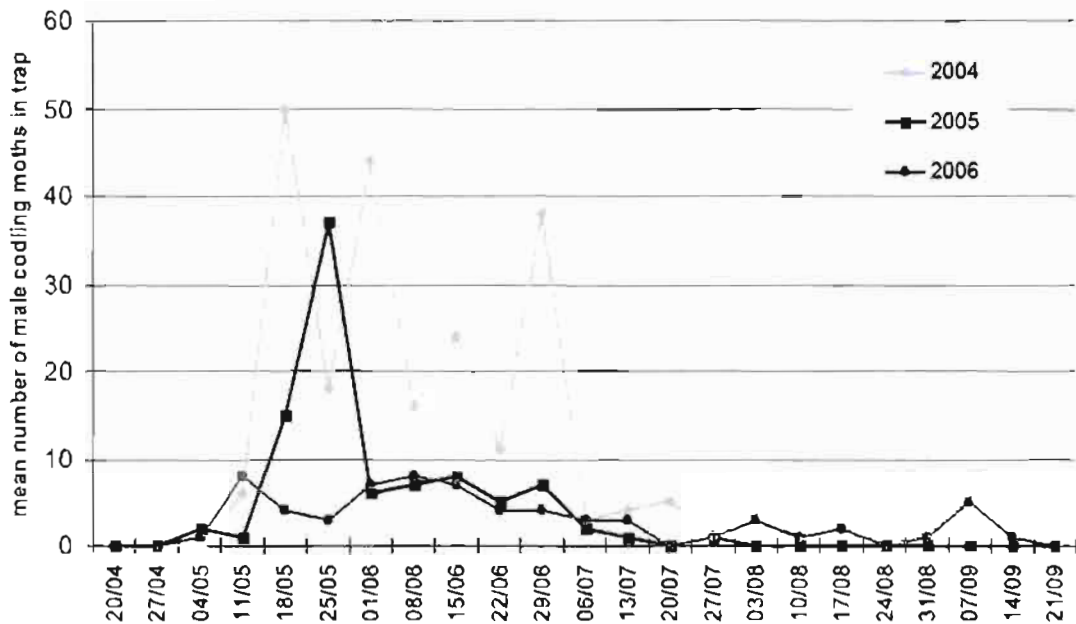


Figure 2. Flight pattern of *Cydia pomonella*. Observation dates of 2004, 2005 and 2006 in an old apple orchard with untreated high-stem trees. The plotted data are the sum of the catches per week.

5.3.3. *Dysaphis plantaginea*

Dysaphis plantaginea, the rosy apple aphid, over-winters as eggs. In the fall, females deposit eggs on bark, especially at the base of the buds. Eggs begin to darken, and after one to two weeks, they become shiny black and are impossible to differentiate from those of green apple aphid and apple grain aphid. In the spring, eggs hatch for two-week period, starting at a mean date of March 26th. Aphid nymphs feed on the outside of leaf and expanding buds until leaves unfold. They undergo five moults until they mature into wingless adult females that give birth to live young without being fertilised by males. These female aphids, the fundatrices, are present at a mean date of April 1st and produce about 70 virginoparae female aphids. This second generation matures and produces live young two or three weeks after petal fall. By mid-July a third generation will develop. Some of the aphids will remain on apple trees all summer while others develop wings and migrate to other hosts such as narrow-leaf and broadleaf plantain. Several more generations develop on summer hosts until fall, when winged females return to the apple trees and produce live female young. These females develop on apple, mate with males, and deposit eggs that will over-winter to the following spring.

DYSAPHIS PLANTAGINEA

MEAN	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
winter egg	o o o	o o o	o o o o	o								
larvae			o o o									
foundresses												
colonies					o o	o o o	o o o o	o o o o				
2006												
winter egg	o o o	o o o	o o o o	o o o								
larvae				o o o								
foundresses												
colonies					o o	o o o	o o o o	o o o o				

Figure 3. Life cycle of *Dysaphis plantaginea*. Mean observation dates for the different development stages, compared with observation dates in 2006

In 2006, the activity of the rosy apple aphid started later than mean. Eggs hatched from the 18th of April on and foundress aphids were observed first on the 24th of April. Half May, curled leaves and first colonies were observed and around the 7th June, migrating larvae to new shoots were observed.

5.3.4. *Panonychus ulmi*

Panonychus ulmi, the red spider mite, over-winter as eggs laid on the bark of trees or smaller branches and spurs. Eggs start to hatch at a mean date of April 20th till about May 25th, depending on weather conditions. After hatching, larvae move to the underside of the leaves and begin feeding. They reach maturity in approximately three weeks after undergoing three moults. After the first moult, protonymphs are found at a mean date of the 22nd of April. Deuteronymphs, after a second moult are found at about the 4th of May. Males, emerging from unfertilised eggs, and females from fertilised eggs, are found respectively on May 9th and 13th. The male and female mate and summer eggs, laid around the 10th of May, hatch around May 23rd. Photoperiod, temperature and nutritional status of the female govern egg type and the number of generations, varying with at least 4 to up to 6, extremely 8 per year.

In 2006, the development of the red spider mite started earlier than in the mean observations of the past 40 years. The hatching of the winter eggs started ten days earlier than the mean, on 11th of April. On May 10th, 1 week earlier than mean, 100 % hatching was reached and first summer eggs were laid. Hatching of the summer eggs started on the mean date May 23rd. The high temperatures of June and July caused spider mite problems in apple and pear orchards in 2006.

PANONYCHUS ULMI

MEAN	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
winter egg	o o o	o o o	o o o	o o o	o o							
larvae				o o	o o o	o o						
adults												
summer eggs					o o	o o o o	o					
summer larvae					o o	o o o o	o o	... 4 to 6 following generations				
2006												
winter egg	o o o	o o o	o o o	o o o	o							
larvae				o o o	o o o o							
adults												
summer eggs					o o o	o o o o	o					
summer larvae					o o	o o o o	o o	... 4 to 6 following generations				

Figure 4. Life cycle of Panonychus ulmi. Mean observation dates of different development stages from 1949-2006.

5.3.5. General note

Winter 2005-2006 was relatively mild. Though, in January, the mean minimum temperature was -1.8 °C, while the mean for the past 30 years was -1.0 °C. Especially the last decade of January was cold, with a mean minimum and maximum temperature of respectively -3.7 and 2.8 °C. February was wet. In combination with the low temperatures at the beginning and the end of February and the first two decades of March, this caused a delay in insect phenology. In 2006, from April on, the mean maximum and minimum month-temperatures were higher than mean for the past 30 years, suddenly advancing insect phenology. An extraordinary shift in minimum and maximum temperatures affected insects depending on day-degree development. In January, both the mean minimum and maximum were below average. In February and March the mean maximum was lower and the mean minimum was higher than the mean temperatures of the last 30 years. Activities of pest species in early spring (e.g. *Psylla pyri*) started later than mean, but later on, during the spring, the difference between the life cycles of 2006 and the mean of the previous years disappeared.

6. METHODOLOGY

6.1. STANDARD OPERATING PROCEDURE : MICROPLOT TRIAL APPLE

6.1.1. Trial plot

The trial design is set up as a randomised block in 4 replicates. In each block the different objects are mixed in an aselect way. The number of degrees of freedom is minimum 12. To correspond to this requirement the number of experimental objects is minimum 5: the number of degrees of freedom corresponds to total (20-1=19) – experimental objects (5-1=4) – blocks (4-1=3) and so it amounts to 19-4-3=12.

6.1.2. Experimental design

The trial is carried out in a one row system. The number of trees in a trial is the same for each plot and the number of trees in a plot depends on the pest. Within each plot the first and last tree are treated but not assessed. The untreated plots are positioned at random in the trial.

6.1.3. Experimental objects

The number of experimental objects is minimum 5. The choice and number of reference compounds depend on the pest and the objective (specific SOP).

6.1.4. Plot identification

The plots are identified separately by means of a yellow wooden label. The plot name is written on it by a pencil and consists of a letter-number combination: the letter identifies the block or replicate and the number the object. The labels are hung on a branch of the first tree of each plot.

The plots are identified separately by means of a white label. The plot name is written on it by an indelible felt-tip and consists of a letter-number combination: the letter identifies the block or replicate and the number the object. The labels are fixed in front of the first plant of each plot.

6.1.5. Water volume and dose

The applied dose of a product is calculated in function of the leaf wall area (LWA), which means:

$$\boxed{\text{number of trees} \times \text{distance within the row} \times \text{tree height} \times 2 \text{ sides}}$$

In a standard orchard (SO) with trees planted in 1 row at 3.5 m between the rows, 1.5 m tree distance within the row and a tree height of 3 m, the number of trees is 1714 with a headland space of 10 %. The LWA is: $1714 \times 1.5 \text{ m} \times 3 \text{ m} \times 2 = 15426 \text{ m}^2$.

Like the amount of the spraying compound, the volume of water used is calculated according to the LWA. To spray 1 m² of LWA, 0.1 l of water is used which corresponds with a water volume of 1000

l/ha LWA or 1500 l/ha SO. In this way, the spraying is executed 'till run off', the moment after which the water starts dripping off the tree.

Two exceptions exist to this rule. First, in the preflowering period, the calculated volume of water used is divided by 3 compared to the postflowering period. During flowering the calculated volume of water is divided by 2 compared to the postflowering period. However, in both cases the amount of formulated product per ha LWA or SO is unchanged and is hence always based on a theoretical volume of water of 1000 l per ha LWA or 1500 l per ha SO.

6.1.6. Trials protocol

For each trial a specific file name is made in an Excel spreadsheet. This contains several work pages, each page having a unique name: the trial protocol and a series of work pages in function of the assessments. The trial protocol mentions the objective of the trial, the location, the variety, the rootstock, the varieties of the pollinator(s), the age, the plant distance and the tree height. The LWA and the amount of water per plot are calculated in function of the number of trees. For each experimental object a calculation is made of the quantity of product that must be sprayed on the 4 replicates.

6.1.7. Test products

The formulated products (WP, WG, DC, SL, SP, OD, SC, EC and EW) are weighed according to the instructions in the technical work manual. For liquid formulations the specific density is considered to determine the corresponding volume. The products are weighed in polystyrene pots with 200 ml contents which are closed by means of a "snap cap" cover. On each pot the internal pcfruit code of the product is written, the quantity of product to be weighed, the four plots to be treated and the amount of water to be sprayed. The product is weighed for the 4 plots together, but each replicate is applied separately on the trees.

For each trial these pots are stored and transported in a stackable perforated Euronorm tray (L 600 x W 400 x H 118) with subdivisions and with a click cover.

6.1.8. Spraying liquid

In the field, the product, weighed for the 4 repetitions, is suspended in a beaker (5 l contents) in which a quantity of water of 4 litre has been carefully measured. After the spraying liquid has been stirred well it is divided over 4 beakers (1.5 l contents) in 4 equal parts of 1 litre. This is done on a horizontally adjusted table. A marking line has been drawn over the whole outline of the beakers to indicate the 1 litre contents. Later the beakers are poured in buckets and these are further filled with the quantity of water measured per plot.

Each bucket is supplied with a yellow wooden label on which the plot name is written. This label is attached to the first tree of the treated plot.

6.1.9. Treatment

The time and the number of treatments depend on the objective of the trial, the climatological conditions (SOP pest/beneficial organisms and trial protocol).

6.1.10. Sprayer type

6.1.11. Sprayer type

A knapsack sprayer, type Stihl, model SR 400, contents 14 l, was used.

6.1.11.1 Average nozzle output

Total output 2.9 l/min.

6.1.11.2 Sprayer pressure

Air output: 590 m³/h

Air speed: 95 m/s

Rotations: 7700 rpm

6.1.11.3 Equipment cleaning and maintenance

After treatment the remaining content of the tank was measured and discarded. The equipment was cleaned by using clear water and letting the sprayers blow till emptiness. This was done every time, before and after each treatment.

6.1.11.4 Application information

With this type of mist blower the air is used as an extra means of transport to spread the product. A motorized paddle wheel generates a strongly concentrated airflow with which the solution is mixed via a dosage system (from 1 to 6). The dose stand used for spraying in the trials is 6. The solution is atomized to very fine drops (ca. 50 to 250 µm) and is blown out by the airflow at high speed. Special attention goes to the spraying technique in order to divide the spraying liquid as homogeneously as possible over the trees. To neutralize the individual differences between the spraying technicians, as many different persons as possible treat the 4 replicates within one experimental object. After each spraying of a plot the mist blower is rinsed with clear water and blown till emptiness at full speed. Also the buckets and beakers are rinsed in between the preparing of the different products. After each trial the different recipients used are washed by means of a brush.

6.1.12. Practical treatments

The other treatments in the experimental plot are carried out and registered uniformly and according to GAP (Good Agriculture Practice).

6.1.13. Observations

The method and the time of evaluation of the effects and side effects of products are determined on the base of the SOP's drawn up for insecticides and acaricides.

The observations always include a search for symptoms of phytotoxicity, carried out mostly by several people (2-3 different persons). This phytotoxicity can be visible as a leaf burning, a reduction in leaf area or changes in leaf position.

6.1.14. Results

The raw data are written on the documents made for this purpose and put in the several work pages of the Excel work file under the specific file name of the trial. The processing of the data is carried out for each plot separately. The validation of the trial results depends on the untreated object and/or the fact whether significant differences have been calculated between the objects. The final data (number of aphids, infestation degree, average fruit weight,...) are processed by means of the statistical software program Unistat. This program is compatible with the spreadsheet program MS Excel and makes work pages with the statistical processing in the original file name of the trial. In doing so the trial set up as well as the raw data, the processing of the spreadsheet and the statistical processing are gathered under one and the same filename.

6.1.15. Harvest destruction

The harvest in plots treated with non registered test products is destroyed, except:

- if treatment is done after harvest
- if there is a Ministerial decision based on the available information and on the advice of the Committee for registration

6.1.16. References

General guidelines

Guideline for the Efficacy Evaluation of Plant Protection Products, PP/1/152(2).
Design and analysis of efficacy evaluation trials (First approved in 1989/Revision approved in 1998).
EPPO Standards Volume 1 Introduction, General & Miscellaneous Guidelines, New & Revised Guidelines (1999), 37-51.

Guideline for the Efficacy Evaluation of Plant Protection Products, PP/1/181(2).

Conduct and Reporting of efficacy evaluation trials. (First approved in 1992/Revision approved in 1996).
EPPO Standards Volume 1 Introduction, General & Miscellaneous Guidelines, New & Revised Guidelines (1999), 52-58.

Guideline for the Efficacy Evaluation of Plant Protection Products, PP/1/135(2).
Phytotoxicity assessment. (First approved in 1987/Revision approved in 1997).
EPPO Standards Volume 1 Introduction, General & Miscellaneous Guidelines, New & Revised Guidelines (1999), 31-36.

Compendium of Growth Stage Identification Keys for Mono- and Dicotyledonous Plants. Extended BBCH scale. Compiled by Reinhold Stauss, Basel.
Fruits, *Meier et al.*, (1994),

Guideline on Good Plant Protection Practice, PP 2/18(1).
Pome fruits (First approved in 1999).
Bulletin OEPP/EPPO Bulletin (1999), 29: 379-406.

Guideline for the Efficacy Evaluation of Plant Protection Products, PP/1/214(1).
Principles of Acceptable Efficacy.
Bulletin OEPP/EPPO Bulletin (2001), 31 331-336.

Dose expression of plant protection products. EPPO Standards – Efficacy evaluation of plant protection products – No. PP 1/239(1). European and Mediterranean Plant Protection Organization. Bulletin OEPP / EPPO Bulletin (2005) 35(3): 563-566

Specific guidelines

Guideline for the Efficacy Evaluation of Plant Protection Products, PP/1/7(3).
Efficacy evaluation of Insecticides and Acaricides
EPPO Guideline ‘*Cydia pomonella*’
EPPO Standards PP1 2nd edition. Volume 3 (2004), p 4.

6.2. TEST METHODS AND ASSESSMENTS: PESTS

6.2.1. Cydia pomonella (L.) the codling moth

Guideline: EPPO Guideline “*Cydia pomonella*”: EPPO Standards PP1 (2004). 2nd Ed. Vol 3. Efficacy Evaluation of Insecticides and acaricides. PP1/7(3): p4-6

Timing of application: Depending on the mode of action of the test compound, treatments are started if a certain developmental stage of the pest is reached.

Flights are followed up at the trial site by pheromone traps. Depending on the remanence of the test compound, treatments are repeated as long as flights continue or resume.

Assessment:

- Fruits that have fallen under the monitor trees are collected and the number of infested fruits is registered.
- 300 fruits, spread all over the monitor trees (height/direction), are observed and sampled for infestation.
- A distinction was made in infested fruits between stings or superficial feeding damage where no larva entered the fruit and entries where a larva entered the fruit, causing deeper wounds

6.2.2. Phytotoxicity

Guideline : Guideline for the Efficacy Evaluation of Plant Protection Products: “Phytotoxicity assessment (2004)” PP/1/135(2). EPPO Standards Vol. 1 : p 31-36

Assessment : For each plot, a classification of phytotoxicity was given per side of the row.
0 = no phytotoxicity, 1 = few necrotic spots, 2 = moderate number of spots

6.3. FORMULAS AND CLASSIFICATIONS

6.3.1. Abbott formula

The efficacy (Abbott value) was calculated according to the formula Abbott.

$$\text{Abbott formula: Efficacy} = \frac{C - T}{C} \times 100$$

C = average degree of infection in the untreated object

T = average degree of infection in the treated object

The response of beneficials to the test products is also expressed as an Abbott value with:

C = average degree of the beneficial population in the untreated object

T = average degree of the beneficial population in the treated object

6.3.2. Statistical analyses

All statistical analyses are performed using the Unistat Statistical Package, version 5.5 (Unistat Ltd. 1998, London, England).

A completely randomised block design is standard used for the statistical analysis. Prior to the analysis of variance, the homogeneity of variances is checked with Bartlett's Chi-Square and Bartlett-Box F-test.

Transformations of data are used to normalise distributions and to stabilise the variances in the different objects of the trial design. Logarithmic transformation ($\log(1+X)$) is mainly applied for infection rates of pathogens. Square root transformation ($\sqrt{0.5+X}$) is used when data involve counts or frequencies. Arcsine transformation ($\arcsin(X)$) or Arcsine transformations of the square root ($\arcsin(\sqrt{X})$) are sometimes performed if data consist of percentages from 0 to 100 % or proportions from 0 to 1.

The original or transformed data are analysed with the GLM (General Linear Model) procedure with different outputs options (Anova, Table of means, Plot of residuals, Multiple comparisons). Treatment means are standard separated by Duncan's multiple range test (5% level).

If transformation has failed to become a normal distribution or equality of variances, the non-parametric randomised block test of Friedman (two-way Anova) was conducted, in which the original data are ranked within each block. Multiple comparisons between treatments are based on ranking sums and differences are determined by t-distribution (Honestly Significant Difference).

References: Zar J.H. 1999. Biostatistical analysis. Fourth Edition. Prentice-Hall, Upper Saddle River, New Jersey. 663 pp. plus Appendices. ISBN: 0-13-081542-X.

Unistat 5.5. Statistical Package for Windows. User's Guide, 930 pp. Version 5.5 November 2002. Unistat House, Shirland Mews, 4, London W9 3DY, England.

7. TRIAL INFORMATION

FIELD EXPERIMENT : 06ZCYDIPOGOLDMELVGEP-30

7.1. Purpose

Control of *Cydia pomonella* (L.), the codling moth, in apple.

7.2. Trial and report status

- Trial execution according to the regulations of Good Experimental Practice: YES
- Trial report according to the regulations of Good Experimental Practice: YES
- Original data file: 06ZCYDIPOGOLDMELVGEP-30-v1.xls

7.3. Geographical location of the experiment

Melveren, Belgium

7.4. Plot information

<u>Crop spacing</u> :	3.25 x 1.25 m
<u>Row system</u> :	1 row
<u>Number of trees</u> :	7
<u>Tree height</u> :	2.5 m
<u>Crown width</u> :	1.6 m
<u>Leaf wall area</u> :	43.75 m ²
<u>Replicates</u> :	4

7.5. Crop identification

<u>Type of crop</u> :	Apple
<u>Variety</u> :	Golden
<u>Rootstock</u> :	EM9
<u>Year of planting</u> :	1997
<u>Type of pollinator</u> :	Granny Smith
<u>Number of pollinators (%)</u> :	8

7.6. Dates of application, weather conditions, phenological stage and pest stage

Ref.	Date	Temperature (° C)	Relative humidity (%)	Sunshine (h min)	Phenological stage (BBCH)	Pest stage
A	07/06/06	15	66	1h45	73	flights
B	15/06/06	12	92	0h00	73	flights
C	22/06/06	15	71	4h00	73	flights
D	29/06/06	14	76	13h15	73	flights
E	06/07/06	20	81	7h30	73	flights
F	13/07/06	16	84	12h30	73	flights
G	20/07/06	22	68	12h00	81	flights
H	27/07/06	22	70	1h35	81	flights

7.7. Test substances and doses

Ref.	Product	Active ingredient	Formulation		Dose (%)	Active ingredient	
						g/ha leaf wall	g/ha standard orchard
ACEG			240	SC	0.035	84.0	126.0
ABCDEFGH			6.7E12 gv/l	SC	0.100	6.7E12 gv	10.1E12 gv
ABCDEFGH			10 g/l (3E13 gv/l)	SC	0.005	0.45 (1.4E12 gv)	0.675 (2.0E12 gv)
ABCDEFGH			10 g/l (3E13 gv/l)	SC	0.007	0.675 (2.0E12 gv)	1.01 (3.0E12 gv)
ABCDEFGH			10 g/l (3E13 gv/l)	SC	0.009	0.9 (2.7E12 gv)	1.35 (4.0E12 gv)
ABCDEFGH			10 g/l (3E13 gv/l)	SC	0.007	0.675 (2.0E12 gv)	1.01 (3.0E12 gv)
	+ sugar				0.133	1330.0	1995.0
ABCDEFGH			10 g/l (3E13 gv/l)	SC	0.007	0.675 (2.0E12 gv)	1.01 (3.0E12 gv)
	+ milk powder				0.250	2500.0	3750.0
ABCDEFGH			10 g/l (3E13 gv/l)	SC	0.007	0.675 (2.0E12 gv)	1.01 (3.0E12 gv)
	+ milk powder				0.250	2500.0	3750.0
ACEG		-	50	SC	0.100	50.0	75.0

Continued

Ref.	Product	Active ingredient	Formulation		Dose (%)	Active ingredient	
						g/ha leaf wall	g/ha standard orchard
ACEG	██████████	-	50	SC	0.133	66.7	100.0
ACEG	██████████	-	50	SC	0.167	83.3	125.0

The objects were treated with a water volume of 1000 l/ha LWA or 1500 l/ha SO. Powdered skim milk and sugar were respectively added to provide some protection to UV rays in sunlight and as a feeding stimulant.

7.8. Other treatments in trial 06ZCYDIPOGOLDMELVGEP-30

Date	Formulated Product	Active ingredient	Target pests/diseases/fertilizers	kg or l/ha
02/04/06	Copper hydroxid	copper	bacteria, scab	3.50 kg
10/04/06	Dodex	dodine	scab	2 l
17/04/06	Captan 80 WG	captan	scab	1.50 kg
	Scala	pyrimethanil	scab	0.75 l
	Urea	nitrogen	nutrient	2.5 kg
21/04/06	Sevin	carbaryl	apple blossom weevil	1.50 l
	Captan 80 WG	captan	scab	1.50 kg
27/04/06	Captan 80 WG	captan	scab	1.50 kg
	Confidor	imidacloprid	aphids	0.35 l
	Topaz	penconazole	powdery mildew	0.25 l
08/05/06	Hermosan	thiram	scab	1.50 kg
	Scala	pyrimethanil	scab	0.75 l
	Urea	nitrogen	nutrient	2.5 kg
	Solubor	boron	nutrient	1.5 l
	Topaz	penconazole	powdery mildew	0.25 l
16/05/06	Captan 80 WG	captan	scab	2.25 kg
	Exact	triadimenol	powdery mildew	0.75 l
	Scala	pyrimethanil	scab	0.75 l
23/05/06	Hermosan	thiram	scab	1.50 kg
	Topaz	penconazole	powdery mildew	0.25 l
	Magnesium nitrate	Mg(NO ₃) ₂	nutrient	5 kg
	Solubor	boron	nutrient	1.5 l
	Toptrace	Manganese	nutrient	0.50 l

Continued

Date	Formulated Product	Active ingredient	Target pests/diseases/fertilizers	kg or l/ha
02/06/06	Captan 80 WG Geyser Magnesium nitrate Toptrace	captan difenoconazol Mg(NO ₃) ₂ Manganese	scab scab, powdery mildew nutrient nutrient	2.25 kg 0.15 l 5 kg 0.50 l
12/06/06	Captan 80 WG Exact	captan triadimenol	scab powdery mildew	2.25 kg 0.75 l
22/06/06	Captan 80 WG Exact Magnesium nitrate Toptrace	captan triadimenol Mg(NO ₃) ₂ Manganese	scab powdery mildew nutrient nutrient	2.25 kg 0.75 l 5 kg 0.50 l
30/06/06	Captan 80 WG Bladaspor Toptrace	captan NPK Manganese	scab nutrient nutrient	2.25 kg 3 kg 0.50 l
10/07/06	Captan 80 WG Exact	captan triadimenol	scab powdery mildew	2.25 kg 0.75 l
19/07/06	Captan 80 WG	captan	scab	2.25 kg

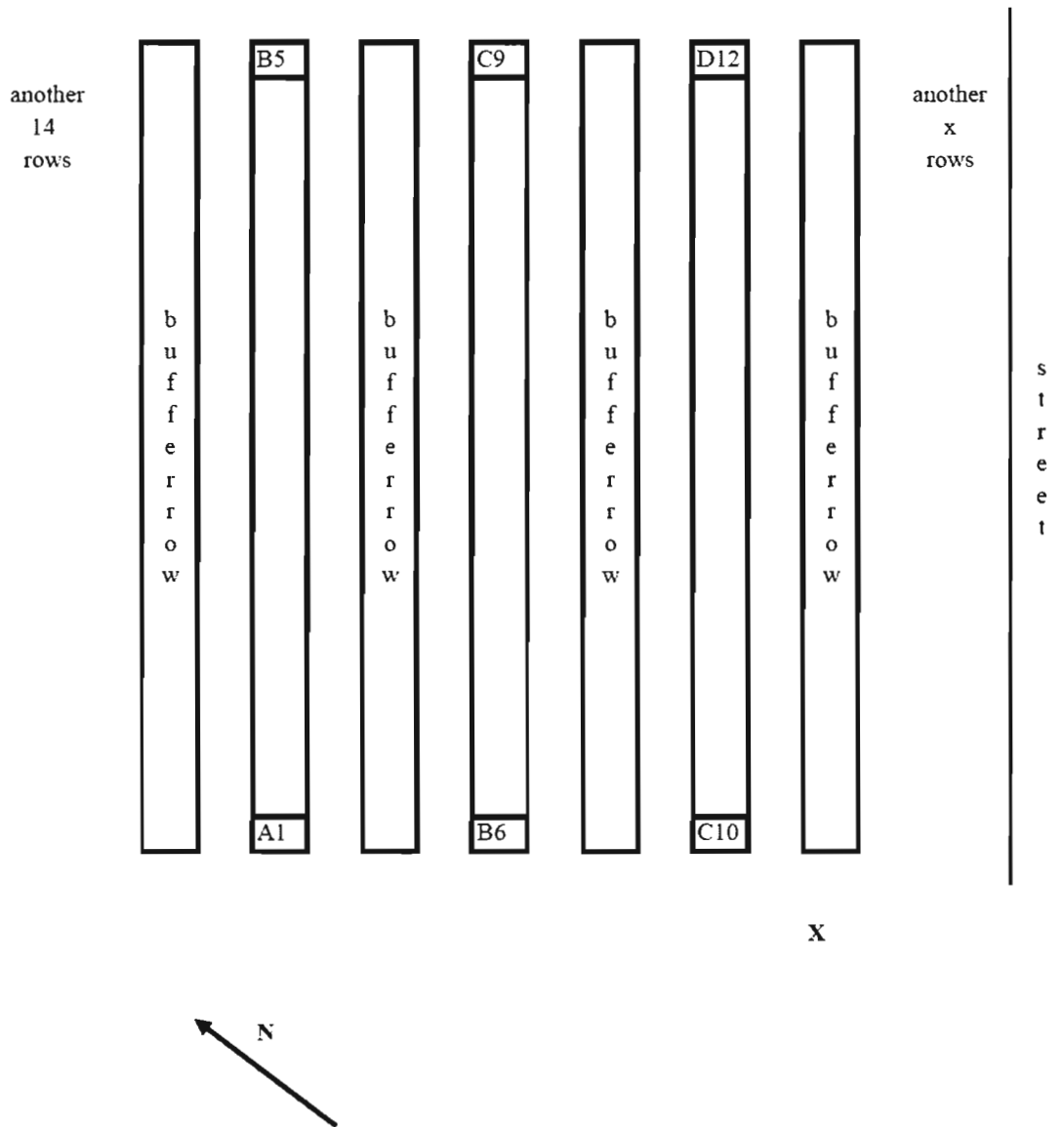
7.9. Trial design

Trial: 06ZCYDIPOJONAMELVGEP-30

Location: Hoebrechts

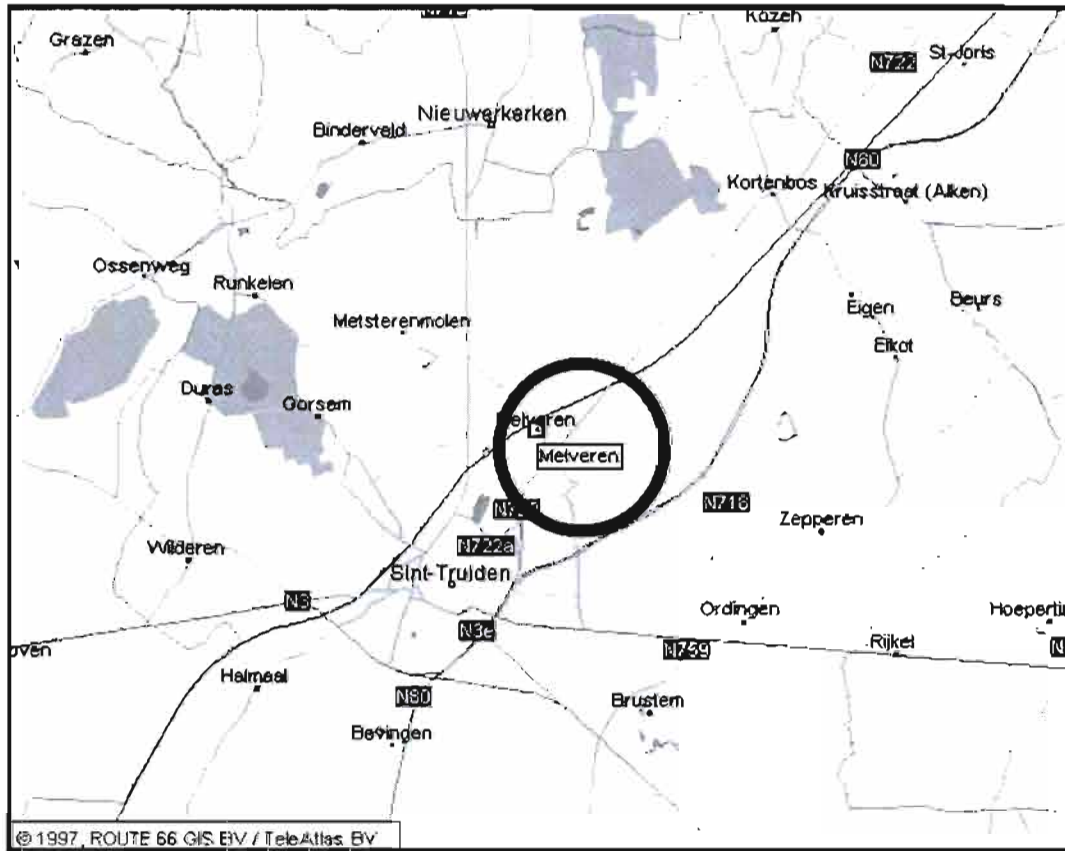
Address: Hasseltsesteenweg, Melveren, Belgium

Legend: Letter-number combinations: plot addresses
...: plots situated in between
N: North
X: Access (road) to the parcel



Check		: A5, B11, C7, D3
	0.035 % or 84 g a.i./ha LWA	: A12, B10, C8, D5
	0.100 % or 6.7E12 GV/ha LWA	: A9, B4, C12, D1
	10g/l GV, 0.005 % or 1.4E12 GV/ha LWA	: A2, B5, C4, D12
	10g/l GV, 0.007 % or 2.0E12 GV/ha LWA	: A6, B1, C6, D11
	10g/l GV, 0.009 % or 2.7E12 GV/ha LWA	: A4, B2, C10, D6
	10g/l GV, 0.007 % or 2.0E12 GV/ha LWA + sugar	: A1, B6, C9, D8
	10g/l GV, 0.007 % or 2.0E12 GV/ha LWA + milk powder	: A10, B8, C5, D2
	10 SC, 0.007 % or E12 GV/ha LWA + milk powder	: A7, B12, C2, D9
	50 SC, 0.100 % or 50.0 g a.i./ha LWA	: A3, B7, C1, D4
	50 SC, 0.133 % or 66.7 g a.i./ha LWA	: A8, B3, C11, D10
	50 SC, 0.167 % or 83.3 g a.i./ha LWA	: A11, B9, C3, D7

7.10. Orientation of the trial



7.11. Results

Table : Percentage of codling moth infested fruits on the tree (on 300 fruits or on total number of fruits per plot)

Observation date : 31/07/06

Product	Formulation		Dose (%)	Plot Value	Object Mean	Object SD	Duncan	Abbott Mean
Check				6.77 7.76 13.66 5.00	8.3	3.8	a	
Treated at 14 d I at dates ACEG								
██████████	240	SC	0.035	0.52 0.91 2.56 1.57	1.4	0.9	b	83.2
Treated at 7 d I at dates ABCDEFGH								
██████████	6.7E12 GV/l	SC	0.100	0.00 2.50 0.00 0.43	0.7	1.2	b	91.2
██████████	10 g/l (3E13 GV/l)	SC	0.005	0.33 0.00 1.49 0.43	0.6	0.6	b	93.2
██████████	10 g/l (3E13 GV/l)	SC	0.007	0.50 0.69 2.27 0.00	0.9	1.0	b	89.6
██████████	10 g/l (3E13 GV/l)	SC	0.009	1.66 1.43 0.33 0.90	1.1	0.6	b	87.0
██████████ + sugar	10 g/l (3E13 GV/l)	SC	0.007 0.133	4.98 0.67 2.14 0.00	1.9	2.2	b	76.5

Continued

Product	Formulation	Dose (%)	Plot Value	Object Mean	Object SD	Duncan	Abbott Mean
[REDACTED] + milk powder	10 g/l (3E13 GV/l) SC	0.007 0.250	2.75	1.6	1.4	b	80.6
			0.94				
			2.76				
			0.00				
[REDACTED] + milk powder	10 g/l (3E13 GV/l) SC	0.007 0.250	1.08	1.3	0.8	b	84.4
			2.38				
			0.43				
			1.28				
Treated at 14 d I at dates ACEG							
[REDACTED]	50 SC	0.100	1.78	1.9	1.7	b	77.7
			1.42				
			4.21				
			0.00				
[REDACTED]	50 SC	0.133	2.73	1.5	1.1	b	82.5
			0.00				
			1.54				
			1.54				
[REDACTED]	50 SC	0.167	3.59	2.1	1.2	b	75.1
			1.20				
			2.33				
			1.13				

Analysis of variance (GLM)**ANOVA**

Dependent Variable: arcsin(sqrt(Date 31/07/2006. Percentage of Codling Moth infested fruits on the tree (on 300 fruits or on total number of fruits per plot))

Due To	Sum of Squares	DoF	Mean Square	F-Stat	Signif
Constant	0.639	1	0.639	5.470	0.7400
Object	0.154	11	0.014	3.966	0.0010
Block	0.032	3	0.011	2.993	0.0448
Explained	0.186	14	0.013	3.758	0.0009
Error	0.117	33	0.004		
Total	0.303	47	0.006		

No infested fruits were found on the ground in the trial plots on the 31st of June 2006.

Table : Percentage of codling moth infested fruits on the ground (on total number of fallen fruits per plot)

Observation date : 08/08/06

Product	Formulation		Dose (%)	Plot Value	Object Mean	Object SD	
Check				0.00 100.00 33.33 -	44.4	50.9	n.s.
Treated at 14 d I at dates ACEG							
	240	SC	0.035	0.00 - 25.00 -	12.5	17.7	n.s.
Treated at 7 d I at dates ABCDEFGH							
	6.7E12 GV/l	SC	0.100	0.00 - - -	0.0		n.s.
	10 g/l (3E13 GV/l)	SC	0.005	0.00 - 0.00 -	0.0	0.0	n.s.
	10 g/l (3E13 GV/l)	SC	0.007	0.00 - - -	0.0		n.s.
	10 g/l (3E13 GV/l)	SC	0.009	100.00 - 0.00 50.00	50.0	50.0	n.s.
	10 g/l (3E13 GV/l)	SC	0.007	0.00 - 0.00 -	0.0	0.0	n.s.
+ sugar			0.133	- 0.00 -			

Continued

Product	Formulation	Dose (%)	Plot Value	Object Mean	Object SD		
[REDACTED] + milk powder	10 g/l (3E13 GV/l) SC	0.007	50.00	33.3	28.9	n.s.	
			0.250				50.00
			0.00				-
			-				-
[REDACTED] + milk powder	10 g/l (3E13 GV/l) SC	0.007	-			n.s.	
			0.250				-
			-				-
			-				-
Treated at 14 d I at dates ACEG							
[REDACTED]	50 SC	0.100	100.00	50.0	50.0	n.s.	
			50.00				-
			-				0.00
			0.00				-
[REDACTED]	50 SC	0.133	-			n.s.	
			-				-
			-				-
			-				-
[REDACTED]	50 SC	0.167	-	0.0		n.s.	
			-				-
			0.00				-
			-				-

n.s.: not statistically different

- : no fallen fruits present in this plot

Analysis of variance (GLM)**ANOVA**

Dependent Variable: arcsin(sqrt(Date 08/08/2006. Percentage of Codling Moth infested fruits on the ground (on total number of fallen fruits per plot)))

27 row(s) omitted due to missing values

Due To	Sum of Squares	DoF	Mean Square	F-Stat	Signif
Constant	3.851	1	3.851	1.261	0.3420
Object	1.970	9	0.219	0.573	0.7879
Block	1.214	3	0.405	1.059	0.4185
Explained	3.616	12	0.301	0.789	0.6568
Error	3.055	8	0.382		
Total	6.671	20	0.334		

Table : Percentage of Codling Moth infested fruits (stings + entries) on the tree and on the ground on total number of fruits per plot (fallen + tree)

Observation date : 08&10/08/06

Product	Formulation		Dose (%)	Plot Value	Object Mean	Object SD		Abbott Mean
Check				6.39 5.17 11.48 2.50	6.4	3.8	a	
Treated at 14 d I at dates ACEG								
██████████	240	SC	0.035	0.52 1.82 1.71 0.78	1.2	0.7	bc	81.1
Treated at 7 d I at dates ABCDEFGH								
██████████	6.7E12 gv/l	SC	0.100	0.00 1.88 0.00 0.43	0.6	0.9	c	91.0
██████████	10 g/l (3E13 gv/l)	SC	0.005	1.33 1.79 1.99 1.70	1.7	0.3	bc	73.3
██████████	10 g/l (3E13 gv/l)	SC	0.007	1.99 0.00 2.73 2.00	1.7	1.2	bc	73.7
██████████	10 g/l (3E13 gv/l)	SC	0.009	0.66 2.38 0.00 1.80	1.2	1.1	bc	81.0
██████████ + sugar	10 g/l (3E13 gv/l)	SC	0.007 0.133	4.98 1.33 3.21 0.67	2.5	1.9	abc	60.1

Continued

Product	Formulation	Dose (%)	Plot Value	Object Mean	Object SD	Abbott Mean	
[REDACTED] + milk powder	10 g/l (3E13 gv/l) SC	0.007	1.65	2.4	2.3	bc	
			0.250	2.36			
				5.52			
				0.00			
[REDACTED] + milk powder	10 g/l (3E13 gv/l) SC	0.007	4.32	2.8	1.7	abc	
			0.250	3.33			
				3.04			
				0.43			
Treated at 14 d I at dates ACEG							
[REDACTED]	50 SC	0.100	2.85	3.2	2.0	ab	
				3.19			
				5.79			
				0.93			
[REDACTED]	50 SC	0.133	1.36	2.0	1.6	bc	
				3.20			
				0.00			
				3.46			
[REDACTED]	50 SC	0.167	3.59	3.4	1.5	ab	
				5.20			
				3.49			
				1.51			

Analysis of variance**ANOVA**

Dependent Variable: arcsin(sqrt(Date 08&10/08/2006. Percentage of Codling Moth infested fruits (stings + entries) on the tree and on the ground on total number of fruits per plot (fallen + tree))

Due To	Sum of Squares	DoF	Mean Square	F-Stat	Signif
Constant	0.914	1	0.914	6.460	0.6965
Object	0.110	11	0.010	2.324	0.0303
Block	0.017	3	0.006	1.314	0.2862
Explained	0.126	14	0.009	2.108	0.0390
Error	0.141	33	0.004		
Total	0.268	47	0.006		

Table : Percentage of codling moth larvae entries on fruits on the tree (on 300 fruits or on total number of fruits per plot)

Observation date : 10/08/06

Product	Formulation		Dose (%)	Plot Value	Object Mean	Object SD	Duncan	Abbott Mean
Check				6.42 3.48 10.56 1.50	5.5	3.9	a	
Treated at 14 d I at dates ACEG								
██████████	240	SC	0.035	0.52 0.91 0.87 0.39	0.7	0.3	bcd	87.7
Treated at 7 d I at dates ABCDEFGH								
██████████	6.7E12 GV/l	SC	0.100	0.00 1.88 0.00 0.43	0.6	0.9	d	89.5
██████████	10 g/l (3E13 GV/l)	SC	0.005	0.67 1.19 1.00 0.00	0.7	0.5	bcd	87.0
██████████	10 g/l (3E13 GV/l)	SC	0.007	1.00 0.00 0.00 1.00	0.5	0.6	d	90.9
██████████	10 g/l (3E13 GV/l)	SC	0.009	0.33 2.38 0.00 0.00	0.7	1.1	cd	87.6
██████████ + sugar	10 g/l (3E13 GV/l)	SC	0.007 0.133	2.27 1.00 1.62 0.33	1.3	0.8	bcd	76.2

Continued

Product	Formulation	Dose (%)	Plot Value	Object Mean	Object SD	Duncan	Abbott Mean
[REDACTED] + milk powder	10 g/l (3E13 GV/l) SC	0.007	0.00	0.6	0.7	cd	88.4
			0.250				
			1.11				
			0.00				
[REDACTED] + milk powder	10 g/l (3E13 GV/l) SC	0.007	2.70	1.0	1.2	bcd	81.8
			0.250				
			0.87				
			0.43				
Treated at 14 d I at dates ACEG							
[REDACTED]	50	SC	0.100	2.4	1.4	abc	57.1
			2.14				
			4.21				
			0.93				
[REDACTED]	50	SC	0.133	1.3	1.0	bcd	75.8
			1.36				
			2.40				
			0.00				
[REDACTED]	50	SC	0.167	2.7	1.4	ab	50.9
			3.08				
			4.00				
			2.94				
			0.75				







Analysis of variance (GLM)**ANOVA**

Dependent Variable: arcsin(sqrt(Date 10/08/2006. Percentage of Codling Moth larvae entries on fruits on the tree (on 300 or on total number of fruits)))

Due To	Sum of Squares	DoF	Mean Square	F-Stat	Signif
Constant	0.469	1	0.469	4.230	0.7596
Object	0.128	11	0.012	3.455	0.0028
Block	0.019	3	0.006	1.929	0.1440
Explained	0.147	14	0.011	3.128	0.0035
Error	0.111	33	0.003		
Total	0.258	47	0.005		

Table : Percentage of codling moth larvae stings on fruits on the tree (on 300 fruits or on total number of fruits per plot)

Observation date : 10/08/06

Product	Formulation		Dose (%)	Plot Value	Object Mean	Object SD		Abbott Mean
Check				0.00 0.87 0.56 1.00	0.6	0.4	n.s.	
Treated at 14 d I at dates ACEG								
	240	SC	0.035	0.00 0.91 0.43 0.39	0.4	0.4	n.s.	28.4
Treated at 7 d I at dates ABCDEFGH								
	6.7E12 GV/l	SC	0.100	0.00 0.00 0.00 0.00	0.0	0.0	n.s.	100.0
	10 g/l (3E13 GV/l)	SC	0.005	0.67 0.60 1.00 1.70	1.0	0.5	n.s.	-63.5
	10 g/l (3E13 GV/l)	SC	0.007	1.00 0.00 2.73 1.00	1.2	1.1	n.s.	-94.9
	10 g/l (3E13 GV/l)	SC	0.009	0.00 0.00 0.00 1.36	0.3	0.7	n.s.	43.8
 + sugar	10 g/l (3E13 GV/l)	SC	0.007 0.133	2.73 0.33 1.62 0.33	1.3	1.2	n.s.	-106.8

Continued

Product	Formulation	Dose (%)	Plot Value	Object Mean	Object SD	Abbott Mean
[REDACTED] + milk powder	10 g/l (3E13 GV/l) SC	0.007	1.11	1.5	2.0	n.s.
			0.48			
			4.44			
			0.00			
[REDACTED] + milk powder	10 g/l (3E13 GV/l) SC	0.007	1.62	1.8	1.4	n.s.
			0.250			
			3.33			
			2.17			
			0.00			
Treated at 14 d I at dates ACEG						
[REDACTED]	50	SC	0.100	0.7	0.7	n.s.
			0.36			
			0.71			
			1.58			
[REDACTED]	50	SC	0.133	0.7	0.9	n.s.
			0.00			
			0.80			
			0.00			
[REDACTED]	50	SC	0.167	0.8	0.3	n.s.
			0.51			
			1.20			
			0.59			
			0.75			-26.0

n.s.: not statistically different

Analysis of variance (GLM)**ANOVA**

Dependent Variable: arcsin(sqrt(Date 10/08/2006. Percentage of codling Moth larvae stings on fruits on the tree (on 300 or on total number of fruits)))

Due To	Sum of Squares	DoF	Mean Square	F-Stat	Signif
Constant	0.250	1	0.250	2.375	0.7913
Object	0.049	11	0.004	1.382	0.2274
Block	0.007	3	0.002	0.716	0.5497
Explained	0.055	14	0.004	1.239	0.2956
Error	0.105	33	0.003		
Total	0.161	47	0.003		

Table : Percentage of codling moth infected fruits (stings + entries) on the tree (on 300 fruits or on total number of fruits per plot)

Observation date : 10/08/06

Product	Formulation	Dose (%)	Plot Value	Object Mean	Object SD	Duncan	Abbott Mean
Check			6.42 4.35 11.11 2.50	6.1	3.7	a	
Treated at 14 d I at dates ACEG							
██████████	240	SC	0.035	0.52 1.82 1.30 0.78	1.1 0.6	bc	81.8
Treated at 7 d I at dates ABCDEFGH							
██████████	6.7E12 GV/l	SC	0.100	0.00 1.88 0.00 0.43	0.6 0.9	c	90.5
██████████	10 g/l (3E13 GV/l)	SC	0.005	1.33 1.79 2.00 1.70	1.7 0.3	bc	72.0
██████████	10 g/l (3E13 GV/l)	SC	0.007	2.00 0.00 2.73 2.00	1.7 1.2	bc	72.4
██████████	10 g/l (3E13 GV/l)	SC	0.009	0.33 2.38 0.00 1.36	1.0 1.1	bc	83.3
██████████ + sugar	10 g/l (3E13 GV/l)	SC	0.007 0.133	5.00 1.33 3.24 0.67	2.6 2.0	abc	58.0

Continued

Product	Formulation	Dose (%)	Plot Value	Object Mean	Object SD	Duncan	Abbott Mean
[redacted] + milk powder	10 g/l (3E13 GV/l) SC	0.007	1.11	2.1	2.4	bc	64.8
			0.250	1.90			
				5.56			
				0.00			
[redacted] + milk powder	10 g/l (3E13 GV/l) SC	0.007	4.32	2.8	1.7	abc	54.4
			0.250	3.33			
				3.04			
				0.43			
Treated at 14 d I at dates ACEG							
[redacted]	50 SC	0.100	2.50	3.0	2.0	ab	50.5
				2.86			
				5.79			
				0.93			
[redacted]	50 SC	0.133	1.36	2.0	1.6	bc	67.1
				3.20			
				0.00			
				3.46			
[redacted]	50 SC	0.167	3.59	3.5	1.5	ab	43.3
				5.20			
				3.53			
				1.51			

Analysis of variance (GLM)

ANOVA

Dependent Variable: arcsin(sqrt(Date 10/08/2006. Percentage of Codling Moth damage (stings + entries) on fruits on the tree (on 300 or on total number of fruits per plot)))

Due To	Sum of Squares	DoF	Mean Square	F-Stat	Signif
Constant	0.876	1	0.876	6.201	0.6987
Object	0.109	11	0.010	2.315	0.0309
Block	0.016	3	0.005	1.230	0.3144
Explained	0.125	14	0.009	2.082	0.0414
Error	0.141	33	0.004		
Total	0.266	47	0.006		

Table : Phytotoxicity: necrotic light brown spots on leaves; classification: 0 = no spots; 1 = few spots; 2 = moderate number of spots – one value per plot (sum of both sides of the row)
Observation date : 02/08/06

Product	Formulation		Dose (%)	Plot Value	Object Mean	Object SD	
Check				2 4 4 2	3.0	1.2	n.s.
Treated at 14 d I at dates ACEG							
██████████	240	SC	0.035	4 4 2 2	3.0	1.2	n.s.
Treated at 7 d I at dates ABCDEFGH							
██████████	6.7E12 GV/l	SC	0.100	2 2 2 4	2.5	1.0	n.s.
██████████	10 g/l (3E13 GV/l)	SC	0.005	2 2 4 2	2.5	1.0	n.s.
██████████	10 g/l (3E13 GV/l)	SC	0.007	2 2 4 4	3.0	1.2	n.s.
██████████	10 g/l (3E13 GV/l)	SC	0.009	2 2 0 2	1.5	1.0	n.s.
██████████ + sugar	10 g/l (3E13 GV/l)	SC	0.007 0.133	4 4 2 4	3.5	1.0	n.s.

Continued

Product	Formulation	Dose (%)	Plot Value	Object Mean	Object SD	
[redacted] + milk powder	10 g/l (3E13 GV/l) SC	0.007 0.250	4	2.5	1.0	n.s.
			2			
			2			
			2			
[redacted] + milk powder	10 g/l (3E13 GV/l) SC	0.007 0.250	2	2.5	1.0	n.s.
			4			
			2			
			2			
Treated at 14 d I at dates ACEG						
[redacted]	50 SC	0.100	2	2.5	1.0	n.s.
			4			
			2			
			2			
[redacted]	50 SC	0.133	2	2.0	1.6	n.s.
			2			
			0			
			4			
[redacted]	50 SC	0.167	2	2.5	1.0	n.s.
			2			
			2			
			4			

n.s.: not statistically different

Analysis of variance (GLM)

ANOVA

Dependent Variable: Date 02/08/2006. Phytotoxicity: necrotic light brown spots on leaves: 0=no spots; 1=few spots; 2=moderate number of spots)

Due To	Sum of Squares	DoF	Mean Square	F-Stat	Signif
Constant	320.333	1	320.333	7.942	0.0074
Object	11.667	11	1.061	0.868	0.5786
Block	3.667	3	1.222	1.000	0.4051
Explained	15.333	14	1.095	0.896	0.5704
Error	40.333	33	1.222		
Total	55.667	47	1.184		

7.12. Conclusion of trial 06ZCydipoGoldMelvGEP-30

A field trial was executed to test the biological efficacy of [REDACTED] (Codling moth granulosis virus) and [REDACTED] ([REDACTED]), against *Cydia pomonella*, the codling moth, on apple.

[REDACTED] granulovirus was applied at 3 different dose rates with a water volume of 1500 l/ha SO: 0.005 %, 0.007 %, 0.009 % or 0.45, 0.675 and 0.9 g a.i. per ha LWA (= 0.675, 1.01 and 1.35 g a.i. per ha SO). The 0.007 % dose rate of [REDACTED] was also applied with an addition of sugar or milk powder.

When the dose rate of [REDACTED] is expressed as the number of granulosis viruses per ha LWA, 0.45, 0.675 and 0.9 g a.i./ha LWA correspond with respectively 1.4E12, 2.0E12 and 2.7E12 GV/ha LWA.

[REDACTED] was also applied at 3 different dose rates with a water volume of 1500 l/ha SO at following dose rates: 0.100 %, 0.133 %, 0.167 % or 50.0, 66.7 and 83.3 g a.i. per ha LWA (= 75.0, 100.0 and 125.0 g a.i. per ha SO).

[REDACTED] ([REDACTED]) and [REDACTED] and [REDACTED] ([REDACTED]) were used as reference products. [REDACTED] is as [REDACTED] an [REDACTED] agonist and causes cessation of feeding and premature lethal moult. The Codling Moth granulosis virus results after ingestion by larvae in interference of food adsorption in the larval gut, ultimately causing death of the insect.

[REDACTED] and [REDACTED] were applied with a strict interval of 14 days and [REDACTED] [REDACTED] and [REDACTED] were applied with an interval of 7 days, from start of egg hatching on, till the end of flights. Assessments of infested fruits on the tree and on the ground were done. At the last assessment date, a difference in infested fruits was made between stings and entries of Codling Moth larvae on the fruits.

% of infested apples						
Object	31/07/2006 on the tree	08/08/2006 + 10/08/2006 ground + on the tree	10/08/2006 stings + entries on the tree	10/08/2006 entries on the tree	10/08/2006 stings on the tree	
Check	8.3 % a	6.4 % a	6.1 % a	5.5 % a	0.6%	n.s.
Efficacy expressed as Mean Abbott						%
7 d I						
██████████ 6.7E12 GV/ha LWA	91.2 b	91.0 c	90.5 c	89.5 d	0.0%	n.s.
██████████ 0.45 g a.i./ha LWA	93.2 b	73.3 bc	72.0 bc	87.0 bcd	1.0%	n.s.
██████████ 0.675 g a.i./ha LWA	89.6 b	73.7 bc	72.4 bc	90.9 d	1.2%	n.s.
██████████ 0.9 g a.i./ha LWA	87.0 b	81.0 bc	83.3 bc	87.6 cd	0.3%	n.s.
██████████ 0.675 g a.i./ha LWA + sugar	76.5 b	60.1 abc	58.0 abc	76.2 bcd	1.3%	n.s.
██████████ 0.675 g a.i./ha LWA + milk powder	80.6 b	62.7 bc	64.8 bc	88.4 cd	1.5%	n.s.
██████████ 0.675 g a.i./ha LWA + milk powder	84.4 b	56.4 abc	54.4 abc	81.8 bcd	1.8%	n.s.
14 d I						
██████████ 84 g a.i./ha LWA	83.2 b	81.1 bc	81.8 bc	87.7 bcd	0.4%	n.s.
██████████ 50 g a.i./ha LWA	77.7 b	50.1 ab	50.5 ab	57.1 abc	0.7%	n.s.
██████████ 66.65 g a.i./ha LWA	82.5 b	68.6 bc	67.1 bc	75.8 bcd	0.9%	n.s.
██████████ 83.3 g a.i./ha LWA	75.1 b	46.0 ab	43.3 ab	50.9 ab	0.8%	n.s.

The total number of infested fruits on the tree (both stings and entries) was assessed, at 31/7 and 10/8. ██████████ gave the best result and was very effective (> 70 %). ██████████ and ██████████ were less effective but not statistically different from ██████████. No statistical differences were found between the different dose rates of ██████████ and ██████████. Though, addition of sugar to ██████████ and the ██████████ with milk powder performed slightly less than the other ██████████ objects.

██████████ was highly effective at the three assessment dates, but was slightly less efficient than ██████████ with an interval of 7 days. ██████████ was not statistically different from ██████████ but only the median dose rate of ██████████ performed statistically better than the check.

With a rate of mean 6.1 to 8.3 % of infested fruits on 300 fruits, this infestation can be considered as high in Belgium.

None of the compounds caused a visible spray residue or phytotoxicity symptoms at any of the assessment dates.

ANNEX :**CERTIFICATE OF GOOD EXPERIMENTAL PRACTICE**

A certificate of GEP (Good Experimental Practice) is added on the following pages:
this certificate is valid for the period from 05/07/2006 till 21/04/2009.

The certificate was granted to Proefcentrum Fruitteelt v.z.w. (pcfruit) by the Federal Public Service:
Health, Food Chain Safety and Environment.
Directorate-General: Animal, Plant and Food.
Department: Pesticides and Fertilizers.



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VOLKSGEZONDHEID,
VEILIGHEID VAN DE VOEDSELKETEN
EN LEEFMILIEU

Directoraat Generaal
Dir. Plant en Voeding
Dienst
Pesticiden en Meststoffen

UW BESLUIT VAN 07/04/06 en 30/05/06

UW NO:

ONDERZ. 41 149/06/

SAFUM

PLAATS:

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Proefcentrum Fruitteelt v.z.w.
Fruitruinweg, 1
3800 SINT-TRUIDEN

OPDRACHT Erkenning van een station of laboratorium dat bepaalde proeven en analyses verricht met betrekking tot bestrijdingsmiddelen voor landbouwkundig gebruik, uitbreiding

Mijnheer,

In toepassing van het ministerieel besluit van 7 april 1995 betreffende de erkenning van stations, of laboratoria die bepaalde proeven en analyses verrichten met betrekking tot bestrijdingsmiddelen voor landbouwkundig gebruik, is het

Proefcentrum Fruitteelt v.z.w. (pcfruit),
Fruitruinweg, 1
3800 Sint-Truiden

Met exploitatiezetsels:

- Fruitruinweg 1, 3800 Sint-Truiden
- De Brede Akker 13, 3800 Sint-Truiden
- Sint-Truidersteenweg 321, 3700 Tongeren

erkend onder nr. 8 SL.

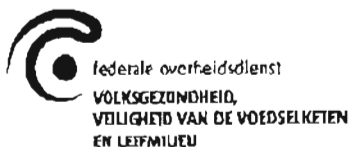
De erkenning is geldig voor de volgende proeven:

- de *werkzaamheid* van bestrijdingsmiddelen voor landbouwkundig gebruik en de effecten van deze middelen op de opbrengst van planten en plantaardige producten zoals vermeld in tabel 1;
- de effecten van bestrijdingsmiddelen voor landbouwkundig gebruik op de *kwaliteit* van planten en plantaardige producten zoals vermeld in tabel 1;
- het testen van de *fytoxiciteit* bij met bestrijdingsmiddelen voor landbouwkundig gebruik behandelde planten en plantaardige producten, effecten op volggewassen, effecten op andere planten, inclusief gewassen op aangrenzende velden zoals vermeld in tabel 1



be

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Tabel 1: Erkenning voor het testen van de werkzaamheid en fytotoxiciteit van proefproducten en de invloed op de kwaliteit van behandelde planten en plantaardige producten

Sector	Herbicide	Fungicide	Insecticide/acaricide	Groei-regulator	Rodenticide	Ontsmetting	Wild-afweer	Bactericide	anti-oxidantia
Fruittreft	A,G	A,B,H	A, B, F	A,B	L	A, B, N, R	L	A,B	-
Kleinfruit en aardbeien in openlucht	A,G	A,B,C,E,G	A, B, F	-	L	-	-	-	-
Tedden onder bescherming	A,G	A,B,C,E,G	A, B, F	-	L	-	-	-	-
Bewassing plantaardige producten	-	A,B,D,T	-	-	L	A, B, D, N, R	-	-	E,T
Boomkweken	A,G	-	-	-	-	-	-	-	-

A	spuiten	E	dompelen	L	lokaas
B	vernevelen	F	feromonenbehandeling	N	nebulisatie
C	microgranulaten	G	zangieten	R	Rookgeneratoren behandeling
D	dompelen of douchen als na-organische behandeling	H	aansmeren	T	thermonebulisatie

Deze erkenning is geldig van 05/07/06 tot 21/04/09.

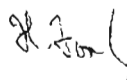
Aangezien er geen fundamentele opmerking werd gemaakt op het moment van de audit (13/01/04), kunnen alle genoteerde proeven van het seizoen 2003-2004 als GEP beschouwd worden.

Belangrijke opmerking :

Indien andere types van behandelingen of proeven (toepassingstechniek of type van product of teelt) moeten gebeuren, is het noodzakelijk het volgende in te dienen :

- een bewijs dat het noodzakelijke materiaal beschikbaar is
- de "S.O.P." voor het gebruik van dit materiaal
- een aanvraag tot uitbreiding van deze erkenning

Hoogachtend


M. H. FONTIER
Diensthoofd



PAGINA 2/2



AARHUS UNIVERSITET

Faculty of Agricultural Sciences, Department of Integrated Pest Management

**Efficacy of [REDACTED] against stripe smut
(*Urocystis occulta*) in rye, seedling blight (*Fusarium
spp*) and common bunt (*Tilletia tritici*)
in winter wheat.**

Results from field trials 2010

Trial no.: 10501-1.
10503-1 , 10503-2.
10505-1 , 10505-2.

Carried out for: [REDACTED]

Created by: Bent J. Nielsen
Aarhus University
Faculty of Agricultural Science
Department of Integrated Pest Management
Research Centre Flakkebjerg
Forsøgsvej 1
DK-4200 Slagelse

Date: 18th of November 2010
Research Centre Flakkebjerg



TITLE PAGE

Title: Efficacy of [REDACTED] against stripe smut (*Urocystis occulta*) in rye, seedling blight (*Fusarium spp.*) and common bunt (*Filletia tritici*) in winter wheat, results from 2010.

Number of pages: 87

Trial numbers: 10501-1
10503-1, 10503-2
10505-1, 10505-2.

Trial leader: Bent J. Nielsen

Research assistants: Hans-Peter Madsen

Trial period: April 2010 - October 2010.

Performance criterion: Performed according to GLP (Good Laboratory Practice) (Appendix 2: GLP certificate).

Publication: The use of the results can only take place after the "General Provisions for commissioned assignments, September 10, 1997" (Appendix 2)

Trial leader's authentication

The undersigned hereby declares that this work was performed under my directions and in accordance with The Principles of Good Experimental Practice. The study was conducted according to the procedures described here in and this report represents a true and accurate record of the results obtained.

Bent J. Nielsen
Bent J. Nielsen
Senior Scientist

26-11-2010
Date



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1. SUMMARY with conclusions

The trials were conducted in rye and winter wheat at Flakkebjerg Research Centre 2010 with the aim of testing the efficacy of the seed treatment product [REDACTED] 30 g/l FS [REDACTED] 30 g/l) against flag smut (stripe smut, *Urocystis occulta*) in rye, Fusarium seedling blight (*Fusarium* spp/*Microdochium nivale*) and common bunt (*Tilletia tritici*) in wheat.

Possible influence on germinated plants (field emergence)

There was no indication of a negative influence on germinating plants in rye (one trial). In the trial with Fusarium seedling blight the seeds were infected by Fusarium, and this could influence the germination rate. In both trials the germination of wheat seeds treated with [REDACTED] 30 g/l FS was similar to the germination of seeds treated with the reference product [REDACTED] 30 g/l) (no statistically significant difference). *Tilletia tritici* is not known to influence the germination of the wheat plant in the field. In both trials there was a clear trend that the field germination of wheat plants treated with [REDACTED] 30 g/l FS was improved in comparison to seeds treated with [REDACTED]. However, the differences when each dose is compared are not significant.

Flag smut (*Urocystis occulta*) in rye

The rye seeds were artificially inoculated with *Urocystis occulta* spores, which resulted in a (moderate) attack in the field of 9.9 % infected plants. Seed treatment with [REDACTED] 30 g/l FS resulted in 100% control at all dose levels.

Fusarium seedling blight (*Fusarium* spp/*Microdochium nivale*)

Seeds naturally infected with *Fusarium* spp and *Microdochium nivale* were used in the seed treatment experiment. Seed treatment with [REDACTED] 30 g/l FS 200ml/100kg reduced the Seedling Blight Index from 15.1 to 7.0 in trial 10503-1 and from 6.8 to 1.5 in trial 10503-2. The control level is approx 54%-78% (200 ml/100kg) and on average at the same level as the reference product [REDACTED] (no significant differences comparing each dose level). The Seedling Blight Index measures damage on root and coleoptiles and has a scale from 0 to 100 (totally dead plants). An index of 6.8-15.1 is considered a moderate level.

Yield (in the Fusarium trial)

The level of yield in plots treated with [REDACTED] 30 g/l FS was at the same level in the two trials as for plots treated with [REDACTED] and no significant differences to untreated could be measured.



Common bunt (*Tilletia tritici*) in wheat

The wheat seeds were artificially inoculated with *Tilletia tritici* spores, which resulted in a (moderate - severe) attack in the field of 9.9 – 29.7% infected plants. Seed treatment with [REDACTED] 30 g/l FS resulted in 100% control at all dose levels in both trials.

Conclusions

[REDACTED] 30 g/l FS has been tested at four dose levels (75, 150, 200 and 300 ml/100kg) in rye and wheat in comparison with the reference product [REDACTED] at the same dose levels. Seed treatment with [REDACTED] 30 g/l FS had a similar effect against flag smut (*Urocystis occulta*) in rye, Fusarium seedling blight (*Fusarium* spp/*Microdochium nivale*) and common bunt (*Tilletia tritici*) in wheat as [REDACTED] compared at the same dose levels. There was no indication of negative influences on the field emergence of the plants or the yield.



2. OBJECTIVE

To test the efficacy of [REDACTED] against stripe smut (*Urocystis occulta*) in rye, seedling blight (*Fusarium spp.*) and common bunt (*Tilletia tritici*) in winter wheat, in field trials 2010.

3. METHODS AND MATERIALS

The seed dressing product [REDACTED] was tested in field trials against stripe smut (*Urocystis occulta*) in one variety of winter rye. Efficacy against seedling blight (*Fusarium spp.*) was tested in two varieties of winter wheat and common bunt (*Tilletia tritici*) with two different doses of inoculation in winter wheat. Further specific details about methods for each trial are enclosed in the protocol section.

3.1 Trial design

Specific detail about trial designs, soil type, technical details etc. are listed in the following site description in the following pages.

3.2 Row trials

The design is randomised complete block with single rows of 9 meters and 200 seeds for each treatment and there are four replicates of each treatment. Number of germinated plants was counted at GS 11-12.

3.3 Harvest trials

The design was randomised complete block with plots of (1.50 * 9m) and there were four replicates of each treatment.

3.4 Data to collect

3.4.1 Phytotoxicity

Number of emerged plants were counted at GS 11-12.

3.4.2 Assessment of seedling blight (*Fusarium spp.*)

In each plot 25 plants are randomly taken out at GS 11-12 and classified according to symptoms on roots and coleoptiles:

GROUP A: No symptoms

GROUP B: Small spot on coleoptiles

GROUP C: More attack on coleoptiles and some on roots, healthy plants

GROUP D: Severe attack on coleoptiles and roots, plants depressed

GROUP E: death plants.



$$\text{INDEX} = \frac{(B + 2xC + 3xD + 4xE) 100}{4(A + B + C + D + E)}$$

3.4.3 Assessment of other seedborne diseases

Plants with attack of seedborne diseases were counted.

3.3 Data to collect

Assessment of other seedborne diseases

Plants with attack of seedborne diseases were counted.

The programme Agricultural Research Manager, ARM (version 8.2.2 Gylling Data Management 2009) is used for data management and statistical analysis.

Guidelines

The trials were carried out following general EPPO-guidelines for experiments with pesticides.

Statistical analysis

The data were subjected to analysis of variance and treatment means were separated at the 95% probability level using F-test. Treatments with the same letter are not significantly different, when using the method student-Newman-Keuls. Untreated is not included in the statistical test.

Soil type

The soil type

JB no. 6 is equal to fine sandy clay loam

JB no. 7 is equal to clay loam



Test products

Treatment	Active ingredient
Name	
[REDACTED]	[REDACTED] 30g/l
[REDACTED]	[REDACTED] 30g/l

Lot. code etc. are shown in the trial details later

Trial location:

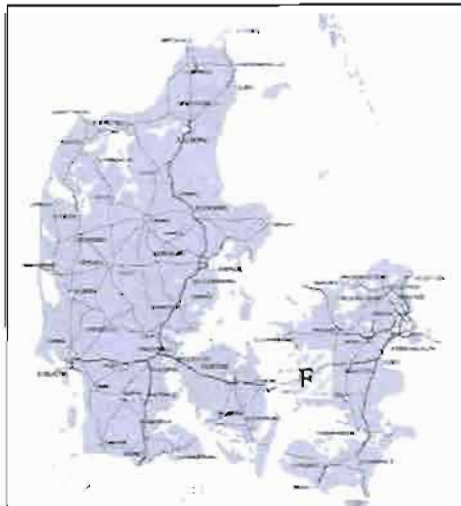


Figure 1: Location of Flakkebjerg Research station.



Protocol Treatments 10501

Confidential

University of Aarhus, Department of IPM, Flakkebjerg

Control of stripe smut (*Urocystis occulta*) in rye

Title No. 2: Registration trials in DK
 Protocol ID: 10501 Trial ID: 10501-1
 Location: Flakkebjerg Study Director: Bent J. Nielsen
 Project ID: R-00073 By: Bent J Nielsen
 Sponsor Contact: [REDACTED]

Trt No.	Treatment Name	Rate	Unit	Appl Code
1	Untreated			
2	[REDACTED]	75	ml/100 kg	A
3	[REDACTED]	150	ml/100 kg	A
4	[REDACTED]	200	ml/100 kg	A
5	[REDACTED]	300	ml/100 kg	A
6	[REDACTED] 30 g/L FS	75	ml/100 kg	A
7	[REDACTED] 30 g/L FS	150	ml/100 kg	A
8	[REDACTED] 30 g/L FS	200	ml/100 kg	A
9	[REDACTED] 30 g/L FS	300	ml/100 kg	A

Additional Treatment Information

Treatment Name
 Untreated = Untreated check
 [REDACTED] = [REDACTED] 30
 [REDACTED] 30 g/L FS = [REDACTED] 30

Rate Unit
 mL/100 kg = Milliliters Product per 100 Kilograms Seed (US=FL OZ/Cwt)4

Replications: 4, Untreated treatments: 1, Reference treatment number: 3, Conduct under GLP/GEP: Yes (GEP with no protection), Design: Randomised Complete Block (RCB). Treatment units: Treated 'Plot' size, Dry Form. Unit: %, Treated 'Plot' size Width: 0,25 meters, Treated 'Plot' size Length: 9 meters, Slurry rate: 100 mL/100 kg, Mix size: 100 g seed, Format definitions: G-A117.def, G-A117.frm

Product quantities required for listed treatments and applications of trials included in this table:

Amount*	Unit	Treatment Name	Form Conc	Form Type	Lot Code
0,725	ul	[REDACTED]	30	FS	09/512
0,725	ul	[REDACTED] 30 g/L FS	30	FS	09/511

* 'Per area' calculations based on spray volume= 100 mL/100 kg, mix size= 100 g seed:100 Grams (mix size basis).



Protocol Description 10501

Trial Establishment Guidelines

Project ID: R-00073 Developer: [redacted]
Revision Number: 1,1 Revision Status: F Final
Revision Date: 10-11-2010 Issue Date: 26-08-2009
Plot Width, Unit: 0,25 m Site Type: FIELD field
Plot Length, Unit: 9 m Experimental Unit: 200 SEED number seeds, bulbs, etc.
Plot Area, Unit: 2,25 m2 Tillage Type: CONTIL conventional-till
Replications: 4 Study Design: RACOB L Randomized Complete Block (RCB)
Untreated Arrangement: INCLUDED single control randomized in each block

Keywords: stripe smut, flag smut, Urocystis occulta, rye, artificial inoculation, efficacy evaluation of seed treatments

Table with 3 columns: Trial ID, Responsible, Number of Trials. Row 1: 10501, HPM, 1

Total Trials: 1
Conduct Under GEP: X

Table with 2 columns: Guideline, Description. Row 1: 1. EPPO, PP 1/19(4)

Objectives:
To test the efficacy of [redacted] 30 FS against stripe smut (Urocystis occulta) in rye in GEP trials. The product is compared with the reference product [redacted] in the same relative dose levels as the test product (150 ml [redacted] 100 kg = standard in Denmark). The test will be performed with artificial seed inoculation.

Crop Description

Crop 1: SECCW Secale cereale (winter) Winter rye
Variety: CAROTOP Description: Artificial inoculation
BBCH Scale: BCER

Target Pest Description

Pest 1 Type: D Code: UROCOC Urocystis occulta
Common Name: Flag smut of rye
Artificial Population: X Establishment Date: 25-09-2009
Establishment Rate, Unit: 5g spores/kg rye
Establishment Method/Description: inoculation before seed treatment

Application

Table with 2 columns: Application Method, Application Timing, Application Placement. Row 1: SEEAPU, PREPLA, SEED



Application Directions

1 trial in winter rye

10501-1 Seed inoculation 5g/kg Sowing time 02 10 2009

Isolate: UO SP 96-1/08

Seed borne infection. The seeds is artificially inoculated before seed treatment with 5g spores of *U. occulta* per kg rye

Seed treatment individually for each product and dose in glas cylinders.

Complete randomised blocks and 4 replicates. plot size is 9 m single rows and 200 seeds per row. The seeds is sown with a standard single row sowing machine (Hege 90) and seed drill at 3-5 cm depth.

Crop Stage At Each Application

Crop 1 Code, BBCH Scale:	SECCW BCER

Pest Stage At Each Application

Pest 1 Code, Disc., Scale:	UROCOC D

Geographic Area/Environmental Considerations:

OSR in narrow crop rotation

Cropping Considerations:

Spraying against insects according to need

Standard fertilizer

Assessment:

Field:

G.S. 11-12: Number of emerged plants in the rows.

Winter: Number of plants with attack of snow mould.

Spring: Assessments of plants that survived the winter.

July: Number of plants with attack of flag smut (stripe smut)

Laboratory:

% Water content of seeds.

% infection with Fusarium (brown coleoptiles).

% germination

Harvest:

No harvest

Destruction:

No

Other:

Any other observed effect on other pests or on other non-target organisms are recorded

The BBCH growth stage of the crop at each date of application and assessment are recorded.

Statistical Analysis:

The program Agricultural Research Manager, ARM (ver.8.2.2, Gylling Data Management, April 2009) is used for data management and statistical calculations. The data are subjected to analysis of variance, and treatment means are separated at the 95% probability level using F-test (Student-Newman-Keuls test). Treatments with the same letter in the tables are not significantly different.

General Comments:

The trials are performed according to "Guidelines for testing of Pesticides" and are carried out at Research Centre Flakkebjerg or farmers field.

The Department of Crop Protection, Research Centre Flakkebjerg has been approved for GEP (Good Efficacy Practice) and is working in accordance with the principle of GEP. The testing unit have Standard Operating Procedures and are inspected by the recognising authorities (GEP unit).

The trials are carried out according to GEP practice.

The results are reported in a systematic form and include analysis, evaluation and original (raw) data. Publication of the results must only take place after consultation with the study director.



m = meter

m² = square meter

FIELD, field = field

SEED, number seeds, bulbs, etc. = number seeds, bulbs, etc.

CONTIL, conventional-till = conventional-till

RACOB, Randomized Complete Block (RCB) = Randomized Complete Block (RCB)

INCLUDED, single control randomized in each block = single control randomized in each block

HPM = Hans-Peter Madsen

X = X=yes

Default = Standard validation for ARM GDMDef trials

SECCW, BCER, Secale cereale (winter), = IE

Artificial inoculation = Artificial inoculated seeds

D, Disease, G-BYRD7, G-DisStg = Disease, such as a fungus, bacteria, or virus

UROCO, Urocystis occulta, = Rye stripe smut

SEEAPU = apply under seed (e.g. spreading in furrow)

PREPLA = preplant

SEED = seed (on)/seed treatment



Trial Treatments 10501-1

Confidential
University of Aarhus, Department of IPM, Flakkebjerg

Control of stripe smut (Urocystis occulta) in rye
Title No. 2: Registration trials in DK
Trial ID: 10501-1 Protocol ID: 10501
Location: Flakkebjerg Study Director: Bent J. Nielsen
Project ID: R-00073 Investigator: Bent J Nielsen
Sponsor Contact: [redacted]

Table with 8 columns: Trt No., Treatment Name, Form Type, Lot Code, Rate, Rate Unit, Appl Code, Appl Description. Rows 1-9 detailing various treatments and rates.

Site Description 10501-1

General Trial Information

Study Director: Bent J. Nielsen Title: Senior scientist
Investigator: Bent J Nielsen Title: Senior scientist

Discipline: F/S fungicide seed treatment
Trial Status: F one-year/final
Initiation Date: 02-09-2009 Planned Completion Date: 01-03-2011

Trial Location

City: Flakkebjerg Latitude of LL Corner °: 55,3262 N
State/Prov.: Slagelse Longitude of LL Corner °: 11,38679 E
Postal Code: DK-4200
Country: Den

Official Trial Code: 10501-1

Conducted Under GEP: X

Table with 2 columns: Guideline, Description. Row 1: PP 1/19(4) Seed-borne cereal fungi

Keywords: stripe smut, flag smut, Urocystis occulta, rye, artificial inoculation, efficacy evaluation of seed treatments

Objectives:

To test the efficacy of [redacted] 30 FS against stripe smut (Urocystis occulta) in rye in GEP trials. The product is compared with the reference product [redacted] in the same relative dose levels as the test product (150 ml [redacted] 100 kg = standard in Denmark). The test will be performed with artificial seed inoculation.



Personnel

Study Director: Bent J. Nielsen **Title:** Senior scientist
Postal Code: DK-4200
Investigator: Bent J Nielsen **Title:** Senior scientist
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Location: Flakkebjerg, Denmark
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Phone No.: +45 89 99 36 54 **Mobile No.:** +45 22 28 33 02

Cooperator/Landowner

Cooperator: DJF, Århus University **Role:** Cooperator
Organization: Dept. of Integrated Pest Management **Org. Type:** University
Address 1: Forsøgsvej 1
Address 2: DK-4200 Flakkebjerg **Phone No.:** +45 89 99 19 00
City: Slagelse
Postal Code: DK-4200
Country: DNK Denmark

Other Personnel

Role	Name	Other
Technician	Hans-Peter Madsen	HPM

Crop Description

Crop 1: SECCW Secale cereale (winter) Winter rye
Variety: CAROTOP **Description:** Artificial inoculation
BBCH Scale: BCER **Planting Date:** 02-10-2009
Planting Method: DRILLE drilled **Rate, Unit:** 200 S/9M ROW
Depth, Unit: 5 cm **Perennial Age, Unit:** 1 YR
Row Spacing, Unit: 25 cm **Spacing Within Row, Unit:** 1,5 m
Seed Bed: MEDIUM medium **Soil Temperature, Unit:** 10,1 C
Soil Moisture: NORMAL normal **Emergence Date:** 23-10-2009

Pest Description

Pest 1 Type: D **Code:** UROCOC Urocystis occulta
Common Name: Flag smut of rye
Description: Flag smut
Artificial Population: X **Establishment Date:** 22-09-2009
Establishment Rate, Unit: 5g spores/kg rye
Establishment Method/Description: inoculation before seed treatment

Site and Design

Plot Width, Unit: 0,25 m **Site Type:** FIELD field
Plot Length, Unit: 9 m **Experimental Unit:** 200 SEED number seeds, bulbs, etc.
Plot Area, Unit: 2,25 m² **Tillage Type:** CONTIL conventional-till
Replications: 4 **Study Design:** RAOBL Randomized Complete Block (RCB)
Untreated Arrangement: INCLUDED single control randomized in each block



AARHUS UNIVERSITET

Faculty of Agricultural Sciences, Department of Integrated Pest Management

Trial Initiation Comments:

SEED ANALYSIS :

WATER CONTENT : 12,0 %

GERMINATION : 99 %

INFECTION : 0,0 % FUSARIUM SPP (BROWN ROOTS)

INOCULATION : SEED BORNE INFECTION THE SEEDS IS ARTIFICIALLY INOCULATED BEFORE SEED TREATMENT WITH 5G SPORES OF U. OCCULTA PER KG RYE

ORIGIN OF SEED : CAROTOP

APPLICATION

EQUIPMENT : SEED TREATMENT IN 0,7 L GLASS CYLINDERS.

28.09.09 : WATER CONTENT DETERMINED

28.09.09 : SEEDS IN BAGS READY FOR SOWING

28.01.10 : GERMINATION TEST PERFORMED (2x50 SEEDS).

28.01.10 : TEST OF BROWN ROOTS

	Previous Crops	Year
1.	SPRING BARLEY	2009
2.	WINTER WHEAT	2008

Maintenance

No.	Date	Maintenance	Rate	Rate Unit
		Treatment Name		
1.	26-03-2010	NPK 27-3-10 WITH SULPHUR	290	kg/ha
2.	08-04-2010	HUSSAR OD	0,03	L/ha
3.	08-04-2010	RENOL	0,5	L/ha
4.	03-05-2010	NPK 26-2-7 WITH SULPHUR	420	kg/ha

Soil Description

% Sand: 44,5 % OM: 2,5 Texture: C clay

% Silt: 19,8 Soil Name: JB 7

% Clay: 19,2 Fert. Level: F fair

Moisture and Weather Conditions

Overall Moisture Conditions: FAIR fair

Closest Weather Station: FLAKKEBJERG RES. GRID 6135 Distance, Unit: 1 km

Application Description

	A
Application Date:	28-09-2009
Application Method:	SEEDTR
Application Timing:	PREPLA
Application Placement:	SEED
Applied By:	HPM
Air Temperature, Unit.	20 C



Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale:	SECCW BCER

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale:	UROCO C D

Application Equipment

	A
Appl. Equipment:	GLASS

Equipment Comment: Seed treatment individually for each product and dose in glass cylinders.
The seeds is sown with a standard single row sowing machine (Hege 90) and seed drill at 3-5 cm depth.



Plotmap 10501-1

Trt	Trt Description
1	Untreated
2	██████████ 75 ml/100kg
3	██████████ 150 ml/100kg
4	██████████ 200ml/100kg
5	██████████ 300ml/100kg
6	██████████ 30 g/L FS 75ml/100kg
7	██████████ 30 g/L FS 150ml/100kg
8	██████████ 30 g/L FS 200ml/100kg
9	██████████ 30 g/L FS 300ml/100kg

401	402	403	404	405	406	407	408	409
5	4	3	6	7	1	9	2	8
301	302	303	304	305	306	307	308	309
6	3	8	1	5	2	7	4	9
201	202	203	204	205	206	207	208	209
3	6	9	2	8	4	5	1	7
101	102	103	104	105	106	107	108	109
5	7	8	1	9	6	2	4	3



Protocol Treatments 10503

Confidential

University of Aarhus, Department of IPM, Flakkebjerg

Control of seedling blight (Fusarium spp.) in winter wheat

Title No. 2: Registration trials in DK
 Protocol ID: 10503 Trial ID:
 Location: Flakkebjerg Study Director: Bent J. Nielsen
 Project ID: R-00073 By: Bent J Nielsen
 Sponsor Contact: [REDACTED]

Tri No.	Treatment Name	Rate	Rate Unit	Appl Code
1	Untreated			
2	[REDACTED]	75	ml/100 kg	A
3	[REDACTED]	150	ml/100 kg	A
4	[REDACTED]	200	ml/100 kg	A
5	[REDACTED]	300	ml/100 kg	A
6	[REDACTED] 30 g/L FS	75	ml/100 kg	A
7	[REDACTED] 30 g/L FS	150	ml/100 kg	A
8	[REDACTED] 30 g/L FS	200	ml/100 kg	A
9	[REDACTED] 30 g/L FS	300	ml/100 kg	A

Additional Treatment Information

Treatment Name
 Untreated = Untreated check
 [REDACTED] = [REDACTED] 30
 [REDACTED] 30 g/L FS = [REDACTED] 30

Rate Unit
 mL/100 kg = Milliliters Product per 100 Kilograms Seed (US=FL OZ/Cwt)4

Replications: 4. Untreated treatments: 1, Reference treatment number: 3, Conduct under GLP/GEP: Yes (GEP with no protection), Design: Randomised Complete Block (RCB), Treatment units: Treated 'Plot' size, Dry Form, Unit %, Treated 'Plot' size Width: 1.5 meters, Treated 'Plot' size Length 9 meters, Slurry rate: 100 mL/100 kg, Mix size: 1200 g seed, Format definitions: G-All7 del, G-All7.fm

Product quantities required for listed treatments and applications of trials included in this table:

Amount*	Unit	Treatment Name	Form Conc	Form Type	Lot Code
0,017	ml	[REDACTED]	30	FS	09/512
0,017	ml	[REDACTED] 30 g/L FS	30	FS	09/511

* 'Per area' calculations based on spray volume= 100 mL/100 kg, mix size= 1200 g seed; 1200 Grams (mix size basis).

* Product amounts adjusted for the 2 trials planned for this protocol



Protocol Description 10503

Trial Establishment Guidelines

Project ID: R-00073 Developer: ██████████
 Revision Number: 1,1 Revision Status: F Final
 Revision Date: 10-11-2010 Issue Date: 26-08-2009
 Plot Width, Unit: 1,5 m Site Type: FIELD field
 Plot Length, Unit: 9 m Experimental Unit: 1 PLOT plot
 Plot Area, Unit: 13,5 m2 Tillage Type: CONTIL conventional-till
 Replications: 4 Study Design: RACDRL Randomized Complete Block (RCB)

Untreated Arrangement: INCLUDED single control randomized in each block

Keywords seedling blight, *Microdochium nivale*, *Fusarium* spp. , efficacy evaluation of seed treatments

Trial ID	Responsible	Number of Trials
10503	HPM	2

Total Trials: 2
 Conduct Under GEP: X

Guideline	Description
1. EPPO	PP 1/19(4)

Objectives:
 To test the efficacy of ██████████ 30 FS against seedling blight (*Fusarium* spp)of wheat in GEP trials. The product is compared with the reference product ██████████ in the same relative dose levels as the test product (150 ml ██████████ 100 kg = standard in Denmark) The test will be performed with artificial seed inoculation.

Crop Description

Crop 1: TRZAW *Triticum aestivum* (winter) Winter wheat
 Variety: SW MAGNIFIK 2009 Description: Natural infected
 BBCH Scale: BCER

Target Pest Description

Pest 1 Type: D Code: FUSASP *Fusarium* spp.
 Common Name: *Fusarium* spp.
 Description: seedling blight
 Establishment Date: 25-09-2009

Establishment Method/Description: Natural infection

Application

	A
Application Method:	SEETRD
Application Timing:	PREPLA
Application Placement:	SEED



Application Directions:

2 trials in winter wheat.

10503-1 Natural infected with *Microdochium nivale*/Fusarium spp. Variety: SW Magnifik Sowing time 02.10.2009
10503-2 Natural infected with *Microdochium nivale*/Fusarium spp. Variety: Ritmo Sowing time 02.10.2009

Seeds are natural infected in field 2009

Seed treatment individually for each product and dose in plastic pail 5,8 L.

Complete randomised blocks and 4 replicates, plot size is 1,5 x 9 m. , 400 plants/m²

Crop Stage At Each Application

Crop 1 Code, BBCH Scale:	TR2AW BCER

Pest Stage At Each Application

Pest 1 Code, Disc., Scale:	FUSASP D



Geographic Area/Environmental Considerations:

OSR in narrow crop rotation

Cropping Considerations:

Spraying against insects according to need
Standard fertilizer

Assessment:

Field:

GS11-12: Number of emerged plants in 5 x 2 m rows per plot
Assessments of seedling blight on 25 plants/plot
Winter: Number of plants with attack of snow mould.
Spring: Assessments of plants that survived the winter.
July: Number of plants with attack of common bunt (if the disease occurs)

Laboratory:

% Water content of seeds.
% infection with Fusarium (brown coleoptiles).
% germination

Harvest: Yield in hkg/ha (0,1 t/ha) for each plot

Destruction:

No

Other:

Any other observed effect on other pests or on other non-target organisms are recorded

The BBCH growth stage of the crop at each date of application and assessment are recorded.

Statistical Analysis:

The program Agricultural Research Manager, ARM (ver.8.2.2. Gylling Data Management, April 2009) is used for data management and statistical calculations. The data are subjected to analysis of variance, and treatment means are separated at the 95% probability level using F-test (Student-Newman-Keuls test). Treatments with the same letter in the tables are not significantly different.

General Comments:

The trials are performed according to "Guidelines for testing of Pesticides" and are carried out at Research Centre Flakkebjerg or farmers field.

The Department of Crop Protection, Research Centre Flakkebjerg has been approved for GEP (Good Efficacy Practice) and is working in accordance with the principle of GEP. The testing unit have Standard Operating Procedures and are inspected by the recognising authorities (GEP unit).

The trials are carried out according to GEP practice.

The results are reported in a systematic form and include analysis, evaluation and original (raw) data. Publication of the results must only take place after consultation with the study director.



m = meter
m2 = square meter
FIELD, field = field
PLOT, plot = plot
CONTIL, conventional-till = conventional-till
RACOB, Randomized Complete Block (RCB) = Randomized Complete Block (RCB)
INCLUDED, single control randomized in each block = single control randomized in each block
HPM = Hans-Peter Madsen
X = X=yes
Default = Standard validation for ARM GDMDef trials
Natural infected = Natural infected seeds from field
D, Disease, G-BYRD7, G-DisStg = Disease, such as a fungus, bacteria, or virus
FUSASP, Fusarium spp., = Fusariose
seedling blight = Fusarium seedling blight (*F. culmorum* and *F. avenaceum*). Seeds infected in field
SEETRD = seed treatment, dry
PREPLA = preplant
SEED = seed (on)/seed treatment



Trial Treatments 10503-1

Confidential
University of Aarhus, Department of IPM, Flakkebjerg

Control of seedling blight (Fusarium spp.) in winter wheat	
Title No. 2: Registration trials in DK	
Trial ID: 10503-1	Protocol ID: 10503
Location: Flakkebjerg	Study Director: Bent J. Nielsen
Project ID: R-00073	Investigator: Bent J. Nielsen
Sponsor Contact: [REDACTED]	

Tri No.	Treatment Name	Form Type	Lot Code	Rate	Rate Unit	Appl Code	Appl Description
1	Untreated						
2	[REDACTED]	FS	09/512	75	ml/100 kg	A	0,900ml / 1200g
3	[REDACTED]	FS	09/512	150	ml/100 kg	A	1,800ml / 1200g
4	[REDACTED]	FS	09/512	200	ml/100 kg	A	2,400ml / 1200g
5	[REDACTED]	FS	09/512	300	ml/100 kg	A	3,600ml / 1200g
6	[REDACTED] 30 g/L FS	FS	09/511	75	ml/100 kg	A	0,900ml / 1200g
7	[REDACTED] 30 g/L FS	FS	09/511	150	ml/100 kg	A	1,800ml / 1200g
8	[REDACTED] 30 g/L FS	FS	09/511	200	ml/100 kg	A	2,400ml / 1200g
9	[REDACTED] 30 g/L FS	FS	09/511	300	ml/100 kg	A	3,600ml / 1200g

Site Description 10503-1

General Trial Information

Study Director: Bent J. Nielsen Title: Senior scientist
Investigator: Bent J. Nielsen Title: Senior scientist

Discipline: F/S fungicide seed treatment
Trial Status: F one-year/final
Initiation Date: 02-09-2009 Planned Completion Date: 01-03-2011

Trial Location

City: Flakkebjerg Latitude of LL Corner °: 55,3262 N
State/Prov.: Slagelse Longitude of LL Corner °: 11,38679 E
Postal Code: DK-4200
Country: Den

Official Trial Code: 10503-1

Conducted Under GEP: X

Guideline	Description
1. PP T/19(4)	Seed-borne cereal fungi

Keywords: seedling blight, Microdochium nivale, Fusarium spp., efficacy evaluation of seed treatments

Objectives:

To test the efficacy of [REDACTED] 30 FS against seedling blight (Fusarium spp.) of wheat in GEP trials. The product is compared with the reference product [REDACTED] in the same relative dose levels as the test product (150 ml [REDACTED] 100 kg = standard in Denmark). The test will be performed with artificial seed inoculation



AARHUS UNIVERSITET

Faculty of Agricultural Sciences, Department of Integrated Pest Management

Personnel

Study Director: Bent J. Nielsen **Title:** Senior scientist
Postal Code: DK-4200
Investigator: Bent J. Nielsen **Title:** Senior scientist
Address: Department of Integrated Pest Management, Forsøgsvej 1
Location: Flakkebjerg, Denmark
Postal Code: DK-4200 **E-mail:** bent.nielsen@agrsci.dk
Phone No.: +45 89 99 36 54 **Mobile No.:** +45 22 28 33 02

Cooperator/Landowner

Cooperator: DJF, Århus University **Role:** Cooperator
Organization: Dept. of Integrated Pest Management **Org. Type:** University
Address 1: Forsøgsvej 1
Address 2: DK-4200 Flakkebjerg **Phone No.:** +45 89 99 19 00
City: Slagelse
Postal Code: DK-4200
Country: DNK Denmark

Other Personnel

Role	Name	Other
Technician	Hans-Peter Madsen	HPM

Crop Description

Crop 1: TRZAW	Triticum aestivum (winter)	Winter wheat
Variety:	SW MAGNIFIK 2009	Description: Natural infected
BBCH Scale:	BCER	Planting Date: 02-10-2009
Planting Method:	DRILLE drilled	Rate, Unit: 400 PLANTS/M2
Depth, Unit:	5 cm	Perennial Age, Unit: 1 YR
Row Spacing, Unit:	12,5 cm	Spacing Within Row, Unit: 1,5 m
Seed Bed:	MEDIUM medium	Soil Temperature, Unit: 10,1 C
Soil Moisture:	NORMAL normal	Emergence Date: 23-10-2009
Harvest Date:	25-08-2010	Harvest Equipment: HALDRUP
Harvested Width, Unit:	1,5 m	Harvested Length, Unit: 9 m
% Standard Moisture:	15,0	

Pest Description

Pest 1 Type: D **Code:** FUSASP Fusarium spp.
Common Name: Fusarium spp.
Description: seedling blight
Establishment Method/Description: Natural infection

Site and Design

Plot Width, Unit: 1,5 m **Site Type:** FIELD field
Plot Length, Unit: 9 m **Experimental Unit:** 1 PLOT plot
Plot Area, Unit: 13,5 m2 **Tillage Type:** CONTIL conventional-till
Replications: 4 **Study Design:** RACOB� Randomized Complete Block (RCB)
Untreated Arrangement: INCLUDED single control randomized in each block



Trial Initiation Comments:

SEED ANALYSIS

WATER CONTENT : 14,0 %
 GERMINATION : 94 %
 INFECTION : 6,3 % FUSARIUM SPP.(BROWN ROOTS)
 : 0,0 % FUSARIUM SPP. (BROWN COLEOPTILES)
 : 0,0 % SEPTORIA

INOCULATION : NATURAL INFECTION.

ORIGIN OF SEED : SW MAGNIFIK 2009

APPLICATION

EQUIPMENT : SEED TREATMENT IN 5,8 L PLASTIC PAIL.

30.09 09 : WATER CONTENT DETERMINED
 30.09 09 : SEEDS IN BAGS READY FOR SOWING
 10.02 10 : GERMINATION TEST PERFORMED (2x50 SEEDS).
 10 02 10 : TEST OF BROWN ROOTS.
 10 02 10 : TEST OF BROWN COLEOPTILES
 10.02 10 : TEST OF SEPTORIA.

	Previous Crops	Year
1.	SPRING BARLEY	2009
2.	WINTER WHEAT	2008

Maintenance

No.	Date	Maintenance Treatment Name	Rate	Rate Unit
1.	26-03-2010	NPK 27-3-10 WITH SULPHUR	290	kg/ha
2.	08-04-2010	HUSSAR OD	0,03	L/ha
3.	08-04-2010	RENOL	0,5	L/ha
4.	03-05-2010	NPK 26-2-7 WITH SULPHUR	420	kg/ha

Soil Description

% Sand: 44,5 % OM: 2,5 Texture: C clay
 % Silt: 19,8 Soil Name: J8 7
 % Clay: 19,2 Fert. Level: F fair

Moisture and Weather Conditions

Overall Moisture Conditions: NORMAL normal
 Closest Weather Station: FLAKKEBJERG RES. GRID 6135 Distance, Unit: 1 km

Application Description

	A
Application Date:	30-09-2009
Application Method:	SEEDTR
Application Timing:	PREPLA
Application Placement:	SEED
Applied By:	HPM



Air Temperature, Unit:	20 C
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Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale:	TRZAW BCER

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale:	FUSASP D

Application Equipment

	A
Appl. Equipment:	PLASTIC PAIL



Plotmap 10503-1

Tri	Tri Description
1	Untreated
2	75ml/100kg
3	150ml/100kg
4	200ml/100kg
5	300ml/100kg
6	30 g/L FS 75ml/100kg
7	30 g/L FS 150ml/100kg
8	30 g/L FS 200ml/100kg
9	30 g/L FS 300ml/100kg

401 7	402 3	403 9	404 8	405 6	406 1	407 4	408 2	409 5
301 3	302 9	303 6	304 2	305 7	306 4	307 5	308 1	309 8
201 9	202 2	203 4	204 3	205 1	206 7	207 6	208 8	209 5
101 3	102 1	103 5	104 7	105 9	106 6	107 8	108 4	109 2



Trial Treatments 10503-2

Confidential
University of Aarhus, Department of IPM, Flakkebjerg

Control of seedling blight (<i>Fusarium</i> spp.) in winter wheat	
Title No. 2: Registration trials in DK	
Trial ID: 10503-2	Protocol ID: 10503
Location: Flakkebjerg	Study Director: Bent J. Nielsen
Project ID: R-00073	Investigator: Bent J Nielsen
Sponsor Contact: [REDACTED]	

Trt No.	Treatment Name	Form Type	Lot Code	Rate	Rate Unit	Appl Code	Appl Description
1	Untreated						
2	[REDACTED]	FS	09/512	75	ml/100 kg	A	0,900ml / 1200g
3	[REDACTED]	FS	09/512	150	ml/100 kg	A	1,800ml / 1200g
4	[REDACTED]	FS	09/512	200	ml/100 kg	A	2,400ml / 1200g
5	[REDACTED]	FS	09/512	300	ml/100 kg	A	3,600ml / 1200g
6	[REDACTED] 30 g/L FS	FS	09/511	75	ml/100 kg	A	0,900ml / 1200g
7	[REDACTED] 30 g/L FS	FS	09/511	150	ml/100 kg	A	1,800ml / 1200g
8	[REDACTED] 30 g/L FS	FS	09/511	200	ml/100 kg	A	2,400ml / 1200g
9	[REDACTED] 30 g/L FS	FS	09/511	300	ml/100 kg	A	3,600ml / 1200g

Site Description 10503-2

General Trial Information

Study Director: Bent J Nielsen Title: Senior scientist
Investigator: Bent J Nielsen Title: Senior scientist

Discipline: F/S fungicide seed treatment

Trial Status: F one-year/final

Initiation Date: 02-09-2009 Planned Completion Date: 01-03-2011

Trial Location

City: Flakkebjerg Latitude of LL Corner °: 55,3262 N
State/Prov.: Slagelse Longitude of LL Corner °: 11,38679 E
Postal Code: DK-4200
Country: Den

Official Trial Code: 10503-2

Conducted Under GEP: X

Guideline	Description
1. PP 1/19(4)	Seed-borne cereal fungi

Keywords: seedling blight, *Microdochium nivale*, *Fusarium* spp. , efficacy evaluation of seed treatments

Objectives:

To test the efficacy of [REDACTED] 30 FS against seedling blight (*Fusarium* spp.) of wheat in GEP trials. The product is compared with the reference product [REDACTED] in the same relative dose levels as the test product (150 ml [REDACTED] 100 kg = standard in Denmark). The test will be performed with artificial seed inoculation.



AARHUS UNIVERSITET

Faculty of Agricultural Sciences Department of Integrated Pest Management

Personnel

Study Director: Bent J. Nielsen **Title:** Senior scientist
Postal Code: DK-4200
Investigator: Bent J. Nielsen **Title:** Senior scientist
Address: Department of Integrated Pest Management, Forsøgsvej 1
Location: Flakkebjerg, Denmark
Postal Code: DK-4200 **E-mail:** bent.nielsen@agrsci.dk
Phone No.: +45 89 99 36 54 **Mobile No.:** +45 22 28 33 02

Cooperator/Landowner

Cooperator: DJF, Århus University **Role:** Cooperator
Organization: Dept. of Integrated Pest Management **Org. Type:** University
Address 1: Forsøgsvej 1
Address 2: DK-4200 Flakkebjerg **Phone No.:** +45 89 99 19 00
City: Slagelse
Postal Code: DK-4200
Country: DNK Denmark

Other Personnel

Role	Name	Other
Technician	Hans-Peter Madsen	HPM

Crop Description

Crop 1: TRZAW Triticum aestivum (winter) **Winter wheat**
Variety: 09321-1 RITMO **Description:** Natural infected
BBCH Scale: BCER **Planting Date:** 02-10-2009
Planting Method: DRILLE drilled **Rate, Unit:** 400 PLANTS/M2
Depth, Unit: 5 cm **Perennial Age, Unit:** 1 YR
Row Spacing, Unit: 12 cm **Spacing Within Row, Unit:** 1.5 m
Seed Bed: MEDIUM medium **Soil Temperature, Unit:** 10.1 C
Soil Moisture: NORMAL normal **Emergence Date:** 23-10-2009
Harvest Date: 25-08-2010 **Harvest Equipment:** HALDRUP
Harvested Width, Unit: 1.5 m **Harvested Length, Unit:** 9 m

Pest Description

Pest 1 Type: D **Code:** FUSASP Fusarium spp.
Common Name: Fusarium spp.
Description: seedling blight
Establishment Method/Description: Natural infection

Site and Design

Plot Width, Unit: 1.5 m **Site Type:** FIELD field
Plot Length, Unit: 9 m **Experimental Unit:** 1 PLOT plot
Plot Area, Unit: 13.5 m2 **Tillage Type:** CONTIL conventional-till
Replications: 4 **Study Design:** RACOB� Randomized Complete Block (RCB)
Untreated Arrangement: INCLUDED single control randomized in each block



AARHUS UNIVERSITET

Faculty of Agricultural Sciences Department of Integrated Pest Management

Trial Initiation Comments:

SEED ANALYSIS

WATER CONTENT : 13,6 %
 GERMINATION 98 %
 INFECTION 2,6 % FUSARIUM SPP.(BROWN ROOTS)
 0,0 % FUSARIUM SPP (BROWN COLEOPTILES)
 0,0 % SEPTORIA

INOCULATION : NATURAL INFECTION.

ORIGIN OF SEED : RITMO 09321-1

APPLICATION

EQUIPMENT SEED TREATMENT IN 5,8 L PLASTIC PAIL.

30.09.09 : WATER CONTENT DETERMINED
 30.09.09 : SEEDS IN BAGS READY FOR SOWING
 10.02.10 : GERMINATION TEST PERFORMED (2x50 SEEDS).
 10.02.10 : TEST OF BROWN ROOTS.

	Previous Crops	Year
1.	SPRING BARLEY	2009
2.	WINTER WHEAT	2008

Maintenance

No.	Date	Maintenance Treatment Name	Rate	Rate Unit
1.	26-03-2010	NPK 27-3-10 WITH SULPHUR	290	kg/ha
2.	08-04-2010	HUSSAR OD	0,03	L/ha
3.	08-04-2010	RENOL	0,5	L/ha
4.	03-05-2010	NPK 26-2-7 WITH SULPHUR	420	kg/ha

Soil Description

% Sand: 44,5 % OM: 2,5 Texture: C clay
 % Silt: 19,8 Soil Name: JB 7
 % Clay: 19,2 Fert. Level: F fair

Moisture and Weather Conditions

Overall Moisture Conditions NORMAL normal
 Closest Weather Station: FLAKKEBJERG RES. GRID 6135 Distance, Unit: 1 km

Application Description

	A
Application Date:	30-09-2009
Application Method:	SEEDTR
Application Timing:	PREPLA
Application Placement:	SEED
Applied By:	HPM
Air Temperature, Unit:	20 C



Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale:	TRZAW BCER

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale:	FUSASP D

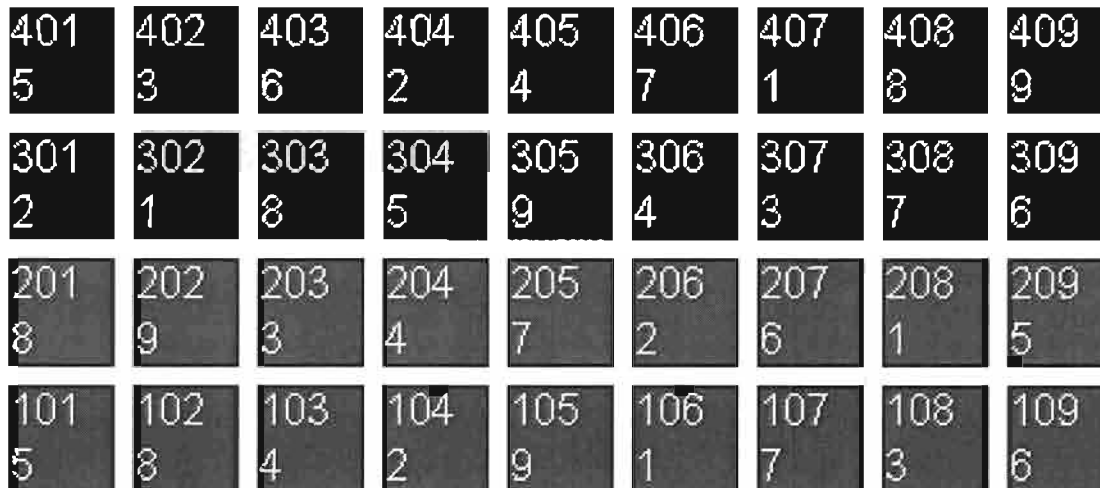
Application Equipment

	A
Appl. Equipment:	PLASTIC PAIL



Plotmap 10503-2

Trt	Trt Description
1	Untreated
2	75ml/100kg
3	150ml/100kg
4	200ml/100kg
5	300ml/100kg
6	30 g/L FS 75ml/100kg
7	30 g/L FS 150ml/100kg
8	30 g/L FS 200ml/100kg
9	30 g/L FS 300ml/100kg





Protocol Treatments 10505

Confidential
University of Aarhus, Department of IPM, Flakkebjerg

Control of common bunt (Tilletia tritici) in winter wheat
Title No. 2: Registration trials in DK
Protocol ID: 10505 Trial ID:
Location: Flakkebjerg Study Director: Bent J. Nielsen
Project ID: 10505 By: Bent J Nielsen
Sponsor Contact: [redacted]

Table with 5 columns: Trt No., Treatment Name, Rate, Rate Unit, Appl Code. Rows include Untreated, various concentrations (75, 150, 200, 300 ml/100 kg), and 30 g/L FS treatments, plus an uninoculated control.

Additional Treatment Information
Treatment Name
Untreated = Untreated check
[redacted] = [redacted] 30
[redacted] 30 g/L FS = [redacted] 30
Uninoculated control = Uninoculated control check of e.g. soil infection
Rate Unit
mL/100 kg = Milliliters Product per 100 Kilograms Seed (US=FL OZ/Cwt)4

Replications: 4, Untreated treatments: 1, Reference treatment number: 3, Conduct under GLP/GEP: Yes (GEP with no protection), Design: Randomised Complete Block (RCB), Treatment units: Treated 'Plot' size, Dry Form. Unit: %, Treated 'Plot' size Width: 0,25 meters, Treated 'Plot' size Length: 9 meters, Slurry rate: 100 mL/100 kg, Mix size: 100 g seed, Format definitions: G-A117.def, G-A117.frm

Product quantities required for listed treatments and applications of trials included in this table:

Table with 6 columns: Amount*, Unit, Treatment Name, Form Conc, Form Type, Lot Code. Rows show 1,450 ul for [redacted] and [redacted] 30 g/L FS.

* 'Per area' calculations based on spray volume= 100 mL/100 kg, mix size= 100 g seed:100 Grams (mix size basis).
* Product amounts adjusted for the 2 trials planned for this protocol.



Protocol Description 10505

Trial Establishment Guidelines

Project ID: 10505	Developer: ██████████
Revision Number: 1,1	Revision Status: F Final
Revision Date: 10-11-2010	Issue Date: 26-08-2009
Plot Width, Unit: 0,25 m	Site Type: FIELD field
Plot Length, Unit: 9 m	Experimental Unit: 200 SEED number seeds, bulbs, etc.
Plot Area, Unit: 2,25 m ²	Tillage Type: CONTIL conventional-till
Replications: 4	Study Design: RACOBL Randomized Complete Block (RCB)
Untreated Arrangement: INCLUDE single control randomized in each block	

Keywords: Common bunt of wheat, *Tilletia tritici*, *Tilletia caries*, artificial inoculation, efficacy evaluation of seed treatments

Trial ID	Responsible	Number of Trials
10505	HPM	2

Total Trials: 2

Conduct Under GEP: X

	Guideline	Description
1.	EPP0	EP 1/19(4)

Objectives:

To test the efficacy of ██████████ 30 FS against common bunt (*Tilletia tritici*) of wheat in GEP trials. The product is compared with the reference product ██████████ in the same relative dose levels as the test product (150 ml ██████████ 100 kg = standard in Denmark). The test will be performed with artificial seed inoculation.

Crop Description

Crop 1: TRZAW Triticum aestivum (winter) Winter wheat
Variety: HERZOG **Description:** Artificial inoculation
BCH Scale: BCER

Target Pest Description

Pest 1 Type: D **Code:** TILLCA *Tilletia tritici*
Common Name: Common bunt of wheat
Description: T tritici (T. caries)
Artificial Population: X **Establishment Date:** 25-09-2009
Establishment Rate, Unit: 5g + 2g spores/kg wheat
Establishment Method/Description: inoculation before seed treatment

Application

	A
Application Method:	SEETRD
Application Timing:	PREPLA
Application Placement:	SEED



Application Directions:

2 trials in winter wheat.

10505-1 Seed inoculation 5g/kg Sowing time 02.10.2009

10505-2 Seed inoculation 2g/kg Sowing time 02.10.2009

isolate: TC SP 95-4/08

Seed borne infection: The seeds is artificially inoculated before seed treatment with 2g and 5g spores of *T. tritici* per kg wheat.

Seed treatment individually for each product and dose in glas cylinders

Complete randomised blocks and 4 replicates, plot size is 9 m single rows and 200 seeds per row. The seeds is sown with a standard single row sowing machine (Hege 90) and seed drill at 3-5 cm depth. Uninoculated control plots are sowed with Wintersteiger

Crop Stage At Each Application

Crop 1 Code, BBCH Scale:	TRZAW BCER

Pest Stage At Each Application

Pest 1 Code, Disc., Scale:	TILLCA D



Geographic Area/Environmental Considerations:

OSR in narrow crop rotation

Cropping Considerations:

Spraying against insects according to need

Standard fertilizer

Assessment:

Field:

:

G.S. 11-12: Number of emerged plants in the rows.

Winter: Number of plants with attack of snow mould.

Spring: Assessments of plants that survived the winter.

July: Number of plants with attack of common bunt

Laboratory:

% Water content of seeds.

% infection with Fusarium (brown coleoptiles).

% Septoria nodorum

% germination

Destruction:

No

Other:

Any other observed effect on other pests or on other non-target organisms are recorded

The BBCH growth stage of the crop at each date of application and assessment are recorded.

Statistical Analysis:

The program Agricultural Research Manager, ARM (ver.8.2.2, Gylling Data Management, April 2009) is used for data management and statistical calculations. The data are subjected to analysis of variance, and treatment means are separated at the 95% probability level using F-test (Student-Newman-Keuls test). Treatments with the same letter in the tables are not significantly different.

General Comments:

The trials are performed according to "Guidelines for testing of Pesticides" and are carried out at Research Centre Flakkebjerg or farmers field.

The Department of Crop Protection, Research Centre Flakkebjerg has been approved for GEP (Good Efficacy Practice) and is working in accordance with the principle of GEP. The testing unit have Standard Operating Procedures and are inspected by the recognising authorities (GEP unit).

The trials are carried out according to GEP practice.

The results are reported in a systematic form and include analysis, evaluation and original (raw) data. Publication of the results must only take place after consultation with the study director.



m = meter
m² = square meter
FIELD, field = field
SEED, number seeds, bulbs, etc. = number seeds, bulbs, etc.
CONTIL, conventional-till = conventional-till
RACOBL, Randomized Complete Block (RCB) = Randomized Complete Block (RCB)
INCLUDED, single control randomized in each block = single control randomized in each block
HPM = Hans-Peter Madsen
X = X=yes
Default = Standard validation for ARM GDMDef trials
Artificial inoculation = Artificial inoculated seeds
D, Disease, G-BYRD7, G-DisStg = Disease, such as a fungus, bacteria, or virus
TILLCA, Tilletia tritici, = common bunt.
T. tritici (T. caries) = Artificial inoculation before seed treatment
SEETRD = seed treatment, dry
PREPLA = preplant
SEED = seed (on)/seed treatment

Trial Treatments 10505-1

Confidential

University of Aarhus, Department of IPM, Flakkebjerg

Control of common bunt (<i>Tilletia tritici</i>) in winter wheat			
Title No. 2: Registration trials in DK			
Trial ID: 10505-1	Protocol ID: 10505		
Location: Flakkebjerg	Study Director: Bent J. Nielsen		
Project ID: 10505	Investigator: Bent J. Nielsen		
Sponsor Contact: [REDACTED]			

Tt. No.	Treatment Name	Form Type	Lot Code	Rate	Rate Unit	Appl Code	Appl Description
1	Untreated						
2	[REDACTED]	FS	09/512	75	ml/100 kg	A	0,075 ml/100 g
3	[REDACTED]	FS	09/512	150	ml/100 kg	A	0,150 ml/100 g
4	[REDACTED]	FS	09/512	200	ml/100 kg	A	0,200 ml/100 g
5	[REDACTED]	FS	09/512	300	ml/100 kg	A	0,300 ml/100g
6	[REDACTED] 30 g/L FS	FS	09/511	75	ml/100 kg	A	0,075 ml/100 g
7	[REDACTED] 30 g/L FS	FS	09/511	150	ml/100 kg	A	0,150 ml/100 g
8	[REDACTED] 30 g/L FS	FS	09/511	200	ml/100 kg	A	0,200 ml/100 g
9	[REDACTED] 30 g/L FS	FS	09/511	300	ml/100 kg	A	0,300 ml/100g
10	Uninoculated control						

Site Description 10505-1

General Trial Information

Study Director: Bent J. Nielsen Title: Senior scientist

Investigator: Bent J. Nielsen Title: Senior scientist

Discipline: F/S fungicide seed treatment

Trial Status: F one-year/initial

Initiation Date: 02-09-2009

Planned Completion Date: 01-03-2011

Trial Location

City: Flakkebjerg Latitude of LL Corner °: 55,3262 N

State/Prov.: Slagelse Longitude of LL Corner °: 11,38679 E

Postal Code: DK-4200

Country: Den

Conducted Under GEP: X

Guideline	Description
1. PP 1/19(4)	Seed-borne cereal fungi

Keywords: Common bunt of wheat, *Tilletia tritici*, *Tilletia caries*, artificial inoculation, efficacy evaluation of seed treatments

Objectives:

To test the efficacy of [REDACTED] 30 FS against common bunt (*Tilletia tritici*) of wheat in GEP trials. The product is compared with the reference product [REDACTED] in the same relative dose levels as the test product (150 ml [REDACTED] 100 kg = standard in Denmark). The test will be performed with artificial seed inoculation.



Personnel

Study Director: Bent J. Nielsen **Title:** Senior scientist
Postal Code: DK-4200
Investigator: Bent J. Nielsen **Title:** Senior scientist
Address: Department of Integrated Pest Management, Forsøgsvej 1
Location: Flakkebjerg, Denmark
Postal Code: DK-4200 **E-mail:** bent.nielsen@agrsci.dk
Phone No.: +45 89 99 36 54 **Mobile No.:** +45 22 28 33 02

Cooperator/Landowner

Cooperator: DJF, Århus University **Role:** Cooperator
Organization: Dept. of Integrated Pest Management **Org. Type:** University
Address 1: Forsøgsvej 1
Address 2: DK-4200 Flakkebjerg **Phone No.:** +45 89 99 19 00
City: Slagelse
Postal Code: DK-4200
Country: DNK Denmark

Other Personnel

Role	Name	Other
Technician	Hans-Peter Madsen	HPM

Crop Description

Crop 1: TRZAW Triticum aestivum (winter) Winter wheat
Variety: HERZOG **Description:** Artificial inoculation
BBCH Scale: BCER **Planting Date:** 02-10-2009
Planting Method: DRILLE drilled **Rate, Unit:** 200 S/9M ROW
Depth, Unit: 5 cm **Perennial Age, Unit:** 1 YR
Row Spacing, Unit: 25 cm **Spacing Within Row, Unit:** 1,5 m
Seed Bed: MEDIUM medium **Soil Temperature, Unit:** 10,1 C
Soil Moisture: NORMAL normal **Emergence Date:** 23-10-2009

Pest Description

Pest 1 Type: D **Code:** TILLCA Tilletia tritici
Common Name: Common bunt of wheat
Description: T. tritici (T. caries)
Artificial Population: X **Establishment Date:** 22-09-2009
Establishment Rate, Unit: 5g spores/kg wheat
Establishment Method/Description: inoculation before seed treatment

Site and Design

Plot Width, Unit: 0,3 m **Site Type:** FIELD field
Plot Length, Unit: 9 m **Experimental Unit:** 200 PLANT plant
Plot Area, Unit: 2,7 m² **Tillage Type:** CONTIL conventional-till
Replications: 4 **Study Design:** RACOB L Randomized Complete Block (RCB)
Untreated Arrangement: INCLUDED single control randomized in each block



AARHUS UNIVERSITET

Faculty of Agricultural Sciences Department of Integrated Pest Management

Trial Initiation Comments:

SEED ANALYSIS

WATER CONTENT : 13,3 %
 GERMINATION : 96 %
 INFECTION : 2,5 % FUSARIUM SPP.(BROWN ROOTS)

INOCULATION : SEED BORNE INFECTION. THE SEEDS IS ARTIFICIALLY INOCULATED BEFORE SEED TREATMENT WITH 5G SPORES OF TILLETIA TRITICI PER KG WINTER WHEAT

ORIGIN OF SEED : HERZOG

APPLICATION

EQUIPMENT : SEED TREATMENT IN 0.7 L GLASS CYLINDERS

16 09.09 : WATER CONTENT DETERMINED
 16 09 09 : GERMINATION TEST PERFORMED (2x50 SEEDS)
 16 09.09 : TEST OF BROWN ROOTS
 28 09 09 : SEEDS IN BAGS READY FOR SOWING

	Previous Crops	Year
1.	SPRING BARLEY	2009
2.	WINTER WHEAT	2008

Maintenance

No.	Date	Maintenance Treatment Name	Rate	Rate Unit
1.	26-03-2010	NPK 27-3-10 WITH SULPHUR	290	kg/ha
2.	08-04-2010	HUSSAR OD	0,03	L/ha
3.	08-04-2010	RENOL	0,5	L/ha
4.	03-05-2010	NPK 26-2-7 WITH SULPHUR	420	kg/ha

Soil Description

% Sand: 44,5 % OM: 2,5 Texture: C clay
 % Silt: 19,8 Soil Name: JB 7
 % Clay: 19,2 Fert. Level: F fair

Moisture and Weather Conditions

Overall Moisture Conditions: NORMAL normal
 Closest Weather Station FLAKKEBJERG RES. GRID 6135 Distance, Unit: 1 km

Application Description

	A
Application Date:	28-09-2009
Application Method:	SEEDTR
Application Timing:	PREPLA
Application Placement:	SEED
Applied By:	HPM
Air Temperature, Unit:	20 C



Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale:	TRZAW BCER

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale:	TILLCA D

Application Equipment

	A
Appl. Equipment:	GLASS



Plotmap 10505-1

Trt	Trt Description
1	Untreated
2	75ml/100kg
3	150ml/100kg
4	200ml/100kg
5	300ml/100kg
6	30 g/L FS 75ml/100kg
7	30 g/L FS 150ml/100kg
8	30 g/L FS 200ml/100kg
9	30 g/L FS 300ml/100kg
10	Uninoculated control

401 9	402 10	403 5	404 8	405 6	406 2	407 3	408 1	409 4	410 7
301 7	302 2	303 10	304 1	305 4	306 6	307 5	308 8	309 9	310 3
201 6	202 5	203 9	204 10	205 7	206 3	207 1	208 2	209 8	210 4
101 3	102 10	103 8	104 1	105 5	106 9	107 7	108 4	109 6	110 2



Trial Treatments 10505-2

Confidential

University of Aarhus, Department of IPM, Flakkebjerg

Control of common bunt (<i>Tilletia tritici</i>) in winter wheat	
Title No. 2: Registration trials in DK	
Trial ID: 10505-2	Protocol ID: 10505
Location: Flakkebjerg	Study Director: Bent J. Nielsen
Project ID: 10505	Investigator: Bent J. Nielsen
Sponsor Contact: [REDACTED]	

Tri No.	Treatment Name	Form Type	Lol Code	Rate	Rate Unit	Appl Code	Appl Description
1	Untreated						
2	[REDACTED]	FS	09/512	75	ml/100 kg	A	0,075 ml/100 g
3	[REDACTED]	FS	09/512	150	ml/100 kg	A	0,150 ml/100 g
4	[REDACTED]	FS	09/512	200	ml/100 kg	A	0,200 ml/100 g
5	[REDACTED]	FS	09/512	300	ml/100 kg	A	0,300 ml/ 100g
6	[REDACTED] 30 g/L FS	FS	09/511	75	ml/100 kg	A	0,075 ml/100 g
7	[REDACTED] 30 g/L FS	FS	09/511	150	ml/100 kg	A	0,150 ml/100 g
8	[REDACTED] 30 g/L FS	FS	09/511	200	ml/100 kg	A	0,200 ml/100 g
9	[REDACTED] 30 g/L FS	FS	09/511	300	ml/100 kg	A	0,300 ml/ 100g
10	Uninoculated control						

Site Description 10505-2

General Trial Information

Study Director: Bent J. Nielsen Title: Senior scientist
 Investigator: Bent J. Nielsen Title: Senior scientist

Discipline: F/S fungicide seed treatment
 Trial Status: F one-year/final
 Initiation Date: 02-09-2009 Planned Completion Date: 01-03-2011

Trial Location

City: Flakkebjerg Latitude of LL Corner °: 55,3262 N
 State/Prov.: Slagelse Longitude of LL Corner °: 11,38679 E
 Postal Code: DK-4200
 Country: Den

Official Trial Code: 10505-2

Conducted Under GEP: X

	Guideline	Description
1.	PP 1/19(4)	Seed-borne cereal fungi

Keywords: Common bunt of wheat, *Tilletia tritici*, *Tilletia caries*, artificial inoculation, efficacy evaluation of seed treatments

Objectives:

To test the efficacy of [REDACTED] 30 FS against common bunt (*Tilletia tritici*) of wheat in GEP trials. The product is compared with the reference product [REDACTED] in the same relative dose levels as the test product (150 ml [REDACTED] 100 kg = standard in Denmark). The test will be performed with artificial seed inoculation.



Personnel

Study Director: Bent J Nielsen Title: Senior scientist
 Postal Code: DK-4200
 Investigator: Bent J Nielsen Title: Senior scientist
 Address: Department of Integrated Pest Management, Forsøgsvej 1
 Location: Flakkebjerg, Denmark
 Postal Code: DK-4200 E-mail: bent.nielsen@agrsci.dk
 Phone No.: +45 89 99 36 54 Mobile No.: +45 22 28 33 02

Cooperator/Landowner

Cooperator: DJF, Århus University Role: Cooperator
 Organization: Dept of Integrated Pest Management Org. Type: University
 Address 1: Forsøgsvej 1
 Address 2: DK-4200 Flakkebjerg Phone No.: +45 89 99 19 00
 City: Slagelse
 Postal Code: DK-4200
 Country: DNK Denmark

Other Personnel

Role	Name	Other
Technician	Hans-Peter Madsen	HPM

Crop Description

Crop 1: TRZAW Triticum aestivum (winter) Winter wheat
 Variety: HERZOG Description: Artificial inoculation
 BBCH Scale: BCER Planting Date: 02-10-2009
 Planting Method: DRILLE drilled Rate, Unit: 200 S/9M ROW
 Depth, Unit: 5 cm Perennial Age, Unit: 1 YR
 Row Spacing, Unit: 25 cm Spacing Within Row, Unit: 1,5 m
 Seed Bed: MEDIUM medium Soil Temperature, Unit: 10,1 C
 Soil Moisture: NORMAL normal Emergence Date: 23-10-2009

Pest Description

Pest 1 Type: D Code: TILLCA Tilletia tritici
 Common Name: Common bunt of wheat
 Description: T. tritici (T. caries)
 Artificial Population: X
 Establishment Rate, Unit: 2g spores/kg wheat
 Establishment Method/Description: inoculation before seed treatment

Site and Design

Plot Width, Unit: 0,3 m Site Type: FIELD field
 Plot Length, Unit: 9 m Experimental Unit: 200 PLANT plant
 Plot Area, Unit: 2,7 m² Tillage Type: CONTIL conventional-till
 Replications: 4 Study Design: RACOB� Randomized Complete Block (RCB)
 Untreated Arrangement: INCLUDED single control randomized in each block



Trial Initiation Comments:

SEED ANALYSIS .

WATER CONTENT . 13,3 %

GERMINATION . 96 %

INFECTION : 2,5 % FUSARIUM SPP.(BROWN ROOTS)

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EQUIPMENT : SEED TREATMENT IN 0,7 L GLASS CYLINDERS

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3.	08-04-2010	RENOL	0,5	L/ha
4.	03-05-2010	NPK 26-2-7 WITH SULPHUR	420	kg/ha

Soil Description

% Sand: 44,5 % OM: 2,5 Texture: C clay

% Silt: 19,8 Soil Name: JB 7

% Clay: 19,2 Fert. Level: F fair

Moisture and Weather Conditions

Overall Moisture Conditions: NORMAL normal

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Application Description

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Application Date:	28-09-2009
Application Method:	SEEDTR
Application Timing:	PREPLA
Application Placement:	SEED
Applied By:	HPM



Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale:	TRZAW BCER

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale:	TILLCA D

Application Equipment

	A
Appl. Equipment:	GLASS



Plotmap 10505-2

Trt	Trt Description
1	Untreated
2	75ml/100kg
3	150ml/100kg
4	200ml/100kg
5	300ml/100kg
6	30 g/L FS 75ml/100kg
7	30 g/L FS 150ml/100kg
8	30 g/L FS 200ml/100kg
9	30 g/L FS 300ml/100kg
10	Uninoculated control

401 7	402 3	403 8	404 2	405 9	406 4	407 6	408 10	409 5	410 1
301 5	302 8	303 10	304 9	305 2	306 1	307 7	308 3	309 4	310 6
201 8	202 7	203 2	204 3	205 5	206 9	207 4	208 6	209 1	210 10
101 4	102 5	103 1	104 10	105 9	106 3	107 8	108 7	109 6	110 2



4. CLIMATE

For the country in general the climate during the growing season (Sept. 2009 – Aug. 2010) was characterized by heavy rainfall in the autumn and at the end of the growing season. But in the spring the weather was very dry. The precipitation was 6.5% higher than normal, and the evaporation was 8% higher than normal. The average temperature was normal, and the global radiation was 6% above normal. But the average temperature in the autumn was high, and again in 2010 the average temperature in July was very high (18.7°C)

At Flakkebjerg the autumn (September – November) began very dry and sunny. September was exceptionally dry; hence ploughing and sowing were carried out under very difficult conditions. The rainfall during November was 53.8% higher than normal. The first frost came early (14 October), but November was warm 1.9°C above normal. The winter (December – February) was very cold and dry. The average temperature in January and February was below zero and the crops were covered by snow. Despite this the crops at Flakkebjerg in general survived the winter in good condition. The spring (March – May) started warm but April and especially May were cold. Hence, the crops and the weeds began growth very slowly. March and April were relatively dry but the rainfall in May was 49.7% less than normal. The summer (June – August) was hot and sunny. In July the average temperature was 2.1°C higher than normal. August was hot and wet with 51.1% more precipitation (107.3 mm) than normal. This made the harvest difficult, and some of the seeds began to germinate before they were harvested.

The automatic weather station at Flakkebjerg is located 12 km from the West Zealand coast. The climate at Flakkebjerg is representative of the area in which most of our trials are situated. The normal climate is given as an average of thirty years (1973-2003).

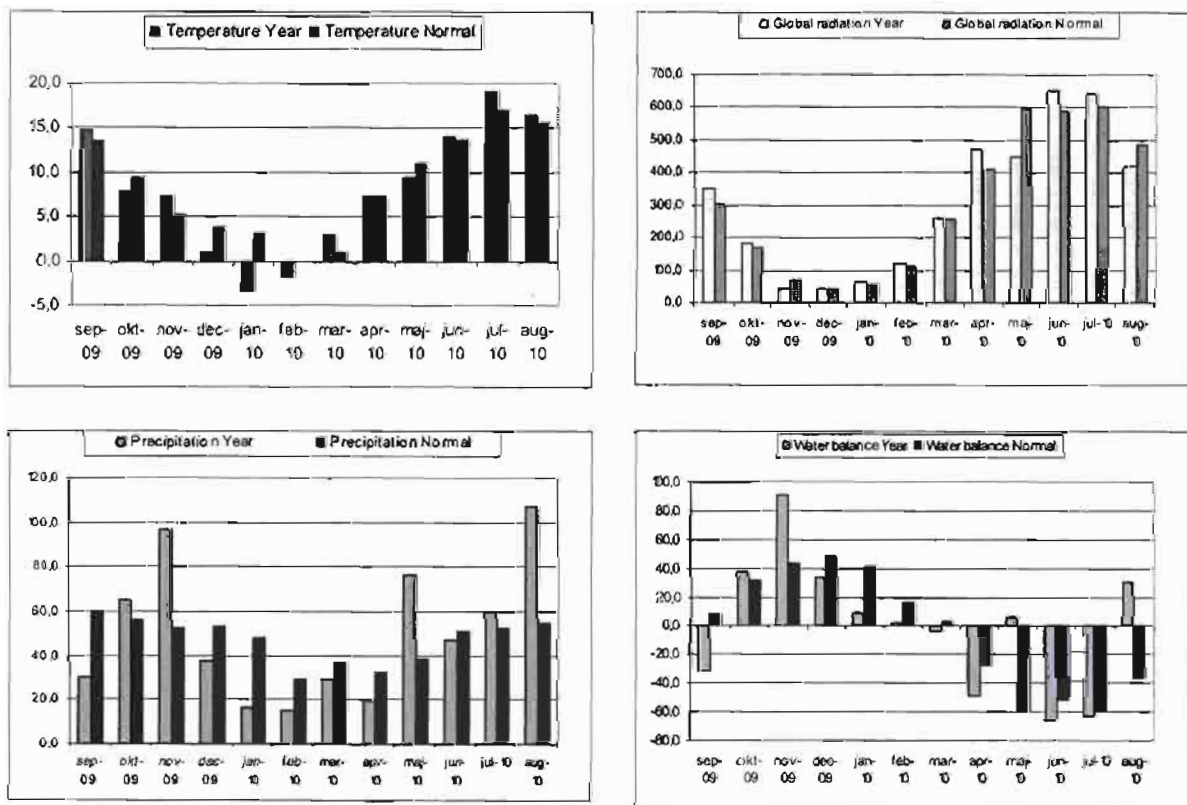


Figure 1: Climate data from Research Centre Flakkebjerg for the growing season September 09 – August 10. The temperature is in °C, the global radiation is measured in MJ/m², the precipitation in mm and the water balance is the difference between precipitation and potential evaporation.

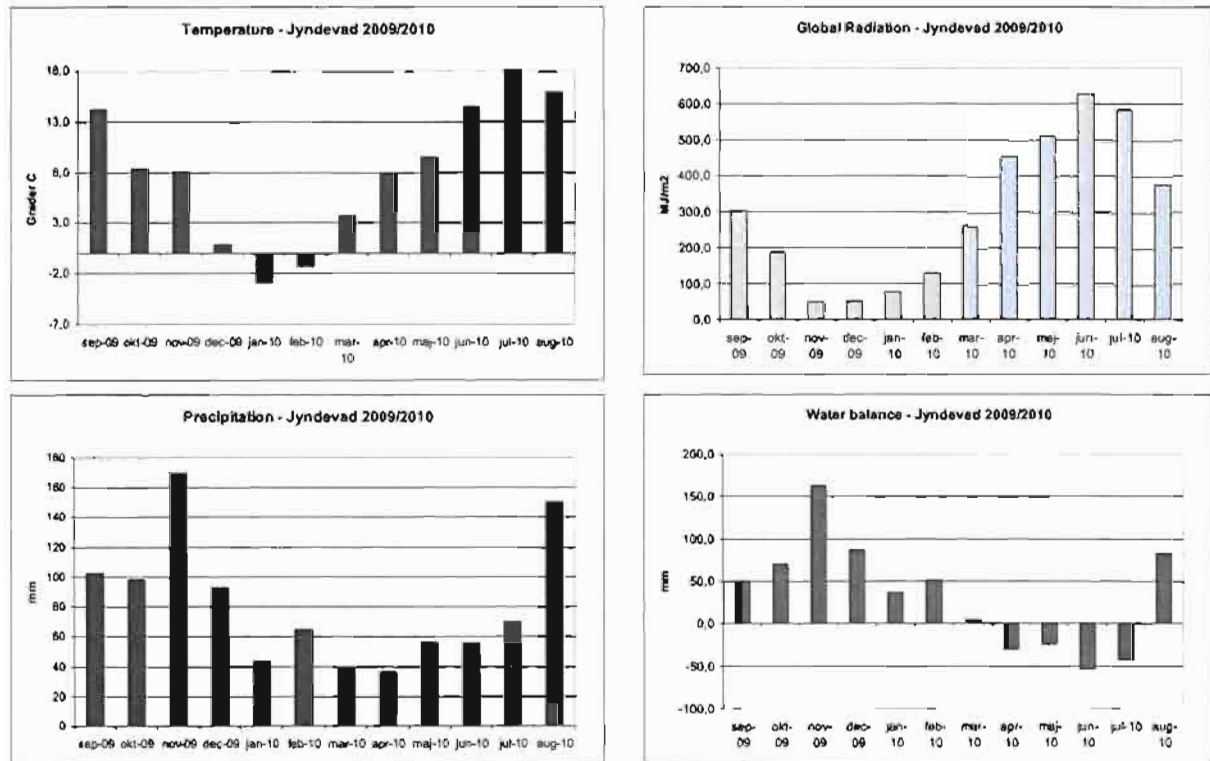


Figure 2: Climate data from the automatic weather station located at Jydeved and representative of our trials in Southern Jutland

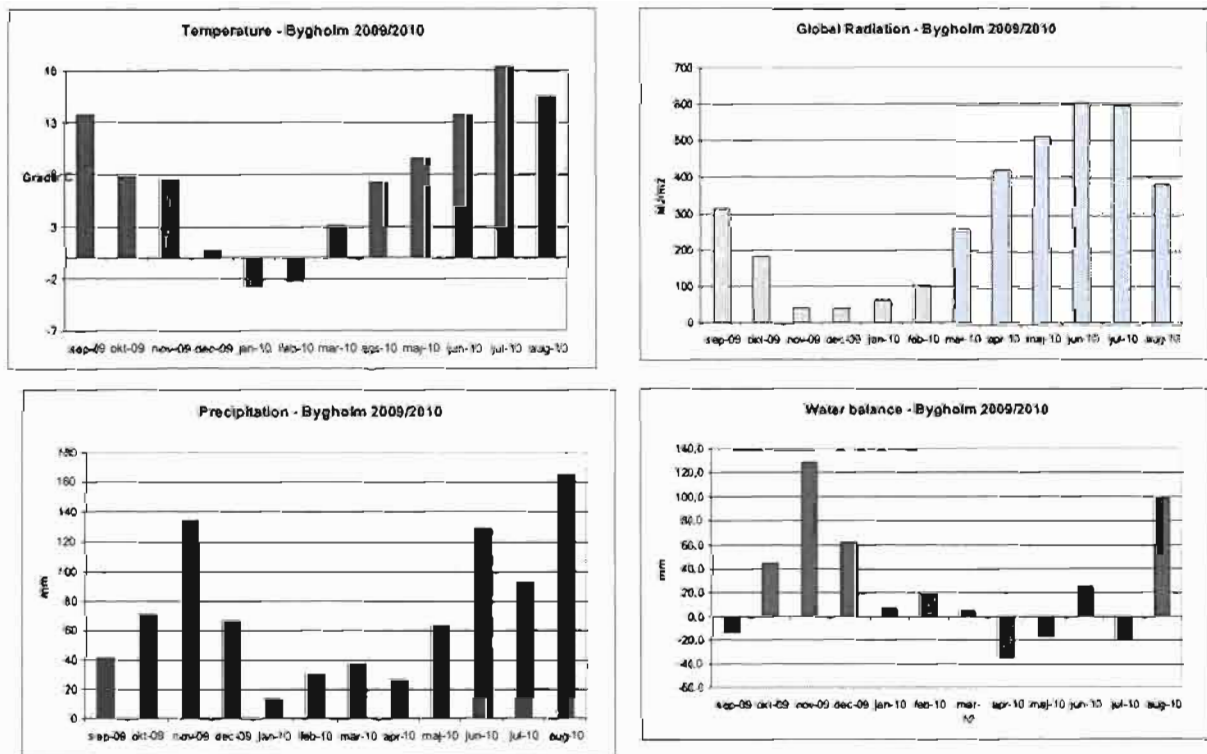


Figure 3: Climate data from the automatic weather station located at Bygholm and representative of our trials in the central part of Eastern Jutland.

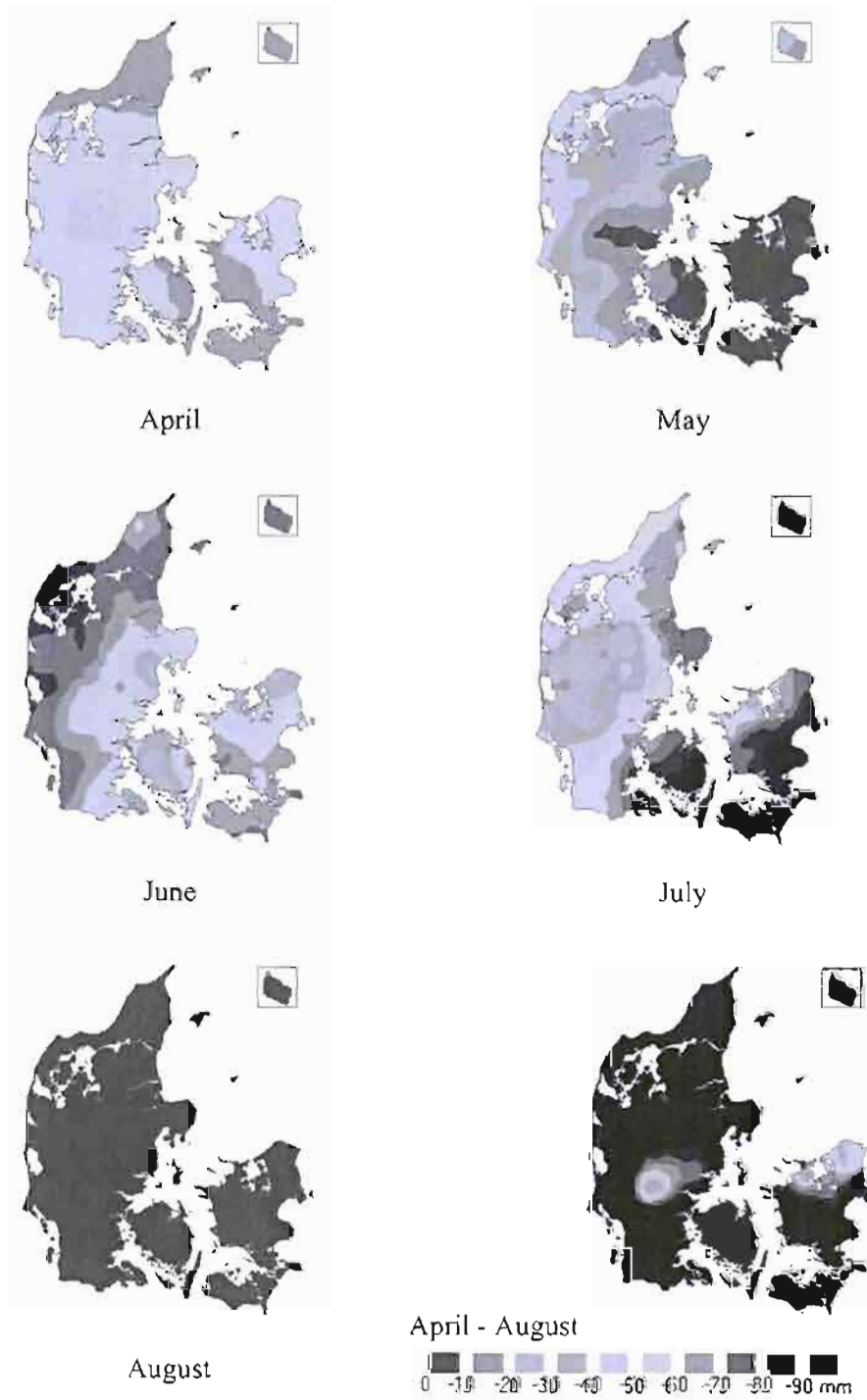


Figure 5: Water balance in the growing season 2010.

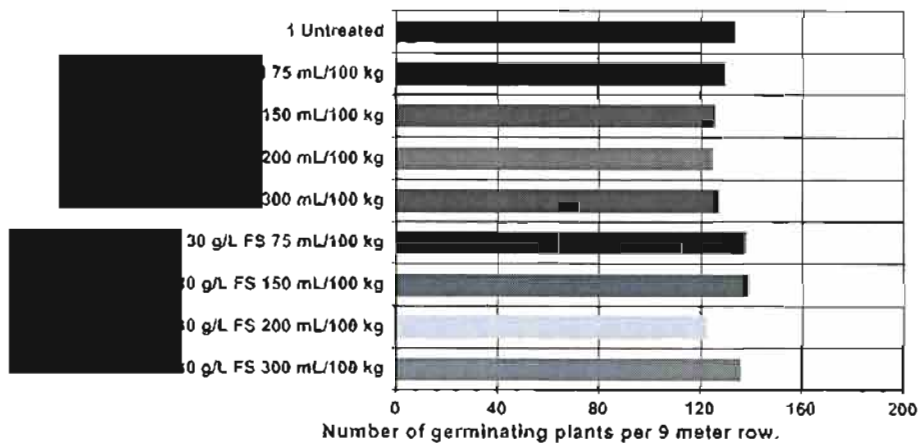


5. RESULTS

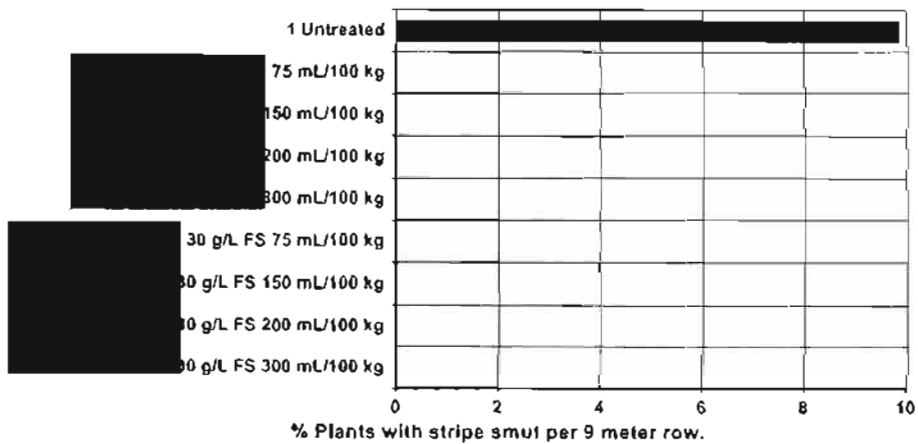
Summary of the trials in Graphics

Trial 10501-1

Control of stripe smut (*Urocystis occulta*) in rye Registration trials in DK.
(Trial ID:10501-1)



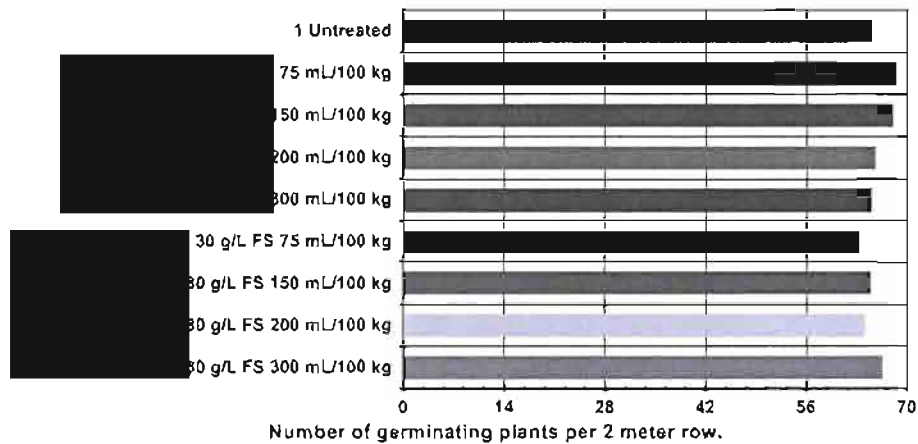
Control of stripe smut (*Urocystis occulta*) in rye Registration trials in DK.
(Trial ID:10501-1)



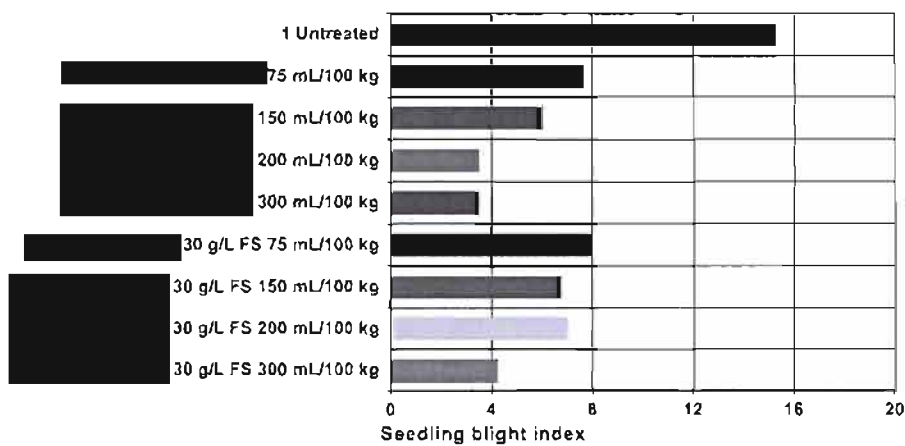


Trial 10503-1

Control of seedling blight (*Fusarium* spp.) in winter wheat Registration trials in DK. (Trial ID:10503-1)

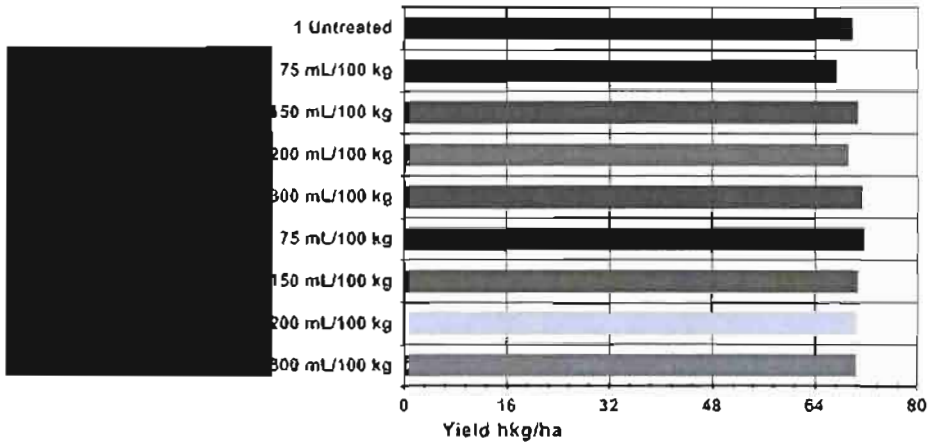


Control of seedling blight (*Fusarium* spp.) in winter wheat Registration trials in DK. (Trial ID:10503-1)

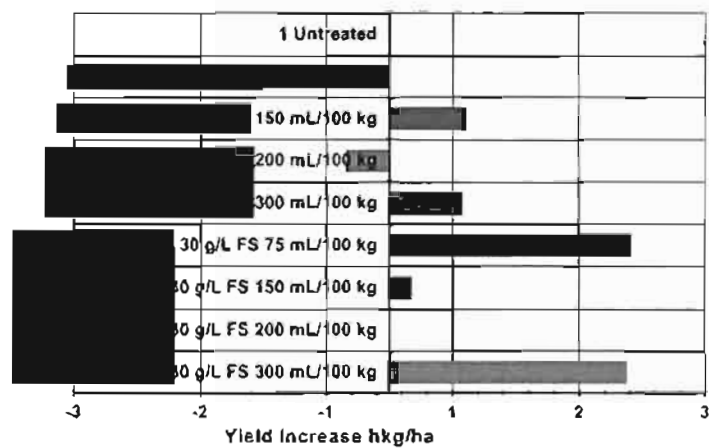




Control of seedling blight (*Fusarium* spp.) in winter wheat Registration trials in DK.
(Trial ID:10503-1)



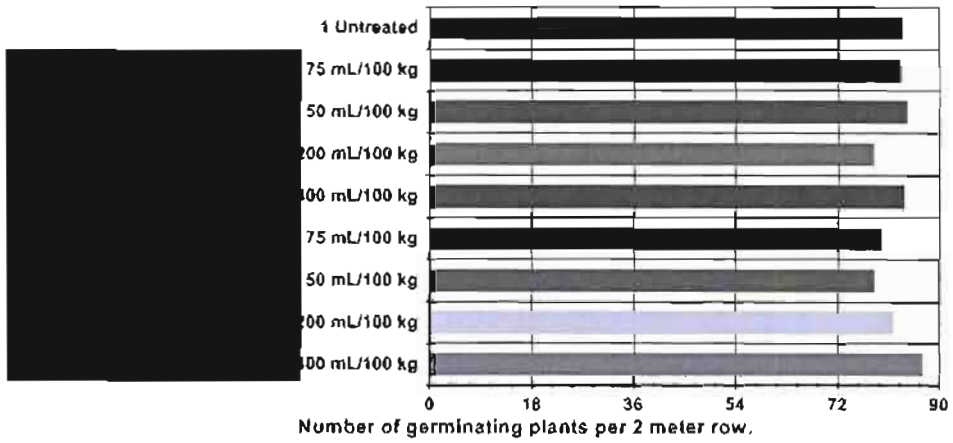
Control of seedling blight (*Fusarium* spp.) in winter wheat Registration trials in DK.
(Trial ID:10503-1)



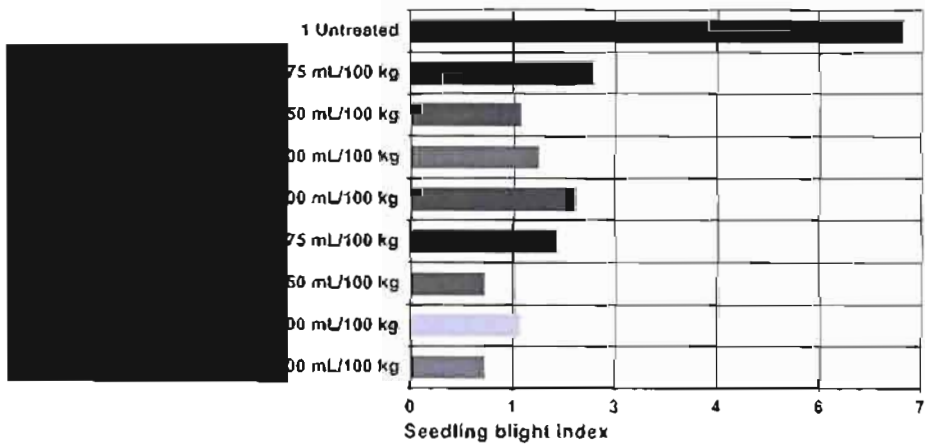


Trial 10503-2

Control of seedling blight (*Fusarium* spp.) in winter wheat Registration trials in DK.
(Trial ID:10503-2)

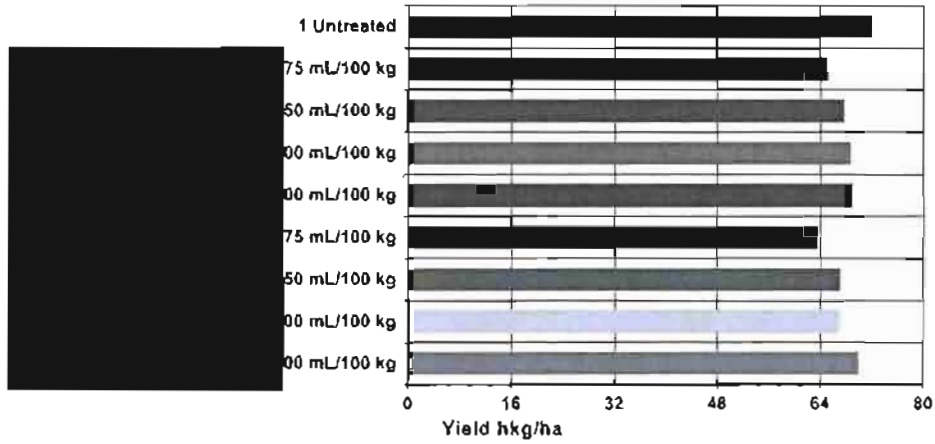


Control of seedling blight (*Fusarium* spp.) in winter wheat Registration trials in DK.
(Trial ID:10503-2)

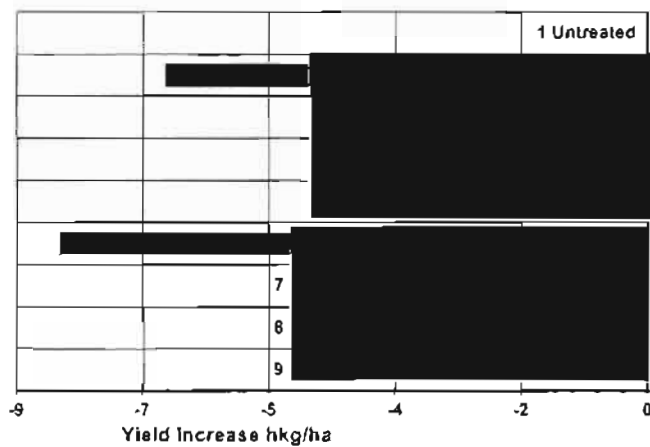




Control of seedling blight (*Fusarium spp.*) in winter wheat Registration trials in DK.
(Trial ID:10503-2)



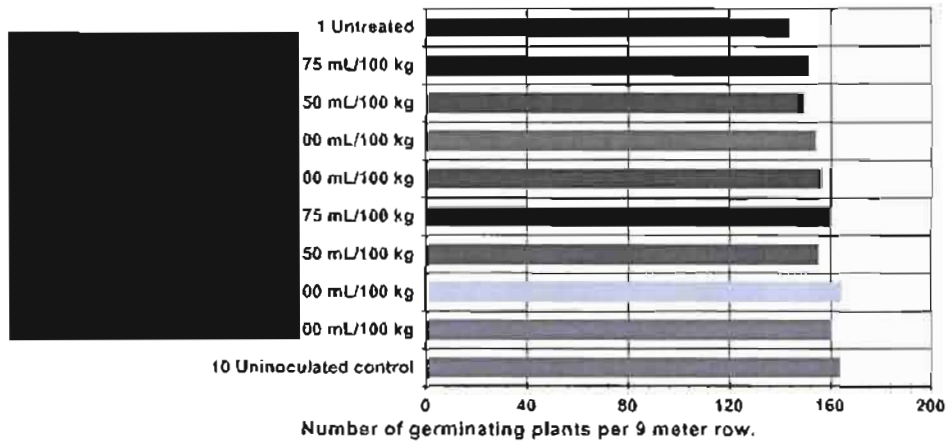
Control of seedling blight (*Fusarium spp.*) in winter wheat Registration trials in DK.
(Trial ID:10503-2)



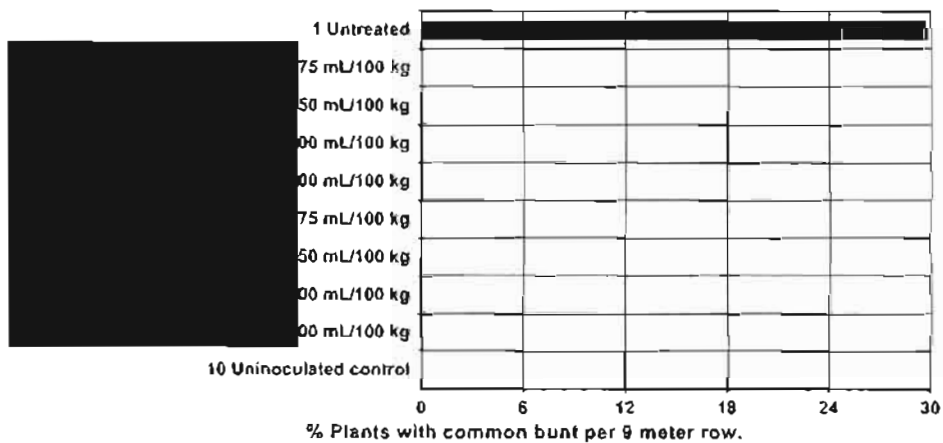


Trial 10505-1

Control of common bunt (*Tilletia tritici*) in winter wheat Registration trials in DK.
(Trial ID:10505-1)



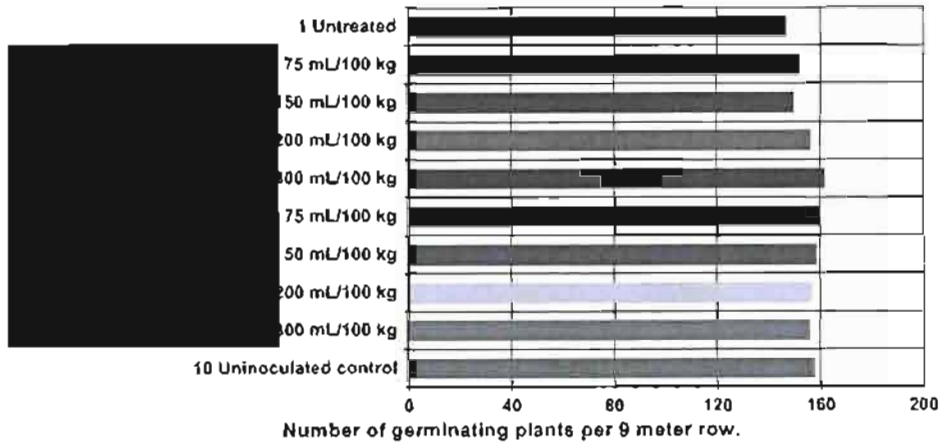
Control of common bunt (*Tilletia tritici*) in winter wheat Registration trials in DK.
(Trial ID:10505-1)



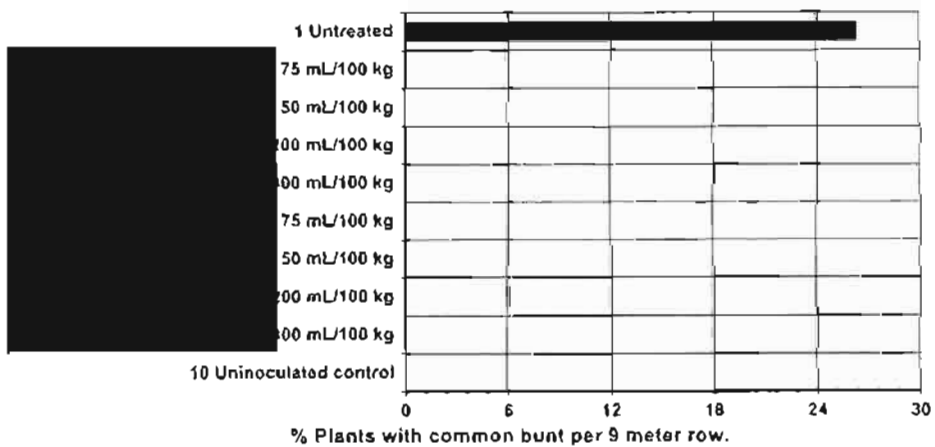


Trial 10505-2

Control of common bunt (*Tilletia tritici*) in winter wheat. Registration trials in DK. (Trial ID:10505-2)



Control of common bunt (*Tilletia tritici*) in winter wheat. Registration trials in DK. (Trial ID:10505-2)





AOV Means table 10501-1.

Pest Type				D Disease
Pest Code				UROCOO
Pest Scientific Name				Urocystis occu>
Pest Name				Flag smut of r>
Crop Code		SECCW		SECCW
BBCH Scale		BCER		BCER
Crop Scientific Name		Secale cereale>		Secale cereale>
Crop Name		Winter rye		Winter rye
Crop Variety		CAROTOP		CAROTOP
Description		PLANTS		FLAG SMUT
Part Rated		PLAEME C		LEAF C
Rating Date		29-10-2009		14-06-2010
Rating Type		COUPLA		DISSEV
Rating Unit		NO/ROW		PERCENT
Sample Size, Unit		9 ROWm		9 M
Collection Basis, Unit		200 SEEDLI		200 SEED
Number of Subsamples		1		1
Crop Stage Majority		11-12		66-69
Crop Stage Scale		BBCH		BBCH
Footnote Number		1		3
Assessed By		AKL		
ARM Action Codes		APOC		T1 APC
Tri	Treatment	Rate	Appl	
No.	Name	Unit	Code	
1	Untreated			
				134,0 a
				(100,0%)
2		75 ml/100 kg	A	
				130,0 a
				(97,0%)
3		150 ml/100 kg	A	
				125,5 a
				(93,7%)
4		200 ml/100 kg	A	
				124,8 a
				(93,1%)
5		300 ml/100 kg	A	
				127,0 a
				(94,8%)
6		30 g/L FS	A	
		75 ml/100 kg		138,0 a
				(103,0%)
7		30 g/L FS	A	
		150 ml/100 kg		139,3 a
				(103,9%)
8		30 g/L FS	A	
		200 ml/100 kg		123,0 a
				(91,8%)
9		30 g/L FS	A	
		300 ml/100 kg		136,0 a
				(101,5%)
LSD (P=.05)				11,65
Standard Deviation				7,98
CV				6,1
Bartlett's X2				3,15
P(Bartlett's X2)				0,925
Replicate F				3,008
Replicate Prob(F)				0,0500
Treatment F				2,365
Treatment Prob(F)				0,0492
				9,9 a
				(0,0%)
				0,0 b
				(100,0%)
				0,0 b
				(100,0%)
				0,0 b
				(100,0%)
				0,0 b
				(100,0%)
				0,0 b
				(100,0%)
				0,0 b
				(100,0%)
				2,13
				1,46
				132,63
				0,0
				1,000
				0,4098
				20,464
				0,0001

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Type	Rating Unit
D, Disease, G-BYRD7, G-DisStg = Disease, such as a fungus, bacteria, or virus	PERCENT = percent
Pest Code	ROWm = row-meter
UROCOO, Urocystis occulta, = Rugges stængelbrand	M = meter
Crop Code	SEEDLI = seeding
SECCW, BCER, Secale cereale (winter), = IE	SEED = seed
Part Rated	Crop Stage Scale
PLAEME = plant - emerged	BBCH = BBCH uniform plant stages
LEAF = leaf	ARM Action Codes
C = Crop is Part Rated	APCC = Automatic percent control (Control forced to 100% on AOV Means Table)
Rating Type	T1 = [2]/[1]*100
COUPLA = count - plant / emergence - objective	
	Footnote 1: Number of plants per 9 meter row
	Footnote 3: Percent plants with flag smut per 9 meter row



AOV Means table 10503-1.

					D Disease							
Pest Type					FUSARIUM							
Pest Code					FUSAS1							
Pest Scientific Name					Fusarium spp							
Pest Name					Fusarium spp							
Crop Code	TRZAW			TRZAW	TRZAW	TRZAW	TRZAW	TRZAW	TRZAW	TRZAW	TRZAW	
BCH Scale	BCER			BCER	BCER	BCER	BCER	BCER	BCER	BCER	BCER	
Crop Scientific Name	Triticum aestivum		Triticum aestivum		Triticum aestivum		Triticum aestivum		Triticum aestivum		Triticum aestivum	
Crop Name	Winter wheat		Winter wheat		Winter wheat		Winter wheat		Winter wheat		Winter wheat	
Crop Variety	SW MAGNIFIK 20>		SW MAGNIFIK 20>		SW MAGNIFIK 20>		SW MAGNIFIK 20>		SW MAGNIFIK 20>		SW MAGNIFIK 20>	
Description	PLANTS		INDEXS		WAT1R		HKGHA		HKGMA		G1000S	
Plant Rated	PLANT C		ROPRN C		GRAIN C		GRAIN C		GRAIN C		GRAIN C	
Rating Date	29-10-2009		12-11-2009		14-09-2010		14-09-2010		14-09-2010		14-09-2010	
Rating Type	COUPLA		DISINC		MOICON		HBLD		INCREASE		TGW	
Rating Unit	NOU/ROW		NOIGROUP		%		%		%		%	
Sample Size Unit	2 ROWW											
Number of Subsamples	5		1		1		1		1		1	
Crop Stage Majority	11		12		99		99		99		99	
Crop Stage Scale	BBCH		BBCH		BBCH		BBCH		BBCH		BBCH	
Footnote Number	1		3		2		2		2		2	
Assessed By	HPM		HPM		HPM		HPM		HPM		HPM	
ARM Action Codes	APOC		T1 APC		TY1 APOC		TY1 APOC		TY1 APOC		TY1 APOC	
Trt No	Treatment Name	Rate	Unit	Appl Code	1	8	13	18	17	12		
1	Untreated				65.8 a (100.0%)	15.1 a (0.0%)	29.3 a	70.2 a (100.0%)	0.00 a	37.20 a (100.0%)		
2	[REDACTED]	75	ml/100 kg	A	69.0 a (104.9%)	7.7 b (48.5%)	38.6 a	67.7 a (96.4%)	-2.10 a	36.34 a (95.1%)		
3	[REDACTED]	150	ml/100 kg	A	66.0 a (100.4%)	8.0 b (50.1%)	31.3 a	71.0 a (101.0%)	0.73 a	37.28 a (100.2%)		
4	[REDACTED]	200	ml/100 kg	A	65.6 a (99.7%)	3.5 b (76.7%)	21.0 a	68.3 a (98.7%)	-6.42 a	35.47 a (95.3%)		
5	[REDACTED]	300	ml/100 kg	A	66.1 a (98.8%)	3.5 b (76.7%)	29.8 a	71.5 a (101.3%)	0.69 a	38.73 a (102.8%)		
6	[REDACTED] 30 g/L FS	75	ml/100 kg	A	63.5 a (96.5%)	8.0 b (48.8%)	21.2 a	71.8 a (102.3%)	2.80 a	36.40 a (97.8%)		
7	[REDACTED] 30 g/L FS	150	ml/100 kg	A	65.0 a (98.1%)	8.8 b (55.2%)	21.1 a	70.7 a (100.6%)	0.21 a	36.01 a (95.8%)		
8	[REDACTED] 30 g/L FS	200	ml/100 kg	A	64.2 a (97.5%)	7.0 b (43.5%)	20.8 a	70.6 a (100.5%)	-4.34 a	36.05 a (100.3%)		
9	[REDACTED] 30 g/L FS	300	ml/100 kg	A	66.8 a (101.2%)	4.3 b (71.8%)	21.4 a	70.6 a (100.5%)	2.25 a	37.21 a (100.0%)		
LSD (P=0.05)					6.76	3.65	9.85	3.11	4.119	2.981		
Standard Deviation					4.61	2.49	6.85	2.51	2.352	2.041		
CV					7.0	36.29	3.88	3.0	613.8	5.35		
Bartlett's X2					9.826	13.081	8.895	3.906	5.142	10.312		
P(Bartlett's X2)					0.277	0.109	0.389	0.885	0.643	0.248		
Replicate F					1.173	0.608	0.712	1.779	14.577	1.481		
Replicate Prob(F)					0.3426	0.6184	0.5846	0.1835	0.0004	0.2488		
Treatment F					0.586	0.002	1.221	1.357	1.023	1.043		
Treatment Prob(F)					0.7789	0.0001	0.2839	0.2736	0.4620	0.4038		

Means followed by same letter do not significantly differ (P < 0.05, Student-Newman-Keuls).
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL



Crop Code	TR2AW		
BBCH Scale	BBCH		
Crop Scientific Name	Triticum aestivum		
Crop Name	Winter wheat		
Crop Variety	SW MAGNIFIK 20>		
Description	KC1HL		
Part Rated	GRAIN C		
Rating Date	14-09-2010		
Rating Type	SPEGRA		
Rating Unit	KG/HL		
Number of Subsamples	1		
Crop Stage Majority	99		
Crop Stage Scale	BBCH		
Footnote Number			
Assessed By	HPM		
ARM Action Codes	APOC		
Trt	Treatment	Rate	Appl
No	Name	Rate Unit	Code
1	Untreated		
2	[REDACTED]	75 ml/100 kg	A
3	[REDACTED]	150 ml/100 kg	A
4	[REDACTED]	200 ml/100 kg	A
5	[REDACTED]	300 ml/100 kg	A
6	[REDACTED] 30 g/L FS	75 ml/100 kg	A
7	[REDACTED] 30 g/L FS	150 ml/100 kg	A
8	[REDACTED] 30 g/L FS	200 ml/100 kg	A
9	[REDACTED] 30 g/L FS	300 ml/100 kg	A
LSD (P=0.05)			2.22
Standard Deviation			1.52
CV			2.13
Bartlett's X2			22.903
P(Bartlett's X2)			0.003*
Replicate F			4.187
Replicate Prob(F)			0.0167
Treatment F			2.106
Treatment Prob(F)			0.0777

Part Rated	U, Disease, G-BYRD7 G-DisStg = Disease, such as a fungus, bacteria, or virus
Part Rated	FUSASPP Fusarium spp = Fusarose
Part Rated	PLAEME = plant - emerged
Part Rated	ROPINF = root - primary inf
Part Rated	GRAIN = grain
Part Rated	C = Crop is Part Rated
Rating Type	COUPLA = count - plant / emergence - objective
Rating Type	MOIICON = moisture content
Rating Type	YIELD = yield
Rating Type	SPEGRA = specific gravity / density
Rating Unit	% = percent
Rating Unit	Q-MET = quintal (metric=100 kg)
Rating Unit	HKG/HA = Hecto kilo per ha
Rating Unit	ROWm = row-meter
Crop Stage Majority	11 = First leaf unfolded
Crop Stage Majority	12 = 2 leaves unfolded
Crop Stage Majority	99 = Harvested product
Crop Stage Scale	BBCH = BBCH uniform plant stages
Assessed By	HPM = Hans-Peter Madsen
ARM Action Codes	APOC = Automatic percent control (Control forced to 100% on AOV Means Table)
ARM Action Codes	TY4 APOC = "" Following are Defined Rating Limits that ARM will Enforce ""
ARM Action Codes	T1 = (([C3]-[C4])^2 + [C5]^3 + [C6]^4)^100/([C7]^4)
ARM Action Codes	TY4 = 7.407407*[9]^(100-@[MVAVGREP(13)]/85)
ARM Action Codes	T5 = [C16]/[IC16]
Footnote 1:	Number of plants per 2 meter row
Footnote 3:	Index for Seedling Blight according to symptoms on roots and coleoptiles. Scale 0-100 where 100 is total death plants due to attack of Fusarium spp or Microdochium nivale



AOV Means table 10503-2

Treatments	1	8	13	15	17	12	14
1 Untreated	83.4 a (100.0%)	6.8 a (0.0%)	19.5 a	12.0 a (106.2%)	0.00 a	38.75 a (100.0%)	69.0 a (100.0%)
2 [redacted] 75 ml/100 kg A	83.1 a (99.7%)	2.5 b (63.0%)	18.4 a	85.2 a (98.4%)	-6.88 a (97.3%)	31.81 a (97.3%)	68.8 a (100.0%)
3 [redacted] 150 ml/100 kg A	84.2 a (101.0%)	1.5 b (77.8%)	16.3 a	87.6 a (98.5%)	-4.82 a (97.1%)	31.61 a (97.1%)	68.3 a (100.0%)
4 [redacted] 200 ml/100 kg A	78.3 a (93.9%)	1.5 b (74.1%)	15.5 a	88.7 a (95.3%)	-3.38 a (98.9%)	28.34 a (98.9%)	68.1 a (99.6%)
5 [redacted] 300 ml/100 kg A	81.7 a (100.4%)	2.3 b (98.7%)	18.6 a	88.6 a (95.6%)	-3.03 a (98.9%)	36.38 a (98.9%)	70.3 a (101.9%)
6 [redacted] 30 g/L FS 15 ml/100 kg A	79.9 a (95.8%)	2.0 b (79.4%)	19.8 a	83.8 a (98.3%)	-5.41 a (93.3%)	36.16 a (93.3%)	71.7 a (104.0%)
7 [redacted] 30 g/L FS 150 ml/100 kg A	78.4 a (94.1%)	1.0 b (88.2%)	19.3 a	87.1 a (93.2%)	-4.90 a (97.8%)	37.91 a (97.8%)	68.3 a (100.0%)
8 [redacted] 30 g/L FS 200 ml/100 kg A	81.9 a (98.3%)	1.5 b (77.8%)	19.2 a	87.1 a (93.2%)	-4.93 a (98.0%)	37.20 a (98.0%)	66.7 a (98.6%)
9 [redacted] 30 g/L FS 300 ml/100 kg A	86.9 a (104.3%)	1.0 b (85.7%)	19.6 a	89.9 a (97.0%)	-2.58 a (93.3%)	36.17 a (93.3%)	70.4 a (102.0%)
LSD (P=0.05)	7.31	2.19	0.93	16.89	0.197	3.378	2.78
Standard Deviation	5.81	1.81	0.38	6.98	6.987	2.315	1.55
CV	6.1	83.29	1.88	10.3	0.0	6.2	2.23
Standard x2	7.88	16.518	0.734	4.541	4.28	5.352	34.817
Standard x2 (kg)	0.446	0.018	0.912	0.805	0.747	0.719	0.001
Replicate II	2.565	3.699	2.169	3.902	1.004	0.949	0.057
Replicate Prob(F)	0.0783	0.0255	0.1204	0.0211	0.8068	0.4328	0.9814
Treatment F	1.310	3.542	0.522	0.511	0.911	0.672	1.734
Treatment Prob(F)	0.1881	0.0076	0.0273	0.8360	0.8381	0.7112	0.1461

Means followed by same letter do not significantly differ (P= 0.05, Student-Newman-Keuls)
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL



Pest Type

D, Disease, G-BYRD7, G-DisStg = Disease, such as a fungus, bacteria, or virus

Pest Code

FUSASP, Fusarium spp., = Fusariose

Part Rated

PLAEME = plant - emerged

ROPRIN = root - primary inf

GRAIN = grain

C = Crop is Part Rated

Rating Type

COUPLA = count - plant / emergence - objective

MOICON = moisture content

YIELD = yield

SPEGRA = specific gravity / density

Rating Unit

% = percent

Q-MET = quintal (metric=100 kg)

HKG/HA = Hecto kilo per ha

M = meter

Crop Stage Majority

11 = First leaf unfolded

12 = 2 leaves unfolded

99 = Harvested product

Crop Stage Scale

BBCH = BBCH uniform plant stages

Assessed By

HPM = Hans-Peter Madsen

ARM Action Codes

APOC = Automatic percent control (Control forced to 100% on AOV Means Table)

TY4 APOC = *** Following are Defined Rating Limits that ARM will Enforce ***

T1 = $([C3] + [C4]^2 + [C5]^3 + [C6]^4) * 100 / ([C7]^4)$

TY4 = $7.407407 * 19 * (100 - @MVAVGREP([13])) / 85$

T5 = $[C16] - [T1C16]$

Footnote 1: Number of plants per 2 meter row.

Footnote 2: Index for Seedling Blight according to symptoms on roots and coleoptiles, Scale 0-100 where 100 is total death plants due to attack of Fusarium spp. or Microdochium nivale.



AOV Means table 10505-1

Pest Type				D Disease
Pest Code				TILLCA
Pest Scientific Name				Tilletia tritici
Pest Name				Common bunt of
Crop Code		TRZAW		TRZAW
BBCH Scale		BCER		BCER
Crop Scientific Name		Triticum aestivum		Triticum aestivum
Crop Name		Winter wheat		Winter wheat
Crop Variety		HERZOG		HERZOG
Description		PLANTS		COMMON BUNT
Part Rated		PLAEME C		EAR C
Rating Date		29-10-2009		26-07-2010
Rating Type		COUPLA		DISSEV
Rating Unit		NO./ROW		PERCENT
Sample Size, Unit		9 ROWm		9 ROWm
Collection Basis, Unit		200 SEEDLI		200 SEEDLI
Number of Subsamples		1		1
Crop Stage Majority		11		77
Crop Stage Scale		BBCH		BBCH
Footnote Number				
Assessed By		HPM		HPM
ARM Action Codes		APOC		T1 APC

Tn	Treatment	Rate	Appl	f	3
No.	Name	Rate	Unit	Code	
1	Untreated			144,0 c (100,0%)	29,7 a (0,0%)
2	██████████	75 ml/100 kg	A	151,8 abc (105,4%)	0,0 b (100,0%)
3	██████████	150 ml/100 kg	A	149,8 bc (104,0%)	0,0 b (100,0%)
4	██████████	200 ml/100 kg	A	154,3 abc (107,1%)	0,0 b (100,0%)
5	██████████	300 ml/100 kg	A	156,5 ab (108,7%)	0,0 b (100,0%)
6	██████████ 30 g/L FS	75 ml/100 kg	A	160,5 ab (111,5%)	0,0 b (100,0%)
7	██████████ 30 g/L FS	150 ml/100 kg	A	155,0 abc (107,6%)	0,0 b (100,0%)
8	██████████ 30 g/L FS	200 ml/100 kg	A	164,3 a (114,1%)	0,0 b (100,0%)
9	██████████ 30 g/L FS	300 ml/100 kg	A	160,3 ab (111,3%)	0,0 b (100,0%)
10	Uninoculated control			163,8 a (113,7%)	0,0 b (100,0%)
LSD (P= 05)				8,32	2,53
Standard Deviation				5,73	1,74
CV				3,67	58,59
Bartlett's X2				3,554	0,0
P(Bartlett's X2)				0,938	
Replicate F				1,663	1,000
Replicate Prob(F)				0,1985	0,4079
Treatment F				5,033	116,527
Treatment Prob(F)				0,0005	0,0001

Means followed by same letter do not significantly differ (P=05, Student-Newman-Keuls)

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

<u>Pest Type</u>	<u>Crop Stage Majority</u>
D, Disease, G-BYRD7, G-DisSig = Disease, such as a fungus, bacteria, or virus	11 = First leaf unfolded
<u>Pest Code</u>	77 = Late milk
TILLCA, Tilletia tritici, = hvede sünkbrand	<u>Crop Stage Scale</u>
<u>Part Rated</u>	BBCH = BBCH uniform plant stages
PLAEME = plant - emerged	<u>Assessed by</u>
EAR = ear	HPM = Hans-Peter Madsen
C = Crop is Part Rated	<u>ARM Action Codes</u>
<u>Rating Type</u>	APOC = Automatic percent control (Control forced to 100% on AOV Means Table)
COUPLA = count - plant / emergence - objective	T1 = [2/1] * 100
<u>Rating Unit</u>	
PERCENT = percent	
ROWm = row-meter	
SEEDLI = seedling	



AOV Means table 10505-2.

Pest Type				D Disease
Pest Code				TILLCA
Pest Scientific Name				Tilletia tritici
Pest Name				Common bunt of
Crop Code		TRZAW		TRZAW
BBCH Scale		BCER		BCER
Crop Scientific Name		Triticum aestivum		Triticum aestivum
Crop Name		Winter wheat		Winter wheat
Crop Variety		HERZOG		HERZOG
Description		PLANTS		COMMON BUNT
Part Rated		PLAEME C		EAR C
Rating Date		29-10-2009		26-07-2010
Rating Type		COUPLA		DISSEV
Rating Unit		NO./ROW		PERCENT
Sample Size, Unit		9 ROWm		9 ROWm
Collection Basis, Unit		200 SEEDLI		200 SEEDLI
Number of Subsamples		1		1
Crop Stage Majority		11		77
Crop Stage Scale		BBCH		BBCH
Footnote Number				
Assessed By		AJL		HPM
ARM Action Codes		APOC		T1 APC

Tn	Treatment	Rate	Appl			
No.	Name	Rate	Unit	Code	1	3
1	Untreated				146,5 a (100,0%)	26,3 a (0,0%)
2	██████████	75 ml/100 kg		A	152,3 a (103,9%)	0,0 b (100,0%)
3	██████████	150 ml/100 kg		A	150,0 a (102,4%)	0,0 b (100,0%)
4	██████████	200 ml/100 kg		A	156,5 a (106,8%)	0,0 b (100,0%)
5	██████████	300 ml/100 kg		A	182,0 a (110,6%)	0,0 b (100,0%)
6	██████████ 30 g/L FS	75 ml/100 kg		A	160,0 a (109,2%)	0,0 b (100,0%)
7	██████████ 30 g/L FS	150 ml/100 kg		A	158,5 a (108,2%)	0,0 b (100,0%)
8	██████████ 30 g/L FS	200 ml/100 kg		A	157,3 a (107,3%)	0,0 b (100,0%)
9	██████████ 0 g/L FS	300 ml/100 kg		A	156,0 a (106,5%)	0,0 b (100,0%)
10	Uninoculated control				158,0 a (107,8%)	0,0 b (100,0%)
LSD (P= 05)					12,79	0,52
Standard Deviation					8,62	0,36
CV					5,66	13,54
Bartlett's X2					7,489	0,0
P(Bartlett's X2)					0,588	-
Replicate F					7,658	1,000
Replicate Prob(F)					0,0007	0,4079
Treatment F					1,163	2181,587
Treatment Prob(F)					0,3562	0,0001

Means followed by same letter do not significantly differ (P= 05, Student-Newman-Keuls)
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL

<u>Pest Type</u> D, Disease, G-BYRD7, G-DisStg = Disease, such as a fungus, bacteria, or virus	<u>Crop Stage Majority</u> 11 = First leaf unfolded 77 = Late milk
<u>Pest Code</u> TILLCA, Tilletia tritici, = hvede stnkbrand	<u>Crop Stage Scale</u> BBCH = BBCH uniform plant stages
<u>Part Rated</u> PLAEME = plant - emerged EAR = ear C = Crop is Part Rated	<u>Assessed By</u> HPM = Hans-Peter Madsen
<u>Rating Type</u> COUPLA = count - plant / emergence - objective	<u>ARM Action Codes</u> APOC = Automatic percent control (Control forced to 100% on AOV Means Table) T1 = [2][1]* 100
<u>Rating Unit</u> PERCENT = percent ROWm = row-meter SEEDLI = seedling	



Appendix 1: INDIVIDUAL TRIAL DATA

Plot Data Summary:

10501-1

10503-1

10503-2

10505-1

10505-2



Plot Data Summary 10501-1

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University of Aarhus, Department of IPM, Flakkebjerg

Pest Type		D Disease		D Disease	
Pest Code		UROCCO		UROCCO	
Pest Scientific Name		Urocystis occu>		Urocystis occu>	
Pest Name		Flag smut of r>		Flag smut of r>	
Crop Code		SECCW		SECCW	
BBCH Scale		BCER		BCER	
Crop Scientific Name		Secale cereale>		Secale cereale>	
Crop Name		Winter rye		Winter rye	
Crop Variety		CAROTOP		CAROTOP	
Description		PLANTS		FLAG SMUT	
Part Rated		PLAEME C		LEAF C	
Rating Date		29-10-2009		14-06-2010	
Rating Type		COUPLA		DISSEV	
Rating Unit		NO./ROW		PERCENT	
Sample Size, Unit		9 ROWm		9 M	
Collection Basis, Unit		200 SEEDL		200 SEED	
Number of Subsamples		1		1	
Crop Stage Majority		11-12		66-68	
Crop Stage Scale		BBCH		BBCH	
Footnote Number		1		2	
Assessed By		AKL		HPM	
IPM Action Codes		APOC		APOC	
T1 Treatment Name		Rate Unit		Appl Code	
Plot		1		2	
3		16.4		8.5	
1 Untreated		104		122.0	
208		141.0		12.0	
304		138.0		10.0	
406		135.0		10.0	
Mean =		134.0		13.0	
2		107		116.0	
204		144.0		0.0	
305		124.0		0.0	
408		136.0		0.0	
Mean =		130.0		0.0	
3		109		119.0	
201		129.0		0.0	
302		134.0		0.0	
403		120.0		0.0	
Mean =		125.5		0.0	
4		108		115.0	
206		138.0		0.0	
308		119.0		0.0	
402		127.0		0.0	
Mean =		124.8		0.0	
5		101		121.0	
207		130.0		0.0	
305		126.0		0.0	
401		131.0		0.0	
Mean =		127.0		0.0	
6		106		141.0	
202		139.0		0.0	
301		126.0		0.0	
404		146.0		0.0	
Mean =		138.0		0.0	
7		102		143.0	
209		150.0		0.0	
307		132.0		0.0	
405		132.0		0.0	
Mean =		139.3		0.0	
8		103		122.0	
205		114.0		0.0	
303		130.0		0.0	
409		126.0		0.0	
Mean =		123.0		0.0	
9		105		123.0	
203		130.0		0.0	
309		143.0		0.0	
407		145.0		0.0	
Mean =		136.0		0.0	



<p><u>Pest Type</u> D, Disease, G-BYRD7, G-DisStg = Disease, such as a fungus, bacteria, or virus</p> <p><u>Pest Code</u> URCOOC, Urocystis occulta, = Rugens stængelbrand</p> <p><u>Crop Code</u> SECCW, BCER, Secale cereale (winter), = IE</p> <p><u>Part Rated</u> PLAEME = plant - emerged LEAF = leaf C = Crop is Part Rated</p> <p><u>Rating Type</u> COUPLA = count - plant / emergence - objective</p> <p><u>Rating Unit</u> PERCENT = percent ROWm = row-meter M = meter SEEDL = seedling SEED = seed</p> <p><u>Crop Stage Scale</u> BBCH = BBCH uniform plant stages</p> <p><u>Assessed By</u> HPM = Hans-Peter Madsen</p> <p><u>ARM Action Codes</u> APOC = Automatic percent control (Control forced to 100% on AOV Means Table) $T1 = [2]/[1] \cdot 100$</p> <p>Footnote 1: Number of plants per 9 meter row Footnote 2: Number of plants with flag smut Footnote 3: Percent plants with flag smut per 9 meter row</p>



Plot Data Summary 10503-1

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University of Aarhus, Department of IPM, Flakkebjerg

						D Disease	D Disease
						FUSASP	FUSASP
						Fusarium spp.	Fusarium spp.
						Fusarium spp	Fusarium spp
Pest Type						TRZAW	TRZAW
Pest Code						BCER	BCER
Pest Scientific Name						Triticum aestivum	Triticum aestivum
Pest Name						Winter wheat	Winter wheat
Crop Code	TRZAW					TRZAW	TRZAW
BBCH Scale						BCER	BCER
Crop Scientific Name						Triticum aestivum	Triticum aestivum
Crop Name						Winter wheat	Winter wheat
Crop Variety	SW MAGNIFIK 20>					SW MAGNIFIK 20>	SW MAGNIFIK 20>
Description	PLANTS					GROUP A	GROUP B
Part Rated	PLAEME C					ROPRIN C	ROPRIN C
Rating Date	29-10-2009					12-11-2009	12-11-2009
Rating Type	COUPLA					NO/ROW	NO/ROW
Rating Unit	NO/ROW					NO/ROW	NO/ROW
Sample Size, Unit	2 ROWm						
Collection Basis, Unit							
Number of Subsamples	5					1	1
Crop Stage Majority	11					12	12
Crop Stage Scale	BBCH					BBCH	BBCH
Footnote Number	1						
Assessed By	HPM					HPM	HPM
ARM Action Codes	APOC						
Tt	Treatment	Rate	Appl	Plot	1	2	3
No.	Name	Rqte	Unit	Code			
1	Untreated			102	87.5	16.4	6.7
				205	83.2	16.0	6.0
				308	67.8	16.0	6.0
				406	64.6	12.0	7.0
				Mean =	65.8	14.8	6.4
2	[REDACTED]	75 ml/100 kg	A	109	69.0	21.0	3.0
				212	69.9	19.2	3.6
				304	67.8	17.0	3.0
				406	66.4	19.0	3.0
				Mean =	69.0	19.0	4.2
3	[REDACTED]	150 ml/100 kg	A	101	75.0	21.0	4.0
				204	72.8	19.0	4.0
				301	82.6	22.0	6.0
				402	61.6	20.0	4.0
				Mean =	68.0	20.5	3.0
4	[REDACTED]	200 ml/100 kg	A	108	66.8	22.0	2.0
				203	65.8	20.0	5.0
				306	67.4	22.0	3.0
				407	82.6	23.0	2.0
				Mean =	65.6	21.8	3.0
5	[REDACTED]	300 ml/100 kg	A	103	66.0	22.0	3.0
				209	68.4	22.0	3.0
				307	67.6	22.0	2.0
				409	60.2	21.0	4.0
				Mean =	65.4	21.8	3.0
6	[REDACTED] 30 g/L FS	75 ml/100 kg	A	106	59.6	21.0	4.0
				207	67.6	17.0	5.0
				303	56.2	17.0	8.0
				405	70.6	19.0	3.0
				Mean =	63.5	18.5	5.0
7	[REDACTED] 30 g/L FS	150 ml/100 kg	A	104	66.6	19.0	6.0
				208	60.6	20.0	2.0
				305	60.2	22.0	1.0
				401	69.4	19.0	4.0
				Mean =	65.0	20.0	3.3
8	[REDACTED] 30 g/L FS	200 ml/100 kg	A	107	69.4	20.0	4.0
				208	83.6	21.0	1.0
				309	61.0	18.0	5.0
				404	62.6	19.0	6.0
				Mean =	64.2	19.5	4.0
9	[REDACTED] 30 g/L FS	300 ml/100 kg	A	105	73.8	19.0	3.0
				201	62.2	24.0	1.0
				302	64.8	22.0	3.0
				403	65.6	20.0	5.0
				Mean =	66.8	21.3	3.5



					D Disease	D Disease	D Disease
					FUSASP	FUSASP	FUSASP
					Fusarium spp	Fusarium spp	Fusarium spp
					Fusarium spp.	Fusarium spp.	Fusarium spp.
					TRZAW	TRZAW	TRZAW
					BCER	BCER	BCER
					Triticum aestiv>	Triticum aestiv>	Triticum aestiv>
					Winter wheat	Winter wheat	Winter wheat
					SW MAGNIFIK 20>	SW MAGNIFIK 20>	SW MAGNIFIK 20>
					GROUP C	GROUP D	GROUP E
					ROPRIN C	ROPRIN C	ROPRIN C
					12-11-2009	12-11-2009	12-11-2009
					NO:GROUP	NO:GROUP	NO:GROUP
					1	1	1
					12	12	12
					BBCH	BBCH	BBCH
					HPM	HPV	HPM
Tn	Treatment	Rate	Appl		4	5	6
No.	Name	Rate	Unit	Code	Plot		
1	Untreated				102	2.1*	1.1*
					205	2.0	1.0
					308	3.0	0.0
					406	4.0	2.0
				Mean =	2.8		1.0
2		75 ml/100 kg	A		108	1.0	0.0
					202	2.2*	0.0*
					304	3.0	0.0
					408	1.0	0.0
				Mean =	1.8		0.0
3		150 ml/100 kg	A		101	0.0	0.0
					204	2.0	0.0
					301	3.0	0.0
					402	1.0	0.0
				Mean =	1.5		0.0
4		200 ml/100 kg	A		108	1.0	0.0
					203	0.0	0.0
					306	0.0	0.0
					407	0.0	0.0
				Mean =	0.3		0.0
5		300 ml/100 kg	A		103	0.0	0.0
					209	0.0	0.0
					307	1.0	0.0
					409	0.0	0.0
				Mean =	0.3		0.0
6		75 ml/100 kg	A		105	0.0	0.0
					207	3.0	0.0
					303	0.0	0.0
					405	3.0	0.0
				Mean =	1.5		0.0
7		150 ml/100 kg	A		104	0.0	0.0
					208	3.0	0.0
					305	2.0	0.0
					401	2.0	0.0
				Mean =	1.8		0.0
8		200 ml/100 kg	A		107	1.0	0.0
					208	3.0	0.0
					309	2.0	0.0
					404	0.0	0.0
				Mean =	1.5		0.0
9		300 ml/100 kg	A		105	0.0	1.0
					201	0.0	0.0
					302	0.0	0.0
					403	0.0	0.0
				Mean =	0.0		0.3



						D Disease	D Disease	D Disease
						FUSASP	FUSASP	FUSASP
						Fusarium spp.	Fusarium spp.	Fusarium spp.
						Fusarium spp.	Fusarium spp.	Fusarium spp.
						TRZAW	TRZAW	TRZAW
						BCER	BCER	BCER
						Triticum aestiv.	Triticum aestiv.	Triticum aestiv.
						Winter wheat	Winter wheat	Winter wheat
						SW MAGNIFIK 20>	SW MAGNIFIK 20>	SW MAGNIFIK 20>
						TOTAL	INDEXS	KG/PLOT
						ROPRIN C	ROPRIN C	GRAIN C
						12-11-2009	12-11-2009	25-06-2010
						DISINC	DISINC	MOICON
						NO/GROUP	NO/GROUP	KG/PLOT
						1	1	1
						12	12	99
						BBCH	BBCH	BBCH
						3	3	2
						HPM	HPM	HPM
						TI APC	TI APC	APGC
TR	Treatment	Rate	Rate	Appl	Plot	7	8	9
No.	Name		Unit	Code				
1	Untreated				102	25.0	14.2*	10.35*
					205	25.0	13.0	10.70
					308	25.0	12.0	9.45
					406	25.0	21.0	16.20
					Mean =	25.0	15.1	10.17
2		75	ml/100 kg	A	109	25.0	5.0	10.25
					202	25.0*	8.0*	9.93*
					304	25.0	11.0	9.90
					406	25.0	7.0	9.25
					Mean =	25.0	7.7	9.83
3		150	ml/100 kg	A	101	25.0	4.0	10.53*
					204	25.0	8.0	10.00
					301	25.0	8.0	10.65
					402	25.0	6.0	10.25
					Mean =	25.0	6.0	10.36
4		200	ml/100 kg	A	108	25.0	4.0	10.00
					203	25.0	5.0	10.55
					306	25.0	3.0	9.80
					407	25.0	2.0	10.10
					Mean =	25.0	3.5	10.06
5		300	ml/100 kg	A	103	25.0	3.0	10.80
					209	25.0	3.0	10.25
					307	25.0	4.0	10.35
					409	25.0	4.0	10.00
					Mean =	25.0	3.5	10.35
6		75	ml/100 kg	A	106	25.0	4.0	10.25
					207	25.0	11.0	10.70
					303	25.0	8.0	10.80
					405	25.0	9.0	10.10
					Mean =	25.0	6.0	10.46
7		150	ml/100 kg	A	104	25.0	6.0	10.55
					206	25.0	8.0	10.45
					305	25.0	5.0	10.20
					401	25.0	3.0	9.95
					Mean =	25.0	6.8	10.29
8		200	ml/100 kg	A	107	25.0	6.0	10.65
					208	25.0	7.0	9.95
					309	25.0	9.0	10.15
					404	25.0	6.0	10.15
					Mean =	25.0	7.0	10.23
9		300	ml/100 kg	A	105	25.0	8.0	10.20
					201	25.0	1.0	10.38*
					302	25.0	3.0	10.40
					403	25.0	5.0	10.15
					Mean =	25.0	4.3	10.28



Crop Code		TRZAW	TRZAW	TRZAW				
BBCH Scale		BCER	BCER	BCER				
Crop Scientific Name		Triticum aestiv	Triticum aestiv	Triticum aestiv				
Crop Name		Winter wheat	Winter wheat	Winter wheat				
Crop Variety		SW MAGNIFIK 20>	SW MAGNIFIK 20>	SW MAGNIFIK 20>				
Description		G/1000S	WATER	KG/HL				
Part Rated		GRAIN C	GRAIN C	GRAIN C				
Rating Date		14-09-2010	14-09-2010	14-09-2010				
Rating Type		TGW	MOICCN	SPEGRA				
Rating Unit		G/1000S	%	KG/HL				
Sample Size, Unit								
Collection Basis, Unit								
Number of Subsamples		1	1	1				
Crop Stage Majority		99	99	99				
Crop Stage Scale		BBCH	BBCH	BBCH				
Footnote Number								
Assessed By		HPM	HPM	HPM				
ARM Action Codes		APOC		APOC				
Trt No	Treatment Name	Rate	Unit	Appl Code	Plot	12	13	14
1	Untreated				102	35,64	19,3	73,9
					205	38,68	21,5	71,8
					308	39,32	19,8	66,9
					406	35,16	20,7	71,6
					Mean =	37,20	20,3	71,0
2	██████████	75 ml/100 kg	A	109	36,40	21,4	72,2	
				202	34,28	19,4	73,3	
				304	36,56	21,0	72,0	
				408	34,32	20,4	72,1	
				Mean =	35,39	20,6	72,4	
3	██████████	150 ml/100 kg	A	101	38,44	21,5	72,5	
				204	38,68	21,1	72,0	
				301	37,44	21,7	71,6	
				402	36,56	21,0	72,2	
				Mean =	37,28	21,3	72,1	
4	██████████	200 ml/100 kg	A	108	36,88	21,2	72,1	
				203	37,72	21,8	71,7	
				306	31,56	20,4	70,8	
				407	35,72	20,6	72,2	
				Mean =	35,47	21,0	71,7	
5	██████████	300 ml/100 kg	A	103	39,40	21,4	72,5	
				209	42,20	20,7	66,6	
				307	33,92	21,2	69,8	
				409	37,40	19,7	66,3	
				Mean =	38,23	20,8	68,8	
6	██████████ 30 g/L FS	75 ml/100 kg	A	106	36,76	21,0	73,2	
				207	37,32	21,3	71,9	
				303	34,96	21,6	71,5	
				405	36,56	21,0	71,5	
				Mean =	36,40	21,2	72,0	
7	██████████ 30 g/L FS	150 ml/100 kg	A	104	38,80	21,4	72,7	
				206	35,48	20,8	71,1	
				305	36,84	21,3	71,4	
				401	34,82	20,6*	71,6*	
				Mean =	36,01	21,1	71,7	
8	██████████ 30 g/L FS	200 ml/100 kg	A	107	38,52	21,5	72,8	
				208	35,56	20,6	72,2	
				309	41,56	20,2	67,0	
				404	36,56	20,9	72,1	
				Mean =	38,05	20,8	71,0	
9	██████████ 30 g/L FS	300 ml/100 kg	A	105	38,92	21,4	73,1	
				201	39,00	22,0	71,3	
				302	35,96	21,2	71,4	
				403	34,96	21,1	72,1	
				Mean =	37,21	21,4	72,0	



						TRZAW	TRZAW	TRZAW
						BCER	BCER	BCER
						Triticum aestivum	Triticum aestivum	Triticum aestivum
						Winter wheat	Winter wheat	Winter wheat
						SW MAGNIFIK 20>	SW MAGNIFIK 20>	SW MAGNIFIK 20>
						PROTEIN	HKG/HA	HKG/HA
						GRAIN C	GRAIN C	GRAIN C
						14-09-2010	14-09-2010	14-09-2010
							YIELD	INCREASE
							Q-MET	HKG/HA
						1	1	1
						99	99	99
						BBCH	BBCH	BBCH
						2	2	2
						HPM	HPM	HPM
						TY4 APCC	TY4 APCC	TY4 APCC
Tit. No.	Treatment Name	Rate	Rate Unit	Appl. Code	Pilot	15	16	17
1	Untreated				102	14.5	71.1*	
					205	13.8	73.1	0.00
					308	13.3	66.2	0.00
					406	14.6	70.5	0.00
					Mean =	14.1	70.2	0.00
2		75	ml/100 kg	A	109	13.7	70.2	
					202	14.3	66.3*	-2.19*
					304	14.2	68.2	1.95
					406	14.9	64.2	-6.32
					Mean =	14.3	67.7	-2.19
3		150	ml/100 kg	A	101	13.8	71.9*	
					204	14.1	68.6	-4.35
					301	14.0	72.7	8.46
					402	14.5	70.6	0.08
					Mean =	14.1	71.0	0.73
4		200	ml/100 kg	A	109	14.1	68.7	
					203	14.0	72.1	-1.02
					306	14.9	66.6	0.38
					407	14.2	69.9	-0.60
					Mean =	14.3	69.3	-0.42
5		300	ml/100 kg	A	103	14.0	74.0	
					209	12.8	70.8	-2.27
					307	14.4	71.1	4.86
					409	13.1	70.0	-0.51
					Mean =	13.5	71.5	0.69
6		75	ml/100 kg	A	106	14.0	70.6	
					207	13.8	70.4	0.28
					303	14.0	73.8	7.58
					405	14.3	69.5	-0.98
					Mean =	14.0	71.6	2.30
7		150	ml/100 kg	A	104	14.1	72.3	
					206	14.0	72.1	-0.98
					305	14.0	70.0	3.74
					401	14.4*	68.4	-2.13
					Mean =	14.1	70.7	0.21
8		200	ml/100 kg	A	107	14.0	72.9	
					208	14.2	68.8	-4.20
					309	12.9	70.6	4.37
					404	14.7	70.0	-0.52
					Mean =	14.0	70.6	-0.14
9		300	ml/100 kg	A	105	13.6	69.9	
					201	13.7	71.1*	2.25*
					302	14.1	71.4	3.21
					403	14.0	69.8	-0.70
					Mean =	13.9	70.6	2.25



Pest Type

D, Disease, G-BYRD7, G-DisStg = Disease, such as a fungus, bacteria, or virus

Pest Code

FUSASP, Fusarium spp., = Fusarirose

Part Rated

PLAEME = plant - emerged

ROPRIN = root - primary inf

GRAIN = grain

C = Crop is Part Rated

Rating Type

COUPLA = count - plant / emergence - objective

MOICON = moisture content

SPEGRA = specific gravity / density

YIELD = yield

Rating Unit

KG/PLOT = kilograms per plot

% = percent

Q-MET = quintal (metric=100 kg)

HKG/HA = Hecto kilo per ha

ROWm = row-meter

Crop Stage Majority

11 = First leaf unfolded

12 = 2 leaves unfolded

99 = Harvested product

Crop Stage Scale

BBCH = BBCH uniform plant stages

Assessed By

HPM = Hans-Peter Madsen

ARM Action Codes

APOC = Automatic percent control (Control forced to 100% on AOV Means Table)

TY4 APOC = *** Following are Defined Rating Limits that ARM will Enforce ***

T1 = $((C3 + C4)^2 + C5)^3 + C6^4 * 100 / ((C7)^4)$

TY4 = $7.407407 * 9 * (100 - @MVAVGREP((13))) / 85$

T5 = $C16 - T1C16$

Footnote 1: Number of plants per 2 meter row.

Footnote 3: Index for Seeding Blight according to symptoms on roots and coleoptiles. Scale 0-100 where 100 is total death plants due to attack of Fusarium spp. or Microdochium nivale.



Post Type	Post Name	Post Scientific Name	Crop Code	BCH Scale	Crop Scientific Name	Crop Variety	Description	Part Rated	Rating Date	Rating Type	Range Unit	Sample Size Unit	Collection Basis Unit	Number of Subsamples	Crop Stage Majority	Crop Stage Scale	Footnote Number	Assessed By	ARH Action Codes	Tn Treatment	No Name	
1	Unrated																					
2	Mean =		104	206	206	80.4	PLANTIS	76.0	25-10-2009	NO/ROW	20.3	20.3	20.3	2	GROUP A	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP C	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP A	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP C	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP A	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP C	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP A	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP C	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP A	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP C	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP A	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP C	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP A	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP C	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP A	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP C	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP A	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP C	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP A	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP C	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP A	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP C	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP A	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP C	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP A	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP C	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP A	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP C	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP A	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP C	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP A	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP C	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP A	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP C	BCH	1					
		TRZAW		87.6	87.6	82.4	Tricum aestiv	79.8														
			104	206	206	80.4	PLANTIS	76.0	25-10-2009	COUPLA	20.3	20.3	20.3	2	GROUP A	BCH	1					
		TRZAW																				



					D Disease	D Disease	D Disease	D Disease	
Pest Type					FUSASP	FUSASP	FUSASP	FUSASP	
Pest Code					FUSASP	FUSASP	FUSASP	FUSASP	
Pest Scientific Name					Fusarium spp.	Fusarium spp.	Fusarium spp.	Fusarium spp.	
Pest Name					Fusarium spp	Fusarium spp	Fusarium spp.	Fusarium spp.	
Crop Code					TRZAW	TRZAW	TRZAW	TRZAW	
BBCH Scale					BCER	BCER	BCER	BCER	
Crop Scientific Name					Triticum aestiv	Triticum aestiv	Triticum aestiv	Triticum aestiv	
Crop Name					Winter wheat	Winter wheat	Winter wheat	Winter wheat	
Crop Variety					09321-1 RITMO	09321-1 RITMO	09321-1 RITMO	09321-1 RITMO	
Description					GROUP D	GROUP E	TOTAL	INDEX	
Part Rated					ROPRIN C	ROPRIN C	ROPRIN C	ROPRIN C	
Rating Date					13-11-2009	13-11-2009	13-11-2009	13-11-2009	
Rating Type									
Rating Unit					NO/GROUP	NO/GROUP	NO/GROUP	NO/GROUP	
Sample Size, Unit									
Collection Basis, Unit									
Number of Subsamples					1	1	1	1	
Crop Stage Maturity					12	12	12	12	
Crop Stage Scale					BBCH	BBCH	BBCH	BBCH	
Footnote Number									
Assessed By					HPM	HPM	HPM	HPM	
ARM Action Codes								T1 APC	
Tt	Treatment	Rate	Appl	Plgt	5	6	7	8	
No	Name	Rate	Unit	Code					
1	Untreated				106	0.0	0.0	25.0	8.0
					208	0.0	0.0	25.0	3.0
					302	0.0	0.0	25.0	7.0
					407	0.0	0.0	25.0	9.0
				Mean =		0.0	0.0	25.0	6.8
2		75 ml/100 kg	A		104	0.0	0.0	25.0	0.0
					206	0.0	0.0	25.0	0.0
					301	0.0	0.0	25.0	1.0
					404	0.0	0.0	25.0	9.0
				Mean =		0.0	0.0	25.0	2.5
3		150 ml/100 kg	A		108	0.0	0.0	25.0	1.0
					203	0.0	0.0	25.0	0.0
					307	0.0	0.0	25.0	0.0
					402	0.0	0.0	25.0	5.0
				Mean =		0.0	0.0	25.0	1.5
4		200 ml/100 kg	A		103	0.0	0.0	25.0	0.0
					204	0.0	0.0	25.0	3.0
					306	0.0	0.0	25.0	0.0
					405	0.0	0.0	25.0	4.0
				Mean =		0.0	0.0	25.0	1.8
5		300 ml/100 kg	A		101	0.0	0.0	25.0	4.0
					209	0.0	0.0	25.0	2.0
					304	0.0	0.0	25.0	0.0
					401	0.0	0.0	25.0	3.0
				Mean =		0.0	0.0	25.0	2.3
6		30 g/L FS	A		109	0.0	0.0	25.0	2.0
					207	0.0	0.0	25.0	3.0
					309	0.0	0.0	25.0	1.0
					403	0.0	0.0	25.0	2.0
				Mean =		0.0	0.0	25.0	2.0
7		150 ml/100 kg	A		107	0.0	0.0	25.0	2.0
					205	0.0	0.0	25.0	1.0
					308	0.0	0.0	25.0	0.0
					406	0.0	0.0	25.0	1.0
				Mean =		0.0	0.0	25.0	1.0
8		30 g/L FS	A		102	0.0	0.0	25.0	2.0
					201	0.0	0.0	25.0	2.0
					303	0.0	0.0	25.0	1.0
					408	0.0	0.0	25.0	1.0
				Mean =		0.0	0.0	25.0	1.5
9		300 ml/100 kg	A		105	0.0	0.0	25.0	2.0
					202	0.0	0.0	25.0	1.0
					305	0.0	0.0	25.0	0.0
					409	0.0	0.0	25.0	1.0
				Mean =		0.0	0.0	25.0	1.0



Crop Code					TRZAW	TRZAW	TRZAW	TRZAW	
BBCH Scale					BCER	BCER	BCER	BCER	
Crop Scientific Name					Triticum aestivum	Triticum aestivum	Triticum aestivum	Triticum aestivum	
Crop Name					Winter wheat	Winter wheat	Winter wheat	Winter wheat	
Crop Variety					09321-1 RITMO	09321-1 RITMO	09321-1 RITMO	09321-1 RITMO	
Description					KG/PLOT	KG/PLOT	KG/PLOT	KG/PLOT	
Part Rated					GRAIN C	GRAIN C	GRAIN C	GRAIN C	
Rating Date					25-08-2010	14-09-2010	14-09-2010	14-09-2010	
Rating Type					MOICON	TGW	MOICON	SPEGRA	
Rating Unit					KG/PLOT	G/1000S	%	KG/HL	
Sample Size, Unit									
Collection Basis, Unit									
Number of Subsamples					1	1	1	1	
Crop Stage Majority					99	99	99	99	
Crop Stage Scale					BBCH	BBCH	BBCH	BBCH	
Footnote Number									
Assessed by					HPM	HPM	HPM	HPM	
ARM Action Codes					APOC	APOC	APOC	APOC	
Tri No.	Treatment Name	Rate	Unit	Appl Code	Plot	9	12	13	14
1	Untreated				106	10,80	40,20	19,5	68,8
					208	10,90	39,12	19,6	69,1
					302	9,95	37,80	19,7	69,2
					407	9,45	37,80	19,0	68,7
					Mean ±		10,28	38,75	19,5
2	██████████	75 ml/100 kg	A		104	10,35	39,00	19,6	69,1
					206	10,45	40,16	19,4	68,4
					301	7,85	35,52	19,3*	68,8*
					404	8,65	36,00	19,1	68,4
					Mean =		9,28	37,67	19,4
3	██████████	150 ml/100 kg	A		108	11,00	39,40	19,6	69,5
					203	8,45	35,36	18,9	68,6
					307	10,00	39,52	19,3	69,4
					402	9,00	36,16	19,2	69,1
					Mean =		9,61	37,61	19,3
4	██████████	200 ml/100 kg	A		103	10,00	38,52	19,8	68,8
					204	10,65	39,76	19,6	68,8
					306	10,45	38,64	19,8	69,2
					405	8,05	36,24	18,8	68,0
					Mean =		9,79	38,34	19,5
5	██████████	300 ml/100 kg	A		101	10,10	40,40	19,4	69,2
					209	10,40	32,16	20,1	74,1
					304	10,30	38,16	19,7	69,6
					401	8,60	34,80	19,1	68,2
					Mean =		9,85	36,38	19,6
6	██████████ 30 g/L FS	75 ml/100 kg	A		109	10,70	33,72	20,2	74,6
					207	8,95	39,36	19,0	69,3
					309	9,55	36,28	19,3	71,3
					403	7,10	35,28	19,3*	71,6*
					Mean =		9,08	36,16	19,4
7	██████████ 30 g/L FS	150 ml/100 kg	A		107	10,80	36,92	19,7	69,2
					205	8,90	36,08	19,0	69,0
					308	9,50	39,28	19,2	69,9
					406	9,20	39,36	19,3	69,1
					Mean =		9,55	37,91	19,3
8	██████████ 0 g/L FS	200 ml/100 kg	A		102	10,85	37,36	19,5	68,6
					201	9,60	36,76	19,0	68,9
					303	7,10	35,08	19,0	68,4
					408	10,60	39,60	19,4	68,5
					Mean =		9,64	37,20	19,2
9	██████████ 30 g/L FS	300 ml/100 kg	A		105	10,35	38,20	19,6	69,3
					202	10,30	38,76	19,5	68,2
					305	8,55	35,72	19,0	69,1
					409	10,70	32,00	20,1	73,6
					Mean =		9,98	36,17	19,6



Crop Code						TRZAW	TRZAW	TRZAW	
BBCH Scale						BCER	BCER	BCER	
Crop Scientific Name						Triticum aestivum	Triticum aestivum	Triticum aestivum	
Crop Name						Winter wheat	Winter wheat	Winter wheat	
Crop Variety						09321-1 RITMO	09321-1 RITMO	09321-1 RITMO	
Description						PROTEIN	HKG/HA	HKG/HA	
Part Rated						GRAIN C	GRAIN C	GRAIN C	
Rating Date						14-09-2010	14-09-2010	14-09-2010	
Rating Type							YIELD	INCREASE	
Rating Unit							Q-MET	HKG/HA	
Sample Size, Unit									
Collection Basis, Unit									
Number of Subsamples						1	1	1	
Crop Stage Majority						99	99	99	
Crop Stage Scale						BBCH	BBCH	BBCH	
Footnote Number									
Assessed By						HPM	HPM	HPM	
ARM Action Codes							TV4 APOC	TS	
Tn	Treatment	Rate	Appl	Plet		15	16	17	
No	Name	Rate	Unit	Code					
1	Untreated					106 208 302 407 Mean =	12,5 12,9 12,7 13,1 12,6	75,5 76,4 69,6 66,7 72,0	0,00 0,00 0,00 0,00 0,00
2		75 ml/100 kg	A			104 206 301 404 Mean =	12,3 12,4 13,0 13,1 12,7	72,5 73,4 53,8 61,0 65,2	-2,98 -2,97 -15,87 -5,77 -6,88
3		150 ml/100 kg	A			108 203 307 402 Mean =	12,5 13,5 12,6 13,5 13,0	77,1 59,7 70,3 63,4 67,6	1,59 -16,65 0,70 -3,33 -4,42
4		200 ml/100 kg	A			103 204 306 405 Mean =	13,0 12,8 12,8 13,4 13,0	70,1 74,8 73,0 57,0 68,7	-5,42 -1,75 3,41 -9,74 -3,38
5		300 ml/100 kg	A			101 209 304 401 Mean =	12,6 14,4 12,5 14,5 13,5	70,9 72,4 72,1 60,6 69,0	-4,54 -3,96 2,45 -6,07 -3,03
6		30 g/L FS	A			109 207 309 403 Mean =	13,8 12,9 13,3 12,3 13,1	74,4 63,2 67,2 49,8 63,8	-1,07 13,19 -2,47 -16,90 -8,41
7		30 g/L FS	A			107 205 308 406 Mean =	13,0 13,0 12,8 13,0 13,0	74,2 62,8 66,9 64,7 67,4	-1,31 -13,55 -2,74 -2,01 -4,90
8		30 g/L FS	A			102 201 303 408 Mean =	12,7 13,0 13,7 13,0 13,1	76,1 67,8 50,1 74,5 67,1	0,63 -8,61 -19,51 7,75 -4,93
9		30 g/L FS	A			105 202 305 409 Mean =	12,6 12,7 13,1 14,0 13,1	72,5 72,3 60,4 74,5 69,9	-2,98 -4,11 -9,28 7,80 -2,14



Pest Type

D, Disease, G-BYRD7, G-DisStg = Disease, such as a fungus, bacteria, or virus

Pest Code

FUSASP, Fusarium spp., = Fusariose

Part Rated

PLAEME = plant - emerged

ROPRIN = root - primary inf

GRAIN = grain

C = Crop is Part Rated

Rating Type

COUPLA = count - plant / emergence - objective

MOICON = moisture content

SPEGRA = specific gravity / density

YIELD = yield

Rating Unit

KG/PLOT = kilograms per plot

% = percent

Q-MET = quintal (metric=100 kg)

HKG/HA = Hecto kilo per ha

M = meter

Crop Stage Majority

11 = First leaf unfolded

12 = 2 leaves unfolded

99 = Harvested product

Crop Stage Scale

BBCH = BBCH uniform plant stages

Assessed By

HPM = Hans-Peter Madsen

ARM Action Codes

APOC = Automatic percent control (Control forced to 100% on AOV Means Table)

TY4 APOC = *** Following are Defined Rating Limits that ARM will Enforce ***

T1 = $[(C3) + (C4)^2 + (C5)^3 + (C6)^4] * 100 / ((C7)^4)$

TY4 = $7.407407 * [9] * (100 - @MVAVGREP([13])) / 85$

T5 = $[C16] - [T1C16]$

Footnote 1: Number of plants per 2 meter row.

Footnote 2: Index for Seedling Blight according to symptoms on roots and coleoptiles. Scale 0-100 where 100 is total death plants due to attack of Fusarium spp. or Microdochium nivale.



Plot Data Summary 10505-1

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University of Aarhus, Department of IPM, Flakkebjerg

Pest Type				D Disease		D Disease		
Pest Code				TILCCA		TILCCA		
Pest Scientific Name				Tilletia trit>		Tilletia trit>		
Pest Name				Common bunt of>		Common bunt of>		
Crop Code		TRZAW		TRZAW		TRZAW		
BBCH Scale		BCER		BCER		BCER		
Crop Scientific Name		Triticum aestiv>		Triticum aestiv>		Triticum aestiv>		
Crop Name		Winter wheat		Winter wheat		Winter wheat		
Crop Variety		HERZOG		HERZOG		HERZOG		
Description		PLANTS		COMMON BUNT		COMMON BUNT		
Part Rated		PLAEME C		EAR C		EAR C		
Rating Date		29-10-2009		26-07-2010		26-07-2010		
Rating Type		COUPLA		COUDIP		DISSEV		
Rating Unit		NO./ROW		NO./ROW		PERCENT		
Sample Size, Unit		9 ROW/m		9 ROW/m		9 ROW/m		
Collection Basis, Unit		200 SEEDLI		200 SEEDLI		200 SEEDLI		
Number of Subsamples		1		1		1		
Crop Stage Majority		11		77		77		
Crop Stage Scale		BBCH		BBCH		BBCH		
Footnote Number								
Assessed By		HPM		HPM		HPM		
ARM Action Codes		APOC		APOC		T1APC		
Tit No.	Treatment Name	Rate	Unit	Appl Code	Plot	1	2	3
1	Untreated				104	149.0	34.0	22.8
					207	146.0	53.0	36.3
					304	144.0	43.0	28.9
					408	137.0	41.0	29.9
					Mean =	144.0	42.8	29.7
2		75 ml/100 kg		A	110	154.0	0.0	0.0
					208	155.0	0.0	0.0
					302	145.0	0.0	0.0
					406	150.0	0.0	0.0
					Mean =	151.8	0.0	0.0
3		150 ml/100 kg		A	101	148.0	0.0	0.0
					206	156.0	0.0	0.0
					310	147.0	0.0	0.0
					407	148.0	0.0	0.0
					Mean =	149.8	0.0	0.0
4		200 ml/100 kg		A	108	155.0	0.0	0.0
					210	154.0	0.0	0.0
					305	158.0	0.0	0.0
					409	150.0	0.0	0.0
					Mean =	154.3	0.0	0.0
5		300 ml/100 kg		A	105	159.0	0.0	0.0
					203	165.0	0.0	0.0
					307	151.0	0.0	0.0
					403	152.0	0.0	0.0
					Mean =	156.5	0.0	0.0
6	30 g/L FS	75 ml/100 kg		A	108	156.0	0.0	0.0
					201	169.0	0.0	0.0
					306	152.0	0.0	0.0
					405	165.0	0.0	0.0
					Mean =	160.5	0.0	0.0
7	30 g/L FS	150 ml/100 kg		A	107	162.0	0.0	0.0
					205	153.0	0.0	0.0
					301	147.0	0.0	0.0
					410	156.0	0.0	0.0
					Mean =	155.0	0.0	0.0
8	30 g/L FS	200 ml/100 kg		A	103	159.0	0.0	0.0
					209	166.0	0.0	0.0
					308	175.0	0.0	0.0
					404	157.0	0.0	0.0
					Mean =	164.3	0.0	0.0
9	30 g/L FS	300 ml/100 kg		A	106	167.0	0.0	0.0
					203	162.0	0.0	0.0
					309	154.0	0.0	0.0
					401	158.0	0.0	0.0
					Mean =	160.3	0.0	0.0
10	Uninoculated control				102	162.0	0.0	0.0
					204	162.0	0.0	0.0
					303	172.0	0.0	0.0
					402	159.0	0.0	0.0
					Mean =	163.8	0.0	0.0



<p><u>Pest Type</u> D, Disease, G-BYRD7, G-DisStg = Disease, such as a fungus, bacteria, or virus</p> <p><u>Pest Code</u> TILLCA, Tilletia tritici, = hvede stunkbrand</p> <p><u>Part Rated</u> PLAEME = plant - emerged EAR = ear C = Crop is Part Rated</p> <p><u>Rating Type</u> COUPLA = count - plant / emergence - objective</p> <p><u>Rating Unit</u> PERCENT = percent ROWm = row-meter SEEDLI = seedling</p> <p><u>Crop Stage Majority</u> 11 = First leaf unfolded 77 = Late milk</p> <p><u>Crop Stage Scale</u> BBCH = BBCH uniform plant stages</p> <p><u>Assessed By</u> HPM = Hans-Peter Madsen</p> <p><u>ARM Action Codes</u> APOC = Automatic percent control (Control forced to 100% on AOV Means Table) TI = [2][1]*100</p>



Plot Data Summary 10505-2

Confidential

University of Aarhus, Department of IPM, Flakkebjerg

Pest Type				D Disease		D Disease		
Pest Code				TILLCA		TILLCA		
Pest Scientific Name				Tilletia trit>		Tilletia trit>		
Pest Name				Common bunt of>		Common bunt of>		
Crop Code		YRZAW		TRZAW		TRZAW		
BBCH Scale		BCER		BCER		BCER		
Crop Scientific Name		Triticum aestiv>		Triticum aestiv>		Triticum aestiv>		
Crop Name		Winter wheat		Winter wheat		Winter wheat		
Crop Variety		HERZOG		HERZOG		HERZOG		
Description		PLANTS		COMMON BUNT		COMMON BUNT		
Plant Rated		PLAEME C		EAR C		EAR C		
Rating Date		29-10-2009		26-07-2010		26-07-2010		
Rating Type		COUPLA		COUDIP		DISSEV		
Rating Unit		NO./ROW		NO./ROW		PERCENT		
Sample Size, Unit		9 ROW/m		9 ROW/m		9 ROW/m		
Collection Basis, Unit		200 SEED/L		200 SEED/L		200 SEED/L		
Number of Subsamples		1		1		1		
Crop Stage Majority		11		77		77		
Crop Stage Scale		BBCH		BBCH		BBCH		
Footnote Number								
Assessed By		AKL		HPM		HPM		
ARM Action Codes		APOC		APOC		T1 APC		
Tt	Treatment	Rate	Unit	Appl Code	Plot	1	2	3
1	Untreated				103	153.0	41.0	28.8
					209	151.0	40.0	28.5
					306	148.0	36.0	24.7
					416	136.0	37.0	27.2
					Mean =	146.5	38.5	26.3
2		75	ml/100 kg	A	116	153.0	0.0	0.0
					203	154.0	0.0	0.0
					305	145.0	0.0	0.0
					404	157.0	0.0	0.0
					Mean =	152.3	0.0	0.0
3		150	ml/100 kg	A	106	167.0	0.0	0.0
					204	138.0	0.0	0.0
					308	144.0	0.0	0.0
					402	151.0	0.0	0.0
					Mean =	150.0	0.0	0.0
4		200	ml/100 kg	A	101	162.0	0.0	0.0
					207	143.0	0.0	0.0
					309	145.0	0.0	0.0
					406	156.0	0.0	0.0
					Mean =	156.5	0.0	0.0
5		300	ml/100 kg	A	102	169.0	0.0	0.0
					205	166.0	0.0	0.0
					301	155.0	0.0	0.0
					409	158.0	0.0	0.0
					Mean =	162.0	0.0	0.0
6	30 g/L FS	75	ml/100 kg	A	109	169.0	0.0	0.0
					208	162.0	0.0	0.0
					310	143.0	0.0	0.0
					407	166.0	0.0	0.0
					Mean =	160.0	0.0	0.0
7	30 g/L FS	150	ml/100 kg	A	108	155.0	0.0	0.0
					202	165.0	0.0	0.0
					307	151.0	0.0	0.0
					401	163.0	0.0	0.0
					Mean =	160.5	0.0	0.0
8	30 g/L FS	200	ml/100 kg	A	107	164.0	0.0	0.0
					201	157.0	0.0	0.0
					302	143.0	0.0	0.0
					403	165.0	0.0	0.0
					Mean =	157.3	0.0	0.0
9	30 g/L FS	300	ml/100 kg	A	105	169.0	0.0	0.0
					206	167.0	0.0	0.0
					304	142.0	0.0	0.0
					405	146.0	0.0	0.0
					Mean =	156.0	0.0	0.0
10	Uninoculated control				104	178.0	0.0	0.0
					210	152.0	0.0	0.0
					303	158.0	0.0	0.0
					408	144.0	0.0	0.0
					Mean =	158.0	0.0	0.0



<p><u>Pest Type</u> D, Disease, G-BYRD7, G-DisStg = Disease, such as a fungus, bacteria, or virus</p> <p><u>Pest Code</u> TILLCA, Tilletia tritici, = hvede stinkbrand</p> <p><u>Part Rated</u> PLAEME = plant - emerged EAR = ear C = Crop is Part Rated</p> <p><u>Rating Type</u> COUPLA = count - plant / emergence - objective</p> <p><u>Rating Unit</u> PERCENT = percent ROWm = row-meter SEEDL = seedling</p> <p><u>Crop Stage Majority</u> 11 = First leaf unfolded 77 = Late milk</p> <p><u>Crop Stage Scale</u> BBCH = BBCH uniform plant stages</p> <p><u>Assessed By</u> HPM = Hans-Peter Madsen</p> <p><u>ARM Action Codes</u> APOC = Automatic percent control (Control forced to 100% on AOV Means Table) T1 = {2}{1}*100</p>
--

GEP Certificate

Appendix 2: GEP Certificate and Publication Rights

General Provisions for commissioned assignments September

10, 1997

1. **Contract basis**
 - 1.1. The contents and financial conditions of the commissioned assignment are laid down in a written agreement.
 - 1.2. The general provisions of the Danish Institute of Agricultural Sciences for commissioned assignments shall apply as conditions agreed for any commissioned assignment, unless these have been explicitly departed from in the written agreement. On placing an order with the Danish Institute of Agricultural Sciences, the giver of the assignment accepts this.
2. **Performance of commissioned assignments**
 - 2.1. The Danish Institute of Agricultural Sciences undertakes the responsibility that the commissioned assignment is carried out conscientiously and with the best possible application of the knowledge that the Danish Institute of Agricultural Sciences has at its disposal.
 - 2.2. The Danish Institute of Agricultural Sciences shall be responsible for obtaining from the public authorities any permits which might be required for performing the research and development work.
 - 2.3. The Danish Institute of Agricultural Sciences undertakes no responsibility that the work carried out will lead to the desired or expected result.
3. **Delay**
 - 3.1. If it appears that a time schedule or time limit will be exceeded the Danish Institute of Agricultural Sciences will inform the giver of the assignment of this, so that the giver of the assignment may decide whether the assignment should be changed or the work be stopped or postponed.
 - 3.2. If the giver of the assignment chooses to cease the work, such work that has already been carried out is to be paid for according to account rendered and the giver of the assignment shall also reimburse all expenses incurred by the Danish Institute of Agricultural Sciences in connection with the carrying through of that part of the work which has been started in accordance with the agreement, after deduction of the economies effected by the cessation of the work
 - 3.3. The Danish Institute of Agricultural Sciences shall not be liable to pay damages in the case of delay, unless a separate agreement has been made to this effect.
4. **Payment**
 - 4.1. The commissioned assignment is normally carried out on a cost-plus-fixed-fee basis according to the charges of the Danish Institute of Agricultural Sciences. Payment from the giver of the assignment to the Danish Institute of Agricultural Sciences and time of payment will be specified in the written assignment.
5. **Obligation of secrecy and right of publication**
 - 5.1. The giver of the assignment and the Danish Institute of Agricultural Sciences shall exchange the information about own experience which is required for the performance of the assignment. If this information is described as confidential by the party supplying it, it is not, without the written permission of this party, to be communicated to a third party.
 - 5.2. All rights to utilize the results belong to the giver of the assignment and to the Danish Institute of Agricultural Sciences until the final report is available, unless otherwise agreed. Publication of results can take place during this period only as previously arranged between the parties. Hereafter, the Danish Institute of Agricultural Sciences reserves the right to utilize the results achieved in its publication and in other information.
 - 5.3. Danish Institute of Agricultural Sciences may freely use and disseminate knowledge of a general nature and knowledge of general results (know-how), even if it has been obtained through the work as a contract assignment.
 - 5.4. All material, especially sales material, which refers to the collaboration between the Danish Institute of Agricultural Sciences and the giver of the assignment, is to be approved in writing by the parties in advance.
 - 5.5. Publication of results in extracts or in an adapted form can only take place according



to the prior written acceptance of the Danish Institute of Agricultural Sciences hereof.

6. Rights concerning results achieved

6.1. If in connection with the performance of the assignment an invention is made by the Danish Institute of Agricultural Sciences, the basic ideas and formulation of which are not found in the original presentation made by the giver of the assignment, this invention belongs to the Danish Institute of Agricultural Sciences (with respect of law an inventions of employees), however the giver of the assignment can, without extra payment (royalties), utilise the invention in such own production that is within the framework of the commissioned

Assignment. Patents for such inventions will be taken out in the name of the Danish Institute of Agricultural Sciences and on the account of the Danish Institute of Agricultural Sciences. If the Danish Institute of Agricultural Sciences applies for a patent, the giver of the assignment shall be informed of this immediately.

6.2. If the giver of the assignment considers that the commissioned assignment contains a patentable invention, and if the Danish Institute of Agricultural Sciences does not at its own request apply for a patent, the giver of the assignment can, within the period of time stipulated in the law an inventions of employees, demand that this should be done. Distribution of costs and rights and any remuneration to the inventor in accordance with the above-mentioned law, are fixed by a separate agreement.

7. Liability

7.1. The Danish Institute of Agricultural Sciences is liable towards the giver of the assignment in accordance with the rules of liability for damages in Danish law, with the limitations resulting from clauses 7.2.-7.6., cf. also clause 3.3.

7.2. The work, reports, opinions and instructions supplied by the Danish Institute of Agricultural Sciences have taken place and been made on the basis of the knowledge and technique that the Danish Institute of Agricultural Sciences has at its disposal at the time of the implementation of the work. The Danish Institute of Agricultural Sciences shall be without any liability whatsoever if a later development should prove the knowledge and technique of the Danish Institute of

Agricultural Sciences to have been defective or incorrect. The same applies to opinions of which it has been stated that they are based on an estimated judgement of valuation.

7.3. If the assignment consists in the preparation of edp-programmes, or if calculations, results or other statements are based on the application of edp, the Danish Institute of Agricultural Sciences shall be without liability for any damage that may be a consequence of errors in the developed or applied programmes.

7.4. The Danish Institute of Agricultural Sciences shall be without liability for any damage that may occur in connection with any type of use which is outside the assignment or outside the purpose in connection with which the services of the Danish Institute of Agricultural Sciences were rendered.

7.5. In relation to a third party, the giver of the assignment shall have the full liability for any damage that may be caused by products manufactured by the giver of the assignment in applying the results of the assignment. The Danish Institute of Agricultural Sciences shall have the liability for any damage solely to the extent that the giver of the assignment can substantiate that the damage caused can be traced back to a negligent act on the part of the Danish Institute of Agricultural Sciences. If staff employed by the giver of the assignment assist at the performance of an assignment, the Danish Institute of Agricultural Sciences shall be without any liability whatsoever for faults or deficiencies which could be traced back to work carried out by such staff.

7.6. The liability of the Danish Institute of Agricultural Sciences can - unless something else has explicitly been agreed upon - never exceed DKK 500,000 for each occurrence. A number of occurrences involving a loss shall be regarded as one single occurrence if the cause can be traced back to the same fault or deficiency. The Danish Institute of Agricultural Sciences will never be liable for loss of production, consequential loss, loss of profits or any other indirect loss. The Danish Institute of Agricultural Sciences cannot be held responsible for damage that has not been notified in writing within five years after the Danish Institute of Agricultural Sciences has



~~rendered the service on which the liability is based. The general rules of Danish law on limitation shall apply irrespective of whether objections have been made to the Danish Institute of Agricultural Sciences.~~

- 7.7. To the extent that a liability extending beyond the limits stipulated in clauses 7.1. - 7.6. should be imposed on the Danish Institute of Agricultural Sciences in relation to a third party, the giver of the assignment shall be under an obligation to indemnify the Danish Institute of Agricultural Sciences for this.

8. Disputes

- 8.1. Disputes shall be settled in pursuance of Danish law.
- 8.2. Unless otherwise agreed, the venue shall be the Maritime and Commercial Court in Copenhagen.
- 8.3 The Danish version of the General provisions for commissioned assignment, September 10th, 1997 will be in power if any doubts or disagreements.



AARHUS UNIVERSITET

Faculty of Agricultural Sciences Department of Integrated Pest Management

Ministry of Food, Agriculture and Fisheries
Danish Institute of Agricultural Sciences
GEP Recognition Unit



Certificate

GEP-approval is granted to

Testing unit: Pesticide Testing: Diseases and Pests
Department of Crop Protection
Research Centre Flakkebjerg
DK-4200 Slagelse

The approval applies to the execution of GEP-efficiency trials of pesticides within

Testing areas. Field trials
Greenhouse trials
Fruitgrowing trials

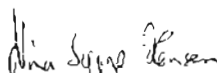
The GEP Recognition Unit at the Danish Institute of Agricultural Sciences controls organization, staff, premises, trial fields, trial equipment, standard operation procedures and trial reports. The testing unit is subject to continuous control and inspection

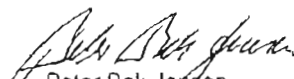
The Certificate is valid for a period of 6 years.


Date of approval: 1st January 2002

Signed: 4th June 2002

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 Agricultural Sciences


 Bent Bromand
 Danish Institute of
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Ministerial order No. 313 of 5th May 2000 states that investigations of the efficiency of plant protection products carried out in Denmark after 1st January 1996 for registration purposes must be performed by testing units which have been approved to carry out these investigations by the Danish Institute of Agricultural Sciences according to the Commission Directive 93/71/EEC.

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Final Report

Determination of Efficacy of [REDACTED] against Pea and bean weevil in Peas,
2 Sites in UK 2008

Study Code: S08-01365

Trial Code(s): [REDACTED]
S08-01365-01
S08-01365-02

Testing Facility: [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
UK

Sponsor: [REDACTED]
[REDACTED]
[REDACTED]
Italy

I the undersigned, hereby declare that the work was performed according to the procedures herein described and that this Report is an accurate and faithful record of the results obtained

[REDACTED]

26/02/2010

[REDACTED], PhD (Study Director)

This document is an account of work carried out by [REDACTED] on behalf of [REDACTED] cannot accept responsibility for decisions made or actions taken on the basis of this Report

[REDACTED]

[REDACTED]

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1. Summary

- Two small plot replicated trials were carried out to evaluate the efficacy of [REDACTED] ([REDACTED] 100g/l CS) when applied at 37.5ml product/ha, 62.5ml product/ha and 75.0ml product/ha for the control of pea and bean weevil in peas. The results obtained were compared with [REDACTED] ([REDACTED] 100g/l CS) applied at 75.0ml product/ha.
- At Trial S08091365-01, two sequential applications were made on the 2nd May and 12th May when pest activity was noted in the crop. At Trial S08091365-02, two sequential applications were made on the 8nd May and 20th May when pest activity was noted in the crop.
- No problems were encountered during mixing or application of any of the product formulations under test.
- Assessments for product efficacy were made pre application, then 1,4 and 7 days after the first application and 1 and 4 days after Application 2 at Trial 1 and 1, 6 and 9 days after application 2 at Trial 2.
- No phytotoxic symptoms or treatment related crop vigour differences were observed on either of the trials at any of the assessment timings
- Weather conditions in May were moderately conducive for pea and bean weevil activity with temperatures above the long term average, but slightly higher than average rainfall. Low levels of damage were found at both trials with between 1 and 2 notches per plant pre application.
- At trial S08-01365-01, few differences in control were observed between any of the treatments and the untreated until 7 days after application A, when all the treatments achieved a significant reduction in notching. The [REDACTED] treatments achieved control comparable to, if not slightly better than that of the standard product [REDACTED]. No dose response was observed between the three rates of [REDACTED] at any of the assessment timings.
- At trial S08-01365-02, all treatments achieved a significant reduction in notching compared to the untreated. [REDACTED] applied at the higher rates of 62.5ml product/ha and 75.0ml product/ha showed control of pea and weevil comparable to that of [REDACTED]. A dose response was apparent with [REDACTED], with the lower rate being significantly less effective than the 62.5ml/ha and 75ml/ha rates at the 1 day after Application B assessment.

2. Objectives

- 2.1 To evaluate the efficacy of [REDACTED] for the control of Pea and bean weevil in peas.
- 2.2 To compare the efficacy in 2.1 with that of [REDACTED].
- 2.3 To monitor treated crop for signs of phytotoxicity.
- 2.4 To establish minimum effective dose.

3. Study Conduct

[REDACTED] are officially recognised as competent to carry out efficacy testing in accordance with European Commission Directive 93/71/EEC by the following authorities;

For phases of studies conducted by [REDACTED]:

- United Kingdom Pesticides Safety Directorate (certification number ORETO [REDACTED]), in the categories of agriculture/horticulture, stored crops, biologicals & semiochemicals and vertebrate control

GLP compliance will not be claimed in respect of this study, but certain procedural aspects may be included within the QA programme.

National regulatory guidelines will also be followed for the countries involved in the study.

SOPs - All work undertaken will follow the test site SOPs. In case of any conflict between SOPs and study plan the study plan is superior.

Relevant EPPO guideline(s)		Variation from EPPO
PP 1/152(3)	Design and analysis of efficacy evaluation trials	No
PP 1/181(3)	Conduct and reporting of efficacy evaluation trials	No
PP 1/135(3)	Phytotoxicity assessment	No
PP 1/225(1)	Minimum effective dose	No
PP 1/60(3)	<i>Sitona lineatus</i>	No

[REDACTED]

[REDACTED]

4. Test site and plot design information

Table 1 - Test site and plot design information

	S08-01365-01	S08-01365-02
Test location	Swepstone	Measham
Region/county/state	Leicestershire	Leicestershire
Country	UK	UK
Location reference	W -1.5031 N 52.68908	W -1.4474 N 52.6979
Soil texture	Sandy clay loam	Sandy clay loam
Crop	Peas	Peas
Cultivar	Kahuna	Kahuna
Drilling/Planting date	27 Mar 2008	05 Apr 2008
Planting rate (kg/ha)	250	250
Drilling rate (kg/ha)	250	250
Drilling depth (cm)	2-3	2-3
Trial design	Randomised complete block	Randomised complete block
Number of replicates	Four	Four
Plot size w, l, other	3m x 9m or 27m ²	3m x 10m or 30m ²

5. Treatment details

Table 2 - Test Item(s) and Reference Item(s)

Product Name	Active ingredient(s)	Batch number	Content of a.i nominal	Formulation Type
[REDACTED]	[REDACTED]	H132	100 g/l	CS
[REDACTED]	[REDACTED]	BSN6C2401	100 g/l	CS

Table 3 - Application Schedule

Treatment No.	Product / Formulation	Rate of product/ha	Dosage rate / ha a.i. in g	Application timing
1	Untreated	-	-	-
2	[REDACTED]	37.5 ml	3.75	A B
3	[REDACTED]	62.5 ml	6.25	A B
4	[REDACTED]	75.0 ml	7.5	A B
5	[REDACTED]	75.0 ml	7.5	A B
Application timing and spray volume				
A	At first signs of weevil damage		Spray Volume	200
B	If weevils re-infest treated plots 7-8 days after Application A		Spray Volume	200

Table 4 - Application Description

	S08-01365-01		S08-01365-02	
Application date	02 May 2008	12 May 2008	09 May 2008	20 May 2008
Time of day	15:15	11:00	12:00	13:00
Application Method	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing	A	B	A	B
Application Placement	BROFOL	BROFOL	BROFOL	BROFOL
Applied by	A McCartney	A McCartney	A McCartney	A McCartney
Temperature of air - shade (°C)	10.5	19.0	21.0	12.5
Relative humidity (%)	88	76	87	78
Wind speed range (m/s)	1.5	1.0	1.0	1.5
Dew presence (Y/N)	N	N	N	N
Temperature of soil - 2-5 cm (°C)	7.0	8.0	8.0	7.0
Wetness of soil - 2-5 cm	WET	DRY	DRY	DRY
Cloud cover (%)	70	60	05	62

Table 5 - Crop Stage at Each Application

	S08-01365-01		S08-01365-02	
	A	B	A	B
Application Timing	A	B	A	B
Stage Scale Used:	BBCH	BBCH	BBCH	BBCH
Stage Majority	14	16	15	19
Stage Minimum	13	15	14	18
Stage Maximum	15	17	16	20

Table 6 - Application Equipment

	S08-01365-01		S08-01365-02	
	A	B	A	B
Application Timing	A	B	A	B
Application equipment	PLOT SPRAYER	PLOT SPRAYER	PLOT SPRAYER	PLOT SPRAYER
Nozzle pressure	3.8 BAR	3.8 BAR	3.8 BAR	3.8 BAR
Nozzle type	LURMARK	LURMARK	LURMARK	LURMARK
Nozzle size	LD015F110	LD015F110	LD015F110	LD015F110
Nozzle spacing, unit	50 CM	50 CM	50 CM	50 CM
Nozzles/Row	6	6	6	6
Boom Length, unit	300 CM	300 CM	300 CM	300 CM
Boom Height, unit	35 CM	35 CM	35 CM	35 CM
Ground Speed, unit	1.0 m/s	1.0 m/s	1.0 m/s	1.0 m/s
Carrier	WATER	WATER	WATER	WATER
Application volume	200 L/HA	200 L/HA	200 L/HA	200 L/HA
Propellant	COMP AIR	COMP AIR	COMP AIR	COMP AIR

6. Evaluations

Observations were made for application problems associated with product formulations and the evaluation types given below were followed. Details of methodology are included in the Results Section. Description and details of evaluation are presented in the tables below

Table 7 - Evaluation descriptions

Evaluation No.	Evaluation Description
1	Phytoxicity as % of total leaf area affected by chlorosis and necrosis. Record any other symptom or plot differences observed using a scale appropriate to symptom.
2	Crop vigour on a 0-10 linear scale, where 0 = no crop and 10 = the most vigorous plot within the trial area
3	Count the total number of semi circular notches cut into the edge of the newest pair of leaves per plant on 5 lots of 10 previously marked plants per plot. Inspect crop and growth stages prior to assessment and ensure the same number of leaves is counted per plant
4	Assess the percentage area of each plant with pea and bean weevil damage
Special Requirements	
<ul style="list-style-type: none">Record any observed effect on the incidence of other pests or other non-target organisms.	

Table 8 - Evaluation details

Trial no.	Evaluation date	Evaluation Timing ^a	Crop growth stage (BBCH)	Untreated crop ground cover (%)	Evaluation type
S08-01365-01	02 May 2008	0 DAAA	14	40	Leaf notching
	03 May 2008	1 DAAA	■	■	■■■■■■■■■■
	06 May 2008	4 DAAA	■	■	■■■■■■■■■■
	09 May 2008	7 DAAA	■	■	■■■■■■■■■■
	13 May 2008	1 DAAB	■	■	■■■■■■■■■■
	16 May 2008	4 DAAB	■	■	■■■■■■■■■■
S08-01365-02	09 May 2008	0 DAAA	■	■	■■■■■■■■■■
	10 May 2008	1 DAAA	■	■	■■■■■■■■■■
	13 May 2008	4 DAAA	■	■	■■■■■■■■■■
	16 May 2008	7 DAAA	■	■	■■■■■■■■■■
	21 May 2008	1 DAAB	■	■	■■■■■■■■■■
	26 May 2008	6 DAAB	■	■	■■■■■■■■■■
	29 May 2008	9 DAAB	■	■	■■■■■■■■■■

^a DAA – days after application

7. Statistical Analysis

For all data, the homogeneity of variance was tested by Bartlett's Test. If this test indicated no homogeneity of variance the transformed values were used for analysis of variance. If still no homogeneity of variance was obtained by the transformation the statistical analysis should be treated with caution. If no homogeneity on a data column is observed this is indicated with a * in the results tables.

Assessment data were then analysed using a two-way analysis of variance (ANOVA) on untransformed and transformed data. The probability of no significant differences occurring between treatment means is calculated as the F probability value ($p(F)$).

A mean comparison test was only performed when the treatment probability of F that is calculated during analysis of variance was significant at the observed significance level specified for the mean comparison test. The mean separation letter "a" is assigned to each treatment mean in an assessment data column when a non-significant treatment P(F) is detected.

Student Newman-Keuls' multiple comparison test was applied to separate any treatment differences that may be implied by the ANOVA TEST and these are indicated by a letter test; treatment means with no letters in common are significantly different according to the test initiated at the 95% confidence level.

Where data have been transformed, treatment means in the report are presented in their detransformed state, with the appropriate letter test and mean descriptions (LSD and Standard Deviation; indicated by the letter "t") derived from the transformed ANOVA.

Analysis details included in the result tables of the report are: co-efficient of variation (CV), least significant difference (LSD), F probability for treatments ($p(F)$), and data type (indicates transformation type if appropriate). Where a transformation has been carried out this is indicated in the table as follows; TA - ARCSIN(SQR(X/100)), TS - SQR(X + 0.5), TL - LOG(X + 1).

8. Results

8.1 Formulations

Observations were made of ease of mixing of the formulations and for any conspicuous problems associated with nozzle blockages or uneven spray pattern during mixing and application

No problems were encountered during mixing or application of any of the product formulations under test.

8.2 ARM Code Descriptions

Table 9 - ARM Code Descriptions

Rating	Code	Description
Part Rated	HOLE	Hole
	PLANT	Plant / Plant Biomass
Rating Data Type	DAMINS	Damage - Insect
	PHYGEN	Phytotoxicity - General
	VIGOUR	Vigour
ARM Action Code	APC	Actual Percent Control
	TSS[n]	Sum of subsamples per plot
	THT[n]	Henderson Tilton Transformation
	C	Rating Scale 0-10
	P	Rating Scale 0-100 / Percent

8.3 Crop Safety

No phytotoxic symptoms were observed on either the trials at any of the assessment timings.

8.4 Crop Vigour

No differences in crop vigour were observed on either of the trials at any of the assessment timings.

8.5 Pea and bean weevil Control

Summaries of the mean number of notches on 50 plants per plot are presented from Table 10

Summaries of the % area of each plant with pea and bean weevil damage are presented from Table 12

Table 10 - Mean number of notches on 50 plants per plot, S08-01365-01

Pest Type	I Insect	I Insect	I Insect	I Insect
Pest Code	SITNLI	SITNLI	SITNLI	SITNLI
Pest Name	Pea & bean weevil	Pea & bean weevil	Pea & bean weevil	Pea & bean weevil
Crop Code	PIBSA	PIBSA	PIBSA	PIBSA
BBCH Scale	BVPU	BVPU	BVPU	BVPU
Crop Name	Field pea	Field pea	Field pea	Field pea
Crop Variety	Kahuna	Kahuna	Kahuna	Kahuna
Description	Pre-app Total			
Part Rated	PLANT P	HOLE P	HOLE P	HOLE P
Rating Date	2/5/08	3/5/08	6/5/08	9/5/08
Rating Data Type	DAMINS	DAMINS	DAMINS	DAMINS
Rating Unit	NUMBER	NUMBER	NUMBER	NUMBER
Number of Subsamples	1	1	1	1
Crop Stage	14	14	14	14
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH
Crop Density, Unit	40 PERCENT	40 PERCENT	40 PERCENT	45 PERCENT
Days After First/Last Applic.	0 0	1 1	4 4	7 7
Trt-Eval Interval	0 DA-A	1 DA-A	4 DA-A	7 DA-A
Plant-Eval Interval	36 DP-1	37 DP-1	40 DP-1	43 DP-1
ARM Action Codes	TSS[1]	TSS[7] APC	TSS[11] APC	TSS[17] APC
Number of Decimals	2	2	2	2
Trt No.	Treatment Name	Rate	Unit	Appl Code
1	Untreated	69.00	a	90.25 (0.0%)
2	[REDACTED]	37.5	ML-G/HA A-B	59.75 a
3	[REDACTED]	62.5	ML-G/HA A-B	65.25 a
4	[REDACTED]	75.0	ML-G/HA A-B	74.25 a
5	[REDACTED]	75.0	ML-G/HA A-B	64.75 a
LSD (P=.05)	17.248	24.975	34.063	30.662
Standard Deviation	11.194	16.209	22.108	19.900
CV	16.81	15.28	21.43	19.97
Replicate F	19.868	3.881	0.512	0.216
Replicate Prob(F)	0.0001	0.0376	0.6813	0.8837
Treatment F	0.929	4.142	0.303	5.186
Treatment Prob(F)	0.4792	0.0246	0.8704	0.0116

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Table 10 – (Continued) Mean number of notches on 50 plants per plot, S08-01365-01

Pest Type	I Insect	I Insect						
Pest Code	SITNLI	SITNLI						
Pest Name	Pea & bean weevil	Pea & bean weevil						
Crop Code	PIBSA	PIBSA						
BBCH Scale	BVPU	BVPU						
Crop Name	Field pea	Field pea						
Crop Variety	Kahuna	Kahuna						
Part Rated	HOLE P	HOLE P						
Rating Date	13/5/08	16/5/08						
Rating Data Type	DAMINS	DAMINS						
Rating Unit	NUMBER	NUMBER						
Number of Subsamples	1	1						
Crop Stage	16	17						
Crop Stage Scale	BBCH	BBCH						
Crop Density, Unit	45 PERCENT	50 PERCENT						
Days After First/Last Applic.	11 1	14 4						
Trt-Eval Interval	1 DA-B	4 DA-B						
Plant-Eval Interval	47 DP-1	50 DP-1						
ARM Action Codes	TSS[23] APC	TSS[29] APC						
Number of Decimals	2	2						
Trt No.	Treatment Name	Rate	Unit	Appl Code				
1	Untreated				358.50 (0.0%)	a	196.25 (0.0%)	a
2		37.5	ML-G/HA	A-B	141.00 (60.7%)	b	99.75 (49.2%)	b
3		62.5	ML-G/HA	A-B	207.00 (42.3%)	ab	101.25 (48.4%)	b
4		75.0	ML-G/HA	A-B	134.75 (62.4%)	b	99.25 (49.4%)	b
5		75.0	ML-G/HA	A-B	225.25 (37.2%)	ab	94.25 (52.0%)	b
LSD (P=.05)					125.794		25.902	
Standard Deviation					81.643		16.811	
CV					38.28		14.23	
Replicate F					1.690		0.404	
Replicate Prob(F)					0.2219		0.7528	
Treatment F					4.900		27.078	
Treatment Prob(F)					0.0142		0.0001	

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Table 11 - Mean number of notches on 50 plants per plot, S08-01365-02

					i Insect	I Insect	I Insect	I Insect				
					SITNLI	SITNLI	SITNLI	SITNLI				
					Pea and bean weevil	Pea & bean weevil	Pea & bean weevil	Pea & bean weevil				
					PIBSA	PIBSA	PIBSA	PIBSA				
					BVPU	BVPU	BVPU	BVPU				
					Field pea	Field pea	Field pea	Field pea				
					Kahuna	Kahuna	Kahuna	Kahuna				
					PLANT C	HOLE P	HOLE P	HOLE P				
					9/5/08	10/5/08	13/5/08	16/5/08				
					DAMINS	DAMINS	DAMINS	DAMINS				
					NUMBER	NUMBER	NUMBER	NUMBER				
					50	50	50	50				
					PLANT	PLANT	PLANT	PLANT				
					1	1	1	1				
					PLOT	PLOT	PLOT	PLOT				
					1	1	1	1				
					15	15	16	17				
					BBCH	BBCH	BBCH	BBCH				
					45 PERCENT	45 PERCENT	45 PERCENT	50 PERCENT				
					0 0	1 1	4 4	7 7				
					0 DA-A	1 DA-A	4 DA-A	7 DA-A				
					TSS[1]	TSS[5] APC	TSS[11] APC	TSS[18] APC				
					2	2	2	2				
Trt No.	Treatment Name	Rate	Unit	Appl Code								
1	Untreated				105.75	a	172.50 (0.0%)	a	228.50 (0.0%)	a	227.25 (0.0%)	a
2	██████████	37.5	ML-G/HA	A-B	97.25	a	175.50 (-1.7%)	a	133.00 (41.8%)	b	109.50 (51.8%)	b
3	██████████	62.5	ML-G/HA	A-B	102.00	a	157.25 (8.8%)	a	107.00 (53.2%)	b	97.50 (57.1%)	b
4	██████████	75.0	ML-G/HA	A-B	98.75	a	169.75 (1.6%)	a	121.50 (46.8%)	b	94.25 (58.5%)	b
5	██████████	75.0	ML-G/HA	A-B	105.50	a	161.75 (6.2%)	a	110.50 (51.6%)	b	85.25 (62.5%)	b
LSD (P=.05)					10.293		28.989		31.668		25.673	
Standard Deviation					6.680		18.814		20.553		16.663	
CV					6.56		11.24		14.67		13.57	
Replicate F					38.332		1.238		1.278		2.318	
Replicate Prob(F)					0.0001		0.3390		0.3262		0.1273	
Treatment F					1.329		0.656		24.105		50.251	
Treatment Prob(F)					0.3147		0.6342		0.0001		0.0001	

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Table 11 – (Continued) Mean number of notches on 50 plants per plot, S08-01365-02

Pest Type	I Insect	I Insect						
Pest Code	SITNLI	SITNLI						
Pest Name	Pea & bean weevil	Pea & bean weevil						
Crop Code	PIBSA	PIBSA						
BBCH Scale	BVPU	BVPU						
Crop Name	Field pea	Field pea						
Crop Variety	Kahuna	Kahuna						
Part Rated	HOLE P	HOLE P						
Rating Date	21/5/08	26/5/08						
Rating Data Type	DAMINS	DAMINS						
Rating Unit	NUMBER	NUMBER						
Sample Size	50	50						
Sample Size Unit	PLANT	PLANT						
Collection Basis	1	1						
Collection Basis Unit	PLOT	PLOT						
Number of Subsamples	1	1						
Crop Stage	19	19						
Crop Stage Scale	BBCH	BBCH						
Crop Density, Unit	60 PERCENT	60 PERCENT						
Days After First/Last Applic.	12 1	17 6						
Trt-Eval Interval	1 DA-B	6 DA-B						
ARM Action Codes	TSS[24] APC	TSS[30] APC						
Number of Decimals	2	2						
Trt No.	Treatment Name	Rate	Appl Unit	Code				
1	Untreated				233.25 (0.0%)	a	204.25 (0.0%)	a
2	██████	37.5	ML-G/HA	A-B	143.25 (38.6%)	b	121.25 (40.6%)	b
3	██████	62.5	ML-G/HA	A-B	89.75 (61.5%)	c	95.75 (53.1%)	b
4	██████	75.0	ML-G/HA	A-B	97.75 (58.1%)	c	107.50 (47.4%)	b
5	██████	75.0	ML-G/HA	A-B	83.00 (64.4%)	c	107.00 (47.6%)	b
LSD (P=.05)					32.812		28.773	
Standard Deviation					21.296		18.674	
CV					16.46		14.69	
Replicate F					3.068		0.322	
Replicate Prob(F)					0.0690		0.8096	
Treatment F					34.626		22.245	
Treatment Prob(F)					0.0001		0.0001	

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Table 12 - Percentage area of plant with pea and bean weevil damage, S08-01365-01

Pest Type					I Insect	I Insect	I Insect	I Insect				
Pest Code					SITNLI	SITNLI	SITNLI	SITNLI				
Pest Name					Pea & bean weevil	Pea & bean weevil	Pea & bean weevil	Pea & bean weevil				
Crop Code					PIBSA	PIBSA	PIBSA	PIBSA				
BBCH Scale					BVPU	BVPU	BVPU	BVPU				
Crop Name					Field pea	Field pea	Field pea	Field pea				
Crop Variety					Kahuna	Kahuna	Kahuna	Kahuna				
Part Rated					PLANT P	PLANT P	PLANT P	PLANT P				
Rating Date					3/5/08	6/5/08	9/5/08	13/5/08				
Rating Data Type					DAMINS	DAMINS	DAMINS	DAMINS				
Rating Unit					%	%	%	%				
Number of Subsamples					1	1	1	1				
Crop Stage					14	14	14	16				
Crop Stage Scale					BBCH	BBCH	BBCH	BBCH				
Crop Density, Unit					40 PERCENT	40 PERCENT	45 PERCENT	45 PERCENT				
Days After First/Last Applic.					1 1	4 4	7 7	11 1				
Trit-Eval Interval					1 DA-A	4 DA-A	7 DA-A	1 DA-B				
Plant-Eval Interval					37 DP-1	40 DP-1	43 DP-1	47 DP-1				
ARM Action Codes					TSS[5] APC	TSS[13] APC	TSS[19] APC	TSS[25] APC				
Number of Decimals					2	2	2	2				
Trit No.	Treatment Name	Rate	Unit	Appl Code								
1	Untreated				109.00 (0.0%)	a	73.50 (0.0%)	a	109.50 (0.0%)	a	190.50 (0.0%)	a
2	██████████	37.5	ML-G/HA	A-B	111.25 (-2.1%)	a	57.00 (22.4%)	a	86.25 (21.2%)	a	123.75 (35.0%)	a
3	██████████	62.5	ML-G/HA	A-B	73.50 (32.6%)	a	80.00 (-8.8%)	a	93.50 (14.6%)	a	137.50 (27.8%)	a
4	██████████	75.0	ML-G/HA	A-B	94.25 (13.5%)	a	66.00 (10.2%)	a	76.75 (29.9%)	a	118.50 (37.8%)	a
5	██████████	75.0	ML-G/HA	A-B	128.75 (-18.1%)	a	78.75 (-7.1%)	a	75.50 (31.1%)	a	123.50 (35.2%)	a
LSD (P=.05)					48.682		19.921		23.974		55.662	
Standard Deviation					31.596		12.929		15.559		36.125	
CV					30.57		18.2		17.62		26.04	
Replicate F					0.013		0.291		0.489		1.312	
Replicate Prob(F)					0.9980		0.8314		0.6961		0.3159	
Treatment F					1.716		2.203		3.213		2.718	
Treatment Prob(F)					0.2109		0.1301		0.0520		0.0803	

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Table 12 – (Continued) Percentage area of plant with pea and bean weevil damage, S08-01365-01

Pest Type	I Insect			
Pest Code	SITNLI			
Pest Name	Pea & bean weevil			
Crop Code	PIBSA			
BBCH Scale	BVPU			
Crop Name	Field pea			
Crop Variety	Kahuna			
Part Rated	PLANT P			
Rating Date	16/5/08			
Rating Data Type	DAMINS			
Rating Unit	%			
Number of Subsamples	1			
Crop Stage	17			
Crop Stage Scale	BBCH			
Crop Density, Unit	50 PERCENT			
Days After First/Last Applic.	14 4			
Trt-Eval Interval	4 DA-B			
Plant-Eval Interval	50 DP-1			
ARM Action Codes	TSS[31] APC			
Number of Decimals	2			
Trt No.	Treatment Name	Rate	Unit	Appl Code
1	Untreated			
				123.50 (0.0%)
				a
2	██████████	37.5	ML-G/HA A-B	
				69.25 (43.9%)
				b
3	██████████	62.5	ML-G/HA A-B	
				71.75 (41.9%)
				b
4	██████████	75.0	ML-G/HA A-B	
				72.00 (41.7%)
				b
5	██████████	75.0	ML-G/HA A-B	
				72.00 (41.7%)
				b
LSD (P=.05)				
14.456				
Standard Deviation				
9.382				
CV				
11.48				
Replicate F				
1.122				
Replicate Prob(F)				
0.3790				
Treatment F				
24.873				
Treatment Prob(F)				
0.0001				

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Table 13 - Percentage area of plant with pea and bean weevil damage, S08-01365-02

Pest Type	I Insect	I Insect	I Insect	I Insect								
Pest Code	SITNLI	SITNLI	SITNLI	SITNLI								
Pest Name	Pea & bean weevil	Pea & bean weevil	Pea & bean weevil	Pea & bean weevil								
Crop Code	PIBSA	PIBSA	PIBSA	PIBSA								
BBCH Scale	BVPU	BVPU	BVPU	BVPU								
Crop Name	Field pea	Field pea	Field pea	Field pea								
Crop Variety	Kahuna	Kahuna	Kahuna	Kahuna								
Part Rated	PLANT P	PLANT P	PLANT P	PLANT P								
Rating Date	10/5/08	13/5/08	16/5/08	21/5/08								
Rating Data Type	DAMINS	DAMINS	DAMINS	DAMINS								
Rating Unit	%	%	%	%								
Sample Size	50	50	50	50								
Sample Size Unit	PLANT	PLANT	PLANT	PLANT								
Collection Basis	1	1	1	1								
Collection Basis Unit	PLOT	PLOT	PLOT	PLOT								
Number of Subsamples	1	1	1	1								
Crop Stage	15	16	17	19								
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH								
Crop Density, Unit	45 PERCENT	45 PERCENT	50 PERCENT	60 PERCENT								
Days After First/Last Applic.	1 1	4 4	7 7	12 1								
Trt-Eval Interval	1 DA-A	4 DA-A	7 DA-A	1 DA-B								
ARM Action Codes	APC TSS[7]	APC TSS[13]	TSS[20] APC	TSS[26] APC								
Number of Decimals	2	2	2	2								
Trt No.	Treatment Name	Rate	Unit	Appl Code								
1	Untreated				207.25 (0.0%)	a	169.25 (0.0%)	a	154.50 (0.0%)	a	161.00 (0.0%)	a
2	██████████	37.5	ML-G/HA	A-B	225.00 (-8.6%)	a	102.75 (39.3%)	b	85.00 (45.0%)	b	105.25 (34.6%)	b
3	██████████	62.5	ML-G/HA	A-B	202.25 (2.4%)	a	75.00 (55.7%)	b	74.75 (51.6%)	b	82.25 (48.9%)	b
4	██████████	75.0	ML-G/HA	A-B	202.75 (2.2%)	a	88.00 (48.0%)	b	68.75 (55.5%)	b	89.00 (44.7%)	b
5	██████████	75.0	ML-G/HA	A-B	202.25 (2.4%)	a	75.50 (55.4%)	b	68.00 (56.0%)	b	76.25 (52.6%)	b
LSD (P=.05)					51.345		35.155		21.134		24.912	
Standard Deviation					33.324		22.816		13.716		16.168	
CV					16.03		22.35		15.21		15.74	
Replicate F					0.288		0.823		0.501		1.800	
Replicate Prob(F)					0.8329		0.5060		0.6886		0.2008	
Treatment F					0.345		11.814		28.453		18.021	
Treatment Prob(F)					0.8424		0.0004		0.0001		0.0001	

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Table 13-- (Continued) Percentage area of plant with pea and bean weevil damage, S08-01365-02

Pest Type	I Insect				
Pest Code	SITNLI				
Pest Name	Pea & bean weevil				
Crop Code	PIBSA				
BBCH Scale	BVPU				
Crop Name	Field pea				
Crop Variety	Kahuna				
Part Rated	PLANT P				
Rating Date	26/5/08				
Rating Data Type	DAMINS				
Rating Unit	%				
Sample Size	50				
Sample Size Unit	PLANT				
Collection Basis	1				
Collection Basis Unit	PLOT				
Number of Subsamples	1				
Crop Stage	19				
Crop Stage Scale	BBCH				
Crop Density, Unit	60 PERCENT				
Days After First/Last Applic.	17 6				
Tr-Eval Interval	6 DA-B				
ARM Action Codes	TSS[32] APC				
Number of Decimals	2				
Trt No.	Treatment Name	Rate	Unit	Appl Code	
1	Untreated				119.75 (0.0%) a
2	██████	37.5	ML-G/HA	A-B	78.50 (34.4%) b
3	██████	62.5	ML-G/HA	A-B	73.50 (38.6%) b
4	██████	75.0	ML-G/HA	A-B	76.00 (36.5%) b
5	██████	75.0	ML-G/HA	A-B	73.00 (39.0%) b
LSD (P=.05)					16.222
Standard Deviation					10.529
CV					12.51
Replicate F					0.621
Replicate Prob(F)					0.6147
Treatment F					14.465
Treatment Prob(F)					0.0002

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

9. Discussion

9.1 Formulations

No problems were encountered during mixing or application of any of the product formulations under test.

9.2 Crop Safety

No phytotoxic symptoms were observed on either of the trials at any of the assessment timings.

9.3 Crop Vigour

No differences in crop vigour were observed on either of the trials at any of the assessment timings.

9.4 Pea and Bean Weevil Control

Weather conditions in May were moderately conducive for pea and bean weevil activity with temperatures above the long term average, but slightly higher than average rainfall. Low levels of damage were found at both trials with between 1 and 2 notches per plant pre application.

At trial S08-01365-01, few differences in control were observed between any of the treatments and the untreated until 7 days after application A, when all the treatments achieved a significant reduction in notching. The [REDACTED] treatments achieved control comparable to, if not slightly better than that of the standard product [REDACTED]. No dose response was observed between the three rates of [REDACTED] at any of the assessment timings.

At trial S08-01365-02, all treatments achieved a significant reduction in notching compared to the untreated. [REDACTED] applied at the higher rates of 62.5ml product/ha and 75.0ml product/ha showed control of pea and weevil comparable to that of [REDACTED]. A dose response was apparent with [REDACTED] with the lower rate being significantly less effective than the 62.5ml/ha and 75ml/ha rates at the 1 day after Application B assessment.

Appendix A - Meteorological Data

Trial S08-01365-01

Location of the weather station		Sutton Bonnington		
Distance to the trial site		23.2km		
Origin of the weather data		The Meteorological Office		
Long-term averages from 1971-2000				
Month/period	Av temp (°C)	Min temp (°C)	Max temp (°C)	Rainfall (mm)
May	11.1	6.3	15.8	42.4
Average conditions during the trial				
Month/period	Av temp (°C)	Min temp (°C)	Max temp (°C)	Rainfall (mm)
May 08	12.9	8.0	17.8	46.0

Trial S08-01365-02

Location of the weather station		Sutton Bonnington		
Distance to the trial site		19.8km		
Origin of the weather data		The Meteorological Office		
Long-term averages from 1971-2000				
Month/period	Av temp (°C)	Min temp (°C)	Max temp (°C)	Rainfall (mm)
May	11.1	6.3	15.8	42.4
Average conditions during the trial				
Month/period	Av temp (°C)	Min temp (°C)	Max temp (°C)	Rainfall (mm)
May 08	12.9	8.0	17.8	46.0

Appendix B - Agronomic Details

Trial S08-01365-01

Crop	Cultivar	Planting/sowing date	Sowing rate or row width (cm)
Peas	Kahuna	27 Mar 2008	250 kg/ha
Active ingredient(s) / fertiliser(s) applied to the trial area			
betazone, isoxaben + terbuthylazine, azoxystrobin, MCPB, chlorothalonil			
Date	Type of irrigation	Volume (mm)	
	None applied		
Soil cultivation			
Ploughed, Power harrowed, Drilled, Rolled			

Previous Crops

Year	Crop	Active ingredient(s) / fertiliser(s) applied to the trial area
2007	Not advised	Not advised

Trial S08-01365-02

Crop	Cultivar	Planting/sowing date	Sowing rate or row width (cm)
Peas	Kahuna	05 Apr 2008	250 kg/ha
Active ingredient(s) / fertiliser(s) applied to the trial area			
betazone, isoxaben + terbuthylazine, azoxystrobin, MCPB, chlorothalonil			
Date	Type of irrigation	Volume (mm)	
	None applied		
Soil cultivation			
Ploughed, Power harrowed, Drilled, Rolled			

Previous Crops

Year	Crop	Active ingredient(s) / fertiliser(s) applied to the trial area
2007	Not advised	Not advised

Appendix C - Copy of the Certificate of Official Recognition of Efficacy Testing Facilities or Organisations



Certificate of

Official Recognition of Efficacy Testing Facilities or Organisations in the United Kingdom

This certifies that



complies with the minimum standards laid down in Commission Directive 93/71/EEC for efficacy testing.

The above Facility/Organisation has been officially recognised as being competent to carry out efficacy trials/tests in the United Kingdom in the following categories:

- Biologicals and Semiochemicals
- Vertebrate Control
- Stored Crops
- Agriculture/Horticulture

Date of issue: 17 December 2007
 Effective date: 1 January 2008
 Expiry date: 31 December 2012

Signature

Authorised signatory

Certification Number

ORETO



an Executive Agency of DEFRA



Department of Agriculture and Rural Development

Appendix D - OECD trial summary table

Summary of the data and results of the efficacy trials:

Type of trial: Efficacy

Product: [REDACTED]

Crop: Combining peas

Insect: *Sitona lineatus*

Report Year	GEP (1)	Trial Site	Dates & GS (2)	Cultivar, F/G (3), N/A (4)	Trial design (5), N.replicates, EPPO	Application data						Mean number of notches on 50 plants/plot (% efficacy)			Notes (10)				
						(6)	Active ingredient (7)	Commercial name, %a.i. and formulation type	g ai/hl, (kg pf/ha)	g ai/ha, (kg pf/ha)	l/ha water	N.appl. dd (8)	7DAAA	1DAAB		4DAAB			
S08- 01365- 01 2008	Y	Swepstone Leics UK	02May 16May 2008 BBCH 14-17	Kahuna F N	Randomize d blocks. 4 Rep EPPO PP1/60,	C	Control	-	-	-	-	-	139.75	a	358.50	a	196.25	a	
						[REDACTED]	[REDACTED] 100 g/l CS	-	3.75/ 37.5	200	2appl. 10dd	88.75 (36.5)	b	141.00 (60.7)	b	99.75 (49.2)	b		
						[REDACTED]	[REDACTED] 100 g/l CS	-	6.25/ 62.5	200	2appl. 10dd	95.00 (32.0)	b	141.00 (60.7)	ab	99.75 (49.2)	b		
						[REDACTED]	[REDACTED] 100 g/l CS	-	7.5/ 75.0	200	2appl. 10dd	86.00 (38.5)	b	62.4	b	49.4	b		
						S	[REDACTED] 100 g/l CS	-	7.5/ 75.0	200	2appl. 10dd	88.75 (36.5)	b	207.00 (42.3)	ab	101.25 (48.4)	b		

Summary of the data and results of the efficacy trials:

Type of trial: Efficacy

Product: [REDACTED]

Crop: Combining peas

Insect: *Sitona lineatus*

Report Year	GEP (1)	Trial Site	Dates & GS (2)	Cultivar, F/G (3), N/A (4)	Trial design (5), N.replicates, EPPO	Application data						Mean number of notches on 50 plants/plot (% efficacy)			Notes (10)			
						(6)	Product (7)	Commercial name, %a.i. and formulation type	g ai/hl, (kg pf/hl)	g ai/ha, (kg pf/ha)	l/ha water	N.appl. dd (8)	7DAAA	1DAAB		6DAAB		
S08-01365-02 2008	Y	Measham, Leics UK	09May 29MAY 2008 BBCH 15-19	Kahuna F N	Randomize d blocks. 4 Rep EPPO PP1/60,	C	Control	-	-	-	-	-	227.25 a	233.25 a	204.25 a			
						[REDACTED]	[REDACTED] 100 g/l CS	-	3.75/ 37.5	200	2appl. 11dd	109.50 (51.8)	b	143.25 (38.6)	b	121.25 (40.6)	b	
						[REDACTED]	[REDACTED] 100 g/l CS	-	6.25/ 62.5	200	2appl. 11dd	97.50 (57.1)	b	61.5	c	53.1	b	
						[REDACTED]	[REDACTED] 100 g/l CS	-	7.5/ 75.0	200	2appl. 11dd	94.25 (58.5)	b	89.75 (61.5)	c	95.75 (53.1)	b	
						S	[REDACTED] 100 g/l CS	-	7.5/ 75.0	200	2appl. 11dd	85.25 (62.5)	b	64.4	c	47.6	b	



Efficacy [redacted] and [redacted] on
Puccinia recondita in winter rye

Sponsor's No.: [redacted] - 2071 - E04

[redacted] No.: 10 1062 476

Sponsor:



Sponsor's Monitor:



Test Facility:



Study Director:



Investigator:



Author:



Date:

October 12th, 2010

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2. GEP Certificate

Anerkennungsbescheinigung

Die Versuchseinrichtung [REDACTED]
 mit [REDACTED] 6
 und organisatorisch zugehörigen Arbeitseinheiten in Blankenhagen, Strausberg, Neustadt/Dosse,
 Neugattersleben, Mollerwitz, Trossin und Gerolzhofen
 ist auf Antrag vom 12.01.2009
 und durchgeführter Besichtigung vom 02.02.2009
 durch Herrn Dillrich, Frau Petrick und Herrn Pfüller
 vom Sächsischen Landesamt für Umwelt, Landwirtschaft und Geologie am 24.03.2009
 in den Versuchskategorien Ackerbau, Grünland, Gemüsebau, Obstbau, Zierpflanzenbau, Forst,
 Hopfenbau, Weinbau, Nichtkulturland, Sonderkulturen und Vorratsschutz
 als Einrichtung für die Prüfung der Wirksamkeit von Pflanzenschutzmitteln im Sinne des § 1d
 Abs. 5 der Pflanzenschutzmittelverordnung und gemäß Richtlinie 91/414/EWG für 5 Jahre amtlich
 anerkannt worden

Recognition Certificate

The testing facility [REDACTED]
 with [REDACTED]
 and subsidiary testing units in Blankenhagen, Strausberg, Neustadt/Dosse, Neugattersleben,
 Mollerwitz, Trossin and Gerolzhofen
 on application from 2009-01-12
 and inspection of 2009-02-02
 by Herrn Dillrich, Frau Petrick and Herrn Pfüller
 from the Sächsisches Landesamt für Umwelt, Landwirtschaft und Geologie on 2009-03-24
 in the trial categories agriculture, grassland, vegetable gardening, fruit-growing, ornamental plant
 growing, forestry, hop growing, viticulture, non-cultivated areas, specialised crops and storage
 protection
 has been officially recognised as an organisation for efficacy testing facility of plant protection
 products according to § 1d Abs. 5 of the Plant Protection Products Ordinance and the Directive
 91/414/EEC for 5 years

24.03.2009

Datum
dateUnterschrift
signSächsisches Landesamt für Umwelt,
Landwirtschaft und Geologie
Stübelallee 2
D-01307 DresdenAdresse der anerkennenden Behörde
address of the recognising authorityStempel
stamp

3. GEP Compliance Statement

trial no.:

09 1062 476

Title:

Efficacy and
on *Puccinia recondita* in
winter rye

I hereby declare that this study was performed according to the study plan by the procedure described in compliance with the "Principles of Good Experimental Practice (GEP)" and the EPPO-Guidelines listed under Material and Methods, 5.1.

Study Director:

4. Summary

The trial was laid down in Trossin, Saxony. The climate is characterized by an annual precipitation of 589 mm and an air temperature of 8.4 °C (averages over 30 years). Trossin is situated approximately 50 km northeast of Leipzig.

The test item were [redacted] (= [redacted]) and [redacted] (= [redacted]). Reference products were [redacted] and [redacted]. For details in application rates and times see under point 5.3. and 5.4.

The plots of the trial were laid out in a randomized block with four replicates. The plot size was 27.5 m².

The applications on April 23rd and May 5th, 2010 took place under good conditions.

Following assessments were carried out:

1. Preliminary assessment at the day of application A (April 23rd, 2010).
2. Efficacy and phytotoxicity assessment at the day of application B (May 5th, 2010).
3. Efficacy and phytotoxicity assessment 15 days after application B (May 20th, 2010).
4. Efficacy and phytotoxicity assessment 41 days after application B (June 15th, 2010).

None of the treatments showed any phytotoxic symptom (chloroses, necroses, stunting, thinning).

The plots of the trial were harvested on July 27th, 2010.

Summary of last two efficacy assessment; averages of treatments

Disease Code	PUCCRE	RHYNSE	RHYNSE	PUCCRE
Crop Code	SECCW	SECCW	SECCW	SECCW
Part Rated	FL-1 P	FL-1 P	FL-2 P	FLAGLE P
Rating Data Type	PESSEV	PESSEV	PESSEV	PESSEV
Rating Unit	%	%	%	%
Rating Date	20-May-2010	20-May-2010	20-May-2010	15-Jun-2010
Crop Stage	55 55	55 55	55 55	67 73
Trt-Eval Interval	15 DA-B	15 DA-B	15 DA-B	41 DA-B
Trt No.	Treatment Name	Product Rate	Product Rate Unit	
				1 2 3 4
1	Untreated	-		0.0 a 1.5 a 16.5 a 8.0 a
2		1.5 l/ha		0.0 a 0.0 a 3.8 b 0.0 b
3		1.0 l/ha		0.0 a 0.0 a 7.0 b 0.0 b
4		0.8 l/ha		0.0 a 0.0 a 1.8 b 1.3 b
5		2.5 l/ha		0.0 a 0.0 a 6.5 b 0.0 b
6		2.0 l/ha		0.0 a 0.0 a 2.8 b 0.0 b
7		1.5 l/ha		0.0 a 0.0 a 1.8 b 0.0 b
LSD (P=,05)				0.00 1.34 4.91 0.92
Standard deviation				0.00 0.90 3.30 0.62
CV				0.0 419.88 57.81 46.95
Grand Mean				0.0 0.21 5.71 1.32

Means followed by same letter do not significantly differ (P=,05, Student-Newman-Keuls)

Harvest, 95 days after application B, averages

Crop Code	SECCW			
Part Rated	GRAIN C			
Assessment Type	YIELD			
Assessment Unit	dt/ha 1)			
Rating Date	27/Jul/2010			
Crop Stage	99			
Crop Stage Scale	BBCH			
Assessed By	H. Scharf			
Trt-Eval Interval	83 DA-B			
ARM Action Codes	TY1 APOC			
Trt No.	Treatment Name	Product Rate	Product Rate Unit	
				1
1	Untreated	-		54.73 (100.00%) b
2		1.5 l/ha		60.07 (109.40%) a
3		1.0 l/ha		57.26 (104.61%) ab
4		0.8 l/ha		57.79 (107.42%) ab
5		2.5 l/ha		58.61 (107.08%) ab
6		2.0 l/ha		57.55 (105.15%) ab
7		1.5 l/ha		57.94 (105.87%) ab

Means followed by same letter do not significantly differ (P=,05, Student-Newman-Keuls)

¹⁾ Converted to 14 % moisture

5. Material and Methods**5.1. EPPO-Guidelines used**

Guideline	Description
EPPO: PP 1/135 (3)	Phytotoxicity assessment
EPPO: PP 1/152 (3)	Design and analysis of efficacy evaluation trials
EPPO: PP 1/181 (3)	Conduct and reporting of efficacy evaluation trials including good experimental practice
EPPO: PP 1/26 (3)	Foliar diseases on cereals

5.2. Layout

Plot width: 2.5 m Plot width, harvest: 1.5 m
 Plot length: 11.0 m Plot length, harvest: 9.0 m

Number of replications: 4 Site type: field
 Tillage type: conventional - till
 Study design: randomized complete block

Trial map:

401	402	403	404	405	406	407
2	7	5	3	6	1	4
301	302	303	304	305	306	307
5	3	6	2	4	7	1
201	202	203	204	205	206	207
6	4	7	1	3	2	5
101	102	103	104	105	106	107
1	2	3	4	5	6	7
101	Plot and block					
7	Treatment					

5.3. Test items and reference products

	Product	Product Synonym	Active Ingredient		Formulation	Batch/Lot Number
			Name	Concentration		
Test Item				83 g/l 67 g/l 170 g/l	SE	341-160809-01
Test Item				100 g/l 40 g/l	EC	266-251108-01
Reference Product		-		84 G/L 250 G/L	SE	-
Reference Product		-		214 g/l 43 g/l 114 g/l	SE	-

The reference products and were provided by .

5.4. Treatments

Application time: A = at the beginning of infestation, at the latest at BBCH 32-35
B = at new infestation, at the latest at BBCH 39-51

Treatment	Product	Product	Application Rate	Applications
			Active Ingredients	
1	untreated		-	-
2		1.5 l/ha	124.5 g/ha+ 100.5 g/ha+ 255 g/ha	AB
3		1.0 l/ha	83 g/ha + 67 g/ha + 170 g/ha	AB
4		0.8 l/ha	171.2 g/ha + 34.4 g/l + 91.2 g/ha	AB
5		2.5 l/ha	250 g/ha + 100 g/ha	AB
6		2.0 l/ha	200 g/ha + 80 g/ha	AB
7		1.5 l/ha	126 g/ha + 375 g/ha	AB

5.5. Description of the trial site

5.5.1. Soil

Soil Texture: loamy sand
 Soil Quality (German standard) 32 points
 Fertility Level: good
 Soil Drainage: good
 Content of organic matter: 1.7
 pH 5.8

5.6. Trial location

Location: 04880 Trossin County/Federal State: Nordsachsen/Saxony
 Altitude: 120 m above sea level

Address: 04880 Trossin
 Unter den Linden 2
 + 49 034223/48196

Farm Manager:



5.7. Crop and diseases

Crop: Winter rye (*Secale cereale*; EPPO-Code: SECCW)

Variety	Conduct	Previous crop	triticale
Sowing date	22-Sep-2009	Sowing method	drilling
Sowing depth	2 cm	Sowing rate	260 seeds/m ²
Row spacing	16.7 cm		
Emergence date	29-Sep-2009	Harvest	27-Jul-2010

Diseases:

Scientific Name	Common Name	EPPO-Code
<i>Puccinia recondita</i>	Brown rust on cereals	PUCCRE
<i>Rhynchosporium secalis</i>	Leaf blotch of cereals	RHYNSE

5.7.1. Climatic conditions

Data in the Appendix, point 7.2., about air temperature and precipitation were recorded in the firm's own weather station in Trossin. It is situated approximately 4,000 m southeast of the test site. The soil temperature was recorded in Spröda, approximately 28 km southwest of the test site. Spröda is part of the net of weather stations of the Ministry of Agriculture of Saxony.

The climate in Trossin is characterized by following mean temperatures and precipitations (average over 30 years):

	Air temperature, °C	Precipitation, mm
January	0.3	41
February	0.9	31
March	4.6	47
April	8.1	44
May	13.5	48
June	16.4	58
July	18.5	60
August	18.3	56
September	13.9	50
October	9.4	42
November	4.3	44
December	1.3	56
Year	9.1	576

5.7.2. Maintenance and crop protection

	Maintenance/crop protection	
7-Oct-2009	herbicide: Fenikan	2.5 l/ha
7-Oct-2009	insecticide: Karate Zeon	0.075 l/ha
17-Mar-2010	N fertilizer: KAS	100 kg N/ha
24-apr-2010	PGR: Moddus	0.6 l/ha

No other pesticides apart from the test and reference products were used during the field phase.

5.8. Application

5.8.1. Application data

	Application A	Application B
Application Date	23-Apr-2010	5-May-2010
Time of Day	08:00 am	09:00 am
Air Temperature (°C)	11.0	12.0
Soil Temperature (°C)	7.0	10.0
Relative Humidity (%)	21	20
Cloud Cover (%)	10	20
Wind Velocity (m/s)	0.5	1.0
Wind Direction	W	NE
Soil Moisture	normal	normal
Presence of Dew	no	no
Rainfall 24 h before application (mm)	none	none
Rainfall 6 h after application (mm)	none	none
Rainfall 12 h after application (mm)	none	none
Next rain occurred on; amount (mm)	26-Apr-10; 6.5	6-May-10; 30.0
treated plots	2 till 7	2 till 7

Development of crop at application time

EPPO-Code	BBCH	Height in cm	% Groundcover	application time
SECCW	32-33	35-40	95	A
SECCW	39-45	75-78	100	B

Infestation level of diseases at application time

application time	A	B
PUCCRE		
Infestation Level (%)	0	0
RHYNSE		
Infestation Level (%)	0	15

5.8.2. Equipment

	A	B
Appl. Equipment:	Bicy.sprayer	Bicy.sprayer
ID No.:	bc244	bc244
Operating Pressure:	2.8 bar	2.8 bar
Nozzle Type:	flat fan	flat fan
Nozzle Size:	DG8005VS	DG8005VS
Nozzle Spacing, Unit:	25 cm	25 cm
Band Width, Unit:	250 cm	250 cm
Boom Length, Unit:	250 cm	250 cm
Boom Height, Unit:	70 cm	110 cm
Ground Speed, Unit:	4 km/h	4 km/h
Spray Volume, Unit:	300 l/ha	300 l/ha
Propellant:	compressed air	compressed air

5.9. Assessments

Following assessments were carried out:

1. Preliminary assessment at the day of application A (April 23rd, 2010).
2. Efficacy and phytotoxicity assessment at the day of application B (May 5th, 2010).
3. Efficacy and phytotoxicity assessment 15 days after application B (May 20th, 2010).
4. Efficacy and phytotoxicity assessment 41 days after application B (June 15th, 2010).

The results of these assessments are shown under point 6 (averages only); for single plot data see Appendix.

5.10. Statistical Analysis

For all statistical analyses the Student-Newman-Keuls-Test was used.

5.11. Abbreviations used

FLAGLE	Flagleaf
FL-1	Flagleaf minus 1
FL-2	Flagleaf minus 2
FL-3	Flagleaf minus 3
FL-4	Flagleaf minus 4
FL-5	Flagleaf minus 5
GRAMAT	Grain, mature

PHYGEN	Phytotoxicity general
WEIFRE	weight fresh
MOICON	Content of moisture
Trt-Eval Interval	Treatment-Evaluation Interval
PESSEV	Pest severity
Trt no.	Treatment Number

6. Results

6.1. Selectivity

None of the treatments gave any crop damage (chloroses, necroses, thinning or stunting) at any stage during the field phase.

6.2. Efficacy: Infected leaf area

Preliminary assessment, average

Disease Code		PUCCRE	RHYNSE	RHYNSE
Crop Code		SECCW	SECCW	SECCW
Part Rated		FL-4	FL-4	FL-5
Rating Data Type		PESSEV	PESSEV	PESSEV
Rating Unit		percent	percent	percent
Rating Date		23-Apr-2010	23-Apr-201	23-Apr-201
Crop Stage		32-33	32-33	32-33
Trt-Eval Interval		0 DA-A	0 DA-A	0 DA-A
Trt No.	Treatment Name	Product Rate	Product Rate Unit	
1	Untreated			
		1	2	3
		0	5	15

Summary of first and second efficacy assessment; averages of treatments

Disease Code		PUCCRE	RHYNSE	RHYNSE	PUCCRE	RHYNSE	RHYNSE
Crop Code		SECCW	SECCW	SECCW	SECCW	SECCW	SECCW
Part Rated		FL-2	FL-2	FL-3	FL-1	FL-1	FL-2
Rating Data Type		PESSEV	PESSEV	PESSEV	PESSEV	PESSEV	PESSEV
Rating Unit		percent	percent	percent	percent	percent	percent
Rating Date		5-May-10	5-May-10	5-May-10	20-May-10	20-May-10	20-May-10
Crop Stage		39-45	39-45	39-45	55	55	55
Trt-Eval Interval		0 DA-B	0 DA-B	0 DA-B	15 DA-B	15 DA-B	15 DA-B
Trt No.	Treatment Name	Product Rate	Product Rate Unit				
1	Untreated	-					
2		1.5 l/ha					
3		1.0 l/ha					
4		0.8 l/ha					
5		2.5 l/ha					
6		2.0 l/ha					
7		1.5 l/ha					
LSD (P=.05)		0.00	1.68	3.48	0.00	1.34	4.91
Standard deviation		0.00	1.13	2.34	0.00	0.90	3.30
CV		0.0	132.08	28.85	0.0	419.88	57.81
Grand Mean		0.0	0.86	8.11	0.0	0.21	5.71

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Summary of third efficacy assessment; averages of treatments

Disease Code	PUCCRE	
Crop Code	SECCW	
Part Rated	FLAGLE	
Rating Data Type	PESSEV	
Rating Unit	percent	
Rating Date	15-Jun-10	
Crop Stage	67-73	
Trt-Eval Interval	41 DA-B	
Trt No.	Treatment Name	Product Rate Product Rate Unit
1	Untreated	- 8.0 a
2		1.5 l/ha 0.0 b
3		1.0 l/ha 0.0 b
4		0.8 l/ha 1.3 b
5		2.5 /ha 0.0 b
6		2.0 l/ha 0.0 b
7		1.5 l/ha 0.0 b
LSD (P=.05)		0.92
Standard deviation		0.62
CV		46.95
Grand Mean		1.32

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

No occurrence of RHYNSE on the flagleaf, the other leaves already has been dried.

6.3. Yield

Crop Code	SECCW		SECCW	SECCW	SECCW
Part Rated	GRAMAT		GRAMAT	GRAMAT	GRAMAT
Rating Data Type	WEIFRE		MOICON	YIELD 1)	YIELD
Rating Unit	KG		percent	dt/ha	relative
Rating Date	99		99	99	99
Crop Stage	96 DA-B		96 DA-B	96 DA-B	96 DA-B
Trt-Eval Interval	96 DA-B		96 DA-B	Y1	
ARM Action Code					
Trt No.	Treatment Name	Product Rate Product Rate Unit	1	2	3
1	Untreated	-	7.26 a	12.2 -	54.92 a
2		1.5 l/ha	7.89 a	12.5 -	59.88 b
3		1.0 l/ha	7.58 a	12.3 -	57.26 ab
4		0.8 l/ha	7.85 a	13.1 -	58.79 ab
5		2.5 /ha	7.69 a	12.0 -	58.61 ab
6		2.0 l/ha	7.66 a	12.8 -	57.55 ab
7		1.5 l/ha	7.73 a	13.0 -	57.94 ab
LSD (P=.05)			0.5747	-	3.102
Standard deviation			0.3869	-	2.088
CV			5.05	-	3.61
Great Mean			7.67	-	57.82

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

¹⁾ Converted to 14 % moisture

7. Appendix: Single Plot Data and Meteorological Data

7.1. Single Plot Data

Pest Type					D Disease	D Disease	D Disease	D Disease	
Pest Code					PUCCRE	RHYNSE	RHYNSE	PUCCRE	
Crop Code					SECCW	SECCW	SECCW	SECCW	
Part Assessed					FL-4 P	FL-4 P	FL-5 P	FL-2 P	
Assessment Date					23-Apr-2010	23-Apr-2010	23-Apr-2010	05-May-2010	
Assessment Type					PESSEV	PESSEV	PESSEV	PESSEV	
Assessment Unit					%	%	%	%	
Sample Size, Unit					1 PLOT	1 PLOT	1 PLOT	1 PLOT	
Crop Stage Minimum/Maximum					32 33	32 33	32 33	39 45	
Crop Density, Unit					95 PERCENT	95 PERCENT	95 PERCENT	100 PERCENT	
Pest Density, Unit					0,0	5,0	15,0	0,0	
Assessed By					H. Scharf	H. Scharf	H. Scharf	H. Scharf	
Tr-Eval Interval					0 DA-A	0 DA-A	0 DA-A	0 DA-B	
ARM Action Codes					APC S05	APC S05	APC S05	APC S05	
Number of Decimals									
Tr	Treatment	Other	Other						
N	Type	Name	Rate	Rate Unit	Plot	1	2	3	4
o.									
1	CHK	Untreated Check			101	0,0	5,0	15,0	0,0
					204	0,0	5,0	15,0	0,0
					307	0,0	5,0	20,0	0,0
					406	0,0	5,0	10,0	0,0
					Mean =	0,0	5,0	15,0	0,0
2	FUNG		1,5	l/ha	102				0,0
	FUNG		1,5	l/ha	206				0,0
					304				0,0
					401				0,0
					Mean =				0,0
3	FUNG		1,0	l/ha	103				0,0
	FUNG		1,0	l/ha	205				0,0
					302				0,0
					404				0,0
					Mean =				0,0
4	FUNG		0,8	l/ha	104				0,0
	FUNG		0,8	l/ha	202				0,0
					305				0,0
					407				0,0
					Mean =				0,0
5	FUNG		2,5	l/ha	105				0,0
	FUNG		2,5	l/ha	207				0,0
					301				0,0
					403				0,0
					Mean =				0,0
6	FUNG		2,0	l/ha	106				0,0
	FUNG		2,0	l/ha	201				0,0
					303				0,0
					405				0,0
					Mean =				0,0
7	FUNG		1,5	l/ha	107				0,0
	FUNG		1,5	l/ha	203				0,0
					306				0,0
					402				0,0
					Mean =				0,0

Pest Type	D Disease							
Pest Code	RHYNSE							
Crop Code	SECCW							
Part Assessed	FL-2 P							
Assessment Date	05-May-2010	05-May-2010	20-May-2010	20-May-2010				
Assessment Type	PESSEV							
Assessment Unit	%							
Sample Size, Unit	1 PLOT							
Crop Stage Minimum/Maximum	39 45	39 45	55 55	55 55				
Crop Density, Unit	100 PERCENT							
Pest Density, Unit	0,5	12,5	0,0	1,5				
Footnote Number								
Assessed By	H. Scharf							
Tri-Eval Interval	0 DA-B	0 DA-B	15 DA-B	15 DA-B				
ARM Action Codes	APC S05							
Number of Decimals								
Tr t N o.	Treatment Type Name	O- ther Rate	Other Rate Unit	Plot	5	6	7	8
1	CHK Unreated Check			101	1,0	15,0	0,0	0,0
				204	0,0	15,0	0,0	0,0
				307	1,0	12,0	0,0	5,0
				406	0,0	8,0	0,0	1,0
				Mean =	0,5	12,5	0,0	1,5
2	FUNG [REDACTED]	1,5 l/ha		102	0,0	5,0	0,0	0,0
	FUNG [REDACTED]	1,5 l/ha		206	0,0	5,0	0,0	0,0
				304	1,0	8,0	0,0	0,0
				401	2,0	6,0	0,0	0,0
				Mean =	0,8	6,0	0,0	0,0
3	FUNG [REDACTED]	1,0 l/ha		103	0,0	8,0	0,0	0,0
	FUNG [REDACTED]	1,0 l/ha		205	0,0	6,0	0,0	0,0
				302	0,0	8,0	0,0	0,0
				404	0,0	8,0	0,0	0,0
				Mean =	0,0	7,5	0,0	0,0
4	FUNG [REDACTED]	1,75 l/ha		104	3,0	5,0	0,0	0,0
	FUNG [REDACTED]	1,75 l/ha		202	0,0	10,0	0,0	0,0
				305	0,0	8,0	0,0	0,0
				407	3,0	10,0	0,0	0,0
				Mean =	1,5	8,3	0,0	0,0
5	FUNG [REDACTED]	2,5 l/ha		105	0,0	5,0	0,0	0,0
	FUNG [REDACTED]	2,5 l/ha		207	0,0	5,0	0,0	0,0
				301	2,0	8,0	0,0	0,0
				403	0,0	10,0	0,0	0,0
				Mean =	0,5	7,0	0,0	0,0
6	FUNG [REDACTED]	2,0 l/ha		106	0,0	8,0	0,0	0,0
	FUNG [REDACTED]	2,0 l/ha		201	3,0	10,0	0,0	0,0
				303	1,0	8,0	0,0	0,0
				405	3,0	10,0	0,0	0,0
				Mean =	1,8	9,0	0,0	0,0
7	FUNG [REDACTED]	1,5 l/ha		107	0,0	5,0	0,0	0,0
	FUNG [REDACTED]	1,5 l/ha		203	0,0	3,0	0,0	0,0
				306	1,0	10,0	0,0	0,0
				402	3,0	8,0	0,0	0,0
				Mean =	1,0	6,5	0,0	0,0

Pest Type Pest Code Crop Code Part Assessed Assessment Date Assessment Type Assessment Unit Sample Size, Unit Crop Stage Minimum/Maximum Crop Density, Unit Pest Density, Unit Assessed By Trt-Eval Interval ARM Action Codes						D Disease RHYNSE SECCW FL-2 P 20-May-2010 PESSEV % 1 PLOT 55 55 100 PERCENT H. Scharf 15 DA-B APC S05	D Disease PUCCRE SECCW FLAGLE P 15-Jun-2010 PESSEV % 1 PLOT 67 73 100 PERCENT H. Scharf 41 DA-B APC S05	SECCW GRAMAT C 27-Jul-2010 YIELD kg/plot 13,5 m2 99 99 H. Scharf 83 DA-B APOC S05	SECCW GRAMAT C 27-Jul-2010 MOICON % 1 PLOT 99 99 H. Scharf 83 DA-B APOC S05	SECCW GRAMAT C 27-Jul-2010 YIELD DT/HA14% 1 HA 99 99 H. Scharf 95 DA-A TYI APOC S05
Tr l N o.	Treatment Type Name	Other Rate	Other Rate Unit	Plot	9	10	11	12	13	
1	CHK Untreated Check			101	10,0	6,0	7,260	12,20	54,90	
				204	15,0	8,0	7,420	12,20	56,11	
				307	16,0	10,0	6,850	12,20	51,80	
				406	25,0	8,0	7,420	12,20	56,11	
				Mean =	16,5	8,0	7,238	12,20	54,73	
2	FUNG FUNG	1,5 l/ha	1,5 l/ha	102	3,0	0,0	7,880	12,50	59,39	
				206	4,0	0,0	8,070	12,50	60,82	
				304	3,0	0,0	8,120	12,50	61,20	
				401	5,0	0,0	7,810	12,50	58,86	
				Mean =	3,8	0,0	7,970	12,50	60,07	
3	FUNG FUNG	1,0 l/ha	1,0 l/ha	103	10,0	0,0	7,610	12,30	57,48	
				205	5,0	0,0	7,230	12,30	54,61	
				302	8,0	0,0	7,860	12,30	59,37	
				404	5,0	0,0	7,620	12,30	57,56	
				Mean =	7,0	0,0	7,580	12,30	57,26	
4	FUNG FUNG	1,75 l/ha	1,75 l/ha	104	0,0	1,0	8,270	13,10	61,90	
				202	5,0	1,0	7,570	13,10	56,66	
				305	1,0	2,0	7,720	13,10	57,78	
				407	1,0	1,0	7,860	13,10	58,83	
				Mean =	1,8	1,3	7,855	13,10	58,79	
5	FUNG FUNG	2,5 l/ha	2,5 l/ha	105	10,0	0,0	7,690	12,00	58,29	
				207	8,0	0,0	7,660	12,00	58,06	
				301	6,0	0,0	7,870	12,00	59,65	
				403	2,0	0,0	7,710	12,00	58,44	
				Mean =	6,5	0,0	7,733	12,00	58,61	
6	FUNG FUNG	2,0 l/ha	2,0 l/ha	106	0,0	0,0	7,380	12,80	55,43	
				201	3,0	0,0	7,670	12,80	57,61	
				303	5,0	0,0	7,490	12,80	56,26	
				405	3,0	0,0	8,110	12,80	60,91	
				Mean =	2,8	0,0	7,663	12,80	57,55	
7	FUNG FUNG	1,5 l/ha	1,5 l/ha	107	0,0	0,0	7,770	13,00	58,22	
				203	3,0	0,0	7,240	13,00	54,25	
				306	1,0	0,0	8,140	13,00	61,00	
				402	3,0	0,0	7,780	13,00	58,30	
				Mean =	1,8	0,0	7,733	13,00	57,94	

Pest Type				SECCW	SECCW	SECCW
Crop Code				PLANT C	PLANT C	PLANT C
Part Assessed				05-May-2010	20-May-2010	15-Jun-2010
Assessment Date				PHYGEN	PHYGEN	PHYGEN
Assessment Type				%	%	%
Assessment Unit				1 PLOT	1 PLOT	1 PLOT
Sample Size, Unit				39 45	55 55	67 73
Crop Stage Minimum/Maximum				100 PERCENT	100 PERCENT	100 PERCENT
Crop Density, Unit						
Pest Density, Unit						
Assessed By				H. Scharf	H. Scharf	H. Scharf
Tri-Eval Interval				12 DA-A	15 DA-B	41 DA-B
ARM Action Codes				S05	S05	S05
Number of Decimals						
Tr	Treatment	Other	Other			
No.	Type	Name	Rate	Rate	Plot	
			Unit	Unit		
1	CHK	Unreated Check			101	0,0
					204	0,0
					307	0,0
					406	0,0
				Mean =		0,0
2	FUNG		1,5 l/ha		102	0,0
	FUNG		1,5 l/ha		206	0,0
					304	0,0
					401	0,0
				Mean =		0,0
3	FUNG		1,0 l/ha		103	0,0
	FUNG		1,0 l/ha		205	0,0
					302	0,0
					404	0,0
				Mean =		0,0
4	FUNG		1,75 l/ha		104	0,0
	FUNG		1,75 l/ha		202	0,0
					305	0,0
					407	0,0
				Mean =		0,0
5	FUNG		2,5 l/ha		105	0,0
	FUNG		2,5 l/ha		207	0,0
					301	0,0
					403	0,0
				Mean =		0,0
6	FUNG		2,0 l/ha		106	0,0
	FUNG		2,0 l/ha		201	0,0
					303	0,0
					405	0,0
				Mean =		0,0
7	FUNG		1,5 l/ha		107	0,0
	FUNG		1,5 l/ha		203	0,0
					306	0,0
					402	0,0
				Mean =		0,0

7.2. Meteorological Data

Source: Trossin (Air temperature and precipitation); approx. 2 km of the test site;
 Spröda (Soil temperature), approx. 28 km of the test site; Sächsische Landes-
 anstalt für Landwirtschaft

April 2010

Day	Temperatures			Soil, depth 5 cm Daily mean °C	Precipitation mm
	Daily mean °C	Air, height 2 m			
		Minimum °C	Maximum °C		
01/APR/10	7.4	3.9	10.9	7.6	0.0
02/APR/10	5.6	-0.1	11.2	7.3	0.0
03/APR/10	6.7	-0.9	14.2	7.5	0.0
04/APR/10	7.9	0.8	14.9	8.4	0.0
05/APR/10	8.7	6.2	11.1	8.2	0.0
06/APR/10	8.1	1.9	14.2	8.3	0.0
07/APR/10	8.8	2.0	15.5	8.5	0.0
08/APR/10	10.3	2.0	18.5	8.7	0.0
09/APR/10	7.8	2.5	13.0	9.3	0.0
10/APR/10	8.4	4.5	12.2	8.7	2.0
11/APR/10	6.4	3.8	9.0	8.2	1.0
12/APR/10	8.9	3.9	13.8	8.0	2.0
13/APR/10	9.8	3.2	16.3	8.5	1.0
14/APR/10	6.9	3.8	10.0	8.5	2.0
15/APR/10	7.3	3.7	10.9	8.2	1.5
16/APR/10	7.6	4.0	11.1	8.2	0.0
17/APR/10	7.4	0.3	14.5	8.4	0.0
18/APR/10	9.7	0.8	18.5	9.2	0.0
19/APR/10	9.8	3.8	15.8	9.7	0.0
20/APR/10	9.5	1.7	17.2	10.0	0.0
21/APR/10	6.2	1.5	10.8	9.7	0.0
22/APR/10	5.7	-0.5	11.8	8.7	0.0
23/APR/10	7.9	-1.0	16.7	8.9	0.0
24/APR/10	8.9	-0.8	18.5	9.4	0.0
25/APR/10	12.6	3.9	21.3	10.3	0.0
26/APR/10	11.3	5.5	17.0	10.7	6.5
27/APR/10	11.9	7.1	16.6	11.0	0.0
28/APR/10	12.7	4.8	20.5	11.2	0.0
29/APR/10	15.2	5.1	25.2	12.0	0.0
30/APR/10	17.2	9.8	24.5	12.8	4.0

Application A: 23/Apr/2010

May 2010

Day	Temperatures			Soil, depth 5 cm Daily mean °C	Precipitation mm
	Daily mean °C	Air, height 2 m			
		Minimum °C	Maximum °C		
01/MAY/10	13.7	10.6	16.8	12.7	0.0
02/MAY/10	11.4	6.3	16.5	12.1	8.0
03/MAY/10	9.6	7.2	11.9	12.0	2.5
04/MAY/10	9.7	7.8	11.6	11.4	0.0
05/MAY/10	8.2	1.9	14.5	11.0	0.0
06/MAY/10	4.8	2.0	7.5	10.5	30.0
07/MAY/10	9.6	6.0	13.1	10.2	0.0
08/MAY/10	10.7	4.5	16.9	10.6	0.0
09/MAY/10	13.4	6.5	20.2	11.4	2.0
10/MAY/10	11.3	8.9	13.7	11.8	0.0
11/MAY/10	9.8	7.1	12.5	11.2	4.0
12/MAY/10	12.8	7.7	17.8	11.8	2.0
13/MAY/10	8.6	5.6	11.6	11.7	0.0
14/MAY/10	9.2	7.2	11.1	11.3	6.5
15/MAY/10	10.0	6.5	13.5	10.7	0.5
16/MAY/10	9.2	4.2	14.2	10.9	0.0
17/MAY/10	10.3	5.7	14.9	11.6	0.0
18/MAY/10	10.3	7.1	13.5	11.6	2.0
19/MAY/10	9.3	6.1	12.5	11.0	16.0
20/MAY/10	11.8	6.8	16.8	11.3	0.0
21/MAY/10	15.2	8.8	21.6	12.5	0.0
22/MAY/10	15.5	8.6	22.3	13.5	0.0
23/MAY/10	16.9	10.5	23.2	14.6	1.5
24/MAY/10	16.8	12.8	20.8	14.9	24.0
25/MAY/10	13.0	8.5	17.5	14.6	0.0
26/MAY/10	12.5	6.8	18.1	14.0	0.0
27/MAY/10	11.8	7.0	16.5	14.1	0.0
28/MAY/10	13.6	9.6	17.5	13.9	5.0
29/MAY/10	14.2	6.4	22.0	13.7	0.0
30/MAY/10	15.4	10.3	20.4	14.1	6.0
31/MAY/10	10.6	9.2	11.9	13.7	6.5

Application B: 5/May/2010

June 2010

Day	Temperatures			Soil, depth 5 cm Daily mean °C	Precipitation mm
	Daily mean °C	Air, height 2 m Minimum °C	Maximum °C		
01/JUNE/10	10.0	8.2	11.8	13.0	2.8
02/JUNE/10	11.9	8.9	14.9	12.7	1.0
03/JUNE/10	16.6	9.2	24.0	13.5	0.0
04/JUNE/10	16.5	8.7	24.3	14.5	0.0
05/JUNE/10	17.8	8.5	27.0	14.9	0.0
06/JUNE/10	20.9	12.2	29.5	15.9	0.0
07/JUNE/10	20.0	15.3	24.7	16.6	1.0
08/JUNE/10	20.2	11.3	29.1	16.2	0.0
09/JUNE/10	21.6	11.3	31.8	17.2	0.0
10/JUNE/10	24.2	16.0	32.4	18.3	0.0
11/JUNE/10	24.2	18.2	30.1	18.5	0.0
12/JUNE/10	18.8	16.6	20.9	17.7	2.0
13/JUNE/10	15.2	9.8	20.5	16.5	0.0
14/JUNE/10	17.3	10.0	24.5	16.0	0.0
15/JUNE/10	16.0	8.2	23.7	15.8	0.0
16/JUNE/10	16.1	6.4	25.8	15.5	0.0
17/JUNE/10	18.1	7.9	28.3	15.5	0.0
18/JUNE/10	17.7	10.2	25.1	15.7	0.0
19/JUNE/10	16.1	10.0	22.1	15.6	0.0
20/JUNE/10	15.1	8.2	22.0	14.9	0.0
21/JUNE/10	14.9	8.0	21.7	14.9	0.0
22/JUNE/10	17.9	10.9	24.8	15.7	0.0
23/JUNE/10	17.0	8.5	25.5	15.8	0.0
24/JUNE/10	18.6	8.7	28.5	15.9	0.0
25/JUNE/10	19.8	11.3	28.2	16.7	0.0
26/JUNE/10	21.2	14.4	27.9	17.5	0.0
27/JUNE/10	21.1	11.5	30.6	17.5	0.0
28/JUNE/10	21.8	10.6	33.0	17.7	0.0
29/JUNE/10	23.6	12.0	35.1	17.7	0.0
30/JUNE/10	21.8	12.6	31.0	17.7	0.0

July 2010

Day	Temperatures			Soil, depth 5 cm Daily mean °C	Precipitation mm
	Daily mean °C	Air, height 2 m Minimum °C	Maximum °C		
01/JUL/10	23.9	16.2	31.5	n.a.	0.0
02/JUL/10	26.0	16.7	35.2	n.a.	0.0
03/JUL/10	26.4	16.3	36.4	n.a.	0.0
04/JUL/10	25.0	17.2	32.7	n.a.	2.5
05/JUL/10	25.3	19.5	31.0	n.a.	6.0
06/JUL/10	18.9	16.6	21.2	n.a.	0.0
07/JUL/10	17.8	10.5	25.0	n.a.	0.0
08/JUL/10	21.7	11.9	31.5	n.a.	0.0
09/JUL/10	24.4	13.9	34.8	n.a.	0.0
10/JUL/10	26.4	16.8	36.0	n.a.	0.0
11/JUL/10	28.2	18.5	37.9	n.a.	0.0
12/JUL/10	30.0	20.0	40.0	n.a.	3.0
13/JUL/10	25.0	19.5	30.5	n.a.	0.0
14/JUL/10	25.4	16.5	34.2	n.a.	0.0
15/JUL/10	24.6	18.1	31.0	n.a.	0.0
16/JUL/10	25.4	15.2	35.5	n.a.	1.5
17/JUL/10	23.2	16.0	30.4	n.a.	6.0
18/JUL/10	26.2	16.8	35.5	n.a.	0.0
19/JUL/10	19.7	11.4	28.0	n.a.	0.0
20/JUL/10	19.8	11.5	28.0	n.a.	0.0
21/JUL/10	23.2	12.6	33.7	n.a.	0.0
22/JUL/10	24.1	16.0	32.2	n.a.	33.0
23/JUL/10	18.9	18.2	19.5	n.a.	16.0
24/JUL/10	18.8	15.8	21.8	n.a.	0.0
25/JUL/10	17.8	12.4	23.2	n.a.	0.0
26/JUL/10	18.5	11.6	25.4	n.a.	0.0
27/JUL/10	19.1	12.0	26.2	n.a.	0.0
28/JUL/10	19.8	13.8	25.8	n.a.	7.0
29/JUL/10	18.4	13.5	23.2	n.a.	0.0
30/JUL/10	17.9	11.7	24.0	n.a.	0.0
31/JUL/10	19.5	11.5	27.5	n.a.	0.0

n.a. = not available

Final Report

Testing the efficacy of [REDACTED] ([REDACTED] F) and [REDACTED] ([REDACTED] F) against *Rhynchosporium secalis* in Winter barley

Sponsor's Project No.: [REDACTED] 10-2061-E04

Trial No.: [REDACTED] 10-2061-E04

Testing Facility

[REDACTED]
Germany
Phone [REDACTED]
Fax [REDACTED]
Mobile Phone [REDACTED]
[REDACTED]

Sponsor

[REDACTED]

Study director:

[REDACTED]

Project Management and Monitoring

[REDACTED]



Date: 18 September 2010

signed [REDACTED]

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1. GEP CERTIFICATE



REGIERUNGSPRÄSIDIUM FREIBURG

Anerkennungsbescheinigung
Recognition Certificate

Die Versuchseinrichtung
The testing facility

[REDACTED]

mit Hauptsitz in
with headquarters in

[REDACTED]

des Inhabers
owned by

[REDACTED]

ist auf Antrag vom
following its application dated

08. Februar 2007

und durchgeführter Inspektion
and pre-inspection of

14. Februar 2007

durch den Inspekteur
by the inspector

Hansjörg Imgraben
Regierungspräsidium Freiburg
Referat 33

von der Anerkennungsbehörde
from the authorizing body

Regierungspräsidium Freiburg

am
on date

15. März 2007

amtlich anerkannt worden
has been officially recognized

im Sinne des § 1 c Abs. 5 der
Pflanzenschutzmittelverordnung
vom 17.08.1998 (BGBl. I
S. 2156)

Freiburg i. Br., den 15. März 2007

Hansjörg Imgraben (Diplom-Agrarbiologe)

2. GEP STATEMENT

This trial was performed in accordance with GEP.

The test facility has been officially recognized as an organisation for efficacy testing of plant protection products according to the Directive 93/71/EC, and related to § 1c / 5 of the German "Pflanzenschutzmittelverordnung", acknowledged by the county Regierungspräsidium Freiburg of Baden-Württemberg. [REDACTED] is not going to accept any responsibility for decisions made or actions taken on the basis of this report.

Date: 18 September 2010

Signature: _____
([REDACTED])



There were no deviations of the contractor's SOP's.

3. INTRODUCTION

This efficacy field trial has been performed as to GEP standards by [REDACTED]. The key guideline followed during execution of this trial was PP 1/26(3) Foliar disease on cereals. Beside this key guideline, the following standard guidelines were followed as well: PP 1/135(3) (Phytotox), PP 1/152(3) (design and analysis) PP 1/181(3) (conduct and reporting). The objective of the trial was the following: Testing the efficacy of [REDACTED] F) and [REDACTED] F) against *Rhynchosporium secalis* in Winter barley.

The trial was established in D-78359 Orsingen-Nenzingen in Baden Württemberg, a typical area for production of HORVW (Winter barley), where the targets for the plant protection product typically occur in high frequency and density. There was no artificial infestation.

The trial initiation date (first application) was 27.04.2010. Crop stage at this first application was BBCH 34. The treatments, as listed below in "material and methods" chapter, were tested in 4 replicates on 2,5 m by 7 m plots arranged in a "Randomized Complete Block (RCB)" design as requested by the EPPO guideline.

The crop, variety Spectrum, was established by the farmer on the 30.09.2009 with standard planting equipment on a sandy loam soil.

Further details on the trial site and application conditions are listed in the "Material and Methods" chapter of this report.

During the scope of the trial, no extreme weather conditions that could lead to anticipation of having had negative impact on the products performances occurred. Details on the climatic conditions at application timing are presented in the material and methods part of this report under "Application description", the representative weather conditions (weather station D-78333 Wahlwies, distance between trial site and weather station: 3,6 km) during the relevant time during the scope of this trial are listed in the appendix.

In terms of product applications, done with VCR III wheelbarrow plot spray equipment, no deviations from the plan were recorded. – Please see “Application description” and “Trial Treatments” in material and methods part of this report.

Trial management, data capture, statistical analysis and reporting have been done with ARM8 software by Gylling data management (www.GDMDATA.com). Results tables are printouts directly from the software. Where abbreviations or codes have been used to describe data listed in this report, at the end of each chapter a “decoding” list is provided.

Trial quality rating aspects listing:

		Explanation in case the answer is “NO”
Was the applied dose at the rate intended (+/-10%)?	YES	
Were pest levels acceptable and homogeneous across the trial area?	YES	
Was the crop even and of good vigour?	YES	
Did the standard product(s) perform as expected?	YES	
Were weather conditions typical for an average season?	YES	
		Explanation in case the answer is “YES”
Are there any factors that caused difficulty during the assessment?	NO	
Are there any other factors that affect the validity of the trial data?	NO	
Are there any other factors that affect the validity of the trial data?	NO	
Data reliability. Are there any data outliers when treatment results are de-randomised?	NO	

4. EXECUTIVE RESULTS SUMMARY

█ and █ were tested against *Rhynchosporium secalis* in Winter barley at full and reduced rates. Treatments were applied at BBCH 34 and BBCH 43. Standard products used were █ and █

4.1. TRIAL TREATMENTS

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate	Rate Unit	Growth Stage	Appl Code	Appl Description	Spray Volume	Volume Unit
1	Untreated Check										
2		320	GAL	SE	1,5	L/ha	POSPOS	A	BBCH 32-35	300	L/ha
		83			125	g Al					
		67			100	g Al					
		170			255	g Al					
		320	GAL	SE	1,5	L/ha	POSPOS	B	BBCH 39-45	300	L/ha
		83			125	g Al					
		67			100	g Al					
		170			255	g Al					
3		320	GAL	SE	1,0	L/ha	POSPOS	A	BBCH 32-35	300	L/ha
		83			83	g Al					
		67			67	g Al					
		170			170	g Al					
		320	GAL	SE	1,0	L/ha	POSPOS	B	BBCH 39-45	300	L/ha
		83			83	g Al					
		67			67	g Al					
		170			170	g Al					
4		371	GAL	SE	0,8	L/ha	POSPOS	A	BBCH 32-35	300	L/ha
		214			171	g Al					
		43			34,4	g Al					
		114			91	g Al					
		371	GAL	SE	0,8	L/ha	POSPOS	B	BBCH 39-45	300	L/ha
		214			171	g Al					
		43			34,4	g Al					
		114			91	g Al					
		300	GAL	SE	0,8	L/ha	POSPOS	A	BBCH 32-35	300	L/ha
		300	GAL	SE	0,8	L/ha	POSPOS	B	BBCH 39-45	300	L/ha
5		140	GAL	EC	2,5	L/ha	POSPOS	A	BBCH 32-35	300	L/ha
		140	GAL	EC	2,5	L/ha	POSPOS	B	BBCH 39-45	300	L/ha
6		140	GAL	EC	2,0	L/ha	POSPOS	A	BBCH 32-35	300	L/ha
		140	GAL	EC	2,0	L/ha	POSPOS	B	BBCH 39-45	300	L/ha
7		334	GAL	EC	1,5	L/ha	POSPOS	A	BBCH 32-35	300	L/ha
		84			126	g Al					
		250			375	g Al					
		334	GAL	EC	1,5	L/ha	POSPOS	B	BBCH 39-45	300	L/ha
		84			126	g Al					
		250			375	g Al					

4.2. PRODUCT HANDLING

There were no problems in terms of product handling during preparation of the spray solution or application. Products dissolved without any problems. No problems with foam were observed.

4.3. SELECTIVITY:

All treatments were fully selective – there were no observations of Phytotox in any treatment at any assessment timing.

4.4. EFFICACY / YIELD:

.A rate response was seen for both test products. Overall the performance at full rate was equal to standard products. Yield was raised by all products between 12 and 21 %.

Key efficacy assessments

Pest Code				RAMUCC	RHYNSE
Crop Code	HORVW	HORVW	HORVW	HORVW	HORVW
Part Rated	GRAMAT C	GRAMAT C	GRAMAT C	FLAGLE P	FLMII P
Rating Date	14/7/10	14/7/10	20/7/10	17/6/10	17/6/10
Rating Type	YIELD	YIELD	TKWT	PESSEV	PESSEV
Rating Unit	%UNCK	DT/HA14%	G	%	%
Pest Density, Unit				41,3%	12,8%
Trt-Eval Interval	78 DA-A	78 DA-A	78 DA-A	34 DA-B	34 DA-B
Trt No.	Treatment Name	Rate	Appl Unit	Code	
1	Untreated Check				
		100,00	72,5	50,9 (100%)	41,3 (0%) 12,8 (0%)
2	[REDACTED]	1,5 L/ha A	116,44	84,3	55,2 (108%)
		1,5 L/ha B			10,8 (74%) 6,0 (53%)
3	[REDACTED]	1,0 L/ha A	114,93	83,3	54,9 (108%)
		1,0 L/ha B			21,0 (49%) 9,8 (24%)
4	[REDACTED]	0,8 L/ha A	121,77	88,2	54,8 (108%)
		0,8 L/ha B			5,3 (87%) 3,0 (76%)
		0,8 L/ha A			
		0,8 L/ha B			
5	[REDACTED]	2,5 L/ha A	116,99	84,8	53,7 (106%)
		2,5 L/ha B			9,5 (77%) 7,0 (45%)
6	[REDACTED]	2,0 L/ha A	112,48	81,5	53,2 (105%)
		2,0 L/ha B			11,5 (72%) 9,0 (29%)
7	[REDACTED]	1,5 L/ha A	115,26	83,5	53,5 (105%)
		1,5 L/ha B			14,8 (64%) 8,5 (33%)

5. MATERIAL AND METHODS

5.1. PLOT MAP

Block	1	2	3	4
101	1 1	201 3	303 6	406 4
102	2 2	202 5	304 4	402 7
103	3 3	207 6	302 1	407 5
104	4 4	204 2	307 7	401 3
105	5 5	205 7	301 2	403 1
106	6 6	206 4	306 3	404 2
107	7 7	203 1	305 5	405 6

5.2. GENERAL TRIAL INFORMATION

Study Director:	[REDACTED]	Title:	Dipl.-Ing. agr.
Investigator:	[REDACTED]		
Discipline:	F fungicide	Trial Reliability:	high
Trial Status:	E established	Planned Completion Date:	19.09.2010
Initiation Date:	27.04.2010		

5.3. TRIAL LOCATION

City:	Orsingen-Nenzingen	Latitude of LL Corner °:	47,5118	N	DEU	55,056664	-	47,274719
State/Prov.:	Baden-Wuerttemberg	Longitude of LL Corner °:	8,5703	E		5,864166	-	15,038887
Postal Code:	D-78359	Altitude of LL Corner, Unit:	491,00	m				
Country:	DEU Germany							
Directions:	Ebene							

5.4. GUIDELINES

Conducted Under GEP: Yes

	Guideline	Description
1.	PP 1/26(3)	Foliar diseases on cereals
2.	PP 1/135(3)	Phytotoxicity assessment
3.	PP 1/152(3)	Design and analysis of efficacy evaluation trials
4.	PP 1/181(3)	Conduct and reporting of efficacy evaluation trials including GEP

5.5. PERSONNEL

Study Director:	[REDACTED]	
Affiliation:	[REDACTED]	
Address:	[REDACTED]	
Location:	[REDACTED]	
Postal Code:	[REDACTED]	E-mail: [REDACTED]
Phone No.:	[REDACTED]	
Investigator:	[REDACTED]	Title: Dipl.-Ing. agr.
Affiliation:	[REDACTED]	
Address:	[REDACTED]	
Location:	[REDACTED]	
Postal Code:	[REDACTED]	E-mail: [REDACTED]
Phone No.:	[REDACTED]	

5.6. COOPERATOR/LANDOWNER

Cooperator:	Konrad Martin	
Address 1:	Stockacherstrasse 32	
		Phone No.: +49-7771-2122
City:	Orsingen-Nenzingen	
State/Prov:	BW	
Postal Code:	D-78359	
Country:	DEU Germany	

5.7. CROP DESCRIPTION

Crop 1:	HORVW	Hordeum vulgare (winter)	Winter barley
Variety:	Spectrum		
BBCH Scale:	BCER		
Planting Method:	DRILLE	drilled	Planting Date: 30.09.2009
Depth, Unit:	3,5	cm	Rate, Unit: 170 KG/HA
Row Spacing, Unit:	13,0	cm	
Seed Bed:	MEDIUM	medium	
Soil Moisture:	NORMAL	normal	
Harvest Date:	14.07.2010		Harvest Equipment: Plot combine WSElite
Harvested Width, Unit:	1,5	m	Harvested Length, Unit: 7,0 m
% Standard Moisture:	14,0		Moisture Meter: Pfeuffer HE 50
Weighing Equipment:	KERN HUS 60 K 20		

5.8. PEST DESCRIPTION

Pest 1 Type:	D	Code:	RHYNSE	Rhynchosporium secalis
Common Name:				Blattfleckenkrankheit: Gerste
Pest 2 Type:	D	Code:	RAMUCC	Ramularia collo-cygni
Common Name:				Ramularia collo-cygni

5.9. SITE AND DESIGN

Plot Width, Unit:	2,5	m	Site Type:	FIELD	field
Plot Length, Unit:	7	m			
Plot Area, Unit:	17,5	m ²	Tillage Type:	CONTIL	conventional-till
Replications:	4		Study Design:	RACOB	Randomized Complete Block (RCB)
			Untreated Arrangement:	INCLUDED	single control randomized in each block

5.10. SOIL DESCRIPTION

Description Name:	Parabraunerde			
% OM:	2,1	Texture:	SL	sandy loam
pH:	6,8			
		Fert. Level:	G	good
		Soil Drainage:	G	good

5.11. MOISTURE AND WEATHER CONDITIONS

Overall Moisture Conditions:	NORMAL	normal
Closest Weather Station:	D-78333 Wahlwies	Distance, Unit: 3,6 km

5.12. APPLICATION DESCRIPTION

	A	B
Application Date:	27.04.2010	14.05.2010
Time of Day:	4pm-5pm	4pm-5pm
Application Method:	SPRAY	SPRAY
Application Timing:	POSPRE	POSPOS
Application Placement:	BROFOL	BROFOL
Applied By:	Th.Martin	Th.Martin
Air Temperature, Unit:	18 C	11 C
% Relative Humidity:	68	80
Wind Velocity, Unit:	0,3 MPS	0,1 MPS
Dew Presence (Y/N):	N no	N no
Soil Moisture:	NORMAL	NORMAL
% Cloud Cover:	30	100

5.13. CROP STAGE AT EACH APPLICATION

	A	B
Crop 1 Code, BBCH Scale:	HORVW BCER	HORVW BCER
Stage Scale Used:	BBCH	BBCH
Stage Majority, Percent:	34 100	43 100

5.14. PEST STAGE AT EACH APPLICATION

	A	B
Pest 1 Code, Type, Scale:	RHYNSE D	RHYNSE D
Pest 2 Code, Type, Scale:	RAMUCC D	RAMUCC D

5.15. APPLICATION EQUIPMENT

	A	B
Appl. Equipment:	VCR III	VCR III
Equipment Type:	SPRBIC	SPRBIC
Operating Pressure, Unit:	2,1 BAR	2,1 BAR
Nozzle Type:	Air Mix	Air Mix
Nozzle Size:	110-03	110-03
Nozzle Spacing, Unit:	50 CM	50 CM
Nozzles/Row:	5	5
Boom Length, Unit:	250 CM	250 CM
Boom Height, Unit:	50 CM	50 CM
Ground Speed, Unit:	4 KPH	4 KPH
Carrier:	water	water
Spray Volume, Unit:	300 L/HA	300 L/HA
Propellant:	pressair	pressair
Tank Mix (Y/N):	N no	N no

Additional Information (Validation List Comments)

F, fungicide = fungicide|

E, established = established|2

N, N = North

E, E = East

DEU, 55.056664, 47.274719, 5.864166, 15.038887 = Germany

m = meters

Default = Standard validation for ARM GDMDef trials

PP 1/26(3), Foliar diseases on cereals = EPPO|

PP 1/135(3), Phytotoxicity assessment = EPPO|

PP 1/152(3), Design and analysis of efficacy evaluation trials = EPPO|

PP 1/181(3), Conduct and reporting of efficacy evaluation trials including GEP = EPPO|

HORVW, BCER, Hordeum vulgare (winter), = US

DRILLE, drilled = drilled

KG/HA = kilogram seed per hectare

cm = centimeter

MEDIUM, medium = medium

NORMAL, normal = normal

m = meter

D, Disease, G-BYRD7, G-DisStg = Disease, such as a fungus, bacteria, or virus

RHYNSE, Rhynchosporium secalis, = US

RAMUCC, Ramularia collo-cygni, = US

FIELD, field = field

CONTIL, conventional-till = conventional-till

RACOB, Randomized Complete Block (RCB) = Randomized Complete Block (RCB)

INCLUDED, single control randomized in each block = single control randomized in each block

, sandy loam = sandy loam

G, good = good

G, good = Good / medium / adequate drainage with aeration not likely to harm crop growth

km = kilometer
 SPRAY = spray
 POSPRE = post-crop/pre-pest
 BROFOL = broadcast - foliar
 C = Celsius
 MPS = meter per second
 N, no = no
 NORMAL = normal
 POSPOS = post-crop/post-pest
 BBCH = BBCH uniform plant stages
 34 = Node 4 at least 2 cm above node 3|BCER
 43 = Mid boot stage: flag leaf sheath just visibly swollen|BCER
 SPRBIC = sprayer - bicycle
 BAR = bar
 CM = centimeter
 KPH = kilometer per hour
 L/HA = liters per hectare

6. RESULTS

6.1. AOV MEANS TABLE

Pest Code				
Crop Code		HORVW	HORVW	HORVW
Crop Variety		Spectrum	Spectrum	Spectrum
Part Rated		PLANT C	PLANT C	PLANT C
Rating Date		05.05.2010	14.05.2010	02.06.2010
Rating Type		PHYGEN	PHYGEN	PHYGEN
Rating Unit		%	%	%
Crop Stage Majority		39	43	59
Crop Stage Scale		BBCH	BBCH	
Crop Density, Unit		100 %	100 %	100 %
Pest Density, Unit				
Days After First/Last Applic.		8 8	17 17	36 19
Trt-Eval Interval		8 DA-A	17 DA-A	19 DA-B
ARM Action Codes		S05	S05	S05
Trt Treatment	Rate	Unit	Appl Code	
No. Name	Rate	Unit	Code	
1	Untreated Check			
2		1,5 L/ha	A	0,0 a
		1,5 L/ha	B	0,0 a
3		1,0 L/ha	A	0,0 a
		1,0 L/ha	B	0,0 a
4		0,8 L/ha	A	0,0 a
		0,8 L/ha	B	0,0 a
		0,8 L/ha	A	0,0 a
		0,8 L/ha	B	0,0 a
5		2,5 L/ha	A	0,0 a
		2,5 L/ha	B	0,0 a
6		2,0 L/ha	A	0,0 a
		2,0 L/ha	B	0,0 a
7		1,5 L/ha	A	0,0 a
		1,5 L/ha	B	0,0 a
Mean Sep. Test				
				SNK.05
Replicate F				0,000
Replicate Prob(F)				1,0000
Treatment F				0,000
Treatment Prob(F)				1,0000

Means followed by same letter do not significantly differ
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code	RHYNSE	RHYNSE	RHYNSE	RHYNSE	RHYNSE	RHYNSE			
Crop Code	HORVV	HORVV	HORVV	HORVV	HORVV	HORVV			
Crop Variety	Spectrum	Spectrum	Spectrum	Spectrum	Spectrum	Spectrum			
Part Rated	FLMI1 P	FLMI2 P	FLAGLE P	FLMI1 P	FLMI2 P	FLAGLE P			
Rating Date	27.04.2010	27.04.2010	14.05.2010	14.05.2010	14.05.2010	02.06.2010			
Rating Type	PESSEV	PESSEV	PESSEV	PESSEV	PESSEV	PESSEV			
Rating Unit	%	%	%	%	%	%			
Crop Stage Majority	34	34	43	43	43	59			
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH				
Crop Density, Unit	100 %	100 %	100 %	100 %	100 %	100 %			
Pest Density, Unit	0 %	0 %	0 %	1,8 %	2,5 %	1,3 %			
Days After First/Last Applic.	0 0	0 0	17 17	17 17	17 17	36 19			
Trt-Eval Interval	0 DA-A	0 DA-A	17 DA-A	17 DA-A	17 DA-A	19 DA-B			
ARM Action Codes	APC S05	APC S05	APC S05	APC S05	APC S05	APC S05			
Trt Treatment	Rate	Appl							
No. Name	Rate	Unit	Code	1	2	7	8	9	14
1 Untreated Check				0,0 a	0,0 a	0,0 a	1,8 a (0,0%)	2,5 a (0,0%)	1,3 a (0,0%)
2	1,5 L/ha	A		0,0 a	0,0 a	0,0 a	0,3 a (85,7%)	0,3 b (90,0%)	0,0 b (100,0%)
	1,5 L/ha	B							
3	1,0 L/ha	A		0,0 a	0,0 a	0,0 a	0,8 a (57,1%)	1,0 ab (60,0%)	0,0 b (100,0%)
	1,0 L/ha	B							
4	0,8 L/ha	A		0,0 a	0,0 a	0,0 a	0,0 a (100,0%)	0,3 b (90,0%)	0,0 b (100,0%)
	0,8 L/ha	B							
	0,8 L/ha	A							
	0,8 L/ha	B							
5	2,5 L/ha	A		0,0 a	0,0 a	0,0 a	0,5 a (71,4%)	0,5 b (80,0%)	0,0 b (100,0%)
	2,5 L/ha	B							
6	2,0 L/ha	A		0,0 a	0,0 a	0,0 a	1,5 a (14,3%)	1,5 ab (40,0%)	0,0 b (100,0%)
	2,0 L/ha	B							
7	1,5 L/ha	A		0,0 a	0,0 a	0,0 a	1,3 a (28,6%)	1,5 ab (40,0%)	0,0 b (100,0%)
	1,5 L/ha	B							
Mean Sep. Test				SNK.05	SNK.05	SNK.05	SNK.05	SNK.05	SNK.05
Replicate F				0,000	0,000	0,000	0,135	1,115	1,000
Replicate Prob(F)				1,0000	1,0000	1,0000	0,9380	0,3691	0,4155
Treatment F				0,000	0,000	0,000	2,461	3,754	25,000
Treatment Prob(F)				1,0000	1,0000	1,0000	0,0647	0,0134	0,0001

Pest Code	RHYNSE	RHYNSE	RHYNSE	RHYNSE	RHYNSE			
Crop Code	HORVV	HORVV	HORVV	HORVV	HORVV			
Crop Variety	Spectrum	Spectrum	Spectrum	Spectrum	Spectrum			
Part Rated	FLMI1 P	FLMI2 P	FLAGLE P	FLMI1 P	FLMI2 P			
Rating Date	02.06.2010	02.06.2010	17.06.2010	17.06.2010	17.06.2010			
Rating Type	PESSEV	PESSEV	PESSEV	PESSEV	PESSEV			
Rating Unit	%	%	%	%	%			
Crop Stage Majority	59	59	71	71	71			
Crop Stage Scale								
Crop Density, Unit	100 %	100 %	100 %	100 %	100 %			
Pest Density, Unit	4 %	4,8 %	5,3 %	12,8%	16 %			
Days After First/Last Applic.	36 19	36 19	51 34	51 34	51 34			
Trt-Eval Interval	19 DA-B	19 DA-B	34 DA-B	34 DA-B	34 DA-B			
ARM Action Codes	APC S05	APC S05	APC S05	APC S05	APC S05			
Trt Treatment	Rate	Appl						
No. Name	Rate	Unit	Code	15	16	21	22	23
1 Untreated Check				4,0 a (0,0%)	4,8 a (0,0%)	5,3 a (0,0%)	12,8 a (0,0%)	16,0 a (0,0%)
2	1,5 L/ha	A		2,3 ab (43,8%)	2,5 bc (47,4%)	0,5 bc (90,5%)	6,0 d (52,9%)	5,3 cd (67,2%)
	1,5 L/ha	B						
3	1,0 L/ha	A		4,0 a (0,0%)	3,8 ab (21,1%)	1,3 b (76,2%)	9,8 b (23,5%)	9,5 b (40,6%)
	1,0 L/ha	B						
4	0,8 L/ha	A		1,5 b (62,5%)	1,5 c (68,4%)	0,0 c (100,0%)	3,0 e (76,5%)	3,3 d (79,7%)
	0,8 L/ha	B						
	0,8 L/ha	A						
	0,8 L/ha	B						
5	2,5 L/ha	A		3,0 ab (25,0%)	2,5 bc (47,4%)	0,8 bc (85,7%)	7,0 cd (45,1%)	6,3 c (60,9%)
	2,5 L/ha	B						
6	2,0 L/ha	A		3,3 ab (18,8%)	3,8 ab (21,1%)	1,5 b (71,4%)	9,0 bc (29,4%)	9,0 b (43,8%)
	2,0 L/ha	B						
7	1,5 L/ha	A		3,8 a (6,3%)	3,5 ab (26,3%)	1,3 b (76,2%)	8,5 bc (33,3%)	10,3 b (35,9%)
	1,5 L/ha	B						
Mean Sep. Test				SNK.05	SNK.05	SNK.05	SNK.05	SNK.05
Replicate F				0,738	1,527	1,737	0,595	0,233
Replicate Prob(F)				0,5433	0,2418	0,1953	0,6263	0,8720
Treatment F				3,750	5,177	39,789	26,322	30,795
Treatment Prob(F)				0,0135	0,0030	0,0001	0,0001	0,0001

Pest Code				RAMUCC	RAMUCC	RAMUCC	RAMUCC	RAMUCC	RAMUCC
Crop Code				HORVW	HORVW	HORVW	HORVW	HORVW	HORVW
Crop Variety				Spectrum	Spectrum	Spectrum	Spectrum	Spectrum	Spectrum
Part Rated				FLMI1 P	FLMI2 P	FLAGLE P	FLMI1 P	FLMI2 P	FLAGLE P
Rating Date				27.04.2010	27.04.2010	14.05.2010	14.05.2010	14.05.2010	02.06.2010
Rating Type				PESSEV	PESSEV	PESSEV	PESSEV	PESSEV	PESSEV
Rating Unit				%	%	%	%	%	%
Crop Stage Majority				34	34	43	43	43	59
Crop Stage Scale				BBCH	BBCH	BBCH	BBCH	BBCH	
Crop Density, Unit				100 %	100 %	100 %	100 %	100 %	100 %
Pest Density, Unit				0 %	0 %	0 %	0,5 %	0 %	8,5 %
Days After First/Last Applic.				0 0	0 0	17 17	17 17	17 17	36 19
Trt-Eval Interval				0 DA-A	0 DA-A	17 DA-A	17 DA-A	17 DA-A	19 DA-B
ARM Action Codes				APC S05	APC S05	APC S05	APC S05	APC S05	APC S05
Trt No.	Treatment Name	Rate	Appl Unit Code	3	4	10	11	12	17
1	Untreated Check			0,0 a	0,0 a	0,0 a	0,5 a (0,0%)	0,0 a	8,5 a (0,0%)
2		1,5 L/ha	A	0,0 a	0,0 a	0,0 a	0,0 a (100,0%)	0,0 a	0,8 b (91,2%)
		1,5 L/ha	B						
3		1,0 L/ha	A	0,0 a	0,0 a	0,0 a	0,0 a (100,0%)	0,0 a	2,0 b (76,5%)
		1,0 L/ha	B						
4		0,8 L/ha	A	0,0 a	0,0 a	0,0 a	0,0 a (100,0%)	0,0 a	0,8 b (91,2%)
		0,8 L/ha	B						
		0,8 L/ha	A						
		0,8 L/ha	B						
5		2,5 L/ha	A	0,0 a	0,0 a	0,0 a	0,0 a (100,0%)	0,0 a	0,8 b (91,2%)
		2,5 L/ha	B						
6		2,0 L/ha	A	0,0 a	0,0 a	0,0 a	0,0 a (100,0%)	0,0 a	1,3 b (85,3%)
		2,0 L/ha	B						
7		1,5 L/ha	A	0,0 a	0,0 a	0,0 a	0,0 a (100,0%)	0,0 a	1,5 b (82,4%)
		1,5 L/ha	B						
Mean Sep. Test				SNK.05	SNK.05	SNK.05	SNK.05	SNK.05	SNK.05
Replicate F				0,000	0,000	0,000	1,000	0,000	0,900
Replicate Prob(F)				1,0000	1,0000	1,0000	0,4155	1,0000	0,4604
Treatment F				0,000	0,000	0,000	3,000	0,000	28,457
Treatment Prob(F)				1,0000	1,0000	1,0000	0,0327	1,0000	0,0001

Pest Code				RAMUCC	RAMUCC	RAMUCC	RAMUCC	RAMUCC
Crop Code				HORVW	HORVW	HORVW	HORVW	HORVW
Crop Variety				Spectrum	Spectrum	Spectrum	Spectrum	Spectrum
Part Rated				FLMI1 P	FLMI2 P	FLAGLE P	FLMI1 P	FLMI2 P
Rating Date				02.06.2010	02.06.2010	17.06.2010	17.06.2010	17.06.2010
Rating Type				PESSEV	PESSEV	PESSEV	PESSEV	PESSEV
Rating Unit				%	%	%	%	%
Crop Stage Majority				59	59	71	71	71
Crop Stage Scale								
Crop Density, Unit				100 %	100 %	100 %	100 %	100 %
Pest Density, Unit				5,5 %	0,5 %	41,3 %	48,8 %	8 %
Days After First/Last Applic.				36 19	36 19	51 34	51 34	51 34
Trt-Eval Interval				19 DA-B	19 DA-B	34 DA-B	34 DA-B	34 DA-B
ARM Action Codes				APC S05	APC S05	APC S05	APC S05	APC S05
Trt No.	Treatment Name	Rate	Appl Unit Code	18	19	24	25	26
1	Untreated Check			5,5 a (0,0%)	0,5 a (0,0%)	41,3 a (0,0%)	48,8 a (0,0%)	8,0 a (0,0%)
2		1,5 L/ha	A	2,3 d (59,1%)	0,0 a (100,0%)	10,8 cd (73,9%)	12,5 c (74,4%)	2,8 c (65,6%)
		1,5 L/ha	B					
3		1,0 L/ha	A	4,8 ab (13,6%)	0,0 a (100,0%)	21,0 b (49,1%)	19,5 b (60,0%)	4,5 bc (43,8%)
		1,0 L/ha	B					
4		0,8 L/ha	A	1,3 e (77,3%)	0,0 a (100,0%)	5,3 d (87,3%)	5,5 d (88,7%)	2,3 c (71,9%)
		0,8 L/ha	B					
		0,8 L/ha	A					
		0,8 L/ha	B					
5		2,5 L/ha	A	3,3 c (40,9%)	0,0 a (100,0%)	9,5 cd (77,0%)	10,3 cd (79,0%)	3,3 bc (59,4%)
		2,5 L/ha	B					
6		2,0 L/ha	A	4,8 ab (13,6%)	0,0 a (100,0%)	11,5 cd (72,1%)	13,3 c (72,8%)	5,3 b (34,4%)
		2,0 L/ha	B					
7		1,5 L/ha	A	3,8 bc (31,8%)	0,0 a (100,0%)	14,8 c (64,2%)	8,5 cd (82,6%)	3,5 bc (56,3%)
		1,5 L/ha	B					
Mean Sep. Test				SNK.05	SNK.05	SNK.05	SNK.05	SNK.05
Replicate F				7,738	1,000	1,263	1,756	1,909
Replicate Prob(F)				0,0016	0,4155	0,3169	0,1915	0,1643
Treatment F				21,561	3,000	44,930	93,154	12,506
Treatment Prob(F)				0,0001	0,0327	0,0001	0,0001	0,0001

Pest Code				HORVW	HORVW	HORVW	HORVW	HORVW
Crop Code				GRAMAT C	GRAMAT C	GRAMAT C	GRAMAT C	PLANT C
Part Rated				14/7/10	14/7/10	20/7/10	14/7/10	14/7/10
Rating Date				YIELD	YIELD	TKWT	MOICON	LODGIN
Rating Type				%UNCK	DT/HA14%	G	%	%
Rating Unit								
Pest Density, Unit								
Trt-Eval Interval				78 DA-A	78 DA-A	78 DA-A	78 DA-A	78 DA-A
Trt No.	Treatment Name	Rate	Appl Unit Code					
1	Untreated Check			100,00 d	72,5 d	50,9 c (100%)	11,3 a (100%)	0,0 a
2		1,5 L/ha	A	116,44 b	84,3 b	55,2 a (108%)	11,9 a (105%)	0,0 a
3		1,0 L/ha	A	114,93 bc	83,3 bc	54,9 a (108%)	11,6 a (103%)	0,0 a
		1,0 L/ha	B					
4		0,8 L/ha	A	121,77 a	88,2 a	54,8 a (108%)	11,7 a (103%)	0,0 a
		0,8 L/ha	B					
		0,8 L/ha	A					
		0,8 L/ha	B					
5		2,5 L/ha	A	116,99 b	84,8 b	53,7 b (106%)	11,6 a (102%)	0,0 a
		2,5 L/ha	B					
6		2,0 L/ha	A	112,48 c	81,5 c	53,2 b (105%)	11,3 a (100%)	0,0 a
		2,0 L/ha	B					
7		1,5 L/ha	A	115,26 bc	83,5 bc	53,5 b (105%)	11,4 a (101%)	0,0 a
		1,5 L/ha	B					
Replicate F				12,108	2,830	0,322	0,047	0,000
Replicate Prob(F)				0,0001	0,0676	0,8095	0,9862	1,0000
Treatment F				71,587	77,746	53,851	1,773	0,000
Treatment Prob(F)				0,0001	0,0001	0,0001	0,1616	1,0000

Crop Code				HORVW	HORVW
Part Rated				PLANT C	PLANT C
Rating Date				30/6/10	17/6/10
Rating Type				GLA	GLA
Rating Unit				%	%
Crop Stage Scale				BBCH	BBCH
Crop Density, Unit				100 %	100 %
Days After First/Last Applic.				64 47	51 34
Trt No.	Treatment Name	Rate	Appl Unit Code		
1	Untreated Check			8,3 b	53,3 b
2		1,5 L/ha	A	22,5 a	88,3 a
		1,5 L/ha	B		
3		1,0 L/ha	A	18,8 a	82,5 a
		1,0 L/ha	B		
4		0,8 L/ha	A	23,8 a	87,3 a
		0,8 L/ha	B		
		0,8 L/ha	A		
		0,8 L/ha	B		
5		2,5 L/ha	A	22,5 a	87,5 a
		2,5 L/ha	B		
6		2,0 L/ha	A	18,8 a	88,3 a
		2,0 L/ha	B		
7		1,5 L/ha	A	20,0 a	85,3 a
		1,5 L/ha	B		
Replicate F				0,868	1,124
Replicate Prob(F)				0,4759	0,3656
Treatment F				12,975	60,853
Treatment Prob(F)				0,0001	0,0001

Pest Code

RHYNSE, Rhynchosporium secalis, = US

RAMUCC, Ramularia collo-cygni, = US

Crop Code

HORVW, BCER, Hordeum vulgare (winter), = US

Part Rated

PLANT = plant

FLM11 = flagleaf minus 1

FLM12 = flagleaf minus 2

FLAGLE = flagleaf

GRAMAT = grain - mature

C = Crop is Part Rated

P = Pest is Part Rated

Rating Type

PHYGEN = phytotoxicity - general / injury

PESSEV = pest severity

LODGIN = lodging

MOICON = moisture content

YIELD = yield

Rating Unit

% = percent

G = gram

%UNCK = percent of untreated check

Crop Stage Majority

39 = Flag leaf stage: flag leaf fully unrolled, ligule just visible|BCER

43 = Mid boot stage: flag leaf sheath just visibly swollen|BCER

59 = End of heading: inflorescence fully emerged|BCER

71 = Watery ripe: first grains have reached half their final size|BCER

34 = Node 4 at least 2 cm above node 3|BCER

89 = Fully ripe: grain hard, difficult to divide with thumbnail|BCER

99 = Harvested product|BCER

Crop Stage Scale

BBCH = BBCH uniform plant stages

ARM Action Codes

S05 = Perform 5% Student-Newman-Keuls mean separation on Standardized Summary

APC S05 = *** Following Identify Non-Analyzable Data for Summary Reports ***

APOC S05 = *** Following are Defined Rating Limits that ARM will Enforce ***

@UPOCR = Percent of control (like APOC) relative to untreated treatment (untreated is 100%, transforms data column immediately left of this POC column)

TY1 = $9.523809 * [C28] * (100 - [C29]) / 14$

@UPOCR = $&100 * @AvgSub([30]) / [TUC30]$

7. APPENDIX

7.1. PLOT DATA

Pest Code									
Crop Code					HORVW	HORVW	HORVW	HORVW	
Crop Variety					Spectrum	Spectrum	Spectrum	Spectrum	
Part Rated					PLANT C	PLANT C	PLANT C	PLANT C	
Rating Date					05.05.2010	14.05.2010	02.06.2010	17.06.2010	
Rating Type					PHYGEN	PHYGEN	PHYGEN	PHYGEN	
Rating Unit					%	%	%	%	
Crop Stage Majority					39	43	59	71	
Crop Stage Scale					BBCH	BBCH			
Crop Density, Unit					100 %	100 %	100 %	100 %	
Pest Density, Unit									
Days After First/Last Applic.					8 8	17 17	36 19	51 34	
Trt-Eval Interval					8 DA-A	17 DA-A	19 DA-B	34 DA-B	
ARM Action Codes					S05	S05	S05	S05	
Trt No.	Treatment Name	Rate	Appl Unit	Code	Plot	5	6	13	20
1	Untreated Check				101				
					203				
					302				
					403				
					Mean =
2		1,5 L/ha	A		102	0,0	0,0	0,0	0,0
		1,5 L/ha	B		204	0,0	0,0	0,0	0,0
					301	0,0	0,0	0,0	0,0
					404	0,0	0,0	0,0	0,0
					Mean =	0,0	0,0	0,0	0,0
3		1,0 L/ha	A		103	0,0	0,0	0,0	0,0
		1,0 L/ha	B		201	0,0	0,0	0,0	0,0
					306	0,0	0,0	0,0	0,0
					401	0,0	0,0	0,0	0,0
					Mean =	0,0	0,0	0,0	0,0
4		0,8 L/ha	A		104	0,0	0,0	0,0	0,0
		0,8 L/ha	B		206	0,0	0,0	0,0	0,0
		0,8 L/ha	A		304	0,0	0,0	0,0	0,0
		0,8 L/ha	B		406	0,0	0,0	0,0	0,0
					Mean =	0,0	0,0	0,0	0,0
5		2,5 L/ha	A		105	0,0	0,0	0,0	0,0
		2,5 L/ha	B		202	0,0	0,0	0,0	0,0
					305	0,0	0,0	0,0	0,0
					407	0,0	0,0	0,0	0,0
					Mean =	0,0	0,0	0,0	0,0
6		2,0 L/ha	A		106	0,0	0,0	0,0	0,0
		2,0 L/ha	B		207	0,0	0,0	0,0	0,0
					303	0,0	0,0	0,0	0,0
					405	0,0	0,0	0,0	0,0
					Mean =	0,0	0,0	0,0	0,0
7		1,5 L/ha	A		107	0,0	0,0	0,0	0,0
		1,5 L/ha	B		205	0,0	0,0	0,0	0,0
					307	0,0	0,0	0,0	0,0
					402	0,0	0,0	0,0	0,0
					Mean =	0,0	0,0	0,0	0,0

				RHYNSE	RHYNSE	RHYNSE	RHYNSE	RHYNSE	RHYNSE	
				HORVW	HORVW	HORVW	HORVW	HORVW	HORVW	
				Spectrum	Spectrum	Spectrum	Spectrum	Spectrum	Spectrum	
				FLMI1 P	FLMI2 P	FLAGLE P	FLMI1 P	FLMI2 P	FLAGLE P	
Rating Date				27.04.2010	27.04.2010	14.05.2010	14.05.2010	14.05.2010	02.06.2010	
Rating Type				PESSEV	PESSEV	PESSEV	PESSEV	PESSEV	PESSEV	
Rating Unit				%	%	%	%	%	%	
Crop Stage Majority				34	34	43	43	43	59	
Crop Stage Scale				BBCH	BBCH	BBCH	BBCH	BBCH		
Crop Density, Unit				100 %	100 %	100 %	100 %	100 %	100 %	
Pest Density, Unit				0 %	0 %	0 %	1,8 %	2,5 %	1,3 %	
Days After First/Last Applic.				0 0	0 0	17 17	17 17	17 17	36 19	
Trt-Eval Interval				0 DA-A	0 DA-A	17 DA-A	17 DA-A	17 DA-A	19 DA-B	
ARM Action Codes				APC S05	APC S05	APC S05	APC S05	APC S05	APC S05	
Trt No.	Treatment Name	Rate	Appl Unit Code	Plot	1	2	7	8	9	14
1	Untreated Check			101	0,0	0,0	0,0	1,0	3,0	1,0
				203	0,0	0,0	0,0	3,0	2,0	2,0
				302	0,0	0,0	0,0	2,0	2,0	1,0
				403	0,0	0,0	0,0	1,0	3,0	1,0
				Mean =	0,0	0,0	0,0	1,8	2,5	1,3
2		1,5 L/ha	A	102	0,0	0,0	0,0	0,0	0,0	0,0
		1,5 L/ha	B	204	0,0	0,0	0,0	0,0	0,0	0,0
				301	0,0	0,0	0,0	0,0	1,0	0,0
				404	0,0	0,0	0,0	1,0	0,0	0,0
				Mean =	0,0	0,0	0,0	0,3	0,3	0,0
3		1,0 L/ha	A	103	0,0	0,0	0,0	1,0	2,0	0,0
		1,0 L/ha	B	201	0,0	0,0	0,0	0,0	0,0	0,0
				306	0,0	0,0	0,0	1,0	1,0	0,0
				401	0,0	0,0	0,0	1,0	1,0	0,0
				Mean =	0,0	0,0	0,0	0,8	1,0	0,0
4		0,8 L/ha	A	104	0,0	0,0	0,0	0,0	0,0	0,0
		0,8 L/ha	B	206	0,0	0,0	0,0	0,0	0,0	0,0
		0,8 L/ha	A	304	0,0	0,0	0,0	0,0	1,0	0,0
		0,8 L/ha	B	406	0,0	0,0	0,0	0,0	0,0	0,0
				Mean =	0,0	0,0	0,0	0,0	0,3	0,0
5		2,5 L/ha	A	105	0,0	0,0	0,0	0,0	1,0	0,0
		2,5 L/ha	B	202	0,0	0,0	0,0	2,0	0,0	0,0
				305	0,0	0,0	0,0	0,0	0,0	0,0
				407	0,0	0,0	0,0	0,0	1,0	0,0
				Mean =	0,0	0,0	0,0	0,5	0,5	0,0
6		2,0 L/ha	A	106	0,0	0,0	0,0	2,0	3,0	0,0
		2,0 L/ha	B	207	0,0	0,0	0,0	1,0	0,0	0,0
				303	0,0	0,0	0,0	1,0	1,0	0,0
				405	0,0	0,0	0,0	2,0	2,0	0,0
				Mean =	0,0	0,0	0,0	1,5	1,5	0,0
7		1,5 L/ha	A	107	0,0	0,0	0,0	1,0	0,0	0,0
		1,5 L/ha	B	205	0,0	0,0	0,0	0,0	2,0	0,0
				307	0,0	0,0	0,0	3,0	3,0	0,0
				402	0,0*	0,0*	0,0	1,0	1,0	0,0
				Mean =	0,0	0,0	0,0	1,3	1,5	0,0

Pest Code		RHYNSE	RHYNSE	RHYNSE	RHYNSE	RHYNSE
Crop Code		HORVW	HORVW	HORVW	HORVW	HORVW
Crop Variety		Spectrum	Spectrum	Spectrum	Spectrum	Spectrum
Part Rated		FLMI1 P	FLMI2 P	FLAGLE P	FLMI1 P	FLMI2 P
Rating Date		02.06.2010	02.06.2010	17.06.2010	17.06.2010	17.06.2010
Rating Type		PESSEV	PESSEV	PESSEV	PESSEV	PESSEV
Rating Unit		%	%	%	%	%
Crop Stage Majority		59	59	71	71	71
Crop Stage Scale						
Crop Density, Unit		100 %	100 %	100 %	100 %	100 %
Pest Density, Unit		4 %	4,8 %	5,3 %	12,8%	16 %
Days After First/Last Applic.		36 19	36 19	51 34	51 34	51 34
Tri-Eval Interval		19 DA-B	19 DA-B	34 DA-B	34 DA-B	34 DA-B
ARM Action Codes		APC S05	APC S05	APC S05	APC S05	APC S05
Tri	Treatment	Rate	Appl			
No.	Name	Rate	Unit	Code	Plot	
	1 Untreated Check					
					15	16
					21	22
					23	
					101	4,0
					203	5,0
					302	3,0
					403	4,0
					Mean =	4,0
						4,8
						5,3
						12,8
						16,0
	2	1,5 L/ha	A		102	1,0
		1,5 L/ha	B		204	3,0
					301	3,0
					404	2,0
					Mean =	2,3
						2,5
						0,5
						6,0
						5,3
	3	1,0 L/ha	A		103	4,0
		1,0 L/ha	B		201	3,0
					306	5,0
					401	4,0
					Mean =	4,0
						3,8
						1,3
						9,8
						9,5
	4	0,8 L/ha	A		104	2,0
		0,8 L/ha	B		206	1,0
		0,8 L/ha	A		304	1,0
		0,8 L/ha	B		406	2,0
					Mean =	1,5
						1,5
						0,0
						3,0
						3,0
						4,0
						3,0
						3,3
						3,8
						1,5
						9,0
						9,0
						10,0
						9,0
						9,0
						9,0
	5	2,5 L/ha	A		105	4,0
		2,5 L/ha	B		202	3,0
					305	3,0
					407	2,0
					Mean =	3,0
						2,5
						0,8
						7,0
						6,3
	6	2,0 L/ha	A		106	2,0
		2,0 L/ha	B		207	5,0
					303	4,0
					405	2,0
					Mean =	3,3
						3,8
						1,5
						9,0
						8,0
						10,0
						9,0
						9,0
	7	1,5 L/ha	A		107	4,0
		1,5 L/ha	B		205	3,0
					307	5,0
					402	3,0
					Mean =	3,8
						3,5
						1,3
						8,5
						10,3

					RAMUCC	RAMUCC	RAMUCC	RAMUCC	RAMUCC	RAMUCC
					HORVW	HORVW	HORVW	HORVW	HORVW	HORVW
					Spectrum	Spectrum	Spectrum	Spectrum	Spectrum	Spectrum
					FLMI1 P	FLMI2 P	FLAGLE P	FLMI1 P	FLMI2 P	FLAGLE P
					27.04.2010	27.04.2010	14.05.2010	14.05.2010	14.05.2010	02.06.2010
					PESSEV	PESSEV	PESSEV	PESSEV	PESSEV	PESSEV
					%	%	%	%	%	%
					34	34	43	43	43	59
					BBCH	BBCH	BBCH	BBCH	BBCH	
					100 %	100 %	100 %	100 %	100 %	100 %
					0 %	0 %	0 %	0,5 %	0 %	8,5 %
					0 0	0 0	17 17	17 17	17 17	36 19
					0 DA-A	0 DA-A	17 DA-A	17 DA-A	17 DA-A	19 DA-B
					APC S05	APC S05	APC S05	APC S05	APC S05	APC S05
Trt	Treatment	Rate	Appl	Plot	3	4	10	11	12	17
No.	Name	Rate	Unit	Code						
1	Untreated Check			101	0,0	0,0	0,0	0,0	0,0	6,0
				203	0,0	0,0	0,0	1,0	0,0	10,0
				302	0,0	0,0	0,0	0,0	0,0	9,0
				403	0,0	0,0	0,0	1,0	0,0	9,0
				Mean =	0,0	0,0	0,0	0,5	0,0	8,5
2		1,5 L/ha	A	102	0,0	0,0	0,0	0,0	0,0	1,0
		1,5 L/ha	B	204	0,0	0,0	0,0	0,0	0,0	0,0
				301	0,0	0,0	0,0	0,0	0,0	2,0
				404	0,0	0,0	0,0	0,0	0,0	0,0
				Mean =	0,0	0,0	0,0	0,0	0,0	0,8
3		1,0 L/ha	A	103	0,0	0,0	0,0	0,0	0,0	2,0
		1,0 L/ha	B	201	0,0	0,0	0,0	0,0	0,0	3,0
				306	0,0	0,0	0,0	0,0	0,0	1,0
				401	0,0	0,0	0,0	0,0	0,0	2,0
				Mean =	0,0	0,0	0,0	0,0	0,0	2,0
4		0,8 L/ha	A	104	0,0	0,0	0,0	0,0	0,0	0,0
		0,8 L/ha	B	206	0,0	0,0	0,0	0,0	0,0	2,0
		0,8 L/ha	A	304	0,0	0,0	0,0	0,0	0,0	1,0
		0,8 L/ha	B	406	0,0	0,0	0,0	0,0	0,0	0,0
				Mean =	0,0	0,0	0,0	0,0	0,0	0,8
5		2,5 L/ha	A	105	0,0	0,0	0,0	0,0	0,0	1,0
		2,5 L/ha	B	202	0,0	0,0	0,0	0,0	0,0	0,0
				305	0,0	0,0	0,0	0,0	0,0	0,0
				407	0,0	0,0	0,0	0,0	0,0	2,0
				Mean =	0,0	0,0	0,0	0,0	0,0	0,8
6		2,0 L/ha	A	106	0,0	0,0	0,0	0,0	0,0	1,0
		2,0 L/ha	B	207	0,0	0,0	0,0	0,0	0,0	2,0
				303	0,0	0,0	0,0	0,0	0,0	0,0
				405	0,0	0,0	0,0	0,0	0,0	2,0
				Mean =	0,0	0,0	0,0	0,0	0,0	1,3
7		1,5 L/ha	A	107	0,0	0,0	0,0	0,0	0,0	2,0
		1,5 L/ha	B	205	0,0	0,0	0,0	0,0	0,0	2,0
				307	0,0	0,0	0,0	0,0	0,0	1,0
				402	0,0*	0,0*	0,0	0,0	0,0	1,0
				Mean =	0,0	0,0	0,0	0,0	0,0	1,5

				RAMUCC	RAMUCC	RAMUCC	RAMUCC	RAMUCC	
				HORVW	HORVW	HORVW	HORVW	HORVW	
				Spectrum	Spectrum	Spectrum	Spectrum	Spectrum	
				FLMI1 P	FLMI2 P	FLAGLE P	FLMI1 P	FLMI2 P	
				02.06.2010	02.06.2010	17.06.2010	17.06.2010	17.06.2010	
				PESSEV	PESSEV	PESSEV	PESSEV	PESSEV	
				%	%	%	%	%	
				59	59	71	71	71	
				100 %	100 %	100 %	100 %	100 %	
				5,5 %	0,5 %	41,3%	48,8%	8 %	
				36 19	36 19	51 34	51 34	51 34	
				19 DA-B	19 DA-B	34 DA-B	34 DA-B	34 DA-B	
				APC S05	APC S05	APC S05	APC S05	APC S05	
Trt	Treatment	Rate	Appl						
No.	Name	Rate	Unit Code	Plot	18	19	24	25	26
1	Untreated Check			101	5,0	0,0	30,0	40,0	5,0
				203	7,0	1,0	45,0	55,0	10,0
				302	4,0	1,0	40,0	45,0	7,0
				403	6,0	0,0	50,0	55,0	10,0
				Mean =	5,5	0,5	41,3	48,8	8,0
2		1,5 L/ha	A	102	2,0	0,0	10,0	10,0	2,0
		1,5 L/ha	B	204	2,0	0,0	10,0	14,0	3,0
				301	3,0	0,0	12,0	14,0	2,0
				404	2,0	0,0	11,0	12,0	4,0
				Mean =	2,3	0,0	10,8	12,5	2,8
3		1,0 L/ha	A	103	4,0	0,0	20,0	17,0	4,0
		1,0 L/ha	B	201	6,0	0,0	22,0	20,0	4,0
				306	4,0	0,0	18,0	19,0	6,0
				401	5,0	0,0	24,0	22,0	4,0
				Mean =	4,8	0,0	21,0	19,5	4,5
4		0,8 L/ha	A	104	0,0	0,0	5,0	5,0	3,0
		0,8 L/ha	B	206	2,0	0,0	5,0	7,0	2,0
		0,8 L/ha	A	304	1,0	0,0	7,0	6,0	2,0
		0,8 L/ha	B	406	2,0	0,0	4,0	4,0	2,0
				Mean =	1,3	0,0	5,3	5,5	2,3
5		2,5 L/ha	A	105	3,0	0,0	10,0	11,0	3,0
		2,5 L/ha	B	202	4,0	0,0	8,0	9,0	4,0
				305	3,0	0,0	11,0	10,0	3,0
				407	3,0	0,0	9,0	11,0	3,0
				Mean =	3,3	0,0	9,5	10,3	3,3
6		2,0 L/ha	A	106	4,0	0,0	10,0	13,0	4,0
		2,0 L/ha	B	207	6,0	0,0	12,0	12,0	6,0
				303	5,0	0,0	14,0	16,0	6,0
				405	4,0	0,0	10,0	12,0	5,0
				Mean =	4,8	0,0	11,5	13,3	5,3
7		1,5 L/ha	A	107	3,0	0,0	14,0	7,0	3,0
		1,5 L/ha	B	205	5,0	0,0	18,0	10,0	4,0
				307	3,0	0,0	12,0	9,0	3,0
				402	4,0	0,0	15,0	8,0	4,0
				Mean =	3,8	0,0	14,8	8,5	3,5

Pest Code			HORWW	HORWW	HORWW	HORWW	HORWW			
Crop Code			GRAMAT C	GRAMAT C	GRAMAT C	GRAMAT C	PLANT C			
Part Rated			GRAMAT C	GRAMAT C	GRAMAT C	GRAMAT C	PLANT C			
Rating Date			14/7/10	14/7/10	20/7/10	14/7/10	14/7/10			
Rating Type			YIELD	YIELD	TKWT	MOICON	LODGIN			
Rating Unit			%UNCK	DT/HA14 %	G	%	%			
Pest Density, Unit			78 DA-A	78 DA-A	78 DA-A	78 DA-A	78 DA-A			
Trt-Eval Interval			78 DA-A	78 DA-A	78 DA-A	78 DA-A	78 DA-A			
Trt No.	Treatment Name	Rate	Appl Unit	Code	Plot					
1	Untreated Check				101	100,00	74,2	51,2	11,1	0,0
					203	100,00	71,3	50,7	11,5	0,0
					302	100,00	73,1	50,6	11,1	0,0
					403	100,00	71,2	51,0	11,4	0,0
					Mean =	100,00	72,5	50,9	11,3	0,0
2		1,5 L/ha	A		102	112,51	83,5	55,5	12,0	0,0
		1,5 L/ha	B		204	118,85	84,7	55,4	11,8	0,0
					301	114,58	83,8	55,0	12,1	0,0
					404	119,84	85,4	54,8	11,5	0,0
					Mean =	116,44	84,3	55,2	11,9	0,0
3		1,0 L/ha	A		103	112,61	83,6	54,6	11,2	0,0
		1,0 L/ha	B		201	115,57	82,3	55,1	11,9	0,0
					306	112,80	82,5	55,0	11,3	0,0
					401	118,75	84,6	54,7	12,0	0,0
					Mean =	114,93	83,3	54,9	11,6	0,0
4		0,8 L/ha	A		104	118,70	88,1	55,0	11,2	0,0
		0,8 L/ha	B		206	121,32	86,4	55,2	11,7	0,0
		0,8 L/ha	A		304	122,96	89,9	54,9	12,1	0,0
		0,8 L/ha	B		406	124,10	88,4	54,2	11,6	0,0
					Mean =	121,77	88,2	54,8	11,7	0,0
5		2,5 L/ha	A		105	113,03	83,9	53,2	12,0	0,0
		2,5 L/ha	B		202	116,21	82,8	53,3	11,2	0,0
					305	117,10	85,7	54,3	11,5	0,0
					407	121,63	86,6	54,0	11,5	0,0
					Mean =	116,99	84,8	53,7	11,6	0,0
6		2,0 L/ha	A		106	110,63	82,1	52,9	11,3	0,0
		2,0 L/ha	B		207	113,33	80,8	53,0	11,4	0,0
					303	113,21	82,8	53,3	11,4	0,0
					405	112,75	80,3	53,5	10,9	0,0
					Mean =	112,48	81,5	53,2	11,3	0,0

Pest Code

RHYNSE, Rhynchosporium secalis, = US

RAMUCC, Ramularia collo-cygni, = US

Crop Code

HORWW, BCER, Hordeum vulgare (winter), = US

Part Rated

PLANT = plant

FLM11 = flagleaf minus 1

FLM12 = flagleaf minus 2

FLAGLE = flagleaf

GRAMAT = grain - mature

C = Crop is Part Rated

P = Pest is Part Rated

Rating Type

PHYGEN = phytotoxicity - general / injury

PESSEV = pest severity

LODGIN = lodging

MOICON = moisture content

YIELD = yield

Rating Unit

% = percent

G = gram

%UNCK = percent of untreated check

Crop Stage Majority

39 = Flag leaf stage: flag leaf fully unrolled, ligule just visible|BCER

43 = Mid boot stage: flag leaf sheath just visibly swollen|BCER

59 = End of heading: inflorescence fully emerged|BCER

71 = Watery ripe: first grains have reached half their final size|BCER

34 = Node 4 at least 2 cm above node 3|BCER

89 = Fully ripe: grain hard, difficult to divide with thumbnail|BCER

99 = Harvested product|BCER

Crop Stage Scale

BBCH = BBCH uniform plant stages

ARM Action Codes

S05 = Perform 5% Student-Newman-Keuls mean separation on Standardized Summary

APC S05 = *** Following Identify Non-Analyzable Data for Summary Reports ***

APOC S05 = *** Following are Defined Rating Limits that ARM will Enforce ***

@UPOCR = Percent of control (like APOC) relative to untreated treatment (untreated is 100%, transforms data column immediately left of this POC column)

TY1 = $9.523809 * [C28] * (100 - [C29]) / 14$

@UPOCR = $\&100 * @AvgSub([30]) / [TUC30]$

7.2. WEATHER DATA

Station: D-78333 Stockach-Wahlwies (Distance 3,6 km from trial area)

Date	Temperature (°C)			Humidity	Precipitation
	Ø 2 m	Max 2m	Min 2m	Ø rel. 2 m	mm
16.04.10	6,2	12,3	-1,5	79,5	0
17.04.10	9	16,4	1,6	68,8	0
18.04.10	7,4	14,7	-0,2	77,1	1
19.04.10	10,3	20,7	0,1	68,3	0
20.04.10	8,5	16,5	1,5	76,9	3,4
21.04.10	9,3	19,5	1,3	68,4	0,2
22.04.10	8,1	15,8	-0,7	61	0
23.04.10	10,2	17,6	1,6	51,1	0
24.04.10	12	21,6	0,3	56,7	0
25.04.10	13,5	22,7	2,7	58	0
26.04.10	11,6	17	6,7	83,6	2,2
27.04.10	12,9	20,8	5,9	70,5	0
28.04.10	14,1	24,5	4,8	60,5	0
29.04.10	16,2	27,1	5	60,1	0
30.04.10	15	23,2	10,3	79,2	7,2
Apr. '10	8,6	27,1	-3	71	27,6
01.05.10	11,1	12,2	10	98	13
02.05.10	9,4	10,9	7,8	97,5	17,4
03.05.10	9,5	14,8	6,3	85,6	5,8
04.05.10	9,1	11,4	7	87	2,8
05.05.10	7,5	8,9	6,4	88,2	0,4
06.05.10	7,2	10	4,1	91,3	5,4
07.05.10	7,1	12,5	3,5	84,4	4,4
08.05.10	10	18,1	2,2	77,7	0
09.05.10	11,2	18,9	5,4	83,3	1,8
10.05.10	11,7	18,8	8	89,1	2,8
11.05.10	12,3	23	5,6	84,2	4,4
12.05.10	13,1	19,8	8,2	76,7	0
13.05.10	7,8	10,9	6	91,5	11,8
14.05.10	7,7	10,7	5,1	86,4	1
15.05.10	7,3	9,9	5,3	83,4	0,2
16.05.10	7,2	10,8	2,6	88	0,4
17.05.10	9,2	15,2	1,4	79,2	0
18.05.10	9,5	15,5	1,8	69,7	0
19.05.10	7,6	14,4	2,7	80,9	5
20.05.10	8,2	10,7	5,7	95,4	0,6
21.05.10	11,7	17	6,1	84,5	0
22.05.10	13,5	23,1	2,5	75,3	0
23.05.10	15,4	24,7	5,3	73,5	0
24.05.10	18	28,9	7	66,5	0

25.05.10	19,1	30,8	8,8	66,8	0
26.05.10	18,7	24,9	12,5	60,7	0
27.05.10	15,8	21,3	10,6	75,3	2
28.05.10	14,6	22,5	7,4	80,6	1,2
29.05.10	17,4	25,1	11,3	70,6	0,2
30.05.10	13,8	18,4	11,2	82,1	12
31.05.10	10,7	15,3	4,2	70,8	1,2
Mai. '10	11,4	30,8	1,4	81	93,8
01.06.10	12,2	17,6	9,5	78,2	0
02.06.10	11,8	13,8	9,3	90,5	1,6
03.06.10	12	13,3	10,8	93,3	7,4
04.06.10	17,1	25,6	10,5	75,6	0
05.06.10	19,4	31,3	7,5	70,5	0
06.06.10	20,4	31,9	10,9	75,5	8,8
07.06.10	19	26,2	12,8	79,3	0,2
08.06.10	18,9	28,5	10,4	79,5	0
09.06.10	21,8	31,8	12,5	70	0
10.06.10	23,4	33,3	15,1	61,6	0
11.06.10	22,2	29,9	15,7	69	0
12.06.10	19,2	24,6	15,4	71,5	0
13.06.10	15,6	16,9	14	93,1	9,4
14.06.10	16,6	23,2	11,5	82,5	0,2
15.06.10	16,8	20,8	11,5	82,6	0,6
16.06.10	13,9	16	12,6	85,8	2,6
17.06.10	15,4	21,4	12,5	86,7	13
18.06.10	14,4	20,9	12	92,8	24,8
19.06.10	10,9	13,2	7,1	91,4	6,6
20.06.10	9,5	12,8	5,1	87,8	0,2
21.06.10	11,6	15,8	8,4	83,7	0
22.06.10	12,1	17,2	4,5	78,9	0
23.06.10	14,4	23	3,4	72,3	0
24.06.10	16,5	26,2	5,3	70,4	0
25.06.10	19,2	30,8	8,4	70,1	0
26.06.10	20,4	29,9	10	71,5	0
27.06.10	21,2	30,9	12	71,1	0
28.06.10	21,6	31,8	11,7	72,6	0
29.06.10	22,1	31,1	14,5	69,8	0
30.06.10	21,5	28,9	13,7	76,7	0
Jun. '10	17	33,3	3,4	79	75,4
01.07.10	22,6	32,2	13,2	73,7	0
02.07.10	23,3	33,7	13,3	73,3	0
03.07.10	24,2	35,4	15	70,2	0
04.07.10	20,7	28,6	17,4	87,6	10,8
05.07.10	21,4	29,2	16,2	77,1	0,2
06.07.10	19,2	25,4	12,3	73,7	1
07.07.10	19,3	29,3	8,9	65,7	0
08.07.10	21,7	35,3	9,5	66	0
09.07.10	23,5	34,2	13	73,2	0
10.07.10	25,8	36	15,6	68,2	0
11.07.10	25,1	36,5	16,8	71,8	0,6
12.07.10	23,1	35,6	15,9	76,4	0,8
13.07.10	22,1	32,5	14,1	78,1	0
14.07.10	25,5	35,8	16,9	73,9	4,8

**VERSUCHSWESEN
PFLANZENSCHUTZ**

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Final Report

Study No.: VP08-4-38

Sponsor's Project Number: [REDACTED]

An evaluation of the efficacy of [REDACTED], [REDACTED]
[REDACTED] and [REDACTED] vs. powdery mildew
on winter wheat

Sponsor:

[REDACTED]
[REDACTED]
Germany

Test Facility:

Versuchswesen Pflanzenschutz
Wallstr. 6
30938 Burgwedel
Germany

Investigator:

Dr. Paul Reh

Field investigator:

Kathrin Braun

Author:

Dr. Paul Reh

Date of reporting: 26.11.2008

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1. GEP-Certificate

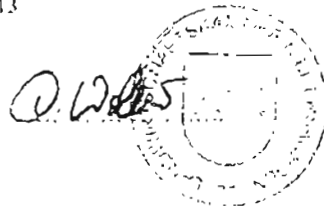
Anerkennungsbescheinigung

Die Versuchseinrichtung Versuchswesen Pflanzenschutz Dr. Paul Reh
mit Hauptsitz in 30938 Burgwedel, Wallstraße 6
und organisatorisch zugehörigen
Arbeitseinheiten in 74933 Neidenstein, Josef-Umdasch-Str. 1
des Trägers der Versuchseinrichtung Versuchswesen Pflanzenschutz, Dr. Paul Reh
ist auf Antrag vom 13.08.2008
und durchgeführter Besichtigung vom 28.08.2008
durch Herrn Dr. Dirk M. Wolber, Pflanzenschutzamt, LWK Niedersachsen
vom Pflanzenschutzamt der Landwirtschaftskammer Niedersachsen am 01.09.2008
amtlich anerkannt worden im Sinne des § 1c Abs. 5 der
Pflanzenschutzmittelverordnung.
Diese Bescheinigung ist gültig bis September 2013

Recognition Certificate

The testing facility Versuchswesen Pflanzenschutz, Dr. Paul Reh
with headquarters in 30938 Burgwedel, Wallstraße 6
and subsidiary testing units in 74933 Neidenstein, Josef-Umdasch-Str. 1
supported by Versuchswesen Pflanzenschutz, Dr. Paul Reh
has been officially recognized under paragraph (5) of Article 1c of the Plant Protection
Products Ordinance following its application dated 13th of August 2008
and pre-inspection of 28th of August 2008
by Mr. Dr. Dirk M. Wolber, Pflanzenschutzamt, LWK Niedersachsen
from the Pflanzenschutzamt der Landwirtschaftskammer Niedersachsen on 1st of
September 2008.
This certificate is valid until September 2013

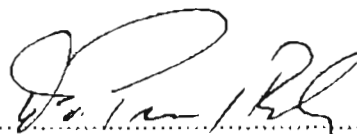
Hannover, 01.09.2008



2. GEP-Compliance Statement

I herewith declare that this study is conducted and reported in compliance with the documents 91/414/EEC and 93/71/EEC.

Burgwedel, the 26. 11. 2008



Dr. Paul Reh
Investigator

3. References

- | | |
|----------------------------------|--|
| EPPO-Standard
No. PP 1/26(3) | Efficacy evaluation of fungicides
Foliar diseases on cereals
European and Mediterranean Plant Protection
Organization
Bulletin OEPP/EPPO Vol. 2, 32-40, 2004 |
| EPPO-Standard
No. PP 1/135(3) | Efficacy evaluation of plant protection products.
Phytotoxicity assessment
European and Mediterranean Plant Protection
Organization
Bulletin OEPP/EPPO, 1-8, update 2006 |
| EPPO-Standard
No. PP 1/152(3) | Efficacy evaluation of plant protection products.
Design and analysis of efficacy evaluation trials
European and Mediterranean Plant Protection
Organization
Bulletin OEPP/EPPO, 9-25, update 2006 |
| EPPO-Standard
No. PP 1/181(3) | Efficacy evaluation of plant protection products.
Conduct and reporting of efficacy evaluation
trials, including good experimental practice
European and Mediterranean Plant Protection
Organization
Bulletin OEPP/EPPO Vol. 1, 53-68, 2004 |

4. Summary

The purpose of the study was to supply data of the efficacy of [REDACTED], [REDACTED] and [REDACTED] vs powdery mildew on winter wheat in Germany 2008.

The trial was carried out according to the EPPO-Standard 1/26(3) in winter wheat in Baden-Württemberg, Germany. The layout of the trial was a completely randomised block with 8 treatments and 4 replicates. The test item [REDACTED] was applied with the rates of 2.5 l/ha and of 2.0 l/ha. The test item [REDACTED] was sprayed with 1.25 l/ha and 1.0 l/ha. The test item [REDACTED] was sprayed with 1.0 l/ha. The commercial standard Opus Top was applied with 1.5 l/ha and Orius P with 1.5 l/ha. The plots were sprayed two times with a small plot sprayer.

The selectivity of the treatments was assessed visually. No signs of non-selectivity were recorded.

The test site was infected with Powdery mildew (*Erysiphe [Blumeria] graminis* ERYSGT), Speckled leaf blotch (*Septoria tritici*, SEPTTR), with Tan spot of cereals (*Drechslera [Pyrenophora] tritici-repentis*, PYRNTR) and later with Brown rust (*Puccinia recondita f. sp. tritici*, PUCCR). The test items as well as the commercial standards showed a good efficacy versus *Erysiphe graminis*, *Drechslera tritici-repentis* and *Puccinia recondita* but not versus *Septoria tritici*.

The enhancement of the green leaf area in the treated plots after the fungicide applications was significantly high. The yield in the treated plots and the thousand grain weight was significantly higher than in the untreated plots.

5. Material and Methods

5.1 Layout

The trial was carried out in Massenbachhausen, Baden-Württemberg in a winter wheat growing area. The layout of the trial was a completely randomised block with 8 treatments and 4 replicates. The plot size was 20 m².

Plot map:

108	8	208	4	308	7	408	4
107	7	207	3	307	1	407	5
106	6	206	5	306	3	406	2
105	5	205	8	305	6	405	7
104	4	204	7	304	8	404	6
103	3	203	1	303	2	403	8
102	2	202	6	302	5	402	1
101	1	201	2	301	4	401	3

5.2 Test Items

Test item	Batch-No.	Active substance (a. s.)	Content of a. s. g/kg or L
		Fenpropidin Epoconazol	
		Epoconazol	
		Proquinazid Tebuconazole Prochloraz	
Orius P	30111417	Tebuconazole Prochloraz	133 267
Opus Top	008381500	Fenpropimorph Epoconazol	250 84

5.3 Treatments

Trtmt No.	Appl. code	Treatments	Application rate (formulation) [l or kg/ha]	Application rate (a. s.) [l or kg/ha]
1		Untreated check	--	--
2	A	[REDACTED]	2.5	[REDACTED]
	B		2.5	
3	A	[REDACTED]	2.0	[REDACTED]
	B		2.0	
4	A	Opus Top	1.5	0.375 + 0.126
	B	Opus Top	1.5	0.375 + 0.126
5	A	[REDACTED]	1.25	[REDACTED]
	B		1.25	
6	A	[REDACTED]	1.0	[REDACTED]
	B		1.0	
7	A	Orius P	1.5	0.1995 + 0.4005
	B	Orius P	1.5	0.1995 + 0.4005
8	A	[REDACTED]	1.0	[REDACTED]
	B		1.0	

Application timing codes

A	after onset of the disease (at least 2 % infection) till BBCH 32-39
B	after re-infection till BBCH 55-61

5.4 Trial Site Description

Field investigator	Kathrin Braun
Farmer	Bernd Schwarz
Address	Gemmingerstr. 16
Location	74252 Massenbachhausen
Federal state	Baden-Württemberg
Country	Germany
Previous crop	Oil seed rape
Crop	winter wheat
Variety	Monopol
Seed rate [kg/ha]	165
Drilling date (ddmmyyyy)	15.10.2007
Soil type	loam/silty loam (L/uL)
pH	6.9
Organic matter content [%]	2.3

Cultivation

Date (ddmmyyyy)	Equipment
13.10.2007	cultivator

Irrigation

Date (ddmmyyyy)	Equipment	Amount [mm]
no irrigation		

Fertiliser

Date (ddmmyyyy)	Trade name	Amount applied [kg/ha]			
		N	P ₂ O ₅	K ₂ O	others
26.02.2008	N-fertiliser	55			
04.04.2008	N-fertiliser	70			
26.05.2008	N-fertiliser	90			

Trial maintenance

Date (ddmmyyyy)	Pest management		
	Trade name	Active substance (a.s.)	Amount a.s. [kg or l/ha]
28.03.2008	Arelon	Isoproturon	1.4
13.04.2008	Primus	Florasulam	0.0025
	Biathlon	Tritosulfuron	0.04998
	CCC	Chlormequat	0.3348

5.5 Application Description

Application equipment

Application timing codes	A	B
Application date (ddmmyyyy)	08.05.2008	07.06.2008
Sprayer type	knapsack sprayer PR1	
Plot size [m ²]	2.5 x 8.0 = 20.0	
Boom length [m]	2.5	
Nozzle spacing [m]	0.5	
Nozzle type	flat fan	
Nozzle size	AD120-03	
Pressure [bar]	2.5	2.5
Speed [km/h]	3.8	4.1
Water volume [l/ha]	300	

Environmental data: application

Application timing codes	A	B
Date (ddmmyyyy)	08.05.2008	07.06.2008
Time	13:10	15.45
Air temperature [°C]	22	21
Rel. humidity [%]	81	84
Cloud cover [%]	0	95
Soil temperature [°C] at 15 cm depth	19	19
Wind speed [m/s]	0	0
Wind direction	--	--
Leaf moisture	dry	dry
Soil moisture	dry	dry-moist
Soil surface	crusted	crusted
Crop stage [BBCH]	32	61
Crop height [cm]	35	60
Soil coverage crop [%]	100	100
Rain 0 – 24 h [mm]	0	03.6

5.6 Assessment Description

The selectivity of the treatments was assessed as visual phytotoxicity, and ground cover in %.

During the assessments the fungus diseases were recorded as pest incidence and pest severity. The diseases were observed separately on the different leaf levels (e.g. flag leaf F, F-1). For the calculation of the efficacy in % control an index of infection was build:

$$\text{index of infection} = \text{pest incidence} \times \text{pest severity}$$

Since the assessment data were not homogenous the data were transformed before performing the analysis of variance.

At harvest the trials were harvested with a small plot combine Type "Hege". The yield figures were presented in dt/ha and corrected to 14% grain moisture. The thousand grain weight (TKG) was determined and reported with a correction to 14% grain moisture.

The data were analysed with the computer programme ARM 7.5.0 (Gylling Data Management, Inc.).

6. Results

6.1 Selectivity

After the treatments the phytotoxicity as ground cover reduction and general phytotoxicity in % was assessed. No signs of non-selectivity were observed.

6.2 Diseases

EPPO-Code	Scientific name	English name	German name
ERYSGT	<i>Erysiphe [Blumeria] graminis</i>	Powdery mildew	Mehltau
PUCCRT	<i>Puccinia recondita f. sp. tritici</i>	Brown rust of wheat	Weizenbraunrost
PYRNTR	<i>Drechslera [Pyrenophora] tritici-repentis</i>	Tan spot of wheat	--
SEPTTR	<i>Septoria tritici</i>	Speckled leaf blotch of wheat	Blattdüre an Weizen

Initial infection at the first application at 08.05.2008

Disease	Pest incidence [%]	Pest severity [%]
ERYSGT	47.5	2.8
PYRNTR	12.5	2.0
SEPTTR	15.0	5.0

6.3 Efficacy

For the calculation of the efficacy in % control an index of infection was build: index of infection = pest incidence X pest severity. The data were transformed before the analysis of variance since the assessment data were not homogeneous.

Efficacy against ERYSGT

Trtmt No.	Treatments	Timing	Rate [l or kg/ha]	Efficacy [%]		
				26.05.2008 18 DATA*	07.06.2008 30 DATA*	24.06.2008 17 DATB*
1	Untreated		--	0 a	0 a	0 a
	<i>Pest incidence</i>			11.3	11.3	22.5
	<i>Pest severity</i>			4.3	16.3	18.8
2		A, B	2.5	100 b	95.4 b	100 b
3		A, B	2.0	100 b	93.8 b	100 b
4	Opus Top	A, B	1.5	100 b	98.5 b	100 b
5		A, B	1.25	100 b	100 b	100 b
6		A, B	1.0	100 b	85.1 b	100 b
7	Orius P	A, B	1.5	100 b	86.0 b	100 b
8		A, B	1.0	100 b	98.7 b	14.3 ab

Means followed by same letter do not significantly differ (P = 0.05 Student-Newman-Keuls).

*DATA, DATB = days after treatment A, days after treatment B

Efficacy against PUCCRT (F = flag leaf)

Trtmt No.	Treatments	Timing	Rate [l or kg/ha]	Efficacy [%]	
				24.06.2008 17 DATB*	
				F-1	F
1	Untreated		--	0 a	0 a
	<i>Pest incidence</i>			72.5	18.8
	<i>Pest severity</i>			15.0	60.0
2		A, B	2.5	100 b	100 b
3		A, B	2.0	100 b	99.2 b
4	Opus Top	A, B	1.5	100 b	100 b
5		A, B	1.25	100 b	100 b
6		A, B	1.0	100 b	100 b
7	Orius P	A, B	1.5	100 b	100 b
8		A, B	1.0	99.7 b	100 b

Means followed by same letter do not significantly differ (P = 0.05 Student-Newman-Keuls).

*DATA, DATB = days after treatment A, days after treatment B

Efficacy against PYRNTR (F = flag leaf)

Trtmt No.	Treatments	Timing	Rate [l or kg/ha]	Efficacy [%]			
				26.05.2008 18 DATA*		07.06.2008 30 DATA*	
				plant	F-1	F	
1	Untreated		--	0 a	0 a	0 a	
	<i>Pest incidence</i>			36.3	67.5	62.5	
	<i>Pest severity</i>			10.0	15.0	4.3	
2		A, B	2.5	57.2 ab	93.7 b	100 b	
3		A, B	2.0	85.3 b	94.2 b	100 b	
4	Opus Top	A, B	1.5	88.7 b	92.7 b	99.1 b	
5		A, B	1.25	87.1 b	91.9 b	100 b	
6		A, B	1.0	81.8 b	89.5 b	94.9 b	
7	Orius P	A, B	1.5	88.5 b	95.2 b	100 b	
8		A, B	1.0	83.0 b	88.7 b	96.9 b	

Means followed by same letter do not significantly differ (P = 0.05 Student-Newman-Keuls).

*DATA, DATB = days after treatment A, days after treatment B

Trtmt No.	Treatments	Timing	Rate [l or kg/ha]	Efficacy [%]	
				24.06.2008 17 DATB*	
				F-1	F
1	Untreated		--	0 a	0 a
	<i>Pest incidence</i>			100	82,5
	<i>Pest severity</i>			17,5	10,0
2		A, B	2.5	63,8 c	88,4 b
3		A, B	2.0	38,3 bc	67,1 b
4	Opus Top	A, B	1.5	66,0 c	84,5 b
5		A, B	1.25	38,3 bc	75,6 b
6		A, B	1.0	34,0 bc	56,6 b
7	Orius P	A, B	1.5	66,0 c	94,4 b
8		A, B	1.0	13,8 ab	0 a

Means followed by same letter do not significantly differ (P = 0.05 Student-Newman-Keuls).

*DATA, DATB = days after treatment A, days after treatment B

Efficacy against SEPTTR (F = flag leaf)

Trtmt No.	Treatments	Timing	Rate [l or kg/ha]	Efficacy [%]		
				26.05.2008 18 DATA*	24.06.2008 17 DATB*	
				plant	F-1	F
1	Untreated		--	0 a	0 a	0 a
	<i>Pest incidence</i>			10,0	42,5	10,0
	<i>Pest severity</i>			5,0	100	80,0
2		A, B	2.5	91,0 b	89,2 c	94,6 bc
3		A, B	2.0	91,0 b	82,6 bc	88,9 bc
4	Opus Top	A, B	1.5	94,1 b	90,5 c	92,0 bc
5		A, B	1.25	98,6 b	82,0 bc	90,7 bc
6		A, B	1.0	92,7 b	58,7 b	64,9 b
7	Orius P	A, B	1.5	93,3 b	76,2 bc	97,3 c
8		A, B	1.0	97,2 b	20,7 a	0 a

Means followed by same letter do not significantly differ (P = 0.05 Student-Newman-Keuls).

*DATA, DATB = days after treatment A, days after treatment B

Green leaf area 17 days after treatment B, 24.06.2008

Trtmt No.	Treatments	Timing	Rate [l or kg/ha]	Green leaf area [%]	Enhancement [%]
1	Untreated		--	60 b	--
2		A, B	2.5	91 a	52
3		A, B	2.0	90 a	50
4	Opus Top	A, B	1.5	89 a	48
5		A, B	1.25	90 a	50
6		A, B	1.0	83 a	37
7	Orius P	A, B	1.5	91 a	52
8		A, B	1.0	85 a	41

Means followed by same letter do not significantly differ (P = 0.05 Student-Newman-Keuls).

6.4 Yield Determination

Trtmt No.	Treatments	Timing	Rate [l or kg/ha]	Yield		TGW	
				[dt/ha]	[%]	[g]	[%]
1	Untreated		--	48,7 c	100	39,5 b	100
2		A, B	2.5	57,3 ab	118	43,4 ab	110
3		A, B	2.0	59,9 a	123	43,2 ab	109
4	Opus Top	A, B	1.5	56,5 ab	116	44,0 ab	111
5		A, B	1.25	58,4 ab	120	45,4 a	115
6		A, B	1.0	57,1 ab	117	42,9 ab	109
7	Orius P	A, B	1.5	59,6 a	123	44,5 ab	113
8		A, B	1.0	53,3 b	110	39,9 b	101

Means followed by same letter do not significantly differ (P = 0.05 Student-Newman-Keuls).

7. Appendix

7.1 Average

7.1.1 *Erysiphe graminis*

Pest Code	ERYSGT	ERYSGT	ERYSGT	ERYSGT	ERYSGT	ERYSGT	
Pest Name	Powdery mil>	Powdery mil>	Powdery mil>	Powdery mil>	Powdery mil>	Powdery mil>	
Crop Code	TRZAW	TRZAW	TRZAW	TRZAW	TRZAW	TRZAW	
Crop Name	Winter wheat	Winter wheat	Winter wheat	Winter wheat	Winter wheat	Winter wheat	
Part Rated	PLANT P	PLANT P	FLM13 P	FLM13 P	FLM11 P	FLM11 P	
Rating Date	26/5/08	26/5/08	7/6/08	7/6/08	24/6/08	24/6/08	
Rating Data Type	PESINC	PESSEV	PESINC	PESSEV	PESINC	PESSEV	
Rating Unit	%	%	%	%	%	%	
Crop Stage	45	45	61	61	75	75	
Tri-Eval Interval	18 DA-A	18 DA-A	0 DA-B	0 DA-B	17 DA-B	17 DA-B	
ARM Action Codes							
Tri Treatment							
No. Name	Rate	Rate	Rate	Rate	Rate	Rate	
	Unit	Unit	Unit	Unit	Unit	Unit	
1 Untreated		12	13	22	23	30	31
2 [REDACTED]	2,5 l/ha	11,3 a	4,3 a	11,3 a	16,3 a	22,5 a	18,8 a
	2,5 l/ha	0,0 b	0,0 b	1,8 b	3,8 b	0,0 a	0,0 b
3 [REDACTED]	2,0 l/ha	0,0 b	0,0 b	2,5 b	3,8 b	0,0 a	0,0 b
	2,0 l/ha						
4 Opus Top	1,5 l/ha	0,0 b	0,0 b	1,3 b	1,3 b	0,0 a	0,0 b
	1,5 l/ha						
5 [REDACTED]	1,25 l/ha	0,0 b	0,0 b	0,0 b	0,0 b	0,0 a	0,0 b
	1,25 l/ha						
6 [REDACTED]	1,0 l/ha	0,0 b	0,0 b	5,0 ab	5,0 b	0,0 a	0,0 b
	1,0 l/ha						
7 Orius P	1,5 l/ha	0,0 b	0,0 b	5,0 ab	5,0 b	0,0 a	0,0 b
	1,5 l/ha						
8 [REDACTED]	1,0 l/ha	0,0 b	0,0 b	2,5 b	0,5 b	22,5 a	5,0 b
	1,0 l/ha						
LSD (P=.05)		1,30	0,78	5,36	5,16	16,17	11,11
Standard Deviation		0,88	0,53	3,64	3,51	10,99	7,55
CV		62,85	99,83	99,59	79,12	195,42	254,38
Bartlett's X2		0,0	0,0	4,389	6,61	0,312	3,935
P(Bartlett's X2)				0,495	0,251	0,576	0,047*
Replicate F		1,000	1,000	0,650	0,517	1,690	1,292
Replicate Prob(F)		0,4123	0,4123	0,5919	0,6750	0,1997	0,3031
Treatment F		81,000	32,111	3,739	8,644	3,591	3,067
Treatment Prob(F)		0,0001	0,0001	0,0088	0,0001	0,0107	0,0218

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

7.1.2 *Drechslera tritici-repentis*

Pest Code		PYRNTR	PYRNTR
Pest Name		Tan spot of>	Tan spot of>
Crop Code		TRZAW	TRZAW
Crop Name		Winter wheat	Winter wheat
Part Rated		PLANT P	PLANT P
Rating Date		26/5/08	26/5/08
Rating Data Type		PESINC	PESSEV
Rating Unit		%	%
Crop Stage		45	45
Trt-Eval Interval		18 DA-A	18 DA-A
ARM Action Codes			
Trt No.	Treatment Name	Rate	Rate
		Unit	Unit
		16	17
1	Untreated		
		36,3 a	10,0 a
2	██████████	2,5 l/ha	
		25,0 ab	6,3 a
		2,5 l/ha	
3	██████████	2,0 l/ha	
		8,8 b	5,5 a
		2,0 l/ha	
4	Opus Top	1,5 l/ha	
		7,5 b	4,8 a
	Opus Top	1,5 l/ha	
5	██████████	1,25 l/ha	
		7,5 b	5,0 a
		1,25 l/ha	
6	██████████	1,0 l/ha	
		10,0 b	5,0 a
		1,0 l/ha	
7	Orius P	1,5 l/ha	
		8,8 b	4,3 a
	Orius P	1,5 l/ha	
8	██████████	1,0 l/ha	
		10,0 b	5,0 a
		1,0 l/ha	
LSD (P=.05)		13,30	4,43
Standard Deviation		9,04	3,01
CV		63,58	52,65
Bartlett's X2		24,186	8,595
P(Bartlett's X2)		0,001*	0,072
Replicate F		1,794	1,134
Replicate Prob(F)		0,1792	0,3582
Treatment F		5,504	1,469
Treatment Prob(F)		0,0011	0,2319

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code		PYRNTR	PYRNTR	PYRNTR	PYRNTR		
Pest Name		Tan spot of>	Tan spot of>	Tan spot of>	Tan spot of>		
Crop Code		TRZAW	TRZAW	TRZAW	TRZAW		
Crop Name		Winter wheat	Winter wheat	Winter wheat	Winter wheat		
Part Rated		FLM11 P	FLM11 P	FLAGLE P	FLAGLE P		
Rating Date		7/6/08	7/6/08	7/6/08	7/6/08		
Rating Data Type		PESINC	PESSEV	PESINC	PESSEV		
Rating Unit		%	%	%	%		
Crop Stage		61	61	61	61		
Tri-Eval Interval		0 DA-B	0 DA-B	0 DA-B	0 DA-B		
ARM Action Codes							
Tri No	Treatment Name	Rate	Unit	24	25	26	27
1	Untreated			67,5 a	15,0 a	62,5 a	4,3 a
2		2,5	l/ha	31,3 c	2,0 b	0,0 b	0,0 b
		2,5	l/ha				
3		2,0	l/ha	22,5 c	2,8 b	0,0 b	0,0 b
		2,0	l/ha				
4	Opus Top	1,5	l/ha	27,5 c	2,8 b	2,5 b	0,5 b
	Opus Top	1,5	l/ha				
5		1,25	l/ha	40,0 b	2,0 b	0,0 b	0,0 b
		1,25	l/ha				
6		1,0	l/ha	31,3 c	3,5 b	8,8 b	1,5 b
		1,0	l/ha				
7	Orius P	1,5	l/ha	23,8 c	2,0 b	0,0 b	0,0 b
	Orius P	1,5	l/ha				
8		1,0	l/ha	22,5 c	5,0 b	5,0 b	1,5 b
		1,0	l/ha				
	LSD (P= 05)			5,98	2,57	7,81	1,18
	Standard Deviation			4,07	1,75	5,31	0,80
	CV			12,23	39,9	53,91	82,48
	Bartlett's X2			0,48	4,736	2,656	0,789
	P(Bartlett's X2)			0,998	0,192	0,448	0,852
	Replicate F			5,207	0,930	0,324	1,224
	Replicate Prob(F)			0,0076	0,4438	0,8082	0,3258
	Treatment F			54,573	25,547	65,719	13,699
	Treatment Prob(F)			0,0001	0,0001	0,0001	0,0001

Means followed by same letter do not significantly differ (P= 05, Student-Newman-Keuls)
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL

Pest Code		PYRNTR	PYRNTR	PYRNTR	PYRNTR		
Pest Name		Tan spot of>	Tan spot of>	Tan spot of>	Tan spot of>		
Crop Code		TRZAW	TRZAW	TRZAW	TRZAW		
Crop Name		Winter wheat	Winter wheat	Winter wheat	Winter wheat		
Part Rated		FLAGLE P	FLAGLE P	FLM11 P	FLM11 P		
Rating Date		24/6/08	24/6/08	24/6/08	24/6/08		
Rating Data Type		PESINC	PESSEV	PESINC	PESSEV		
Rating Unit		%	%	%	%		
Crop Stage		75	75	75	75		
Tri-Eval Interval		17 DA-B	17 DA-B	17 DA-B	17 DA-B		
ARM Action Codes							
Tri	Treatment	Rate	Unit	40	41	42	43
No	Name	Rate	Unit				
1	Untreated			82,5 a	10,0 a	100,0 a	17,5 a
2		2,5	l/ha	30,0 ab	3,0 b	35,0 b	7,5 b
		2,5	l/ha				
3		2,0	l/ha	55,0 ab	5,0 ab	62,5 ab	10,0 ab
		2,0	l/ha				
4	Opus Top	1,5	l/ha	30,0 ab	4,3 b	35,0 b	5,0 b
	Opus Top	1,5	l/ha				
5		1,25	l/ha	45,0 ab	5,0 ab	62,5 ab	10,0 ab
		1,25	l/ha				
6		1,0	l/ha	67,5 ab	5,0 ab	70,0 ab	7,5 b
		1,0	l/ha				
7	Orius P	1,5	l/ha	20,0 b	2,8 b	35,0 b	5,0 b
	Orius P	1,5	l/ha				
8		1,0	l/ha	87,5 a	10,0 a	87,5 a	13,8 ab
		1,0	l/ha				
LSD (P= 05)				39,23	3,53	27,68	6,40
Standard Deviation				26,67	2,40	18,82	4,35
CV				51,11	42,67	30,89	45,66
Bartlett's X2				3,809	5,103	2,361	6,797
P(Bartlett's X2)				0,801	0,277	0,884	0,079
Replicate F				1,914	0,607	2,902	0,811
Replicate Prob(F)				0,1583	0,6175	0,0589	0,5018
Treatment F				3,599	5,603	6,994	3,955
Treatment Prob(F)				0,0106	0,0010	0,0002	0,0065

Means followed by same letter do not significantly differ (P= .05, Student-Newman-Keuls)

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL

7.1.3 *Puccinia recondita f. sp. tritici*

Pest Code	PUCCRT	PUCCRT	PUCCRT	PUCCRT			
Pest Name	Brown rust >	Brown rust >	Brown rust >	Brown rust >			
Crop Code	TRZAW	TRZAW	TRZAW	TRZAW			
Crop Name	Winter wheat	Winter wheat	Winter wheat	Winter wheat			
Part Rated	FLAGLE P	FLAGLE P	FLMI1 P	FLMI1 P			
Rating Date	24/6/08	24/6/08	24/6/08	24/6/08			
Rating Data Type	PESINC	PESSEV	PESINC	PESSEV			
Rating Unit	%	%	%	%			
Crop Stage	75	75	75	75			
Tri-Eval Interval	17 DA-B	17 DA-B	17 DA-B	17 DA-B			
ARM Action Codes							
Tri No.	Treatment Name	Rate	Unit	32	33	34	35
1	Untreated			72.5 a	15.0 a	18.8 a	60.0 a
2		2.5	l/ha	0.0 b	0.0 b	0.0 b	0.0 b
3		2.5	l/ha				
		2.0	l/ha	0.0 b	0.0 b	1.3 b	5.0 b
4	Opus Top	1.5	l/ha	0.0 b	0.0 b	0.0 b	0.0 b
	Opus Top	1.5	l/ha				
5		1.25	l/ha	0.0 b	0.0 b	1.3 b	2.5 b
		1.25	l/ha				
6		1.0	l/ha	0.0 b	0.0 b	0.0 b	0.0 b
		1.0	l/ha				
7	Orius P	1.5	l/ha	0.0 b	0.0 b	0.0 b	0.0 b
	Orius P	1.5	l/ha				
8		1.0	l/ha	2.5 b	1.3 b	0.0 b	0.0 b
		1.0	l/ha				
LSD (P=.05)				22.32	5.82	8.96	26.64
Standard Deviation				15.18	3.96	6.09	18.11
CV				161.89	194.83	229.28	214.69
Bartlett's X2				8.615	4.834	12.705	13.304
P(Bartlett's X2)				0.003*	0.028*	0.002*	0.001*
Replicate F				1.031	0.848	0.695	0.695
Replicate Prob(F)				0.3991	0.4832	0.5653	0.5653
Treatment F				11.310	7.062	4.595	5.332
Treatment Prob(F)				0.0001	0.0002	0.0030	0.0013

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL

7.1.4 *Septoria tritici*

Pest Code	SEPTTR	SEPTTR	SEPTTR	SEPTTR	SEPTTR	SEPTTR			
Pest Name	Speckled le>	Speckled le>	Speckled le>	Speckled le>	Speckled le>	Speckled le>			
Crop Code	TRZAW	TRZAW	TRZAW	TRZAW	TRZAW	TRZAW			
Crop Name	Winter wheat	Winter wheat	Winter wheat	Winter wheat	Winter wheat	Winter wheat			
Part Rated	PLANT P	PLANT P	FLAGLE P	FLAGLE P	FLMI1 P	FLMI1 P			
Rating Date	26/5/08	26/5/08	24/6/08	24/6/08	24/6/08	24/6/08			
Rating Data Type	PESINC	PESSEV	PESINC	PESSEV	PESINC	PESSEV			
Rating Unit	%	%	%	%	%	%			
Crop Stage	45	45	75	75	75	75			
Tri-Eval Interval	18 DA-A	18 DA-A	17 DA-B	17 DA-B	17 DA-B	17 DA-B			
ARM Action Codes									
Tri Treatment No.	Treatment Name	Rate	Unit	18	19	36	37	38	39
1	Untreated			10,0 a	5,0 a	10,0 a	80,0 a	42,5 a	100,0 a
2		2,5	l/ha	1,8 b	1,8 ab	1,8 b	22,5 b	7,5 b	60,0 cd
		2,5	l/ha						
3		2,0	l/ha	1,8 b	1,8 ab	5,0 b	17,5 b	12,5 b	57,5 cd
		2,0	l/ha						
4	Opus Top	1,5	l/ha	1,3 b	1,3 b	4,3 b	15,0 b	8,8 b	45,0 d
	Opus Top	1,5	l/ha						
5		1,25	l/ha	0,5 b	0,5 b	3,0 b	22,5 b	11,3 b	70,0 bcd
		1,25	l/ha						
6		1,0	l/ha	1,5 b	2,0 ab	6,3 b	45,0 b	20,0 b	87,5 abc
		1,0	l/ha						
7	Orius P	1,5	l/ha	2,3 b	1,0 b	3,0 b	6,3 b	17,5 b	57,5 cd
	Orius P	1,5	l/ha						
8		1,0	l/ha	1,3 b	0,5 b	11,3 a	77,5 a	35,0 a	95,0 ab
		1,0	l/ha						
LSD (P=.05)				5,00	2,61	3,07	28,14	11,93	21,51
Standard Deviation				3,40	1,77	2,09	19,13	8,11	14,62
CV				134,43	103,27	37,55	53,46	41,86	20,43
Bartlett's X2				15,48	5,237	0,906	13,483	15,837	3,47
P(Bartlett's X2)				0,03*	0,514	0,97	0,061	0,027*	0,748
Replicate F				0,132	0,433	0,411	4,266	1,552	0,833
Replicate Prob(F)				0,9398	0,7315	0,7470	0,0168	0,2306	0,4907
Treatment F				3,235	2,640	10,768	9,012	9,991	7,614
Treatment Prob(F)				0,0172	0,0400	0,0001	0,0001	0,0001	0,0001

Means followed by same letter do not significantly differ (P= .05, Student-Newman-Keuls)

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

7.1.5 Pest Index and Efficacy
Erysiphe graminis

Pest Code		ERYSGT	ERYSGT	ERYSGT	ERYSGT	ERYSGT		
Pest Name		Powdery mil>	Powdery mil>	Powdery mil>	Powdery mil>	Powdery mil>		
Crop Code		TRZAW	TRZAW	TRZAW	TRZAW	TRZAW		
Crop Name		Winter wheat	Winter wheat	Winter wheat	Winter wheat	Winter wheat		
Part Rated		PLANT P	PLANT P	FLMI3 P	FLMI3 P	FLMI1 P		
Rating Date		26/5/08	26/5/08	7/6/08	7/6/08	24/6/08		
Rating Data Type		DISIND	DISIND	DISIND	DISIND	DISIND		
Rating Unit								
Crop Stage		45	45	61	61	75		
Tri-Eval Interval		18 DA-A	18 DA-A	0 DA-B	0 DA-B	17 DA-B		
ARM Action Codes		APC T3	APC TS[55]	APC T4	APC TS[56]	APC T5		
Tri No.	Treatment Name	Rate	Unit	55	58	56	59	57
1	Untreated			48,8 a (0,0%)	46,52337730 a (0,0%)	200,0 a (0,0%)	178,70157121 a (0,0%)	262,5 a (0,0%)
2		2,5	l/ha	0,0 b (100,0%)	0,00000007 b (100,0%)	15,0 b (92,5%)	8,14495168 b (95,4%)	0,0 b (100,0%)
3		2,0	l/ha	0,0 b (100,0%)	0,00000007 b (100,0%)	18,8 b (90,6%)	11,00956836 b (93,8%)	0,0 b (100,0%)
4	Opus Top	1,5	l/ha	0,0 b (100,0%)	0,00000007 b (100,0%)	8,3 b (96,9%)	2,71401742 b (98,5%)	0,0 b (100,0%)
5		1,25	l/ha	0,0 b (100,0%)	0,00000007 b (100,0%)	0,0 b (100,0%)	0,00000007 b (100,0%)	0,0 b (100,0%)
6		1,0	l/ha	0,0 b (100,0%)	0,00000007 b (100,0%)	37,5 b (81,3%)	26,62217597 b (85,1%)	0,0 b (100,0%)
7	Orius P	1,5	l/ha	0,0 b (100,0%)	0,00000007 b (100,0%)	25,0 b (87,5%)	25,00000059 b (86,0%)	0,0 b (100,0%)
8		1,0	l/ha	0,0 b (100,0%)	0,00000007 b (100,0%)	5,0 b (97,5%)	2,26308583 b (98,7%)	225,0 ab (14,3%)
LSD (P= 05)				11,70	0,8959808051	84,00	4,5317315821	155,72
Standard Deviation				7,95	0,6091866511	57,11	3,0811713441	105,87
CV				130,54	41,28	148,58	72,2	173,74
Bartlett's X2				0,0	0,0	28,105	3,856	0,54
P(Bartlett's X2)						0,001*	0,57	0,462
Replicate F				1,000	1,000	0,645	0,450	1,754
Replicate Prob(F)				0,4123	0,4123	0,5945	0,7200	0,1868
Treatment F				18,778	50,963	5,405	6,788	4,579
Treatment Prob(F)				0,0001	0,0001	0,0012	0,0003	0,0031

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 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL

ARM Action Codes	
T3	= [12]*[13]
TS[55]	= SQR([55] + .5)
T4	= [22]*[23]
TS[56]	= SQR([56] + .5)
T5	= [30]*[31]

Drechslera tritici-repentis

Pest Code	PYRNTR	PYRNTR	PYRNTR	PYRNTR	PYRNTR	PYRNTR	
Pest Name	Tan spot of-	Tan spot of-	Tan spot of-	Tan spot of-	Tan spot of-	Tan spot of-	
Crop Code	TRZAW	TRZAW	TRZAW	TRZAW	TRZAW	TRZAW	
Crop Name	Winter wheat	Winter wheat	Winter wheat	Winter wheat	Winter wheat	Winter wheat	
Part Rated	PLANT P	PLANT P	FLMI1 P	FLMI1 P	FLAGLE P	FLAGLE P	
Rating Date	26/5/08	26/5/08	7/6/08	7/6/08	7/6/08	7/6/08	
Rating Data Type	DISIND	DISIND	DISIND	DISIND	DISIND	DISIND	
Rating Unit							
Crop Stage	45	45	61	61	61	61	
Tri-Eval Interval	18 DA-A	18 DA-A	0 DA-B	0 DA-B	0 DA-B	0 DA-B	
ARM Action Codes	APC T9	TL[66] APC	APC T10	APC TS[67]	APC T11	APC TS[68]	
Tri Treatment	Rate						
No. Name	Rate Unit	66	71	67	72	68	73
1 Untreated		431.3 a (0.0%)	274.4329193 a (0.0%)	1000.0 a (0.0%)	990.7742690 a (0.0%)	275.0 a (0.0%)	261.96599910 a (0.0%)
2	2.5 l/ha	187.5 b (56.5%)	117.4373668 ab (57.2%)	52.5 b (93.8%)	62.0477815 b (93.7%)	0.0 b (100.0%)	0.0000007 b (100.0%)
3	2.0 l/ha	52.5 b (87.8%)	40.2300341 b (85.3%)	60.0 b (94.0%)	57.7591343 b (94.2%)	0.0 b (100.0%)	0.0000007 b (100.0%)
4 Opus Top	1.5 l/ha	38.8 b (91.0%)	30.9005768 b (88.7%)	77.5 b (92.3%)	72.5518490 b (92.7%)	5.0 b (96.2%)	2.26308583 b (99.1%)
5	1.25 l/ha	37.5 b (91.3%)	35.4142568 b (87.1%)	80.0 b (92.0%)	80.0000060 b (91.9%)	0.0 b (100.0%)	0.0000007 b (100.0%)
6	1.0 l/ha	50.0 b (88.4%)	49.9999783 b (81.8%)	111.3 b (88.9%)	104.1469144 b (89.5%)	17.5 b (93.6%)	13.26248874 b (94.9%)
7 Orus P	1.5 l/ha	40.0 b (90.7%)	31.4479650 b (88.5%)	47.5 b (95.3%)	47.1529016 b (95.2%)	0.0 b (100.0%)	0.0000007 b (100.0%)
8	1.0 l/ha	50.0 b (88.4%)	46.6136865 b (83.0%)	112.5 b (88.8%)	111.5567967 b (88.7%)	10.0 b (96.4%)	8.07836709 b (96.9%)
LSD (P= 05)		234.35	0.51810383t	124.82	3.11658747t	63.35	2.864707280t
Standard Deviation		159.34	0.35226417t	84.86	2.11900017t	43.08	1.947744207t
CV		143.63	20.0	43.77	18.37	112.07	57.01
Bartlett's X2		49.428	4.794	35.566	11.792	25.029	3.236
P(Bartlett's X2)		0.001*	0.57	0.001*	0.067	0.001*	0.357
Replicate F		1.949	0.839	0.434	0.501	0.862	0.708
Replicate Prob(F)		0.1526	0.4677	0.7309	0.6857	0.4664	0.5582
Treatment F		3.037	3.492	59.222	59.294	19.783	29.553
Treatment Prob(F)		0.0227	0.0122	0.0001	0.0001	0.0001	0.0001

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Mean comparisons performed only when ANOV Treatment P(F) is significant at mean comparison OSL.

ARM Action Codes

T9 = [16]^[17]

TL[66] = LOG([66] + 1)

T10 = [24]^[25]

TS[67] = SQR([67] + .5)

T11 = [26]^[27]

TS[68] = SQR([68] + .5)

Pest Code		PYRNTR	PYRNTR	PYRNTR
Pest Name		Tan spot of-	Tan spot of-	Tan spot of-
Crop Code		TRZAW	TRZAW	TRZAW
Crop Name		Winter wheat	Winter wheat	Winter wheat
Part Rated		FLAGLE P	FLAGLE P	FLM11 P
Rating Date		24/6/08	24/6/08	24/6/08
Rating Data Type		DISIND	DISIND	DISIND
Rating Unit				
Crop Stage		75	75	75
Tri-Eval Interval		17 DA-B	17 DA-B	17 DA-B
ARM Action Codes		APC T12	APC TS[69]	APC T13
Tri Treatment	Rate			
No.	Name	Rate	Unit	
1	Untreated			
		762,5 a		117,5 a
		(0,0%)		(0,0%)
2		142,5 b		42,5 c
	2,5 l/ha			
	2,5 l/ha	(81,3%)		(63,8%)
3		275,0 b		72,5 bc
	2,0 l/ha			
	2,0 l/ha	(63,9%)		(38,3%)
4	Opus Top	142,5 b		40,0 c
	Opus Top			
	1,5 l/ha	(81,3%)		(66,0%)
5		225,0 b		72,5 bc
	1,25 l/ha			
	1,25 l/ha	(70,5%)		(38,3%)
6		337,5 b		77,5 bc
	1,0 l/ha			
	1,0 l/ha	(55,7%)		(34,0%)
7	Orius P	47,5 b		40,0 c
	Orius P			
	1,5 l/ha	(93,8%)		(66,0%)
8		912,5 a		101,3 ab
	1,0 l/ha			
	1,0 l/ha	(-19,7%)		(13,8%)
LSD (P= 05)		311,59		28,95
Standard Deviation		211,85		19,68
CV		59,57		27,93
Bartlett's X2		15,735		4,119
P(Bartlett's X2)		0,028*		0,766
Replicate F		2,011		3,277
Replicate Prob(F)		0,1433		0,0412
Treatment F		8,726		8,638
Treatment Prob(F)		0,0001		0,0001

Means followed by same letter do not significantly differ (P= .05, Student-Newman-Keuls)

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Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL

ARM Action Codes

T12 = [40]+[41]

TS[69] = SQR([69] + .5)

T13 = [42]+[43]

Puccinia recondita f. sp. tritici

		PUCCRT	PUCCRT	PUCCRT	PUCCRT		
Pest Code		Brown rust >	Brown rust >	Brown rust >	Brown rust >		
Pest Name		TRZAW	TRZAW	TRZAW	TRZAW		
Crop Code		FLAGLE P	FLAGLE P	FLMI1 P	FLMI1 P		
Part Rated		24/6/08	24/6/08	24/6/08	24/6/08		
Rating Date		DISIND	DISIND	DISIND	DISIND		
Rating Data Type		75	75	75	75		
Crop Stage		17 DA-B	17 DA-B	17 DA-B	17 DA-B		
Trt-Eval Interval		APC T14	APC TL[75]	APC T15	APC TL[76]		
ARM Action Codes							
Trt No.	Treatment Name	Rate	Unit	75	77	76	78
1	Untreated			1337,5 a (0,0%)	653,9568525 a (0,0%)	1650,0 a (0,0%)	262,3739276 a (0,0%)
2		2,5	l/ha	0,0 b (100,0%)	0,0000000 b (100,0%)	0,0 b (100,0%)	0,0000000 b (100,0%)
3		2,0	l/ha	0,0 b (100,0%)	0,0000000 b (100,0%)	25,0 b (98,5%)	2,1701536 b (99,2%)
4	Opus Top	1,5	l/ha	0,0 b (100,0%)	0,0000000 b (100,0%)	0,0 b (100,0%)	0,0000000 b (100,0%)
5		1,25	l/ha	0,0 b (100,0%)	0,0000000 b (100,0%)	12,5 b (99,2%)	1,6723450 b (99,4%)
6		1,0	l/ha	0,0 b (100,0%)	0,0000000 b (100,0%)	0,0 b (100,0%)	0,0000000 b (100,0%)
7	Orius P	1,5	l/ha	0,0 b (100,0%)	0,0000000 b (100,0%)	0,0 b (100,0%)	0,0000000 b (100,0%)
8		1,0	l/ha	12,5 b (99,1%)	1,6723450 b (99,7%)	0,0 b (100,0%)	0,0000000 b (100,0%)
LSD (P= .05)				654,07	0,596501291	926,97	1,146335841
Standard Deviation				444,71	0,405567421	630,25	0,779405671
CV				263,53	100,04	298,79	186,21
Bartlett's X2				18,952	0,027	35,8	1,435
P(Bartlett's X2)				0,001*	0,869	0,001*	0,488
Replicate F				0,987	1,086	0,955	0,330
Replicate Prob(F)				0,4179	0,3765	0,4323	0,8034
Treatment F				4,511	23,619	3,406	4,601
Treatment Prob(F)				0,0033	0,0001	0,0137	0,0030

Means followed by same letter do not significantly differ (P= 05, Student-Newman-Keuls)

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Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL

ARM Action Codes

T14 = [32]*[33]
 TL[75] = LOG([75]+ 1)
 T15 = [34]*[35]
 TL[76] = LOG([76]+ 1)

Septoria tritici

Pest Code	SEPTTR	SEPTTR	SEPTTR	SEPTTR	SEPTTR	SEPTTR
Pest Name	Speckled le>	Speckled le>	Speckled le>	Speckled le>	Speckled le>	Speckled le>
Crop Code	TRZAW	TRZAW	TRZAW	TRZAW	TRZAW	TRZAW
Crop Name	Winter wheat	Winter wheat	Winter wheat	Winter wheat	Winter wheat	Winter wheat
Part Rated	PLANT P	PLANT P	FLAGLE P	FLAGLE P	FLMI1 P	FLMI1 P
Rating Date	26/5/08	26/5/08	24/6/08	24/6/08	24/6/08	24/6/08
Rating Data Type	DISIND	DISIND	DISIND	DISIND	DISIND	DISIND
Rating Unit						
Crop Stage	45	45	75	75	75	75
Tri-Eval Interval	18 DA-A	18 DA-A	17 DA-B	17 DA-B	17 DA-B	17 DA-B
ARM Action Codes	T6	APC TS[60]	T7	APC TS[61]	T8	APC TS[62]
Tn Treatment						
No. Name						
Rate						
Unit						
	60	63	61	64	62	65
1 Untreated	50.0 a	45,84481126 a (0,0%)	800.0 a	742,76905621 a (0,0%)	4250.0 a	4123,3739475 a (0,0%)
2 [REDACTED] 2,5 l/ha	7,3 b	4,10669559 b (91,0%)	75.0 b	40,45675301 bc (94,6%)	475.0 b	445,2650592 c (89,2%)
3 [REDACTED] 2,0 l/ha	7,3 b	4,10669654 b (91,0%)	87,5 b	82,79064243 bc (88,9%)	775.0 b	716,6929428 bc (82,6%)
4 Opus Top 1,5 l/ha	6,3 b	2,71401814 b (94,1%)	67,5 b	59,59429765 bc (92,0%)	412,5 b	393,3580410 c (90,5%)
5 [REDACTED] 1,25 l/ha	1,0 b	0,62499994 b (98,6%)	105,0 b	68,92986987 bc (90,7%)	775,0 b	742,8563365 bc (82,0%)
6 [REDACTED] 1,0 l/ha	4,0 b	3,36635862 b (92,7%)	287,5 b	260,94604050 b (64,9%)	1750,0 b	1703,1035639 b (58,7%)
7 Orius P 1,5 l/ha	4,5 b	3,08161313 b (93,3%)	27,5 b	20,11193477 c (97,3%)	1100,0 b	981,8415899 bc (76,2%)
8 [REDACTED] 1,0 l/ha	2,5 b	1,29673291 b (97,2%)	837,5 a	834,88570361 a (-12,4%)	3400,0 a	3269,8184422 a (20,7%)
LSD (P=.05)	23,05	2,682119876t	232,71	7,013723598t	1261,82	13,60256045t
Standard Deviation	15,67	1,823601071t	158,22	4,768703938t	857,92	9,24852178t
CV	151,51	76,17	55,33	35,17	53,05	25,6
Bartlett's X2	29,053	6,047	25,676	10,12	18,313	4,853
P(Bartlett's X2)	0,001*	0,534	0,001*	0,182	0,011*	0,678
Replicate F	0,169	0,060	2,536	3,379	1,299	1,748
Replicate Prob(F)	0,9163	0,9803	0,0843	0,0374	0,3010	0,1880
Treatment F	4,262	4,001	18,252	16,166	11,311	12,950
Treatment Prob(F)	0,0045	0,0063	0,0001	0,0001	0,0001	0,0001

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 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL

ARM Action Codes	
T6 =	{18}*{19}
TS[60] =	SQR({60} + 5)
T7 =	{36}*{37}
TS[61] =	SQR({61} + .5)
T8 =	{38}*{39}
TS[62] =	SQR({62} + .5)

7.1.6 Infection in %

The infection [%] was calculated:

$$\text{pest incidence} \times \text{pest severity} = \text{index of infection}/100 = \text{infection in \%}$$

Erysiphe graminis

Pest Code			ERYSGT	ERYSGT	ERYSGT	ERYSGT
Pest Name			Powdery mil>	Powdery mil>	Powdery mil>	Powdery mil>
Crop Code			TRZAW	TRZAW	TRZAW	TRZAW
Crop Name			Winter wheat	Winter wheat	Winter wheat	Winter wheat
Part Rated			PLANT P	FLMI3 P	FLMI3 P	FLMI1 P
Rating Date			26/5/08	7/6/08	7/6/08	24/6/08
Rating Data Type			INFECT	INFECT	INFECT	INFECT
Rating Unit			percent	percent	percent	percent
Crop Stage			45	61	61	75
Tri-Eval Interval			18 DA-A	0 DA-B	0 DA-B	17 DA-B
ARM Action Codes			T16	T17	TL[80]	T18
Tri No.	Treatment Name	Rate	79	80	90	81
1	Untreated		0,488 a	2,000 a	1,738613183 a	2,63 a
2		2,5 l/ha	0,000 b	0,150 b	0,133368148 b	0,00 b
		2,5 l/ha				
3		2,0 l/ha	0,000 b	0,188 b	0,170173707 b	0,00 b
		2,0 l/ha				
4	Opus Top	1,5 l/ha	0,000 b	0,063 b	0,057371264 b	0,00 b
	Opus Top	1,5 l/ha				
5		1,25 l/ha	0,000 b	0,000 b	0,000000000 b	0,00 b
		1,25 l/ha				
6		1,0 l/ha	0,000 b	0,375 b	0,329573992 b	0,00 b
		1,0 l/ha				
7	Orius P	1,5 l/ha	0,000 b	0,250 b	0,250000010 b	0,00 b
	Orius P	1,5 l/ha				
8		1,0 l/ha	0,000 b	0,050 b	0,046635159 b	2,25 ab
		1,0 l/ha				
LSD (P=.05)			0,1170	0,8400	0,1536359345	1,557
Standard Deviation			0,0795	0,5711	0,10445866291	1,059
CV			130,54	148,58	101,32	173,74
Bartlett's X2			0,0	28,105	10,429	0,54
P(Bartlett's X2)				0,001*	0,064	0,462
Replicate F			1,000	0,645	0,406	1,754
Replicate Prob(F)			0,4123	0,5945	0,7504	0,1868
Treatment F			18,778	5,405	7,315	4,579
Treatment Prob(F)			0,0001	0,0012	0,0002	0,0031

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

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Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

ARM Action Codes

- T16 = [C55]/100
- T17 = [C56]/100
- TL[80] = LOG([80]+ 1)
- T18 = [C57]/100

Drechslera tritici-repentis

Pest Code	PYRNTR	PYRNTR	PYRNTR	PYRNTR	PYRNTR	PYRNTR	PYRNTR		
Pest Name	Tan spot of>	Tan spot of>	Tan spot of>	Tan spot of>	Tan spot of>	Tan spot of>	Tan spot of>		
Crop Code	TRZAW	TRZAW	TRZAW	TRZAW	TRZAW	TRZAW	TRZAW		
Crop Name	Winter wheat	Winter wheat	Winter wheat	Winter wheat	Winter wheat	Winter wheat	Winter wheat		
Part Rated	PLANT P	FLMI1 P	FLMI1 P	FLAGLE P	FLAGLE P	FLAGLE P	FLAGLE P		
Rating Date	26/5/08	7/6/08	7/6/08	7/6/08	7/6/08	24/6/08	24/6/08		
Rating Data Type	INFECT	INFECT	INFECT	INFECT	INFECT	INFECT	INFECT		
Rating Unit	percent	percent	percent	percent	percent	percent	percent		
Crop Stage	45	61	61	61	61	75	75		
Trit-Eval Interval	18 DA-A	0 DA-B	0 DA-B	0 DA-B	0 DA-B	17 DA-B	17 DA-B		
ARM Action Codes	T22	T23	TL[86]	T24	TA[87]	T25	TL[88]		
Treatment No.	Rate	Unit	85	86	95	87	96	88	97
1 Untreated			4.313	10.000 a	9.82947352 a	2.75 a	2.6225264 a	7.63 a	7.429493693 a
2 [REDACTED]	2.5 l/ha		1.875	0.625 b	0.62144029 b	0.00 b	0.0000000 b	1.43 b	0.967989840 bc
3 [REDACTED]	2.0 l/ha		0.525	0.600 b	0.58252841 b	0.00 b	0.0000000 b	2.75 b	2.384736300 bc
4 Opus Top	1.5 l/ha		0.385	0.775 b	0.73012318 b	0.05 b	0.0125078 b	1.43 b	1.166966317 bc
5 [REDACTED]	1.25 l/ha		0.375	0.800 b	0.80000009 b	0.00 b	0.0000000 b	2.25 b	1.738613183 bc
6 [REDACTED]	1.0 l/ha		0.500	1.113 b	1.03885327 b	0.18 b	0.1218425 b	3.38 b	3.204482637 ab
7 Orius P	1.5 l/ha		0.400	0.475 b	0.47270866 b	0.00 b	0.0000000 b	0.48 b	0.441687002 c
8 [REDACTED]	1.0 l/ha		0.500	1.125 b	1.11474275 b	0.10 b	0.0728720 b	9.13 a	8.188446864 a
LSD (P= 05)			2.3435	1.2482	0.1151810701	0.634	1.756866751	3.116	0.30023223181
Standard Deviation			1.5934	0.8486	0.0783128071	0.431	1.194512011	2.119	0.20413101271
CV			143.63	43.77	22.87	112.07	70.75	59.57	38.26
Bartlett's X2			49.428	35.566	9.736	25.029	2.189	15.735	6.03
P(Bartlett's X2)			0.001*	0.001*	0.136	0.001*	0.534	0.028*	0.536
Replicate F			1.949	0.434	0.721	0.882	0.714	2.011	2.911
Replicate Prob(F)			0.1526	0.7309	0.5504	0.4664	0.5547	0.1433	0.0584
Treatment F			3.037	59.222	52.867	19.783	28.375	8.726	8.128
Treatment Prob(F)			0.0227	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P= 05, Student-Newman-Keuls)
 t=Mean descriptions are reported in transformed data units, and are not de-transformed.
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
 The data from assessment 18 DA-A are inhomogeneous thus no AOV is possible

Puccinia recondita f. sp. tritici

Trt	Treatment	Rate	98	99
No.	Name	Rate Unit		
1	Untreated		13,38	16,50
2			0,00	0,00
3			0,00	0,25
4	Opus Top	1,5 l/ha	0,00	0,00
	Opus Top	1,5 l/ha		
5			0,00	0,13
6			0,00	0,00
7	Orius P	1,5 l/ha	0,00	0,00
	Orius P	1,5 l/ha		
8			0,13	0,00

The data are inhomogeneous thus no AOV is possible

ARM Action Codes

T27 = [C75]/100

T28 = [C76]/100

Septoria tritici

Pest Code	SEPTTR	SEPTTR	SEPTTR	SEPTTR	SEPTTR	SEPTTR		
Pest Name	Speckled le>	Speckled le>	Speckled le>	Speckled le>	Speckled le>	Speckled le>		
Crop Code	TRZAW	TRZAW	TRZAW	TRZAW	TRZAW	TRZAW		
Crop Name	Winter wheat	Winter wheat	Winter wheat	Winter wheat	Winter wheat	Winter wheat		
Part Rated	PLANT P	PLANT P	FLAGLE P	FLAGLE P	FLMI1 P	FLMI1 P		
Rating Date	26/5/08	26/5/08	24/6/08	24/6/08	24/6/08	24/6/08		
Rating Data Type	INFECT	INFECT	INFECT	INFECT	INFECT	INFECT		
Rating Unit	percent	percent	percent	percent	percent	percent		
Crop Stage	45	45	75	75	75	75		
Tri-Eval Interval	18 DA-A	18 DA-A	17 DA-B	17 DA-B	17 DA-B	17 DA-B		
ARM Action Codes	T19	TA[82]	T20	TL[83]	T21	TL[84]		
Tri	Treatment	Rate						
No.	Name	Rate Unit	82	91	83	92	84	93
1	Untreated		0.500 a	0.4582333 a	8.00 a	6.949231843 a	42.50 a	39.853786639 a
2		2.5 l/ha	0.073 b	0.0306413 b	0.75 b	0.565084633 c	4.75 b	4.270710419 d
3		2.0 l/ha	0.073 b	0.0306413 b	0.88 b	0.831420922 bc	7.75 b	6.784410678 cd
		2.0 l/ha						
4	Opus Top	1.5 l/ha	0.063 b	0.0156372 b	0.68 b	0.611855032 c	4.13 b	3.820570851 d
	Opus Top	1.5 l/ha						
5		1.25 l/ha	0.010 b	0.0025003 b	1.05 b	0.800102970 bc	7.75 b	7.179077390 cd
		1.25 l/ha						
6		1.0 l/ha	0.040 b	0.0291448 b	2.88 b	2.499635708 b	17.50 b	16.606633893 bc
		1.0 l/ha						
7	Onus P	1.5 l/ha	0.045 b	0.0224354 b	0.28 b	0.254278089 c	11.00 b	8.974908773 cd
	Onus P	1.5 l/ha						
8		1.0 l/ha	0.025 b	0.0062520 b	8.38 a	8.328767656 a	34.00 a	31.399718564 ab
		1.0 l/ha						
LSD (P=.05)			0.2305	1.76259821t	2.327	0.2435267662t	12.618	0.2913108163t
Standard Deviation			0.1567	1.19840884t	1.582	0.1655763851t	8.579	0.1980652560t
CV			151.51	104.44	55.33	38.59	53.05	18.48
Bartlett's X2			29.053	3.921	25.676	10.689	18.313	1.248
P(Bartlett's X2)			0.001*	0.789	0.001*	0.153	0.011*	0.99
Replicate F			0.169	0.090	2.536	3.779	1.299	2.177
Replicate Prob(F)			0.9163	0.9646	0.0843	0.0259	0.3010	0.1209
Treatment F			4.262	3.596	18.252	16.655	11.311	12.388
Treatment Prob(F)			0.0045	0.0106	0.0001	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
 t=Mean descriptions are reported in transformed data units, and are not de-transformed.
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL

ARM Action Codes	
T19	= [60]/100
TA[82]	= Arcsine square root percent([82])
T20	= [61]/100
TL[83]	= LOG([83]+ 1)
T21	= [62]/100
TL[84]	= LOG([84]+ 1)

7.1.7 Green Leaf Area

Pest Code			
Pest Name			
Crop Code			TRZAW
Part Rated			PLANT C
Rating Date			24/6/08
Rating Data Type			GREENAREA
Crop Stage			75
Tri-Eval Interval			17 DA-B
ARM Action Codes			APOC TA[44]
Tri	Treatment	Rate	
No.	Name	Rate Unit	54
1	Untreated		60,2154983 b (100,0%)
2		2,5 l/ha	91,3967300 a
		2,5 l/ha	(151,8%)
3		2,0 l/ha	90,0000319 a
		2,0 l/ha	(149,5%)
4	Opus Top	1,5 l/ha	88,8322309 a
	Opus Top	1,5 l/ha	(147,5%)
5		1,25 l/ha	90,0000319 a
		1,25 l/ha	(149,5%)
6		1,0 l/ha	82,5708167 a
		1,0 l/ha	(137,1%)
7	Onus P	1,5 l/ha	91,3967300 a
	Onus P	1,5 l/ha	(151,8%)
8		1,0 l/ha	85,4612207 a
		1,0 l/ha	(141,9%)
LSD (P= 05)			5,39492280t
Standard Deviation			3,66806425t
CV			5,4
Bartlett's X2			7,015
P(Bartlett's X2)			0,22
Replicate F			0,492
Replicate Prob(F)			0,6915
Treatment F			16,152
Treatment Prob(F)			0,0001

Means followed by same letter do not significantly differ (P= 05, Student-Newman-Keuls)

t=Mean descriptions are reported in transformed data units, and are not de-transformed.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

ARM Action Codes

TA[44] = Arcsine square root percent([44])

7.1.8 Yield

Crop Code		TRZAW	TRZAW
Crop Name		Winter wheat	Winter wheat
Part Rated		GRAIN C	GRAIN C
Rating Date		26/7/08	14/8/08
Rating Data Type		YIELD	TGW
Rating Unit		DT/HA14%	G 14%
Crop Stage		99	99
Tri-Eval Interval		79 DA-A	98 DA-A
ARM Action Codes		APOC TY1	APOC T2
Tit No	Treatment Name	Rate	Unit
1	Untreated		
		48,7 c	39,5 b
		(100,0%)	(100,0%)
2		2,5 l/ha	57,3 ab
		2,5 l/ha	43,4 ab
		(117,7%)	(109,8%)
3		2,0 l/ha	59,9 a
		2,0 l/ha	43,2 ab
		(122,9%)	(109,2%)
4	Opus Top	1,5 l/ha	56,5 ab
	Opus Top	1,5 l/ha	44,0 ab
		(116,0%)	(111,2%)
5		1,25 l/ha	58,4 ab
		1,25 l/ha	45,4 a
		(119,9%)	(114,9%)
6		1,0 l/ha	57,1 ab
		1,0 l/ha	42,9 ab
		(117,3%)	(106,5%)
7	Orus P	1,5 l/ha	59,6 a
	Orus P	1,5 l/ha	44,5 ab
		(122,5%)	(112,5%)
8		1,0 l/ha	53,3 b
		1,0 l/ha	39,9 b
		(109,5%)	(100,9%)
LSD (P=,05)		3,89	3,18
Standard Deviation		2,64	2,17
CV		4,68	5,05
Bartlett's X2		5,162	7,856
P(Bartlett's X2)		0,64	0,364
Replicate F		6,309	2,106
Replicate Prob(F)		0,0035	0,1299
Treatment F		7,932	3,754
Treatment Prob(F)		0,0001	0,0086

Means followed by same letter do not significantly differ (P=,05, Student-Newman-Keuls)

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL

ARM Action Codes

TY1 = B 430233[C48]

T2 = [C51]*14[C52]

7.2 Single Values

7.2.1 Ground Cover

Crop Code				TRZAW
Crop Name				Winter wheat
Part Rated				PLANT C
Rating Date				8/5/08
Rating Data Type				GROUND
Rating Unit				%
Crop Stage				32
Tri-Eval Interval				0 DA-A
Tri	Treatment	Rate		
No.	Name	Rate	Unit	Plot
1	Untreated		101	100.0
			203	100.0
			307	100.0
			402	100.0
		Mean =		100.0

Crop Code				TRZAW	TRZAW	TRZAW	TRZAW
Crop Name				Winter wheat	Winter wheat	Winter wheat	Winter wheat
Part Rated				PLANT C	PLANT C	PLANT C	PLANT C
Rating Date				26/5/08	7/6/08	24/5/08	7/7/08
Rating Data Type				GROUND	GROUND	GROUND	GROUND
Rating Unit				%	%	%	%
Crop Stage				45	61	75	85
Tri-Eval Interval				18 DA-A	0 DA-B	17 DA-B	30 DA-B
Tri No.	Treatment Name	Rate	Plot	10	20	28	45
1	Untreated		101	100.0	100.0	100.0	100.0
			203	100.0	100.0	100.0	100.0
			307	100.0	100.0	100.0	100.0
			402	100.0	100.0	100.0	100.0
			Mean =	100.0	100.0	100.0	100.0
2	[REDACTED]	2.5 l/ha	102	100.0	100.0	100.0	100.0
			201	100.0	100.0	100.0	100.0
			303	100.0	100.0	100.0	100.0
			406	100.0	100.0	100.0	100.0
			Mean =	100.0	100.0	100.0	100.0
3	[REDACTED]	2.0 l/ha	103	100.0	100.0	100.0	100.0
			207	100.0	100.0	100.0	100.0
			306	100.0	100.0	100.0	100.0
			401	100.0	100.0	100.0	100.0
			Mean =	100.0	100.0	100.0	100.0
4	Opus Top	1.5 l/ha	104	100.0	100.0	100.0	100.0
			208	100.0	100.0	100.0	100.0
			301	100.0	100.0	100.0	100.0
			408	100.0	100.0	100.0	100.0
			Mean =	100.0	100.0	100.0	100.0
5	[REDACTED]	1.25 l/ha	105	100.0	100.0	100.0	100.0
			206	100.0	100.0	100.0	100.0
			302	100.0	100.0	100.0	100.0
			407	100.0	100.0	100.0	100.0
			Mean =	100.0	100.0	100.0	100.0
6	[REDACTED]	1.0 l/ha	106	100.0	100.0	100.0	100.0
			202	100.0	100.0	100.0	100.0
			305	100.0	100.0	100.0	100.0
			404	100.0	100.0	100.0	100.0
			Mean =	100.0	100.0	100.0	100.0
7	Orus P	1.5 l/ha	107	100.0	100.0	100.0	100.0
			204	100.0	100.0	100.0	100.0
			308	100.0	100.0	100.0	100.0
			405	100.0	100.0	100.0	100.0
			Mean =	100.0	100.0	100.0	100.0
8	[REDACTED]	1.0 l/ha	108	100.0	100.0	100.0	100.0
			205	100.0	100.0	100.0	100.0
			304	100.0	100.0	100.0	100.0
			403	100.0	100.0	100.0	100.0
			Mean =	100.0	100.0	100.0	100.0

7.2.2 Phytotoxicity

Crop Code				TRZAW	TRZAW	TRZAW	TRZAW
Crop Name				Winter wheat	Winter wheat	Winter wheat	Winter wheat
Part Rated				PLANT C	PLANT C	PLANT C	PLANT C
Rating Date				26/5/08	7/8/08	24/6/08	7/7/08
Rating Data Type				PHYGEN	PHYGEN	PHYGEN	PHYGEN
Rating Unit				%	%	%	%
Crop Stage				45	61	75	85
Trit-Eval Interval				18 DA-A	0 DA-B	17 DA-B	30 DA-B
Trit No.	Treatment Name	Rate	Plot	11	21	29	46
1	Untreated		101	0.0	0.0	0.0	0.0
			203	0.0	0.0	0.0	0.0
			307	0.0	0.0	0.0	0.0
			402	0.0	0.0	0.0	0.0
			Mean =		0.0	0.0	0.0
2	[REDACTED]	2.5 l/ha	102	0.0	0.0	0.0	0.0
		2.5 l/ha	201	0.0	0.0	0.0	0.0
			303	0.0	0.0	0.0	0.0
			406	0.0	0.0	0.0	0.0
			Mean =		0.0	0.0	0.0
3	[REDACTED]	2.0 l/ha	103	0.0	0.0	0.0	0.0
		2.0 l/ha	207	0.0	0.0	0.0	0.0
			306	0.0	0.0	0.0	0.0
			401	0.0	0.0	0.0	0.0
			Mean =		0.0	0.0	0.0
4	Opus Top	1.5 l/ha	104	0.0	0.0	0.0	0.0
		1.5 l/ha	208	0.0	0.0	0.0	0.0
			301	0.0	0.0	0.0	0.0
			408	0.0	0.0	0.0	0.0
			Mean =		0.0	0.0	0.0
5	[REDACTED]	1.25 l/ha	105	0.0	0.0	0.0	0.0
		1.25 l/ha	206	0.0	0.0	0.0	0.0
			302	0.0	0.0	0.0	0.0
			407	0.0	0.0	0.0	0.0
			Mean =		0.0	0.0	0.0
6	[REDACTED]	1.0 l/ha	106	0.0	0.0	0.0	0.0
		1.0 l/ha	202	0.0	0.0	0.0	0.0
			305	0.0	0.0	0.0	0.0
			404	0.0	0.0	0.0	0.0
			Mean =		0.0	0.0	0.0
7	Orius P	1.5 l/ha	107	0.0	0.0	0.0	0.0
		1.5 l/ha	204	0.0	0.0	0.0	0.0
			308	0.0	0.0	0.0	0.0
			405	0.0	0.0	0.0	0.0
			Mean =		0.0	0.0	0.0
8	[REDACTED]	1.0 l/ha	108	0.0	0.0	0.0	0.0
		1.0 l/ha	205	0.0	0.0	0.0	0.0
			304	0.0	0.0	0.0	0.0
			403	0.0	0.0	0.0	0.0
			Mean =		0.0	0.0	0.0

7.2.3 *Erysiphe graminis*

Pest Code		ERY-SGT	ERYSGT
Pest Name		Powdery mild	Powdery mild
Crop Code		TRZAW	TRZAW
Crop Name		Winter wheat	Winter wheat
Part Rate		PLANT P	PLANT P
Rating Date		8/5/08	8/5/08
Rating Date Type		PESINC	PESSEV
Rating Unit		%	%
Crop Stage		32	32
Tri-Eval Interval		0 DA-A	0 DA-A
ARM Action Codes			
Tri Treatment	Rate		
No. Name	Rate Unit Plot	2	3
1 Untreated	101	5.0	2.0
	203	5.0	2.0
	307	4.0	2.0
	402	5.0	5.0
	Mean =	4.75	2.8

7.4 Abbreviations

BBCH	Growth stages of mono- and dicotyledonous plants
DATA	Days after treatment A
DA-A	Days after treatment A
DATB	Days after treatment B
DA-B	Days after treatment B
DISIND	Disease index
ERYSGT	Blumeria (Erysiphe) graminis f. sp. tritici
FLAGLE	Flag leaf
FLMI1	Flag leaf -1
FLMI2	Flag leaf -2
FLMI3	Flag leaf -3
INFECT	Infection
PHYGEN	Phytotoxicity: general
PESINV	Pest incidence
PESSEV	Pest severity
PUCCRT	Puccinia recondita
PYRNTR	Pyrenophora (Helminthosporium) tritici-repentis
SEPTTR	Septoria tritici
TGW	Thousand grain weight
TRZAW	Triticum aestivum

Selectivity of herbicides in broad beans

1 Abstract

In a springtime cultivation of broad beans (*Vicia faba* cultivar Tilia) the selectivity of several herbicides was tested. In the trial pre emergence applications and applications at sixth leaf stage were conducted at normal and double doses. Product 1 (24% active ingredient a + 17.5% active ingredient b), Product 2 (455 g/l active ingredient c), Product 3 (720 g/l active ingredient d) and Product 4 (960 g/l Active ingredient e) were applied pre emergence. Product 5 (50 g/l active ingredient f). Product 6 (500 g/l active ingredient g), Product 3 (720 g/l active ingredient d) and Product 4 (960 g/l Active ingredient e) were applied at a fourth leaf stage.

The trial was sprinkled two days after the pre emergence application, this in order to have a good germination. The trial was four times assessed on phytotoxicity symptoms on the leaves, 16 days after application A and 13, 33 (at flowering) and 63 days after application B.. The assessments were assessed with a relative percentage of phytotoxicity symptoms per plot compared to untreated plots.

At the first assessment yellow and purple discoloration of the leaves was seen in the plots were Product 1 at the double doses was conducted. Until the start of the flowering stage were only in plots treated with Product 1 small burning symptoms seen. Later, after a rainy period, around the broad beans stage were 50% of the pods had reached their length (79 days after application A and 63 days after application B) increased the phytotoxicity symptoms in plots treated with Product 1 at normal and double dose. The plots treated with Product 1 at double dose were almost completely destroyed (98.8%). The normal dose also gave unacceptable phytotoxicity results, 37.5% of the plants were burned or destroyed.

At harvest the harvest weight of the pods and seed weight were collected. Also a sample of pods was taken and send to a lab to analyse the protein content. Due to the complete destruction of the plants in plots with the double dose of Product 1 was it impossible to collect data from these plots. The analysis of the other objects showed a loss of harvestable pods in the plots with Product 1 at the normal dose. No significant reductions in yield were seen in the other plots. The 1000 seed weight and protein content analysis did not showed a significant difference in the plots (Product 1 at double dose excluded from analysis).

It can be concluded that a pre emergence application of Product 1 at normal and double dose was not safe for the plant and led to yield losses and complete destruction at the double dose.



Figure 1: Phytotoxicity symptoms seen in Product 1 at normal dose and Product 1 at double dose, 79 days after application A and 63 days after application B, (b) l onptx



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Table 1. Treatments, tbl1onptx

Object	Product dose	Active ingredient dose	Active ingredient content	Applicaiton timing
1	Untreated Check			
2	Product 1	2,5 kg/ha	1040 g ai/ha 24 + 17,5 % aw/w active ingredient a + active ingredient b	pré emergence
3	Product 1	5 kg/ha	2080 g ai/ha 24 + 17,5 % aw/w active ingredient a + active ingredient b	pré emergence
4	Product 4	0,8 l/ha	770 g ai/ha 960 GA/L Active ingredient e	pré emergence
5	Product 4	1,6 l/ha	1540 g ai/ha 960 GA/L Active ingredient e	pré emergence
6	Product 3	1 l/ha	720 g ai/ha 720 GA/L active ingredient d	pré emergence
7	Product 3	2 l/ha	1440 g ai/ha 720 GA/L active ingredient d	pré emergence
8	Product 2	1,8 l/ha	820 g ai/ha 455 GA/L active ingredient c	pré emergence
9	Product 2	3,6 l/ha	1640 g ai/ha 455 GA/L active ingredient c	pré emergence
10	Product 3	0,5 l/ha	360 g ai/ha 720 GA/L active ingredient d	leaf stage: 4 leaves
11	Product 3	1 l/ha	720 g ai/ha 720 GA/L active ingredient d	leaf stage: 4 leaves
12	Product 4	0,5 l/ha	480 g ai/ha 960 GA/L Active ingredient e	leaf stage: 4 leaves
13	Product 4	1 l/ha	960 g ai/ha 960 GA/L Active ingredient e	leaf stage: 4 leaves
14	Product 5	1 l/ha	50 g ai/ha 50 GA/L active ingredient f	leaf stage: 4 leaves
15	Product 5	2 l/ha	100 g ai/ha 50 GA/L active ingredient f	leaf stage: 4 leaves
16	Product 6	0,1 l/ha	50 g ai/ha 500 GA/L active ingredient g	leaf stage: 4 leaves
17	Product 6	0,2 l/ha	100 g ai/ha 500 GA/L active ingredient g	leaf stage: 4 leaves



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3 Trial description

3.1 General trial information

Trial subject Selectivity of herbicides in broad beans
Trial ID Tb11onptx
GEP-trial Yes
Type of trial selectivity
Number tender 10-07a-crp
Date request trial consent n/a
Number of trial consent n/a
Number general trial G11-04
consent
Products conform general Product 1
trial consent Product 4
Product 3
Product 2
Product 5
Product 6

3.2 Trial performer

Name Proefstation voor de Groenteteelt
Address Duffelsesteenweg 101
2860 Sint-Katelijne-Waver
Director Raf De Vis
Study director Luc De Rooster
Trial coordinator Liesbeth Wachters
Phone 0032(0)15/30 00 60
Fax 0032(0)15/30 00 61
E-mail luc.de.rooster@proefstation.be / liesbeth.wachters@proefstation.be

3.3 Client information

Firm
Contact
Address
Phone
Fax
E-mail

3.4 Trial location

Name Etienne Rigo
Address Ferme de Mellemont 1, 1360 Thorembais les Beguines
Phone 0475 44 14 25
Soil name Sand
pH 7
% C 1,6
Soil fractions -
Previous crop Winter *Triticum*
Location see Appendix 1: trial plan



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3.5 Site description

Study design	Randomized Complete Blocks
Plot length (m)	7
Plot width (m)	3
Plot area (m ²)	21
Planting distance (cm)	45 cm between the row
Number of plants per plot	-
Number of objects	17
Number of parallels	4
Total number of plots	68
Total area of the trial (m ²)	1428

3.6 Crop information

Crop	<i>Vicia faba</i> = faba bean/ broad bean
Variety (firm)	Tilia Nunhems
Growing period	Spring-summer
Sowing date	23/4/2011
Planting method	field

3.7 Fertilization

<u>Date</u>	<u>Composition-dose per are</u>
10/7/2011	magnesium

3.8 General crop protection

	<u>Date</u>	<u>Product-dose per are (content active ingredient)</u>
Insecticide	10/7/2011	1,25 L/ha Product 7 (5 g/l active ingredient h + 100 g/l active ingredient i)
Insecticide	21/7/2011	1,5 L/ha Product 7 (5 g/l active ingredient h + 100 g/l active ingredient i)
Fungicide	21/7/2011	700 g/ha Product 8 (50 % active ingredient j)
Fungicide	21/7/2011	2 kg/ha Product 9 (4,5 % active ingredient k + 68 % active ingredient l)

3.9 Meteorological data

Source KMI-post, Post Ernage-Gembloux

Data See Treatment circumstances and Appendix 2: meteorological data

3.10 Destruction of the harvest

The harvest was destroyed in all objects

Date of crop destruction: 9/8/2011



4 Treatments

4.1 Treatment schedule

Table 2. Treatment schedule, tb1lonptx

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate Rate	Unit	Other Rate	Other Rate Unit	Appl Code	Spray Volume	Volume Unit
1	Untreated Check										
2	Product 1	41,5	%AW/W	WG	1040	g ai/ha	2,5	kg/ha	A	500	L/ha
3	Product 1	41,5	%AW/W	WG	2080	g ai/ha	5	kg/ha	A	500	L/ha
4	Product 4	960	GA/L	EC	770	g ai/ha	0,8	l/ha	A	500	L/ha
5	Product 4	960	GA/L	EC	1540	g ai/ha	1,6	l/ha	A	500	L/ha
6	Product 3	720	GA/L	EC	720	g ai/ha	1	l/ha	A	500	L/ha
7	Product 3	720	GA/L	EC	1440	g ai/ha	2	l/ha	A	500	L/ha
8	Product 2	455	GA/L	CS	820	g ai/ha	1,8	l/ha	A	500	L/ha
9	Product 2	455	GA/L	CS	1640	g ai/ha	3,6	l/ha	A	500	L/ha
10	Product 3	720	GA/L	EC	360	g ai/ha	0,5	l/ha	B	500	L/ha
11	Product 3	720	GA/L	EC	720	g ai/ha	1	l/ha	B	500	L/ha
12	Product 4	960	GA/L	EC	480	g ai/ha	0,5	l/ha	B	500	L/ha
13	Product 4	960	GA/L	EC	960	g ai/ha	1	l/ha	B	500	L/ha
14	Product 5	50	GA/L	EC	50	g ai/ha	1	l/ha	B	500	L/ha
15	Product 5	50	GA/L	EC	100	g ai/ha	2	l/ha	B	500	L/ha
16	Product 6	500	GA/L	SC	50	g ai/ha	0,1	l/ha	B	500	L/ha
17	Product 6	500	GA/L	SC	100	g ai/ha	0,2	l/ha	B	500	L/ha

- A spray application pre emergence (BBCH 01-08)
B spray application at 2-4 leaf stage (BBCH 12-14)

Additional treatment information:

- Product 1 = 24% active ingredient a + 17.5% active ingredient b
Product 2 = 455 g/l active ingredient c
Product 3 = 720 g/l active ingredient d
Product 4 = 960 g/l Active ingredient e
Product 5 = 50 g/l active ingredient f
Product 6 = 500 g/l active ingredient g

4.2 Treatment circumstances

Table 3. Application equipment, tb1 lonptx

Application code	A,B
Application method	spray treatment
Operating pressure (bar)	2
Nozzle type	Teejet XR
Nozzle size	110 03
Boom length (m)	1,5
Boom height (m)	0,4
Ground speed (km/u)	2,3
Incorporation equipment	-
Incorporation depth	-
Spray volume (l/ha)	500

Table 4. Treatment, environmental conditions, tb1 lonptx

Application code	A	B
Application date	26/4/2011	12/5/2011
Application performer	Mv, lv	Mv, lv
Start application	13:00	13:15
End application	15:00	15:00
Application method	Spray	Spray
Application placement	Foliar	Foliar
Average air temperature (°C)	22,2	18,6
Relative humidity (%)	39	49
Wind velocity (m/s)	3,4	4,4
Wind direction	North-East	North-East
Soil moisture (dry, wet, normal)	Dry	Dry
Cloud cover (%)	20	50
Precipitation 6 hours before the treatment (l/m ²)	0	0
Precipitation 6 hours after the treatment (l/m ²)	0	0

Table 5. Treatment, crop description, tb1 lonptx

Application code	A	B
Crop humidity (dry, wet, dew)	-	Dry
Crop condition (bad, moderate, good)	-	Good
Crop uniformity (bad, moderate, good)	-	Good
Crop stage (BBCH-scale)	-	14
Average crop height (cm)	-	6



4.3 Registration spray volume per plot

Amount spray volume (mix size) per plot: 1050ml/ plot

Table 6 Registration of spray volume per plot, tb1 lonptx

Application code	A	B
Spray volume in object 1, parallel 1(%)	90	94
Spray volume in object 1, parallel 2(%)	83	100
Spray volume in object 1, parallel 3(%)	93	95
Spray volume in object 1, parallel 4(%)	87	99
Spray volume in object 2, parallel 1(%)	93	
Spray volume in object 2, parallel 2(%)	98	
Spray volume in object 2, parallel 3(%)	101	
Spray volume in object 2, parallel 4(%)	93	
Spray volume in object 3, parallel 1(%)	87	
Spray volume in object 3, parallel 2(%)	90	
Spray volume in object 3, parallel 3(%)	91	
Spray volume in object 3, parallel 4(%)	95	
Spray volume in object 4, parallel 1(%)	98	
Spray volume in object 4, parallel 2(%)	97	
Spray volume in object 4, parallel 3(%)	92	
Spray volume in object 4, parallel 4(%)	99	
Spray volume in object 5, parallel 1(%)	101	
Spray volume in object 5, parallel 2(%)	93	
Spray volume in object 5, parallel 3(%)	97	
Spray volume in object 5, parallel 4(%)	110	
Spray volume in object 6, parallel 1(%)	99	
Spray volume in object 6, parallel 2(%)	96	
Spray volume in object 6, parallel 3(%)	96	
Spray volume in object 6, parallel 4(%)	100	
Spray volume in object 7, parallel 1(%)	101	
Spray volume in object 7, parallel 2(%)	97	
Spray volume in object 7, parallel 3(%)	102	
Spray volume in object 7, parallel 4(%)	94	
Spray volume in object 8, parallel 1(%)	99	
Spray volume in object 8, parallel 2(%)	98	
Spray volume in object 8, parallel 3(%)	94	
Spray volume in object 8, parallel 4(%)	98	
Spray volume in object 9, parallel 1(%)	93	
Spray volume in object 9, parallel 2(%)	96	
Spray volume in object 9, parallel 3(%)	95	
Spray volume in object 9, parallel 4(%)	93	
Spray volume in object 10, parallel 1(%)		97
Spray volume in object 10, parallel 2(%)		107
Spray volume in object 10, parallel 3(%)		95
Spray volume in object 10, parallel 4(%)		109
Spray volume in object 11, parallel 1(%)		109
Spray volume in object 11, parallel 2(%)		95
Spray volume in object 11, parallel 3(%)		98
Spray volume in object 11, parallel 4(%)		98
Spray volume in object 12, parallel 1(%)		104
Spray volume in object 12, parallel 2(%)		102
Spray volume in object 12, parallel 3(%)		99
Spray volume in object 12, parallel 4(%)		95



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Application code	A	B
Spray volume in object 13, parallel 1(%)		102
Spray volume in object 13, parallel 2(%)		106
Spray volume in object 13, parallel 3(%)		96
Spray volume in object 13, parallel 4(%)		88
Spray volume in object 14, parallel 1(%)		105
Spray volume in object 14, parallel 2(%)		100
Spray volume in object 14, parallel 3(%)		100
Spray volume in object 14, parallel 4(%)		103
Spray volume in object 15, parallel 1(%)		107
Spray volume in object 15, parallel 2(%)		106
Spray volume in object 15, parallel 3(%)		107
Spray volume in object 15, parallel 4(%)		105
Spray volume in object 16, parallel 1(%)		105
Spray volume in object 16, parallel 2(%)		104
Spray volume in object 16, parallel 3(%)		106
Spray volume in object 16, parallel 4(%)		100
Spray volume in object 17, parallel 1(%)		105
Spray volume in object 17, parallel 2(%)		103
Spray volume in object 17, parallel 3(%)		100
Spray volume in object 17, parallel 4(%)		106

Comments:

A deviation of more than 10% was noticed.

Application A:	Application B:
Object 1 parallel 2	Object 13 parallel 4
Object 1 parallel 4	

These deviations did not seemed to influence the results.



Assessments

4.4 Assessment of phytotoxicity and visible residue

PP 1/135(3) Guideline for the efficacy evaluation of plant protection products – Phytotoxicity assessment.
PP 1/53(3) Guideline for the efficacy evaluation of herbicides – Weeds in lupin and Vicia beans

Sample size:

- per plot
- describe damaged plant parts and specific symptoms
- mention crop stage

Frequency

- 1-2 weeks after each trial treatment
- with interval of 1-2 weeks as long as symptoms are visible
- Flowering stage

Method phytotoxicity:

- absolute by means of counts of measures (e.g. number of damaged plants, crop weight,...)
- relative by means of visual estimates (e.g. a percentage of the untreated)
- describe damage symptoms

Data assessments:

12/5/2011: discoloration, yellow and purple colouring
16 days after application A

25/5/2011: phytotoxicity symptoms as stunting and burning
29 days after application A and 13 days after application B

14/6/2011 = flowering stage: Phytotoxicity symptoms as stunting and burning
49 days after application A and 33 days after application B

14/7/2011: Phytotoxicity symptoms as stunting and burning.
93 days after application A and 84 days after application B

4.5 Quantitative and qualitative recording of yield

At harvest registration of yield parameters

- yield in net plots, expressed in kg/ha at a fixed moisture
- 1000-seed weight

Data assessments: 28/7/2011

- Humidity of one object was analysed in order to see if there was variability between the objects. See Raw data (the deviation was 2,22% so no large deviations were seen)
- Protein content (object 3 double dose of Product 1 was excluded for the analysis due to no harvestable beans)

Data assessments: Analysis executed by Euraceta (Rue de la Métallurgie 4, BE-4530 Villers-le-Bouillet) on 4/8/2011



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5 Results and statistical analysis

5.1 Explanation of the used codes

Crop Code

VICFX = *Vicia faba* = faba bean/ broad bean

Part Rated

LEAF = foliage

Assessment data

PHYCOL = phytotoxicity - color change; percent

PHYSTU = phytotoxicity - stunting; percent

WEIFR = weight fresh

PROCON = protein content

Crop Stage Scale

BBCH 15: 5 leaves unfolded

BBCH 21: Beginning of side shoot development: first side shoot detectable

BBCH 61: Flowers open on first raceme

BBCH 75: 50% of pods have reached final length

BBCH 79: Nearly all pods have reached final length

BBCH 80: Beginning of ripening: seed green



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5.2 Crop safety

Table 7 Statistical analysis of phytotoxicity assessed four times, tb1lonptx

Crop Code	VICFX	VICFX	VICFX	VICFX
BBCH Scale	BFAB	BFAB	BFAB	BFAB
Crop Scientific Name	<i>Vicia faba</i>	<i>Vicia faba</i>	<i>Vicia faba</i>	<i>Vicia faba</i>
Crop Name	Faba bean	Faba bean	Faba bean	Faba bean
Crop Variety	Talia	Talia	Talia	Talia
Part Assessed	LEAF C	LEAF C	LEAF C	LEAF C
Assessment Date	12/05/2011	25/05/2011	14/06/2011	14/07/2011
Assessment Type	PHYCOL	PHYSTU	PHYSTU	PHYSTU
Assessment Unit	%	%	%	%
Sample Size, Unit	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Collection Basis, Unit	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Crop Stage Majority	14	21	61	75
Days After First/Last Applic.	16 16	29 13	49 33	79 63
Trt-Eval Interval	16 DA-A	13 DA-B	33 DA-B	63 DA-B
Trt No.	Treatment Name	Other Rate	Other Rate Unit	
1	Untreated Check			0,0 a
2	Product 1	2,5 kg/ha		0,0 a
3	Product 1	5 kg/ha		2,5 a
4	Product 4	0,8 L/ha		0,0 a
5	Product 4	1,6 L/ha		0,0 a
6	Product 3	1 L/ha		0,0 a
7	Product 3	2 L/ha		0,0 a
8	Product 2	1,8 L/ha		0,0 a
9	Product 2	3,6 L/ha		0,0 a
10	Product 3	0,5 L/ha		0,0 a
11	Product 3	1 L/ha		0,0 a
12	Product 4	0,5 L/ha		0,0 a
13	Product 4	1 L/ha		0,0 a
14	Product 5	1 L/ha		0,0 a
15	Product 5	2 L/ha		0,0 a
16	Product 6	0,1 L/ha		0,0 a
17	Product 6	0,2 L/ha		0,0 a
LSD (P=.05)				
Standard Deviation				
CV				
Grand Mean				
Bartlett's X2				
P(Bartlett's X2)				
Replicate F				
Replicate Prob(F)				
Treatment F				
Treatment Prob(F)				

Means followed by same letter do not significantly differ (P=0,05; Student-Newman-Keuls)

- 1st column Relative percentage phytotoxicity as discoloration (yellow and purple) compared to the untreated, 16 days after application A
- 2nd column Relative percentage phytotoxicity as growth/stunting compared to the untreated, 29 days after application A and 13 days after application B
- 3rd column Relative percentage phytotoxicity as growth/stunting compared to the untreated, 49 days after application A and 33 days after application B
- 5th column Relative percentage phytotoxicity as growth/stunting compared to the untreated, 79 days after application A and 63 days after application B



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5.3 Harvest assessments

Table 8 Statistical analysis of yield in ton/ha; 1000 seed weight and protein content, tbi lonptx

Crop Code	VICFX		VICFX		VICFX		VICFX	
BBCH Scale	BFAB		BFAB		BFAB		BFAB	
Crop Scientific Name	Vicia faba		Vicia faba		Vicia faba		Vicia faba	
Crop Name	Faba bean		Faba bean		Faba bean		Faba bean	
Crop Variety	Talia		Talia		Talia		Talia	
Part Assessed	PODMAR C		SEEMAR C		SEEMAR -		SEEMAR C	
Assessment Date	28/07/2011		28/07/2011		28/07/2011		4/08/2011	
Assessment Type	WEIFRE		WEIFRE		WEIFRE		PROCON	
Assessment Unit	1 HECTARE		1000 seeds		kg		%	
Sample Size, Unit	1 PLOT		1 PLOT		1 PLOT		1 PLOT	
Collection Basis, Unit	1 PLOT		1 PLOT		1 PLOT		1 PLOT	
Crop Stage Majority	79		79		79		80	
Days After First/Last Applic.	93 77		93 77		93 77		100 84	
Trt-Eval Interval	77 DA-B		77 DA-B		77 DA-B		84 DA-B	
Trt No.	Treatment Name	Other Rate	Other Rate Unit					
1	Untreated Check			20,3 a	982 a	7223 a	8,92 a	
2	Product 1	2,5 kg/ha		10,9 b	1008 a	3895 b	7,88 a	
3	Product 1	5 kg/ha		0 c	*Not analysed	*Not analysed	*Not analysed	
4	Product 4	0,8 L/ha		18,8 a	993 a	6690 a	7,69 a	
5	Product 4	1,6 L/ha		19,9 a	981 a	7089 a	7,69 a	
6	Product 3	1 L/ha		19,1 a	1038 a	6834 a	8,42 a	
7	Product 3	2 L/ha		20,8 a	1065 a	7421 a	7,63 a	
8	Product 2	1,8 L/ha		20,4 a	1117 a	7271 a	8,58 a	
9	Product 2	3,6 L/ha		19,5 a	1118 a	6967 a	8,42 a	
10	Product 3	0,5 L/ha		19,9 a	1020 a	7076 a	8,13 a	
11	Product 3	1 L/ha		21 a	1060 a	7484 a	8,58 a	
12	Product 4	0,5 L/ha		19,2 a	1017 a	6835 a	7,86 a	
13	Product 4	1 L/ha		20,2 a	1032 a	7195 a	7,83 a	
14	Product 5	1 L/ha		19,8 a	957 a	7053 a	8,34 a	
15	Product 5	2 L/ha		19,5 a	1060 a	6950 a	7,75 a	
16	Product 6	0,1 L/ha		20,2 a	995 a	7214 a	7,63 a	
17	Product 6	0,2 L/ha		19,8 a	1047 a	7072 a	7,86 a	
LSD (P=,05)				2,58	113,8	937	0,922	
Standard Deviation				1,8	79,6	655,7	0,645	
CV				9,91	7,73	9,51	7,99	
Grand Mean				18,18	1030,61	6891,81	8,07	
Bartlett's X2				19,337	4,647	19,303	21,202	
P(Bartlett's X2)				0,199	0,995	0,2	0,131	
Replicate F				6,263	1,605	6,431	3,633	
Replicate Prob(F)				0,0011	0,2015	0,001	0,0198	
Treatment F				33,266	1,352	6,358	1,627	
Treatment Prob(F)				0,0001	0,2127	0,0001	0,1042	

Means followed by same letter do not significantly differ (P=0,05; Student-Newman-Keuls)

- 1st column Fresh weight in ton/ha of harvest pods, 93 days after application A and 77 days after application B
 2nd column Fresh weight of 1000 harvested beans * Object three was left out of the analysis due to no pods/beans were harvestable
 3rd column Fresh weight of beans in ton/ha * Object three was left out of the analysis due to no pods/beans were harvestable
 4th column Percentage protein content * Object three was left out of the analysis due to no pods/beans were harvestable



6 Discussion

In a springtime cultivation of broad beans (*Vicia faba* cultivar Tilia) the selectivity of several herbicides was tested. In the trial pre emergence applications and applications at sixth leaf stage were conducted at normal and double doses. Product 1 (24% active ingredient a + 17.5% active ingredient b), Product 2 (455 g/l active ingredient c), Product 3 (720 g/l active ingredient d) and Product 4 (960 g/l Active ingredient e) were applied pre emergence. Product 5 (50 g/l active ingredient f), Product 6 (500 g/l active ingredient g), Product 3 (720 g/l active ingredient d) and Product 4 (960 g/l Active ingredient e) were applied at a fourth leaf stage.

6.1 Phytotoxicity

The trial was sprinkled two days after the pre emergence application, this in order to have a good germination. The trial was four times assessed on phytotoxicity symptoms on the leaves, 16 days after application A and 13, 33 (at flowering) and 63 days after application B.. The assessments were assessed with a relative percentage of phytotoxicity symptoms per plot compared to untreated plots.

At the first assessment yellow and purple discoloration of the leaves was seen in the plots were Product 1 at the double doses was conducted. Until the start of the flowering stage were only in plots treated with Product 1 small burning symptoms seen. Later, after a rainy period, around the broad beans stage were 50% of the pods had reached their length (79 days after application A and 63 days after application B) increased the phytotoxicity symptoms in plots treated with Product 1 at normal and double dose. The plots treated with Product 1 at double dose were almost completely destroyed (98.8%). The normal dose also gave unacceptable phytotoxicity results, 37.5% of the plants were burned or destroyed.

6.2 Yield

At harvest the harvest weight of the pods and seed weight were collected. Also a sample of pods was taken and send to a lab to analyse the protein contend. Due to the complete destruction of the plants in plots with the double dose of Product 1 was it impossible to collect data from these plots. The analysis of the other objects showed a loss of harvestable pods in the plots with Product 1 at the normal dose. No significant reductions in yield were seen in the other plots. The 1000 seed weight and protein content analysis did not showed a significant difference in the plots (Product 1 at double dose excluded from analysis).

6.3 Conclusion

It can be concluded that a pre emergence application of Product 1 at normal and double dose was not safe for the plant and led to yield losses and complete destruction at the double dose.

7 Approbation of the report

Signature of the study director	Date

8 Appendix

8.1 Appendix 1: trial plan

Ferme de Mellemont, 1360 Thorembais les Beguines, Belgium

Figure 2 Trial location, tb1 lonptx



Figure 3 Trial plan, tb1 lonptx

109 15		209 12		309 16		409 11	
108 3	117 8	208 17	217 4	308 1	317 2	408 5	417 14
107 10	116 16	207 14	216 6	307 13	316 7	407 9	416 8
106 9	115 13	206 5	215 11	306 3	315 17	406 10	415 6
105 1	114 4	205 2	214 7	305 8	314 12	405 16	414 15
104 12	113 6	204 9	213 16	304 5	313 14	404 1	413 17
103 2	112 14	203 15	212 3	303 6	312 10	403 13	412 4
102 5	111 17	202 1	211 8	302 11	311 9	402 7	411 12
101 11	110 7	201 13	210 10	301 15	310 4	401 3	410 2



8.2 Appendix 2: meteorological data

Table 9 Meteorological data during the treatment A on 26/4/2011 (6 hours before and 6 hours after the treatment) (based on data from hobo rain calculator + KMI Post Ernage-Gembloux), tb1lonptx

Date	Hour	Temperature (°C)	Relative humidity (%)	Precipitation (l/m ²)
26/04/2011	7:00			0,0
26/04/2011	8:00			0,0
26/04/2011	9:00			0,0
26/04/2011	10:00			0,0
26/04/2011	11:00			0,0
26/04/2011	12:00			0,0
26/04/2011	13:00			0,0
26/04/2011	14:00	Mean temperature of the whole day was 10,3°C	Mean relative humidity of the whole day was 85%	0,0
26/04/2011	15:00			0,0
26/04/2011	16:00			0,0
26/04/2011	17:00			0,0
26/04/2011	18:00			0,0
26/04/2011	19:00			0,0
26/04/2011	20:00			0,0
26/04/2011	21:00			0,0

Table 10 Meteorological data during the treatment B on 12/5/2011 (6 hours before and 6 hours after the treatment) (based on data from hobo raincalculator + KMI Gembloux) tb1lonptx

Date	Hour	Temperature (°C)	Relative humidity (%)	Precipitation (l/m ²)
12/05/2011	7:00			0,0
12/05/2011	8:00			0,0
12/05/2011	9:00			0,0
12/05/2011	10:00			0,0
12/05/2011	11:00			0,0
12/05/2011	12:00			0,0
12/05/2011	13:00			0,0
12/05/2011	14:00	Mean temperature of the whole day was 13,5°C	Mean relative humidity of the whole day was 72%	0,0
12/05/2011	15:00			0,0
12/05/2011	16:00			0,0
12/05/2011	17:00			0,0
12/05/2011	18:00			0,0
12/05/2011	19:00			0,0
12/05/2011	20:00			0,0
12/05/2011	21:00			0,0

Table 11 Meteorological data during the trial, tb1lonptx

Date	Mean temperature (°C)	Maximum temperature (°C)	Minimum temperature (°C)	Precipitation incl. irrigation (l/m ²)
27/04/2011	11,8	14,6	8,9	11,80
28/04/2011	14,2	21,5	7,0	5,40
29/04/2011	15,7	21,2	10,2	0,40
30/04/2011	14,3	19,8	8,7	0,00
1/05/2011	14,3	19,8	8,7	0,00
2/05/2011	11,4	16,4	6,4	0,00
3/05/2011	8,6	14,0	3,1	0,00
4/05/2011	8,1	14,8	1,5	0,00
5/05/2011	10,6	19,2	2,0	0,00
6/05/2011	15,8	23,8	7,8	0,00
7/05/2011	19,4	26,5	12,4	0,00
8/05/2011	20,3	25,7	15,0	0,00



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Date	Mean temperature (°C)	Maximum temperature (°C)	Minimum temperature (°C)	Precipitation incl. irrigation (l/m ²)
9/05/2011	16,3	21,4	11,3	0,00
10/05/2011	17,4	22,8	12,1	0,00
11/05/2011	15,6	20,6	10,6	0,00
12/05/2011	13,5	18,1	8,8	0,00
13/05/2011	12,7	18,9	6,5	0,00
14/05/2011	11,6	16,9	6,3	0,00
15/05/2011	11,8	16,1	7,6	1,20
16/05/2011	11,9	14,7	9,1	0,00
17/05/2011	14,3	18,7	9,8	0,00
18/05/2011	15,5	22,5	8,6	0,00
19/05/2011	14,3	18,8	9,7	0,00
20/05/2011	14,7	21,5	8,0	0,00
21/05/2011	14,6	23,8	5,4	0,00
22/05/2011	15,0	20,1	9,9	0,60
23/05/2011	15,3	22,6	7,9	0,00
24/05/2011	13,2	18,2	8,3	0,00
25/05/2011	14,5	23,2	5,8	0,00
26/05/2011	14,8	17,9	11,8	0,40
27/05/2011	12,0	14,0	9,9	0,20
28/05/2011	13,0	18,9	7,0	0,00
29/05/2011	16,8	22,6	11,1	0,00
30/05/2011	18,9	28,8	9,0	0,00
31/05/2011	11,4	14,7	8,1	5,80
1/06/2011	12,6	19,2	5,9	0,00
2/06/2011	14,1	22,6	5,7	0,00
3/06/2011	18,7	25,3	12,0	0,00
4/06/2011	21,9	28,8	15,0	0,00
5/06/2011	19,6	23,1	16,0	5,20
6/06/2011	17,9	23,8	11,9	4,40
7/06/2011	15,3	20,8	9,8	4,00
8/06/2011	13,8	18,4	9,2	1,40
9/06/2011	13,3	18,2	8,4	0,00
10/06/2011	12,8	18,4	7,2	4,00
11/06/2011	11,3	16,6	6,1	0,40
12/06/2011	11,8	18,5	5,1	0,00
13/06/2011	16,6	20,8	12,4	1,00
14/06/2011	17,5	22,2	12,8	0,00
15/06/2011	18,0	23,8	12,3	0,00
16/06/2011	15,5	20,8	10,2	8,40
17/06/2011	13,7	18,4	9,1	1,20
18/06/2011	13,5	16,6	10,4	3,40
19/06/2011	13,3	17,3	9,3	5,00
20/06/2011	13,2	18,0	8,4	3,40
21/06/2011	18,2	21,4	15,0	1,60
22/06/2011	15,1	18,0	12,3	6,60
23/06/2011	14,2	18,2	10,1	0,20
24/06/2011	13,6	17,4	9,7	1,60
25/06/2011	14,1	18,0	10,3	1,00
26/06/2011	20,3	25,7	14,9	0,00
27/06/2011	24,9	33,3	16,5	0,00
28/06/2011	26,3	34,8	17,9	25,60
29/06/2011	15,3	20,4	10,1	4,40
30/06/2011	14,6	19,9	9,4	0,20
1/07/2011	13,8	19,2	8,4	0,80
2/07/2011	12,3	18,3	6,2	0,00
3/07/2011	13,1	20,3	6,0	0,00
4/07/2011	13,9	20,6	7,2	0,00
5/07/2011	17,8	26,4	9,3	0,00
6/07/2011	17,1	20,9	13,4	1,00
7/07/2011	18,1	22,1	14,1	0,00
8/07/2011	17,5	21,9	13,1	0,80



Date	Mean temperature (°C)	Maximum temperature (°C)	Minimum temperature (°C)	Precipitation incl. irrigation (l/m ²)
9/07/2011	15,4	20,2	10,6	0,40
10/07/2011	15,7	21,4	9,9	0,00
11/07/2011	18,6	24,4	12,8	0,00
12/07/2011	18,8	24,6	12,9	9,60
13/07/2011	13,2	14,8	11,6	1,20
14/07/2011	12,7	14,4	11,0	2,00
15/07/2011	16,6	22,8	10,4	0,00
16/07/2011	16,7	22,2	11,3	6,00
17/07/2011	15,9	18,8	13,0	5,60
18/07/2011	14,6	17,4	11,8	0,40
19/07/2011	14,4	17,9	10,9	15,20
20/07/2011	15,7	19,7	11,7	1,40
21/07/2011	15,5	20,8	10,3	14,20
22/07/2011	12,5	16,5	8,4	0,80
23/07/2011	12,0	15,8	8,3	2,40
24/07/2011	14,6	18,3	10,9	0,80
25/07/2011	15,9	21,2	10,6	14,40
26/07/2011	13,7	17,0	10,4	0,20
27/07/2011	16,3	19,2	13,4	1,80
28/07/2011	17,6	21,4	13,8	0,00

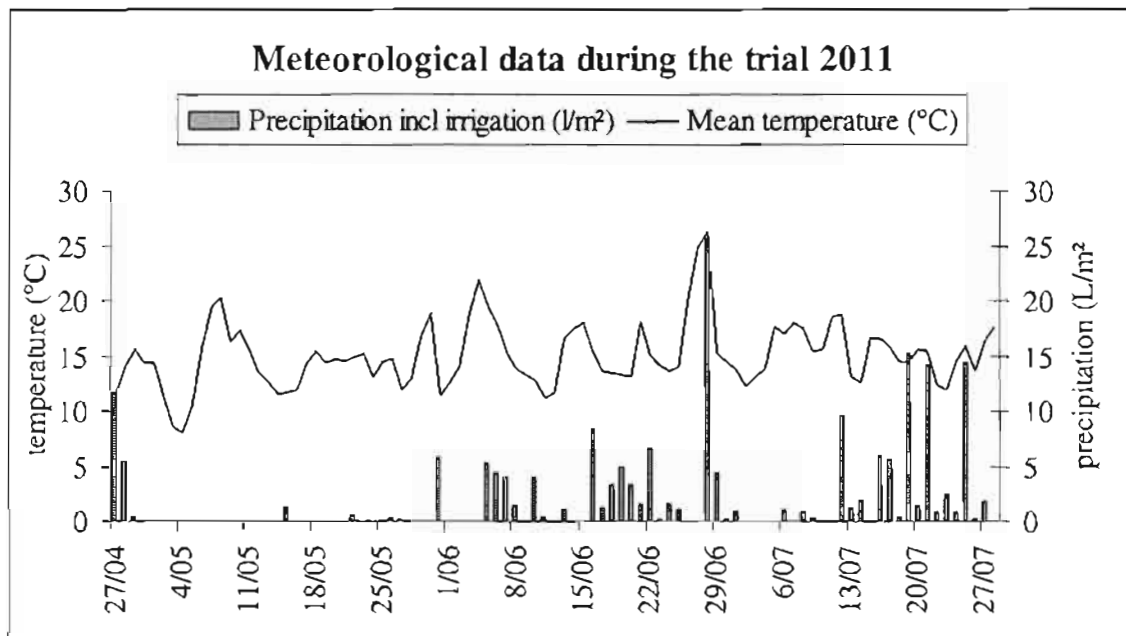


Figure 4: Meteorological data during the trial, tbl1onptx

8.3 Appendix 3: raw assessment data

Table 12 Analysis humidity of First repetition plot 108 (double dose of Product 1) was excluded due to no beans were harvestable, tb1 lonptx

plotnumber	Humidity %
101	79,80
102	75,20
103	72,60
104	75,00
105	71,80
106	70,30
107	74,80
109	76,70
110	76,10
111	72,80
112	73,70
113	72,90
114	74,50
115	73,90
116	75,60
117	73,20
standaardev	2,215



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Table 13 Raw data Phytotoxicity data, tb1lonptx

Crop Code	VICFX	VICFX	VICFX	VICFX				
BBCH Scale	BFAB	BFAB	BFAB	BFAB				
Crop Scientific Name	Vicia faba	Vicia faba	Vicia faba	Vicia faba				
Crop Name	Faba bean	Faba bean	Faba bean	Faba bean				
Crop Variety	Talia	Talia	Talia	Talia				
Part Assessed	LEAF C	LEAF C	LEAF C	LEAF C				
Assessment Date	12/05/2011	25/05/2011	14/06/2011	14/07/2011				
Assessment Type	PHYCOL	PHYSTU	PHYSTU	PHYSTU				
Assessment Unit	%	%	%	%				
Sample Size, Unit	1 PLOT	1 PLOT	1 PLOT	1 PLOT				
Collection Basis, Unit	1 PLOT	1 PLOT	1 PLOT	1 PLOT				
Crop Stage Majority	14	21	61	75				
Days After First/Last Applic.	16 16	29 13	49 33	79 63				
Tri-Eval Interval	16 DA-A	13 DA-B	33 DA-B	63 DA-B				
Tri No.	Treatment Name	Other Rate	Other Rate Unit	Plot				
1	Untreated Check			105	0	0	0	0
				202	0	0	0	0
				308	0	0	0	0
				404	0	0	0	0
				Mean =	0	0	0	0
2	Product 1	2,5	kg/ha	103	0	0	0	40
				205	0	0	0	50
				317	0	0	0	30
				410	0	0	0	30
				Mean =	0	0	0	37,5
3	Product 1	5	kg/ha	108	0	0	0	100
				212	0	0	0	100
				306	0	0	0	95
				401	10	10	30	100
				Mean =	2,5	2,5	7,5	98,8
4	Product 4	0,8	L/ha	114	0	0	0	0
				217	0	0	0	10
				310	0	0	0	0
				412	0	0	0	0
				Mean =	0	0	0	2,5
5	Product 4	1,6	L/ha	102	0	0	0	0
				206	0	0	0	0
				304	0	0	0	0
				408	0	0	0	0
				Mean =	0	0	0	0
6	Product 3	1	L/ha	113	0	0	0	0
				216	0	0	0	0
				303	0	0	0	0
				415	0	0	0	0
				Mean =	0	0	0	0
7	Product 3	2	L/ha	110	0	0	0	0
				214	0	0	0	0
				316	0	0	0	0
				402	0	0	0	0
				Mean =	0	0	0	0
8	Product 2	1,8	L/ha	117	0	0	0	0
				211	0	0	0	0
				305	0	0	0	0
				416	0	0	0	0
				Mean =	0	0	0	0



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Table 14 Raw data Phytotoxicity data, tb11onptx

Crop Code	VICFX	VICFX	VICFX	VICFX				
BBCH Scale	BFAB	BFAB	BFAB	BFAB				
Crop Scientific Name	Vicia faba	Vicia faba	Vicia faba	Vicia faba				
Crop Name	Faba bean	Faba bean	Faba bean	Faba bean				
Crop Variety	Talia	Talia	Talia	Talia				
Part Assessed	LEAF C	LEAF C	LEAF C	LEAF C				
Assessment Date	12/05/2011	25/05/2011	14/06/2011	14/07/2011				
Assessment Type	PHYCOL	PHYSTU	PHYSTU	PHYSTU				
Assessment Unit	%	%	%	%				
Sample Size, Unit	1 PLOT	1 PLOT	1 PLOT	1 PLOT				
Collection Basis, Unit	1 PLOT	1 PLOT	1 PLOT	1 PLOT				
Crop Stage Majority	14	21	61	75				
Days After First/Last Applic.	16 16	29 13	49 33	79 63				
Trt-Eval Interval	16 DA-A	13 DA-B	33 DA-B	63 DA-B				
Trt No.	Treatment Name	Other Rate	Other Rate Unit	Plot				
9	Product 2	3,6	L/ha	106	0	0	0	0
				204	0	0	0	0
				311	0	0	0	0
				407	0	0	0	0
					0	0	0	0
10	Product 3	0,5	L/ha	107	0	0	0	0
				210	0	0	0	0
				312	0	0	0	0
				406	0	0	0	0
	Mean =				0	0	0	0
11	Product 3	1	L/ha	101	0	0	0	0
				215	0	0	0	0
				302	0	0	0	0
				409	0	0	0	0
	Mean =				0	0	0	0
12	Product 4	0,5	L/ha	104	0	0	0	0
				209	0	0	0	0
				314	0	0	0	0
				411	0	0	0	0
	Mean =				0	0	0	0
13	Product 4	1	L/ha	115	0	0	0	10
				201	0	0	0	0
				307	0	0	0	0
				403	0	0	0	0
	Mean =				0	0	0	2,5
14	Product 5	1	L/ha	112	0	0	0	0
				207	0	0	0	0
				313	0	0	0	0
				417	0	0	0	0
	Mean =				0	0	0	0
15	Product 5	2	L/ha	109	0	0	0	0
				203	0	0	0	0
				301	0	0	0	0
				414	0	0	0	0
	Mean =				0	0	0	0
16	Product 6	0,1	L/ha	116	0	0	0	0
				213	0	0	0	0
				309	0	0	0	0
				405	0	0	0	0
	Mean =				0	0	0	0
17	Product 6	0,2	L/ha	111	0	0	0	0
				208	0	0	0	0
				315	0	0	0	0
				413	0	0	0	0
	Mean =				0	0	0	0



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Table 15 Raw data yield in ton/ha, fresh weight of 1000 seeds and protein content at harvest, tbl1onptx

Trt No.	Treatment Name	Other Rate	Other Rate Unit	Plot	VICFX BFAB	VICFX BFAB	VICFX BFAB
					Vicia faba Faba bean Talia PODMAR C 28/07/2011	Vicia faba Faba bean Talia SEEMAR C 28/07/2011	Vicia faba Faba bean Talia SEEMAR C 4/08/2011
					WEIFRE T-MET 4 m2 1 PLOT 79 ldr 93 77 77 DA-B	1000 seed weight g 300 g 1 PLOT 79 ldr 93 77 77 DA-B	PROCON % 40 g 1 PLOT 80 Euraceta 100 84 84 DA-B
1	Untreated Check			105 202 308 404	19,7 18,2 22,0 21,1 20,3	965 1110 964 889 982	8,94 7,62 8,19 10,94 8,92
2	Product 1	2,5	kg/ha	103 205 317 410	6,0 6,9 16,3 14,4 10,9	1008 872 1117 1035 1008	8,00 8,25 7,69 7,56 7,88
3	Product 1	5	kg/ha	108 212 306 401	0 0 0 0	No data due to no harvestable beans	No data due to no harvestable beans
4	Product 4	0,8	L/ha	114 217 310 412	18,9 20,6 18,2 17,4 18,8	975 1058 1018 920 993	7,44 7,69 7,69 7,94 7,69
5	Product 4	1,6	L/ha	102 206 304 408	19,8 18,0 22,7 19,1 19,9	992 1064 1036 832 981	7,62 8,31 7,69 7,13 7,69
6	Product 3	1	L/ha	113 216 303 415	18,1 19,1 19,8 19,5 19,1	1069 1049 1100 934 1038	7,87 9,19 8,69 7,94 8,42
7	Product 3	2	L/ha	110 214 316 402	20,6 20,3 20,7 21,7 20,8	1129 1158 956 1018 1065	7,44 9,25 6,69 7,13 7,63
8	Product 2	1,8	L/ha	117 211 305 416	21,1 18,1 19,9 22,4 20,4	1096 1210 1144 1019 1117	7,94 8,81 8,38 9,19 8,58
9	Product 2	3,6	L/ha	106 204 311 407	20,1 18,2 18,8 21,0 19,5	1147 1067 1036 1222 1118	9,06 8,75 8,13 7,75 8,42



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Table 16 Raw data yield in ton/ha, fresh weight of 1000 seeds and protein content at harvest, tb1lonptx

					VICFX	VICFX	VICFX
					BFAB	BFAB	BFAB
					Vicia faba	Vicia faba	Vicia faba
					Faba bean	Faba bean	Faba bean
					Talia	Talia	Talia
					PODMAR C	SEEMAR C	SEEMAR C
					28/07/2011	28/07/2011	4/08/2011
					WEIFRE	1000 seed weight	PROCON
					T-MET	g	%
					4 m2	300 g	40 g
					1 PLOT	1 PLOT	1 PLOT
					79	79	80
					ldr	ldr	Euraceta
					93 77	93 77	100 84
					77 DA-B	77 DA-B	84 DA-B
Trt No.	Treatment Name	Other Rate	Other Rate Unit	Plot			
10	Product 3	0,5	L/ha	107	19,9	973	8,31
				210	18,2	1078	8,75
				312	18,7	953	7,75
				406	22,6	1077	7,69
				Mean =	19,9	1020	8,13
11	Product 3	1	L/ha	101	21,8	947	7,56
				215	18,6	1119	9,44
				302	20,1	1036	8,31
				409	23,3	1137	9,00
				Mean =	21,0	1060	8,58
12	Product 4	0,5	L/ha	104	20,4	1084	7,62
				209	17,0	853	8,13
				314	21,2	1082	8,06
				411	18,1	1047	7,62
				Mean =	19,2	1017	7,86
13	Product 4	1	L/ha	115	18,7	1034	7,81
				201	18,6	1044	7,62
				307	21,1	946	7,62
				403	22,2	1103	8,25
				Mean =	20,2	1032	7,83
14	Product 5	1	L/ha	112	18,9	1037	9,00
				207	17,4	1025	8,56
				313	21,1	875	7,81
				417	21,7	892	8,00
				Mean =	19,8	957	8,34
15	Product 5	2	L/ha	109	20,0	1058	7,69
				203	19,4	1123	8,38
				301	16,8	1069	7,19
				414	21,8	991	7,75
				Mean =	19,5	1060	7,75
16	Product 6	0,1	L/ha	116	22,0	967	7,44
				213	18,9	1065	8,69
				309	21,1	1000	7,44
				405	18,9	946	6,94
				Mean =	20,2	995	7,63
17	Product 6	0,2	L/ha	111	18,3	1064	8,13
				208	17,8	1115	8,88
				315	20,5	1027	7,69
				413	22,6	983	6,75
				Mean =	19,8	1047	7,86

8.4 Appendix 4: Pictures of phytotoxicity symptoms



Picture 1



Picture 2



Picture 3

Figure 5: Phytotoxicity symptoms (pictures 1 to 3) seen in object 3 plot 401 on 12/5/2011 (17 days after the application A)



Figure 6: Phytotoxicity symptoms seen in object 3 plot 401 on 25/5/2011 (29 days after application A)



picture 1



picture 2

Figure 7: Phytotoxicity symptoms seen in object 3 assessment on 14/6/2011 (49 days after application A)



picture 1



picture 2

Figure 8: Phytotoxicity symptoms seen in object 2 (picture 1) and in object 3 (picture 2) assessment on 14/7/2011 (79 days after application A)



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Trial ID : R060-06F

[REDACTED]
Protocol ID : FFBA01B3-2006BE

[REDACTED] :

Performance in barley

B-4458 Fexhe-Slins

Belgium
2006

[REDACTED]

Experimentation carried out by Redebel s.a. from March to July 2006.
Statement of GEP compliance 1 SL recognised by Belgian Agriculture Ministry.
This trial may be used for registration.

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Trial Treatments

Tr No.	Appl Code	Growth Stage	Type	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Other Rate	Other Rate Unit
1	AB		CHK	Untreated Check		XX				
2	A	31 [BBCH]	FUNG		312.5	EC	2.00	L/HA	625	GA/HA
	B	37-39 [BBCH]	FUNG		480	SC	1.50	L/HA	720	GA/HA
	B	37-39 [BBCH]	FUNG		250	EC	0.50	L/HA	125	GA/HA
3	A	31 [BBCH]	FUNG		312.5	EC	2.00	L/HA	625	GA/HA
	B	37-39 [BBCH]	FUNG		480	SC	2.00	L/HA	960	GA/HA
	B	37-39 [BBCH]	FUNG		250	EC	0.50	L/HA	125	GA/HA
4	A	31 [BBCH]	FUNG		312.5	EC	2.00	L/HA	625	GA/HA
	B	37-39 [BBCH]	FUNG		480	SC	2.00	L/HA	960	GA/HA
	B	37-39 [BBCH]	FUNG		125	SC	0.50	L/HA	62.5	GA/HA
5	A	31 [BBCH]	FUNG		312.5	EC	2.00	L/HA	625	GA/HA
	B	37-39 [BBCH]	FUNG		480	SC	2.00	L/HA	960	GA/HA
	B	37-39 [BBCH]	FUNG		312.5	EC	1.00	L/HA	312.5	GA/HA
6	A	31 [BBCH]	FUNG		312.5	EC	2.00	L/HA	625	GA/HA
	B	37-39 [BBCH]	FUNG		200	EC	1.25	L/HA	250	GA/HA
7	A	31 [BBCH]	FUNG		250	SC	0.60	L/HA	150	GA/HA
	A	31 [BBCH]	FUNG		312.5	EC	1.00	L/HA	312.5	GA/HA
	B	37-39 [BBCH]	FUNG		250	SC	0.60	L/HA	150	GA/HA
	B	37-39 [BBCH]	FUNG		312.5	EC	1.00	L/HA	312.5	GA/HA
8	A	31 [BBCH]	FUNG		480	SC	1.50	L/HA	720	GA/HA
	A	31 [BBCH]	FUNG		312.5	EC	1.00	L/HA	312.5	GA/HA
	B	37-39 [BBCH]	FUNG		480	SC	1.50	L/HA	720	GA/HA
	B	37-39 [BBCH]	FUNG		312.5	EC	1.00	L/HA	312.5	GA/HA
9	A	31 [BBCH]	FUNG		480	SC	2.00	L/HA	960	GA/HA
	A	31 [BBCH]	FUNG		312.5	EC	1.00	L/HA	312.5	GA/HA
	B	37-39 [BBCH]	FUNG		480	SC	2.00	L/HA	960	GA/HA
	B	37-39 [BBCH]	FUNG		312.5	EC	1.00	L/HA	312.5	GA/HA
10	A	31 [BBCH]	FUNG		250	SC	0.60	L/HA	150	GA/HA
	A	31 [BBCH]	FUNG		312.5	EC	1.00	L/HA	312.5	GA/HA
	B	37-39 [BBCH]	FUNG		250	SC	0.60	L/HA	150	GA/HA
	B	37-39 [BBCH]	FUNG		312.5	EC	1.00	L/HA	312.5	GA/HA
11	A	31 [BBCH]	FUNG		300	SC	1.20	L/HA	360	GA/HA
	B	37-39 [BBCH]	FUNG		300	SC	1.20	L/HA	360	GA/HA
12	B	37-39 [BBCH]	FUNG		250	SC	0.80	L/HA	200	GA/HA
	B	37-39 [BBCH]	FUNG		312.5	EC	1.00	L/HA	312.5	GA/HA
13	B	37-39 [BBCH]	FUNG		480	SC	1.50	L/HA	720	GA/HA
	B	37-39 [BBCH]	FUNG		312.5	EC	1.00	L/HA	312.5	GA/HA
14	B	37-39 [BBCH]	FUNG		480	SC	2.00	L/HA	960	GA/HA
	B	37-39 [BBCH]	FUNG		312.5	EC	1.00	L/HA	312.5	GA/HA
15	B	37-39 [BBCH]	FUNG		480	SC	2.00	L/HA	960	GA/HA
	B	37-39 [BBCH]	FUNG		250	EC	0.50	L/HA	125	GA/HA
16	B	37-39 [BBCH]	FUNG		200	EC	1.25	L/HA	250	GA/HA
17	B	37-39 [BBCH]	FUNG		300	SC	1.50	L/HA	450	GA/HA
18	B	37-39 [BBCH]	FUNG		280	SC	1.00	L/HA	280	GA/HA
19	B	37-39 [BBCH]	FUNG		250	SC	0.8	L/HA	200	GA/HA
20	A	31 [BBCH]	FUNG		312.5	EC	1.00	L/HA	312.5	GA/HA
	B	37-39 [BBCH]	FUNG		312.5	EC	2.00	L/HA	625	GA/HA
21	A	31 [BBCH]	FUNG		312.5	EC	1.00	L/HA	312.5	GA/HA
	B	37-39 [BBCH]	FUNG		312.5	EC	2.00	L/HA	625	GA/HA
22	A	31 [BBCH]	FUNG		410	EC	0.30	L/HA	123	GA/HA
	B	37-39 [BBCH]	FUNG		410	EC	0.30	L/HA	123	GA/HA
23	A	31 [BBCH]	FUNG		410	EC	0.50	L/HA	205	GA/HA
	B	37-39 [BBCH]	FUNG		410	EC	0.50	L/HA	205	GA/HA

Additional Treatment Information

Growth Stage

31 [BBCH] = BBCH growth stage 31 (1st node)

Type

CHK = Check or Untreated

FUNG = Fungicide or Bactericide

Treatment Name

Untreated Check, , XX = |

[REDACTED]

Input Pro, 250, EC = Prothioconazole|250|Fungicide|9446/B

Opus, 125, SC = Epoxiconazole|125|Fungicide|8472/b

Fandango, 200, EC = Fluxastrobine+Prothioconazole|100+100|Fungicide|9458/B

[REDACTED]

Form Type

XX = Others|Temporary categorisation of all other formulations not listed above.

EC = Emulsifiable concentrate|A liquid, homogeneous formulation to be applied as an emulsion after dilution in water.

SC = Suspension concentrate (flowable concentrate)|A stable suspension of active ingredient(s) in a fluid, which may contain other dissolved active ingredient(s), intended for dilution with water before use.

Rate Unit

L/HA = Liters Product per Hectare (US=PT/A) 'P'

Settings

Replications: 4, Untreated treatments: 1, Conduct under GLP/GEP: Yes (GEP with no protection), Design: Randomized Complete Block, Treatment units: Treated plot size, Dry Form. Unit: g/kg, Treated plot size Width: 2.5 meters, Treated plot size Length: 9.5 meters, Application volume: 150 l/ha, Mix size: 2 liters, Mix overage: 300 ml, Format definitions: R-A117.DEF, R-A117.FRM

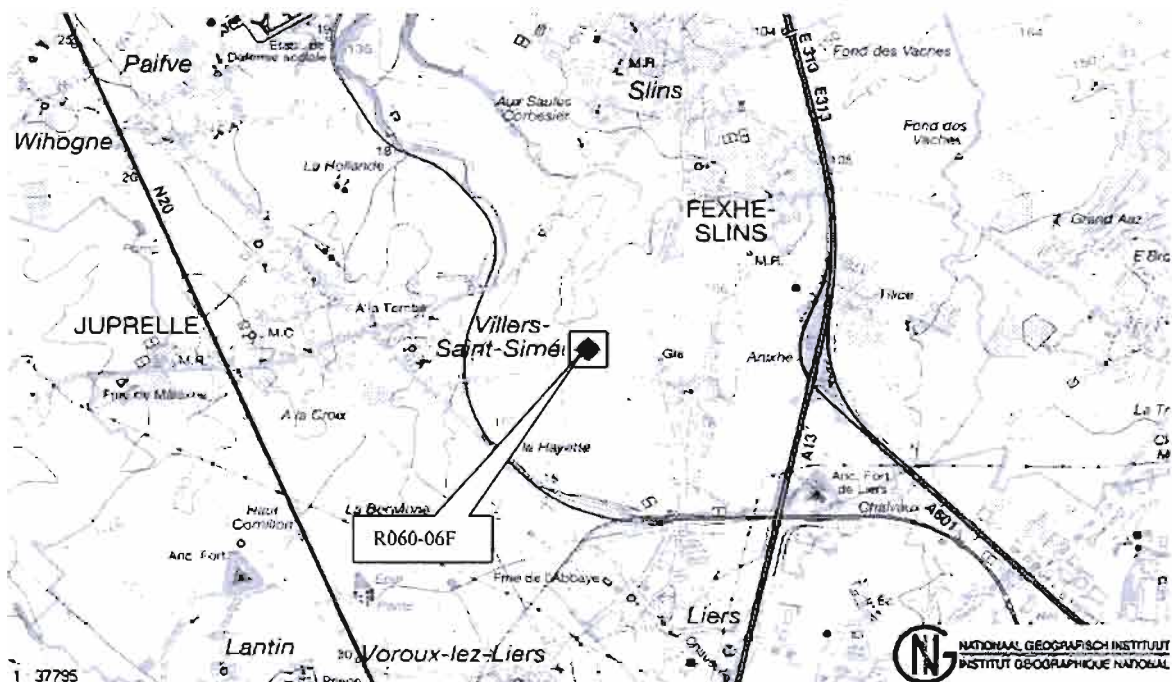
Trial Comments

Trial Objective

- What is the benefit of [REDACTED] used over a standard triazol programme in barley?
- What is the optimal rate of [REDACTED] ?
- What is the benefit of [REDACTED] versus competitors?

Location

The trial was located on a silty loam soil type in Fexhe-Slins, near Liège (Belgium).



Comments

Field Homogeneity

The trial was established on a flat, uniform part of the field.

Weather Conditions

Taken as a whole, the autumn of 2005 was exceptionally mild and abnormally sunny. It was the warmest autumn since the beginning of the measurement in 1833. At Uccle, the mean temperature (12.3°) was 1.9° above what is normal (10.4°C) for the time of year. The total rainfall figure was lower than normal, at 182.1 mm (the norm is 208.9 mm), while the total number of hours of sunshine was higher, at 390 hours (where the norm is 325 hours).

The winter of 2005 – 2006 was classified as totally normal, with mean temperature values of 2.5°C (the norm is 3.1°C), rainfall of 153.5 mm (norm: 186.8 mm) and sunshine duration of 154 hours (the norm is 168 hours).

March, the first month of the meteorological spring, was characterised in Uccle by normal climatic conditions. The mean temperature at Uccle was 4.5°C (the norm is 5.5°C). The total rainfall collected was 53.6 mm (norm: 65.3 mm). There were 114 hours of sunshine (norm: 120 hours).

April was also characterised by normal value. The mean temperature was 9.3°C (the norm is 9.0°C). The total rainfall collected was 46.0 mm (norm: 53.1 mm). There were 141 hours of sunshine (norm: 158 hours).

The month of May was characterised by normal figures for mean temperature, abnormally high total rainfall and abnormally low hours of sunshine. The mean temperature was 14.2°C (the norm is 12.7°C). The total rainfall collected was 115.6 mm (norm: 61.6 mm). There were 136 hours of sunshine (norm: 199 hours).

In all, the spring of 2006 was characterised by normal mean temperature, at 10.4°C (the norm is 9.1°C). The rainfall values were abnormally high, at 226.9 mm (as against a norm of 168.3 mm), while the sunshine duration was abnormally low, with 391 hours against a norm of 477 hours.

June, the first month of the meteorological summer, was characterised in Uccle by abnormally high average for temperature and hours of sunshine, and a deficit for total rainfall. The mean temperature was 17.3°C (the norm is 15.5°C). The total rainfall collected was 25.8 mm (norm: 67.4 mm). There were 246 hours of sunshine (norm: 202 hours).

The month of July in Uccle was characterised by outstanding high values for hours of sunshine and mean temperatures. The mean temperature was 23.0°C (the norm is 17.1°C), which was the hottest month of July never registered since the beginning of the meteorological observations in 1833. Record of maximum temperature was also registered on 19th July with 36.2°C, while 26 days were noted above 25°C and 8 days

above 30°C. There were 309 hours of sunshine (norm: 195 hours; record: 314 hours). Rainfall was normal with 48.1 mm (norm: 74.3 mm).

Trial Development

The crop was sown on the 27th October 2005. The winter barley variety MARADO was sown at a rate of 115 kg/ha.

The first application was carried out on 19th April 2006 when the crop had reached the second node stage (BBCH 32).

The second application was carried out on 4th May 2006 (15 DAAA), at the flag leaf stage (BBCH 39). *Pyrenophora teres* (PYRNTE) and *Erysiphe graminis f. sp. hordeum* (ERYSGH) were detected on the leaves but the level of infestation was very weak : PYRNTE reached only 0.1% on L2, 2.2% on L3 and 2.5% on L4. The infestation rate of ERYSGH was inferior to 1%. L1 was still perfectly free of disease.

Assessments of efficacy and phytotoxicity commenced from 27th April 2006 (8 DAAA, and continued up to 26th June 2006 (68 DAAA, 53 DAAB).

The trial was harvested in good conditions on 11th July 2006.

The thousand grains weight, moisture and specific weight of the samples were analysed by Redebel s.a. on 13th July 2006.

Treatment Phytotoxicity

No symptoms of phytotoxicity were discovered in any of the treated plots throughout the assessment period.

Treatment Efficacy

The efficacy is expressed as a percentage of the disease reduction in comparison with the infestation in the control (APC = Automatic Percent Control – Untreated = 0%).

- On 22nd May 2006 (33 DAAA, 18 DAAB):

In the untreated plots, the level of disease developed slowly : *Pyrenophora teres* (PYRNTE) reached an infestation rate of 0.6% on L1, 3.3% on L2 and 8% on L3.

Rhynchosporium secalis (RHYNSE) was also detected on L3, but at a very weak level; only 0.3%. No more symptom of ERYSGH was detected.

These levels of infestation were too weak to analyse the efficacy of the treatments, excepted for PYRNTE on L3.

On L3, the treatments consisting of an initial application at stage BBCH 32 provided equivalent efficacy against PYRNTE, between 70 and 93%, with the exception of treatments Nos. 22 and 23, i.e. A9856-E 0.3 and 0.5 L/HA, with 25 and 10% control respectively.

The treatments applied at stage BBCH 39 only (18 days later) were weaker with efficacy varying from 20 to 58%.

- On 14th June 2006 (56 DAAA, 41 DAAB):

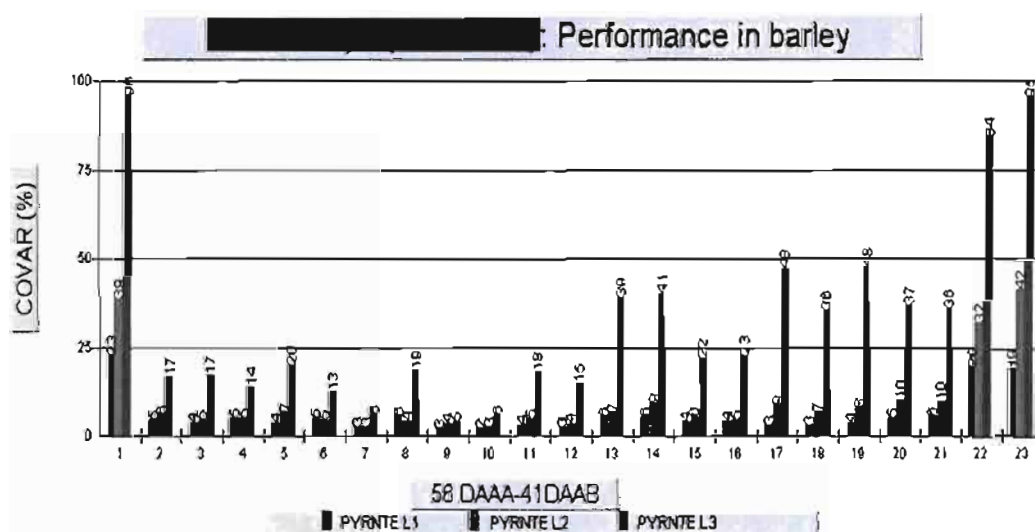
In the control, PYRNTE and RHYNSE had made progress. PYRNTE was evaluated at 23% on L1, 39% on L2, 96% on L3 and RHYNSE reached 2.0% on L1, 12% on L2 and 95% on L3.

Symptoms of "tâches de léopard" (ZZXXAA) were also detected in the untreated plot : 3.4% on L1, 16% on L2 and 97% on L3.

All the treatments provided equivalent control of PYRNTE, at between 75 and 90% on L1 and between 74 and 92% on L2, except for treatments Nos. 22 and 23, which were significantly inferior.

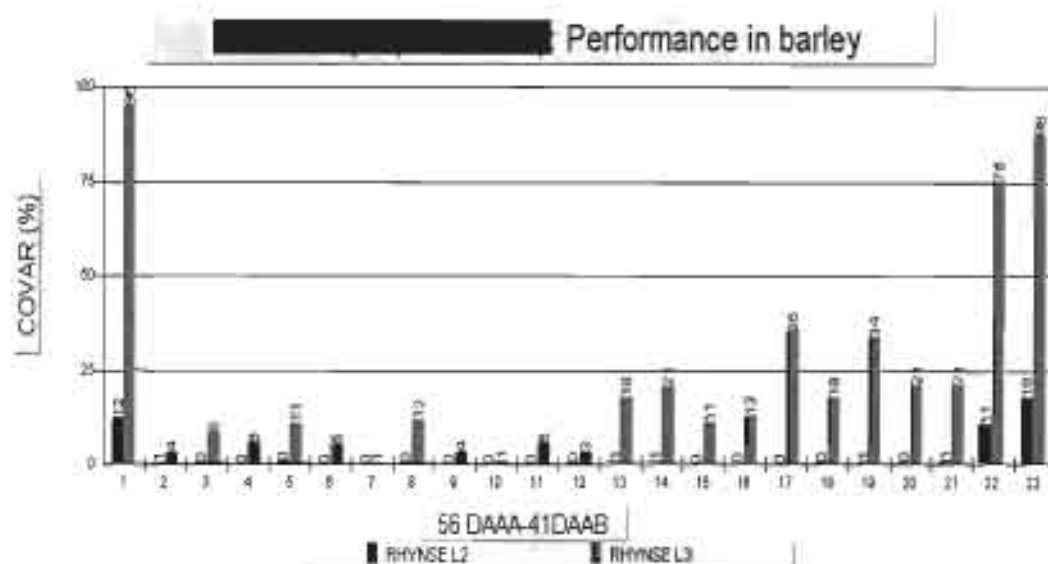
Most of the treatments provided equivalent efficacy on L3, varying from 76 to 95%. Treatments Nos.13, 14, and 17 to 21 achieved intermediate levels of efficacy, from 50 to 63%, while treatments Nos. 22 and 23 were still the weakest, with 1 to 12% efficacy.

The graphs below present the **disease infestation rates per leaf**.

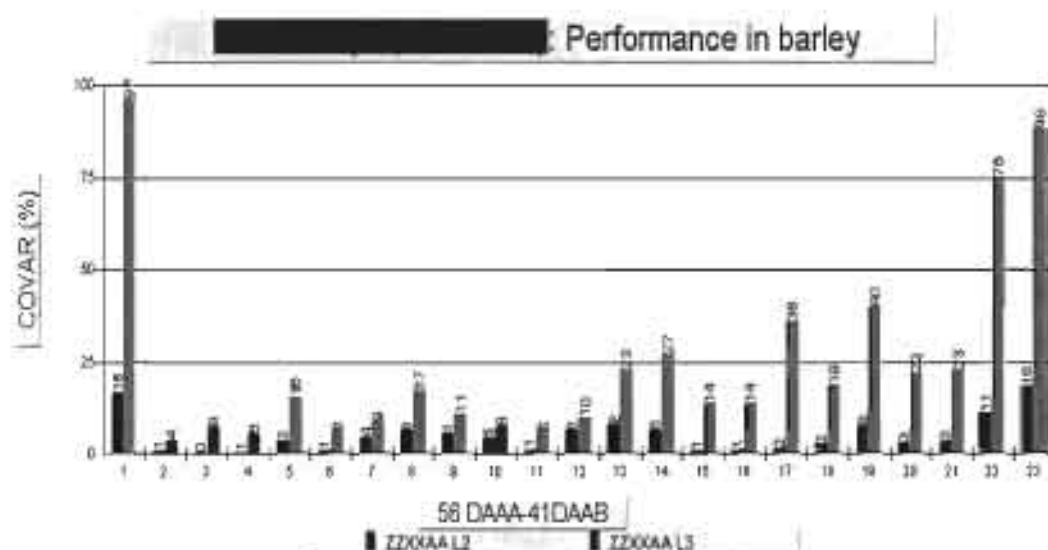


Against RHYNSE, most of the treatments provided equivalent levels of control, between 90 and 99% on L2, with the exception of treatments Nos. 22 and 23, which were distinctly weaker (< 15%).

On L3, efficacy varying from 78 to 99% was found for most of the treatments. Treatments Nos.17 and 19 were intermediate (63 to 64%), while treatments Nos. 22 and 23 were still the weakest (8-21%).



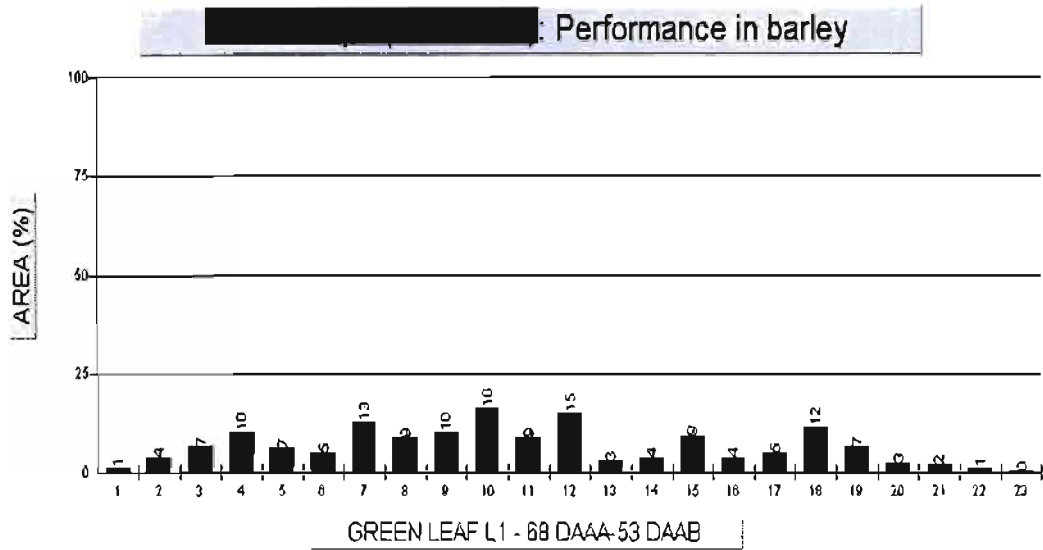
In terms of "tâches de léopard" (ZZXXAA), most of the treatments provided efficacy on L2 of between 68 and 97%, with the exception of Nos. 8, 12, 13, 14, 19, 22, and 23, which were found to be weaker. On L3, this efficacy was between 72 and 96% for most of the treatments, with the exception of Nos. 17, 19, 22 and 23.



Green Leaf Surface

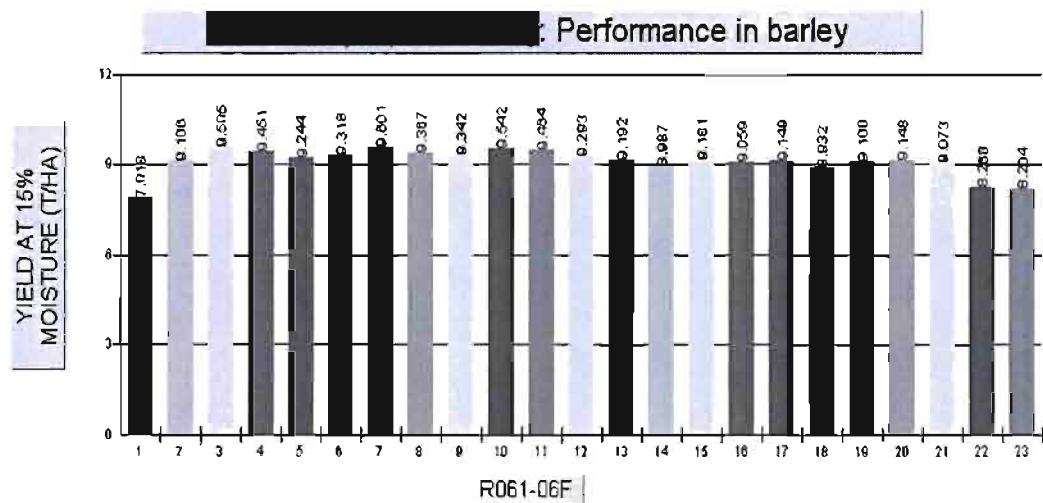
On 26th June 2006 (68 DAAA, 53 DAAB), the green leaf surface of leaf L1 was evaluated. In the control plot, it was evaluated at 1% on L1.

In the treated plots, treatment No. 10 presented the highest percentage green surface: 16%. Treatment No. 12 came close, with 15%. With the remaining treatments, the rate found varied from 3 to 13%. Treatments Nos. 20 to 23 were weaker.



Harvest results

The control reached a yield at 15% moisture of 7 918 T/HA (= 100%).



Significant increase in yield due to the treatments varied between 13 and 21%. Best results were noted for treatments No. 3 (██████████ at BBCH 32 followed by ██████████ at BBCH 39) and No. 7 (double application of Amistar + A8593-N at BBCH 32 and BBCH 39): 121%. All the other treatments showed statistically the same level of yield, from 113 to 119%; with the exception of treatment No. 18 (single application of ██████████ at BBCH 39): 113%. Treatments Nos. 22 and 23, based on ██████████, confirmed their weakness and provided equivalent results than the control : 104%.

From a qualitative point of view, all the treatments offered specific weight (Untreated = 100% = 62.6 KG/100 L) and thousand grains weight (TGW; Untreated = 100% = 39.9 G) significantly superior to the control, ranging respectively from 102 to 104% and from 108 to 112%.

Only treatments Nos. 22 and 23 were found equivalent to untreated : 100-101%.

Conclusions

In the context of this fungicide trial carried out on a crop of winter barley of the MARADO variety, all the treatments proved to be perfectly selective with regard to the crop.

From a disease control point of view, all the treatments applied at the two node stage (BBCH 32) followed by an application at the flag leaf stage (BBCH 39), or applied at the BBCH 39 only, were proved to be efficient against *Pyrenophora teres* (PYRNTE), *Rhynchosporium secalis* (RHYNSE) but also on the "tâches de léopard" (ZZXXAA) phenomenon, and this excepted for treatments based on the double applications, at BBCH 32 and BBCH 39, of [REDACTED] used at 0.3 L/HA or 0.5 L/HA which were insufficient.

Very little significant difference between treatments appeared in this trial regarding either the dose used or the triazole partner, for [REDACTED]. However, globally speaking, against the 2 diseases present, PYRNTE and RHYNSE, the double application of [REDACTED] 2.0 L/HA + [REDACTED] 1.0 L/HA seemed the most favourable.

Regarding the "tâches de léopard" symptoms, the presence of [REDACTED] in the mix with [REDACTED], and preferably in the latter case using the dose of 2.0 L//HA, provided the best results in terms of both single and double application.

The quantitative and qualitative harvest results (specific weight and 1000 grains weight) were to be compared with the observation results, without any significant difference between all the treatments, excepted for treatments [REDACTED] which were found to be significantly weaker and equivalent to the control.

Plot Map

Block	1	2	3	4
101	1	201 7	301 19	401 8
102	2	202 23	302 4	402 22
103	3	203 11	303 15	403 17
104	4	204 5	304 1	404 9
105	5	205 20	305 22	405 6
106	6	206 18	306 10	406 12
107	7	207 21	307 17	407 23
108	8	208 19	308 3	408 20
109	9	209 3	309 12	409 14
110	10	210 16	310 2	410 18
111	11	211 12	311 21	411 13
112	12	212 4	312 8	412 10
113	13	213 17	313 20	413 16
114	14	214 22	314 5	414 21
115	15	215 8	315 23	415 1
116	16	216 13	316 9	416 15
117	17	217 1	317 11	417 4
118	18	218 14	318 6	418 2
119	19	219 10	319 14	419 11
120	20	220 2	320 7	420 5
121	21	221 15	321 18	421 19
122	22	222 9	322 16	422 7
123	23	223 6	323 13	423 3

Site Description

General Trial Information

Sponsor: [REDACTED]	
Contact: [REDACTED]	
Contractor: Redebel s.a.	
Investigator: Philippe Reynens	
Trial Location	
City: Fexhe-Slins	Trial Status: ONE-YEAR/FINAL
State/Prov.: Liège	
Postal Code: 4458	Initiation Date: 30/3/06
Country: BEL	Planned Completion Date: 13/7/06
E-Longitude of LL Corner °: 5.560100	
N-Latitude of LL Corner °: 50.709600	

Conducted Under GEP: X

Guideline	Description
1. PP 1/026(3)	Foliar diseases on cereals
2. PP 1/135(2)	Phytotoxicity assessment
3. PP 1/152(2)	Design and analysis of efficacy evaluation trials
4. PP 1/181(2)	Conduct and reporting of efficacy evaluation trials

Objectives:

- What is the benefit of [REDACTED] used over a standard triazol programme in barley?
- What is the optimal rate of [REDACTED]?
- What is the benefit of [REDACTED] versus competitors?

Cooperator/Landowner

Cooperator: Dupuis Pierre	Country: Belgium
	Phone No: 04 278 69 63
Address 1: Rue Provinciale, 523	
City: Fexhe-Slins	
State/Prov: Lg	
Postal Code: 4458	E-mail/Mobile: (0495) 106 963

Crop Description

Crop 1: HORVW	Hordeum vulgare (winter)	Winter barley
Variety: Marado		
BBCH Scale:	BCER	Planting Date: 27/10/05
Planting Method:	SEEDS	Rate, Unit: 115 KG/HA
Depth, Unit:	2 CM	
Row Spacing, Unit:	12.5 CM	

Pest Description

Pest 1 Type: D	Code: PYRNTE	Pyrenophora teres
Common Name: Net blotch of barley		
Pest 2 Type: D	Code: ERYSGH	Erysiphe graminis f. sp. horde
Common Name: Powdery mildew of barley		
Pest 3 Type: D	Code: RHYNSE	Rhynchosporium secalis
Common Name: Leaf blotch of cereals		
Pest 4 Type: D	Code: Z2XXAA	Unknown nonparasitic caus. fac
Common Name: Unknown nonpar. causal factor		

Site and Design

Plot Width, Unit: 2.5 M Site Type: FIELD
 Plot Length, Unit: 9.5 M Tillage Type: CONVENTIONAL-TILL
 Replications: 4 Study Design: Randomized Complete Block

	Previous Crops	Year
1.	TRZAW	2005
2.	BEAVA	2004
3.	HORVW	2003

Harvest

Harvest Date: 11/7/06	Harvest Equipment: Wint. Expert
Harvested Width, Unit: 1.6 M	Harvested Length, Unit: 9.5 M

Maintenance

No.	Date	Maintenance Treatment Name	Form Conc	Form Unit	Form Type	Rate	Unit
1.	26/10/05	Javelin	562.5		SC	3	L/HA
2.	26/10/05	Fury	100		EW	0.1	L/HA
3.	27/3/06	Liquid Nitrogen	390.0	g/l	SL	150	L/HA
4.	22/4/06	Moddus 250 EC	250.0		EC	0.35	L/HA
5.	28/4/06	Ammonium nitrate	27.0	%	GR	100	L/HA
6.	9/5/06	Ethefon 480	480.0		SL	1	L/HA

Field Prep./Maintenance:
 Applied by the farmer.

Soil Description

% Sand: 6.1 % OM: 2.7 Texture: SILT LOAM
 % Silt: 77.0 pH: 6.2
 % Clay: 16.9 CEC: 11.3

Additional Measured Elements

Element	Quantity	Unit
Phosphorus P	9	mg/100gr
Water soluble P	0.2	mg/100gr
potassium	20	mg/100gr
Magnesium Mg	15	mg/100gr
Sodium Na	3	mg/100gr
Calcium Ca	196	mg/100gr

Application Description

	A	B
Application Date:	19/4/06	4/5/06
Time of Day:	15:15	11:00
Application Method:	SPRAY	SPRAY
Application Timing:	POST	POST
Application Placement:	BRODIR	BRODIR
Applied By:	REDEBEL	REDEBEL
Air Temperature, Unit:	15 C	26 C
% Relative Humidity:	47	32
Wind Velocity, Unit:	2 MPS	2.5 MPS
Wind Direction:	SSW	E
Soil Temperature, Unit:	13 C	14.5 C
Soil Moisture:	EXCESSIVE	ADEQUATE
% Cloud Cover:	60	0

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale:	HORVW BCER	HORVW BCER
Stage Scale Used:	BBCH	BBCH
Stage Majority, Percent:	32	39

Application Equipment

	A	B
Appl. Equipment:	RAM315D	RAM317D
Operating Pressure:	2.5	1.6
Pressure Unit:	bars	bars
Nozzle Type:	FLAT FAN	FLAT FAN
Nozzle Size:	A111015	DG8002
Nozzle Spacing, Unit:	50 cm	50 cm
Nozzles/Row:	5	5
Boom Length, Unit:	250 cm	250 cm
Ground Speed, Unit:	4 kph	4 kph
Carrier:	water	water
Spray Volume:	150	150
Volume Unit:	L/HA	L/HA
Propellant:	Nitrogen	Nitrogen

Treatment Application Comment

No comment

Weather Data

Date	Air T° max (C)	Air T° min (C)	Rainfalls (l/sqm)	Sunshine (hh:mm)	Humid max (%)	Humid min (%)	Wind Spd (kph)	Wind Direct
9/4/06	11.2	4.4	0.0	6:10	94	49	14.0	W
10/4/06	11.8	4.8	0.0	3:04	94	57	14.0	NNE
11/4/06	11.4	1.2	2.5	6:05	94	46	14.0	W
12/4/06	12.8	1.4	0.3	3:08	97	61	18.0	W
13/4/06	14.6	5.8	2.6	0:24	95	74	29.0	WSW
14/4/06	13.8	5.8	1.2	2:34	89	58	18.0	W
15/4/06	16.0	5.4	7.0	0:19	97	71	14.0	SE
16/4/06	16.1	6.5	6.2	0:55	95	75	22.0	W
17/4/06	14.0	8.2	1.4	1:18	93	67	14.0	WSW
18/4/06	14.8	6.0	0.0	5:31	92	59	14.0	W
19/4/06	15.1	5.0	0.0	8:00	79	54	11.0	SSW
20/4/06	16.1	5.2	0.0	3:39	79	47	7.0	VR
21/4/06	19.0	7.0	0.8	8:28	79	45	7.0	WNW
22/4/06	13.0	7.0	0.0	1:08	88	61	11.0	NNW
23/4/06	16.8	6.1	0.9	11:05	87	38	7.0	W
24/4/06	20.0	9.0	0.1	5:28	79	43	7.0	VR
25/4/06	22.2	9.5	3.0	8:49	74	54	11.0	W
26/4/06	17.4	10.5	0.2	2:28	90	65	11.0	WNW
27/4/06	16.0	10.0	0.0	1:04	88	55	11.0	NNE
28/4/06	15.0	7.0	0.0	6:48	100	42	14.0	N
29/4/06	10.8	4.0	0.9	5:31	88	46	11.0	WNW
30/4/06	10.0	3.2	2.2	3:32	94	76	11.0	SSW
1/5/06	12.0	3.7	1.0	0:29	84	57	9.4	S
2/5/06	21.7	9.7	1.0	6:43	92	35	13.3	SSW
3/5/06	28.4	14.2	0.0	7:39	59	32	13.3	SW
4/5/06	28.2	15.5	0.0	11:11	76	23	16.2	ESE
5/5/06	31.2	16.1	3.0	7:28	79	29	11.5	VR
6/5/06	26.8	15.2	2.0	6:40	91	22	12.2	E
7/5/06	25.2	14.5	0.0	4:48	45	24	15.5	SE
8/5/06	24.1	15.3	0.0	5:29	77	29	12.2	S
9/5/06	24.8	13.1	8.0	6:48	85	44	14.8	W
10/5/06	26.5	12.4	0.0	8:32	96	30	13.0	N
11/5/06	30.0	14.9	0.0	13:33	77	27	9.4	NE
12/5/06	28.4	13.5	0.0	11:08	68	26	10.8	W
13/5/06	19.2	11.9	32.0	2:05	98	47	13.3	SSW
14/5/06	15.5	11.1	0.0	0:53	98	73	9.4	W

Closest Weather Station: Liège-Monsin

Distance: 8 KM

Weather Data source: I. R. M./K.M.I. Uccle, Belgium

VR = Variable origin

Analysis Of Variance

Treatment Phytotoxicity

Rating Date							27/4/06	15/5/06
SE Name							PHYTOTOX	PHYTOTOX
Pest Type								
Pest Code								
Pest Stage								
Crop Code							HORVW	HORVW
BBCH Scale Type							BCER	BCER
Crop Variety							Marado	Marado
Crop Stage							32	65
Crop Stage Scale							BBCH	BBCH
Part Rated							PLANT C	PLANT C
Rating Data Type							PHYGEN	PHYGEN
Rating Unit							%UNCK	%UNCK
Sample Size							1	1
Sample Size Unit							PLOT	PLOT
Number of Subsamples							1	1
Footnote Number								
Assessed By							REDEBEL	REDEBEL
Days After Last Applic.							8	11
Tri-Eval Interval							8 DA-A	26 DA-A
ARM Action Codes							P	P
Number of Decimals							0	0
Trt No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Unit	1	10
1	AB		CHK	Untreated Check			0 a	0 a
2	A	31 [BBCH]	FUNG		2.00	L/HA	0 a	0 a
	B	37-39 [BBCH]	FUNG		1.50	L/HA		
	B	37-39 [BBCH]	FUNG		0.50	L/HA		
3	A	31 [BBCH]	FUNG		2.00	L/HA	0 a	0 a
	B	37-39 [BBCH]	FUNG		2.00	L/HA		
	B	37-39 [BBCH]	FUNG		0.50	L/HA		
4	A	31 [BBCH]	FUNG		2.00	L/HA	0 a	0 a
	B	37-39 [BBCH]	FUNG		2.00	L/HA		
	B	37-39 [BBCH]	FUNG		0.50	L/HA		
5	A	31 [BBCH]	FUNG		2.00	L/HA	0 a	0 a
	B	37-39 [BBCH]	FUNG		2.00	L/HA		
	B	37-39 [BBCH]	FUNG		1.00	L/HA		
6	A	31 [BBCH]	FUNG		2.00	L/HA	0 a	0 a
	B	37-39 [BBCH]	FUNG		1.25	L/HA		
7	A	31 [BBCH]	FUNG		0.60	L/HA	0 a	0 a
	A	31 [BBCH]	FUNG		1.00	L/HA		
	B	37-39 [BBCH]	FUNG		0.60	L/HA		
	B	37-39 [BBCH]	FUNG		1.00	L/HA		
8	A	31 [BBCH]	FUNG		1.50	L/HA	0 a	0 a
	A	31 [BBCH]	FUNG		1.00	L/HA		
	B	37-39 [BBCH]	FUNG		1.50	L/HA		
	B	37-39 [BBCH]	FUNG		1.00	L/HA		
9	A	31 [BBCH]	FUNG		2.00	L/HA	0 a	0 a
	A	31 [BBCH]	FUNG		1.00	L/HA		
	B	37-39 [BBCH]	FUNG		2.00	L/HA		
	B	37-39 [BBCH]	FUNG		1.00	L/HA		
10	A	31 [BBCH]	FUNG		0.60	L/HA	0 a	0 a
	A	31 [BBCH]	FUNG		1.00	L/HA		
	B	37-39 [BBCH]	FUNG		0.60	L/HA		
	B	37-39 [BBCH]	FUNG		1.00	L/HA		
11	A	31 [BBCH]	FUNG		1.20	L/HA	0 a	0 a
	B	37-39 [BBCH]	FUNG		1.20	L/HA		

Rating Date							27/4/06	15/5/06
SE Name							PHYTOTOX	PHYTOTOX
Pest Type								
Pest Code								
Pest Stage								
Crop Code							HORVW	HORVW
BBCH Scale Type							BCER	BCER
Crop Variety							Marado	Marado
Crop Stage							32	65
Crop Stage Seale							BBCH	BBCH
Part Rated							PLANT C	PLANT C
Rating Data Type							PHYGEN	PHYGEN
Rating Unit							%UNCK	%UNCK
Sample Size							1	1
Sample Size Unit							PLOT	PLOT
Number of Subsamples							1	1
Footnote Number								
Assessed By							REDEBEL	REDEBEL
Days After Last Applic.							8	11
Trt-Eval Interval							8 DA-A	26 DA-A
ARM Action Codes							P	P
Number of Decimals							0	0
Trt No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Rate Unit	I	10
12	B	37-39	[BBCH] FUNG		0.80	L/HA	0 a	0 a
	B	37-39	[BBCH] FUNG		1.00	L/HA		
13	B	37-39	[BBCH] FUNG		1.50	L/HA	0 a	0 a
	B	37-39	[BBCH] FUNG		1.00	L/HA		
14	B	37-39	[BBCH] FUNG		2.00	L/HA	0 a	0 a
	B	37-39	[BBCH] FUNG		1.00	L/HA		
15	B	37-39	[BBCH] FUNG		2.00	L/HA	0 a	0 a
	B	37-39	[BBCH] FUNG		0.50	L/HA		
16	B	37-39	[BBCH] FUNG		1.25	L/HA	0 a	0 a
17	B	37-39	[BBCH] FUNG		1.50	L/HA	0 a	0 a
18	B	37-39	[BBCH] FUNG		1.00	L/HA	0 a	0 a
19	B	37-39	[BBCH] FUNG		0.8	L/HA	0 a	0 a
20	A	31	[BBCH] FUNG		1.00	L/HA	0 a	0 a
	B	37-39	[BBCH] FUNG		2.00	L/HA		
21	A	31	[BBCH] FUNG		1.00	L/HA	0 a	0 a
	B	37-39	[BBCH] FUNG		2.00	L/HA		
22	A	31	[BBCH] FUNG		0.30	L/HA	0 a	0 a
	B	37-39	[BBCH] FUNG		0.30	L/HA		
23	A	31	[BBCH] FUNG		0.50	L/HA	0 a	0 a
	B	37-39	[BBCH] FUNG		0.50	L/HA		
LSD (P=.05)							0.0	0.0
Standard Deviation							0.0	0.0
CV							0.0	0.0
Grand Mean							0.0	0.0
Bartlett's X2							0.0	0.0
P(Bartlett's X2)							.	.
Replicate F							0.000	0.000
Replicate Prob(F)							1.0000	1.0000
Treatment F							0.000	0.000
Treatment Prob(F)							1.0000	1.0000

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Diseases coverage**PYRNTE**

Rating Date	4/5/06	4/5/06	4/5/06	4/5/06	22/5/06						
SE Name	%LEAF1	%LEAF2	%LEAF3	%LEAF4	%LEAF1						
Pest Type	D Disease	D Disease	D Disease	D Disease	D Disease						
Pest Code	PYRNTE	PYRNTE	PYRNTE	PYRNTE	PYRNTE						
Pest Stage	mixed	mixed	mixed	mixed	mixed						
Crop Code	HORVW	HORVW	HORVW	HORVW	HORVW						
BBCH Scale Type	BCER	BCER	BCER	BCER	BCER						
Crop Variety	Marado	Marado	Marado	Marado	Marado						
Crop Stage	39	39	39	39	69						
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH						
Part Rated	LEAF1 P	LEAF2 P	LEAF3 P	LEAF4 P	LEAF1 P						
Rating Data Type	COVAR	COVAR	COVAR	COVAR	COVAR						
Rating Unit	%AREA	%AREA	%AREA	%AREA	%AREA						
Sample Size	1	1	1	1	1						
Sample Size Unit	LEAF	LEAF	LEAF	LEAF	LEAF						
Number of Subsamples	10	10	10	10	10						
Footnote Number											
Assessed By	REDEBEL	REDEBEL	REDEBEL	REDEBEL	REDEBEL						
Days After Last Applic.	0	0	0	0	18						
Tri-Eval Interval	15 DA-A	15 DA-A	15 DA-A	15 DA-A	33 DA-A						
ARM Action Codes	P	P	P	P	P						
Number of Decimals	1	1	1	1	1						
Tri No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Unit	2	3	4	5	11
1	AB		CHK	Untreated Check			0.0	0.1	2.2	2.5	0.6 ab
2	A	31 [BBCH]	FUNG		2.00	L/HA					0.0 c
	B	37-39 [BBCH]	FUNG		1.50	L/HA					
	B	37-39 [BBCH]	FUNG		0.50	L/HA					
3	A	31 [BBCH]	FUNG		2.00	L/HA					0.0 c
	B	37-39 [BBCH]	FUNG		2.00	L/HA					
	B	37-39 [BBCH]	FUNG		0.50	L/HA					
4	A	31 [BBCH]	FUNG		2.00	L/HA					0.0 c
	B	37-39 [BBCH]	FUNG		2.00	L/HA					
	B	37-39 [BBCH]	FUNG		0.50	L/HA					
5	A	31 [BBCH]	FUNG		2.00	L/HA					0.1 bc
	B	37-39 [BBCH]	FUNG		2.00	L/HA					
	B	37-39 [BBCH]	FUNG		1.00	L/HA					
6	A	31 [BBCH]	FUNG		2.00	L/HA					0.0 c
	B	37-39 [BBCH]	FUNG		1.25	L/HA					
7	A	31 [BBCH]	FUNG		0.60	L/HA					0.0 c
	A	31 [BBCH]	FUNG		1.00	L/HA					
	B	37-39 [BBCH]	FUNG		0.60	L/HA					
	B	37-39 [BBCH]	FUNG		1.00	L/HA					
8	A	31 [BBCH]	FUNG		1.50	L/HA					0.1 bc
	A	31 [BBCH]	FUNG		1.00	L/HA					
	B	37-39 [BBCH]	FUNG		1.50	L/HA					
	B	37-39 [BBCH]	FUNG		1.00	L/HA					
9	A	31 [BBCH]	FUNG		2.00	L/HA					0.1 bc
	A	31 [BBCH]	FUNG		1.00	L/HA					
	B	37-39 [BBCH]	FUNG		2.00	L/HA					
	B	37-39 [BBCH]	FUNG		1.00	L/HA					
10	A	31 [BBCH]	FUNG		0.60	L/HA					0.0 c
	A	31 [BBCH]	FUNG		1.00	L/HA					
	B	37-39 [BBCH]	FUNG		0.60	L/HA					
	B	37-39 [BBCH]	FUNG		1.00	L/HA					
11	A	31 [BBCH]	FUNG		1.20	L/HA					0.1 bc
	B	37-39 [BBCH]	FUNG		1.20	L/HA					

Rating Date		4/5/06	4/5/06	4/5/06	4/5/06	22/5/06					
SE Name		%LEAF1	%LEAF2	%LEAF3	%LEAF4	%LEAF1					
Pest Type		D Disease	D Disease	D Disease	D Disease	D Disease					
Pest Code		PYRNTE	PYRNTE	PYRNTE	PYRNTE	PYRNTE					
Pest Stage		mixed	mixed	mixed	mixed	mixed					
Crop Code		HORVW	HORVW	HORVW	HORVW	HORVW					
BBCH Scale Type		BCER	BCER	BCER	BCER	BCER					
Crop Variety		Marado	Marado	Marado	Marado	Marado					
Crop Stage		39	39	39	39	69					
Crop Stage Scale		BBCH	BBCH	BBCH	BBCH	BBCH					
Part Rated		LEAF1 P	LEAF2 P	LEAF3 P	LEAF4 P	LEAF1 P					
Rating Data Type		COVAR	COVAR	COVAR	COVAR	COVAR					
Rating Unit		%AREA	%AREA	%AREA	%AREA	%AREA					
Sample Size		1	1	1	1	1					
Sample Size Unit		LEAF	LEAF	LEAF	LEAF	LEAF					
Number of Subsamples		10	10	10	10	10					
Footnote Number											
Assessed By		REDEBEL	REDEBEL	REDEBEL	REDEBEL	REDEBEL					
Days After Last Applic.		0	0	0	0	18					
Tri-Eval Interval		15 DA-A	15 DA-A	15 DA-A	15 DA-A	33 DA-A					
ARM Action Codes		P	P	P	P	P					
Number of Decimals		1	1	1	1	1					
Tri No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Rate Unit	2	3	4	5	11
12	B	37-39 [BBCH]	FUNG		0.80	L/HA					0.0 c
	B	37-39 [BBCH]	FUNG		1.00	L/HA					
13	B	37-39 [BBCH]	FUNG		1.50	L/HA					0.0 c
	B	37-39 [BBCH]	FUNG		1.00	L/HA					
14	B	37-39 [BBCH]	FUNG		2.00	L/HA					0.1 bc
	B	37-39 [BBCH]	FUNG		1.00	L/HA					
15	B	37-39 [BBCH]	FUNG		2.00	L/HA					0.1 bc
	B	37-39 [BBCH]	FUNG		0.50	L/HA					
16	B	37-39 [BBCH]	FUNG		1.25	L/HA					0.1 bc
17	B	37-39 [BBCH]	FUNG		1.50	L/HA					0.1 bc
18	B	37-39 [BBCH]	FUNG		1.00	L/HA					0.1 bc
19	B	37-39 [BBCH]	FUNG		0.8	L/HA					0.2 bc
20	A	31 [BBCH]	FUNG		1.00	L/HA					0.0 c
	B	37-39 [BBCH]	FUNG		2.00	L/HA					
21	A	31 [BBCH]	FUNG		1.00	L/HA					0.0 c
	B	37-39 [BBCH]	FUNG		2.00	L/HA					
22	A	31 [BBCH]	FUNG		0.30	L/HA					0.6 a
	B	37-39 [BBCH]	FUNG		0.30	L/HA					
23	A	31 [BBCH]	FUNG		0.50	L/HA					0.3 abc
	B	37-39 [BBCH]	FUNG		0.50	L/HA					
LSD (P=.05)											0.31
Standard Deviation											0.22
CV											203.92
Grand Mean					0.0		0.05	2.2	2.48		0.11
Bartlett's X2											43.177
P(Bartlett's X2)											0.001*
Replicate F											4.980
Replicate Prob(F)											0.0036
Treatment F											2.291
Treatment Prob(F)											0.0051

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Rating Date	22/5/06	22/5/06	14/6/06	14/6/06	14/6/06						
SE Name	%LEAF2	%LEAF3	%LEAF1	%LEAF2	%LEAF3						
Pest Type	D Disease	D Disease	D Disease	D Disease	D Disease						
Pest Code	PYRNTE	PYRNTE	PYRNTE	PYRNTE	PYRNTE						
Pest Stage	mixed	mixed	mixed	mixed	mixed						
Crop Code	HORVW	HORVW	HORVW	HORVW	HORVW						
BBCH Scale Type	BCER	BCER	BCER	BCER	BCER						
Crop Variety	Marado	Marado	Marado	Marado	Marado						
Crop Stage	69	69	73	73	73						
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH						
Part Rated	LEAF2 P	LEAF3 P	LEAF1 P	LEAF2 P	LEAF3 P						
Rating Data Type	COVAR	COVAR	COVAR	COVAR	COVAR						
Rating Unit	%AREA	%AREA	%AREA	%AREA	%AREA						
Sample Size	1	1	1	1	1						
Sample Size Unit	LEAF	LEAF	LEAF	LEAF	LEAF						
Number of Subsamples	10	10	10	10	10						
Footnote Number											
Assessed By	REDEBEL	REDEBEL	REDEBEL	REDEBEL	REDEBEL						
Days After Last Applic.	18	18	41	41	41						
Tri-Eval Interval	33 DA-A	33 DA-A	56 DA-A	56 DA-A	56 DA-A						
ARM Action Codes	P	APC	APC	APC	APC						
Number of Decimals	1	0	0	0	0						
Trt No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Rate Unit	12	13	17	20	23
1	AB		CHK	Untreated Check			3.3 a	8 a (0%)	23 a (0%)	39 ab (0%)	96 a (0%)
2	A	31 [BBCH]	FUNG		2.00	L/HA	0.7 cd	1 e (90%)	5 b (79%)	6 c (84%)	17 c-f (82%)
	B	37-39 [BBCH]	FUNG		1.50	L/HA					
	B	37-39 [BBCH]	FUNG		0.50	L/HA					
3	A	31 [BBCH]	FUNG		2.00	L/HA	0.5 cd	1 e (92%)	4 b (83%)	5 c (87%)	17 c-f (82%)
	B	37-39 [BBCH]	FUNG		2.00	L/HA					
	B	37-39 [BBCH]	FUNG		0.50	L/HA					
4	A	31 [BBCH]	FUNG		2.00	L/HA	0.5 cd	2 de (75%)	5 b (76%)	5 c (86%)	14 def (85%)
	B	37-39 [BBCH]	FUNG		2.00	L/HA					
	B	37-39 [BBCH]	FUNG		0.50	L/HA					
5	A	31 [BBCH]	FUNG		2.00	L/HA	0.2 d	1 e (88%)	4 b (84%)	7 c (81%)	20 c-f (79%)
	B	37-39 [BBCH]	FUNG		2.00	L/HA					
	B	37-39 [BBCH]	FUNG		1.00	L/HA					
6	A	31 [BBCH]	FUNG		2.00	L/HA	0.4 cd	1 e (90%)	5 b (77%)	5 c (88%)	13 ef (87%)
	B	37-39 [BBCH]	FUNG		1.25	L/HA					
7	A	31 [BBCH]	FUNG		0.60	L/HA	0.4 cd	1 e (87%)	3 b (88%)	3 c (92%)	6 f (94%)
	A	31 [BBCH]	FUNG		1.00	L/HA					
	B	37-39 [BBCH]	FUNG		0.60	L/HA					
	B	37-39 [BBCH]	FUNG		1.00	L/HA					
8	A	31 [BBCH]	FUNG		1.50	L/HA	0.5 cd	1 e (86%)	6 b (76%)	4 c (89%)	19 c-f (80%)
	A	31 [BBCH]	FUNG		1.00	L/HA					
	B	37-39 [BBCH]	FUNG		1.50	L/HA					
	B	37-39 [BBCH]	FUNG		1.00	L/HA					
9	A	31 [BBCH]	FUNG		2.00	L/HA	0.5 cd	2 de (79%)	3 b (88%)	4 c (90%)	5 f (95%)
	A	31 [BBCH]	FUNG		1.00	L/HA					
	B	37-39 [BBCH]	FUNG		2.00	L/HA					
	B	37-39 [BBCH]	FUNG		1.00	L/HA					
10	A	31 [BBCH]	FUNG		0.60	L/HA	0.3 cd	1 e (93%)	2 b (90%)	3 c (92%)	6 f (93%)
	A	31 [BBCH]	FUNG		1.00	L/HA					
	B	37-39 [BBCH]	FUNG		0.60	L/HA					
	B	37-39 [BBCH]	FUNG		1.00	L/HA					
11	A	31 [BBCH]	FUNG		1.20	L/HA	1.0 cd	2 de (70%)	4 b (85%)	5 c (87%)	18 c-f (81%)
	B	37-39 [BBCH]	FUNG		1.20	L/HA					
12	B	37-39 [BBCH]	FUNG		0.80	L/HA	0.9 cd	3 cde (58%)	3 b (88%)	4 c (90%)	15 def (84%)
	B	37-39 [BBCH]	FUNG		1.00	L/HA					
13	B	37-39 [BBCH]	FUNG		1.50	L/HA	0.6 cd	3 cde (57%)	6 b (75%)	7 c (82%)	39 bcd (59%)
	B	37-39 [BBCH]	FUNG		1.00	L/HA					

Rating Date			22/5/06	22/5/06	14/6/06	14/6/06	14/6/06	
SE Name			%LEAF2	%LEAF3	%LEAF1	%LEAF2	%LEAF3	
Pest Type			D Disease	D Disease	D Disease	D Disease	D Disease	
Pest Code			PYRNTE	PYRNTE	PYRNTE	PYRNTE	PYRNTE	
Pest Stage			mixed	mixed	mixed	mixed	mixed	
Crop Code			HORVW	HORVW	HORVW	HORVW	HORVW	
BBCH Scale Type			BCER	BCER	BCER	BCER	BCER	
Crop Variety			Marado	Marado	Marado	Marado	Marado	
Crop Stage			69	69	73	73	73	
Crop Stage Scale			BBCH	BBCH	BBCH	BBCH	BBCH	
Part Rated			LEAF2 P	LEAF3 P	LEAF1 P	LEAF2 P	LEAF3 P	
Rating Data Type			COVAR	COVAR	COVAR	COVAR	COVAR	
Rating Unit			%AREA	%AREA	%AREA	%AREA	%AREA	
Sample Size			1	1	1	1	1	
Sample Size Unit			LEAF	LEAF	LEAF	LEAF	LEAF	
Number of Subsamples			10	10	10	10	10	
Footnote Number								
Assessed By			REDEBEL	REDEBEL	REDEBEL	REDEBEL	REDEBEL	
Days After Last Applie.			18	18	41	41	41	
Trt-Eval Interval			33 DA-A	33 DA-A	56 DA-A	56 DA-A	56 DA-A	
ARM Action Codes			P	APC	APC	APC	APC	
Number of Decimals			1	0	0	0	0	
Trt Appl								
No. Code								
Growth Stage								
Type								
Treatment Name								
Rate								
Rate Unit								
			12	13	17	20	23	
14 B	37-39 [BBCH]	FUNG	2.00 L/HA	1.3 bcd	4 b-e	6 b	9 c	41 bc
B	37-39 [BBCH]	FUNG	1.00 L/HA		(47%)	(76%)	(76%)	(58%)
15 B	37-39 [BBCH]	FUNG	2.00 L/HA	0.6 cd	5 a-d	4 b	6 c	22 c-f
B	37-39 [BBCH]	FUNG	0.50 L/HA		(39%)	(82%)	(85%)	(77%)
16 B	37-39 [BBCH]	FUNG	1.25 L/HA	0.3 cd	3 cde	4 b	5 c	23 c-f
					(58%)	(81%)	(88%)	(76%)
17 B	37-39 [BBCH]	FUNG	1.50 L/HA	1.6 bcd	6 abc	3 b	9 c	48 b
					(20%)	(85%)	(76%)	(51%)
18 B	37-39 [BBCH]	FUNG	1.00 L/HA	0.7 cd	5 a-d	3 b	7 c	36 b-e
					(39%)	(85%)	(82%)	(63%)
19 B	37-39 [BBCH]	FUNG	0.8 L/HA	1.8 bc	6 abc	4 b	8 c	48 b
					(24%)	(83%)	(79%)	(50%)
20 A	31 [BBCH]	FUNG	1.00 L/HA	0.4 cd	1 e	5 b	10 c	37 b-e
B	37-39 [BBCH]	FUNG	2.00 L/HA		(86%)	(78%)	(74%)	(61%)
21 A	31 [BBCH]	FUNG	1.00 L/HA	0.6 cd	2 de	6 b	10 c	36 b-e
B	37-39 [BBCH]	FUNG	2.00 L/HA		(80%)	(76%)	(74%)	(63%)
22 A	31 [BBCH]	FUNG	0.30 L/HA	1.4 bcd	6 abc	20 a	32 b	84 a
B	37-39 [BBCH]	FUNG	0.30 L/HA		(25%)	(14%)	(17%)	(12%)
23 A	31 [BBCH]	FUNG	0.50 L/HA	2.4 b	7 ab	19 a	42 a	95 a
B	37-39 [BBCH]	FUNG	0.50 L/HA		(10%)	(16%)	(-8%)	(1%)
LSD (P=.05)			0.88	2.0	4.3	7.6	14.8	
Standard Deviation			0.62	1.4	3.0	5.4	10.4	
CV			69.3	47.06	47.33	52.12	31.77	
Grand Mean			0.9	2.98	6.37	10.27	32.84	
Bartlett's X2			37.489	43.504	37.282	86.821	57.298	
P(Bartlett's X2)			0.021*	0.004*	0.022*	0.001*	0.001*	
Replicate F			12.553	8.812	13.819	0.617	1.192	
Replicate Prob(F)			0.0001	0.0001	0.0001	0.6065	0.3198	
Treatment F			5.856	10.054	14.777	17.327	26.206	
Treatment Prob(F)			0.0001	0.0001	0.0001	0.0001	0.0001	

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

RHYNSE

Rating Date	22/5/06	22/5/06	22/5/06	14/6/06	14/6/06						
SE Name	%LEAF1	%LEAF2	%LEAF3	%LEAF1	%LEAF2						
Pest Type	D Disease	D Disease	D Disease	D Disease	D Disease						
Pest Code	RHYNSE	RHYNSE	RHYNSE	RHYNSE	RHYNSE						
Pest Stage	mixed	mixed	mixed	mixed	mixed						
Crop Code	HORVW	HORVW	HORVW	HORVW	HORVW						
BBCH Scale Type	BCER	BCER	BCER	BCER	BCER						
Crop Variety	Marado	Marado	Marado	Marado	Marado						
Crop Stage	69	69	69	73	73						
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH						
Part Rated	LEAF1 P	LEAF2 P	LEAF3 P	LEAF1 P	LEAF2 P						
Rating Data Type	COVAR	COVAR	COVAR	COVAR	COVAR						
Rating Unit	%AREA	%AREA	%AREA	%AREA	%AREA						
Sample Size	1	1	1	1	1						
Sample Size Unit	LEAF	LEAF	LEAF	LEAF	LEAF						
Number of Subsamples	10	10	10	10	10						
Footnote Number											
Assessed By	REDEBEL	REDEBEL	REDEBEL	REDEBEL	REDEBEL						
Days After Last Applic.	18	18	18	41	41						
Trt-Eval Interval	33 DA-A	33 DA-A	33 DA-A	56 DA-A	56 DA-A						
ARM Action Codes	P	P	P	P	APC						
Number of Decimals	1	1	1	1	0						
Trt No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Rate Unit	14	15	16	18	21
1	AB		CHK	Untreated Check			0.0 a	0.0 a	0.3 a	2.0 a	12 ab (0%)
2	A	31 [BBCH]	FUNG		2.00	L/HA	0.0 a	0.0 a	0.0 a	0.7 a	1 b (94%)
	B	37-39 [BBCH]	FUNG		1.50	L/HA					
	B	37-39 [BBCH]	FUNG		0.50	L/HA					
3	A	31 [BBCH]	FUNG		2.00	L/HA	0.0 a	0.0 a	0.0 a	0.0 a	0 b (98%)
	B	37-39 [BBCH]	FUNG		2.00	L/HA					
	B	37-39 [BBCH]	FUNG		0.50	L/HA					
4	A	31 [BBCH]	FUNG		2.00	L/HA	0.0 a	0.0 a	0.3 a	0.1 a	0 b (98%)
	B	37-39 [BBCH]	FUNG		2.00	L/HA					
	B	37-39 [BBCH]	FUNG		0.50	L/HA					
5	A	31 [BBCH]	FUNG		2.00	L/HA	0.0 a	0.0 a	0.0 a	0.1 a	0 b (96%)
	B	37-39 [BBCH]	FUNG		2.00	L/HA					
	B	37-39 [BBCH]	FUNG		1.00	L/HA					
6	A	31 [BBCH]	FUNG		2.00	L/HA	0.0 a	0.0 a	0.0 a	0.2 a	0 b (99%)
	B	37-39 [BBCH]	FUNG		1.25	L/HA					
7	A	31 [BBCH]	FUNG		0.60	L/HA	0.0 a	0.0 a	0.1 a	0.2 a	0 b (99%)
	A	31 [BBCH]	FUNG		1.00	L/HA					
	B	37-39 [BBCH]	FUNG		0.60	L/HA					
	B	37-39 [BBCH]	FUNG		1.00	L/HA					
8	A	31 [BBCH]	FUNG		1.50	L/HA	0.0 a	0.0 a	0.1 a	0.4 a	0 b (97%)
	A	31 [BBCH]	FUNG		1.00	L/HA					
	B	37-39 [BBCH]	FUNG		1.50	L/HA					
	B	37-39 [BBCH]	FUNG		1.00	L/HA					
9	A	31 [BBCH]	FUNG		2.00	L/HA	0.0 a	0.0 a	0.0 a	0.1 a	0 b (98%)
	A	31 [BBCH]	FUNG		1.00	L/HA					
	B	37-39 [BBCH]	FUNG		2.00	L/HA					
	B	37-39 [BBCH]	FUNG		1.00	L/HA					
10	A	31 [BBCH]	FUNG		0.60	L/HA	0.0 a	0.0 a	0.0 a	0.1 a	0 b (97%)
	A	31 [BBCH]	FUNG		1.00	L/HA					
	B	37-39 [BBCH]	FUNG		0.60	L/HA					
	B	37-39 [BBCH]	FUNG		1.00	L/HA					
11	A	31 [BBCH]	FUNG		1.20	L/HA	0.0 a	0.0 a	0.0 a	0.1 a	0 b (98%)
	B	37-39 [BBCH]	FUNG		1.20	L/HA					

Rating Date		22/5/06	22/5/06	22/5/06	14/6/06	14/6/06					
SE Name		%LEAF1	%LEAF2	%LEAF3	%LEAF1	%LEAF2					
Pest Type		D Disease	D Disease	D Disease	D Disease	D Disease					
Pest Code		RHYNSE	RHYNSE	RHYNSE	RHYNSE	RHYNSE					
Pest Stage		mixed	mixed	mixed	mixed	mixed					
Crop Code		HORVW	HORVW	HORVW	HORVW	HORVW					
BBCH Scale Type		BCER	BCER	BCER	BCER	BCER					
Crop Variety		Marado	Marado	Marado	Marado	Marado					
Crop Stage		69	69	69	73	73					
Crop Stage Scale		BBCH	BBCH	BBCH	BBCH	BBCH					
Part Rated		LEAF1 P	LEAF2 P	LEAF3 P	LEAF1 P	LEAF2 P					
Rating Data Type		COVAR	COVAR	COVAR	COVAR	COVAR					
Rating Unit		%AREA	%AREA	%AREA	%AREA	%AREA					
Sample Size		1	1	1	1	1					
Sample Size Unit		LEAF	LEAF	LEAF	LEAF	LEAF					
Number of Subsamples		10	10	10	10	10					
Footnote Number											
Assessed By		REDEBEL	REDEBEL	REDEBEL	REDEBEL	REDEBEL					
Days After Last Applic.		18	18	18	41	41					
Trt-Eval Interval		33 DA-A	33 DA-A	33 DA-A	56 DA-A	56 DA-A					
ARM Action Codes		P	P	P	P	APC					
Number of Decimals		1	1	1	1	0					
Trt No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Rate Unit	14	15	16	18	21
12	B	37-39	[BBCH]	FUNG	0.80	L/HA	0.0 a	0.1 a	0.5 a	0.2 a	0 b
	B	37-39	[BBCH]	FUNG	1.00	L/HA					(96%)
13	B	37-39	[BBCH]	FUNG	1.50	L/HA	0.0 a	0.0 a	0.0 a	0.2 a	1 b
	B	37-39	[BBCH]	FUNG	1.00	L/HA					(96%)
14	B	37-39	[BBCH]	FUNG	2.00	L/HA	0.0 a	0.0 a	0.0 a	0.1 a	1 b
	B	37-39	[BBCH]	FUNG	1.00	L/HA					(94%)
15	B	37-39	[BBCH]	FUNG	2.00	L/HA	0.0 a	0.0 a	0.2 a	0.2 a	0 b
	B	37-39	[BBCH]	FUNG	0.50	L/HA					(98%)
16	B	37-39	[BBCH]	FUNG	1.25	L/HA	0.0 a	0.0 a	0.0 a	0.1 a	0 b
											(98%)
17	B	37-39	[BBCH]	FUNG	1.50	L/HA	0.0 a	0.0 a	0.0 a	0.2 a	0 b
											(98%)
18	B	37-39	[BBCH]	FUNG	1.00	L/HA	0.0 a	0.0 a	0.2 a	0.4 a	0 b
											(96%)
19	B	37-39	[BBCH]	FUNG	0.8	L/HA	0.0 a	0.0 a	0.1 a	0.2 a	1 b
											(94%)
20	A	31	[BBCH]	FUNG	1.00	L/HA	0.0 a	0.0 a	0.0 a	0.2 a	0 b
	B	37-39	[BBCH]	FUNG	2.00	L/HA					(96%)
21	A	31	[BBCH]	FUNG	1.00	L/HA	0.0 a	0.0 a	0.0 a	0.1 a	1 b
	B	37-39	[BBCH]	FUNG	2.00	L/HA					(90%)
22	A	31	[BBCH]	FUNG	0.30	L/HA	0.0 a	0.0 a	0.0 a	0.3 a	11 ab
	B	37-39	[BBCH]	FUNG	0.30	L/HA					(12%)
23	A	31	[BBCH]	FUNG	0.50	L/HA	0.0 a	0.0 a	0.0 a	2.6 a	18 a
	B	37-39	[BBCH]	FUNG	0.50	L/HA					(-49%)
LSD (P=.05)					0.00		0.00	0.04	0.33	1.62	7.2
Standard Deviation					0.00		0.00	0.03	0.23	1.15	5.1
CV					0.0		959.17	306.13	314.32	239.18	
Grand Mean					0.0		0.0	0.08	0.37	2.14	
Bartlett's X2					0.0		0.0	52.066	206.667	253.643	
P(Bartlett's X2)					.		.	0.001*	0.001*	0.001*	
Replicate F					0.000		1.000	7.429	0.226	0.503	
Replicate Prob(F)					1.0000		0.3985	0.0002	0.8782	0.6816	
Treatment F					0.000		1.000	1.120	1.216	3.361	
Treatment Prob(F)					1.0000		0.4768	0.3498	0.2656	0.0001	

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Rating Date							14/6/06
SE Name							%LEAF3
Pest Type							D Disease
Pest Code							RHYNSE
Pest Stage							mixed
Crop Code							HORVW
BBCH Scale Type							BCER
Crop Variety							Marado
Crop Stage							73
Crop Stage Scale							BBCH
Part Rated							LEAF3 P
Rating Data Type							COVAR
Rating Unit							%AREA
Sample Size							1
Sample Size Unit							LEAF
Number of Subsamples							10
Footnote Number							
Assessed By							REDEBEL
Days After Last Applic.							41
Trt-Eval Interval							56 DA-A
ARM Action Codes							APC
Number of Decimals							0
Trt No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Unit	
1	AB		CHK	Untreated Check			24 95 a (0%)
2	A	31 [BBCH]	FUNG		2.00	L/HA	4 d
	B	37-39 [BBCH]	FUNG		1.50	L/HA	(96%)
	B	37-39 [BBCH]	FUNG		0.50	L/HA	
3	A	31 [BBCH]	FUNG		2.00	L/HA	8 d
	B	37-39 [BBCH]	FUNG		2.00	L/HA	(91%)
	B	37-39 [BBCH]	FUNG		0.50	L/HA	
4	A	31 [BBCH]	FUNG		2.00	L/HA	6 d
	B	37-39 [BBCH]	FUNG		2.00	L/HA	(94%)
	B	37-39 [BBCH]	FUNG		0.50	L/HA	
5	A	31 [BBCH]	FUNG		2.00	L/HA	11 cd
	B	37-39 [BBCH]	FUNG		2.00	L/HA	(88%)
	B	37-39 [BBCH]	FUNG		1.00	L/HA	
6	A	31 [BBCH]	FUNG		2.00	L/HA	5 d
	B	37-39 [BBCH]	FUNG		1.25	L/HA	(94%)
7	A	31 [BBCH]	FUNG		0.60	L/HA	1 d
	A	31 [BBCH]	FUNG		1.00	L/HA	(99%)
	B	37-39 [BBCH]	FUNG		0.60	L/HA	
	B	37-39 [BBCH]	FUNG		1.00	L/HA	
8	A	31 [BBCH]	FUNG		1.50	L/HA	12 cd
	A	31 [BBCH]	FUNG		1.00	L/HA	(88%)
	B	37-39 [BBCH]	FUNG		1.50	L/HA	
	B	37-39 [BBCH]	FUNG		1.00	L/HA	
9	A	31 [BBCH]	FUNG		2.00	L/HA	4 d
	A	31 [BBCH]	FUNG		1.00	L/HA	(96%)
	B	37-39 [BBCH]	FUNG		2.00	L/HA	
	B	37-39 [BBCH]	FUNG		1.00	L/HA	
10	A	31 [BBCH]	FUNG		0.60	L/HA	1 d
	A	31 [BBCH]	FUNG		1.00	L/HA	(99%)
	B	37-39 [BBCH]	FUNG		0.60	L/HA	
	B	37-39 [BBCH]	FUNG		1.00	L/HA	
11	A	31 [BBCH]	FUNG		1.20	L/HA	6 d
	B	37-39 [BBCH]	FUNG		1.20	L/HA	(94%)
12	B	37-39 [BBCH]	FUNG		0.80	L/HA	3 d
	B	37-39 [BBCH]	FUNG		1.00	L/HA	(96%)
13	B	37-39 [BBCH]	FUNG		1.50	L/HA	18 cd
	B	37-39 [BBCH]	FUNG		1.00	L/HA	(81%)

Rating Date							14/6/06
SE Name							%LEAF3
Pest Type							D Disease
Pest Code							RHYNSE
Pest Stage							mixed
Crop Code							HORVW
BBCH Scale Type							BCER
Crop Variety							Marado
Crop Stage							73
Crop Stage Scale							BBCH
Part Rated							LEAF3 P
Rating Data Type							COVAR
Rating Unit							%AREA
Sample Size							1
Sample Size Unit							LEAF
Number of Subsamples							10
Footnote Number							
Assessed By							REDEBEL
Days After Last Applic.							41
Tri-Eval Interval							56 DA-A
ARM Action Codes							APC
Number of Decimals							0
Tri No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Rate Unit	
14	B	37-39 [BBCH]	FUNG		2.00	L/HA	21 cd
	B	37-39 [BBCH]	FUNG		1.00	L/HA	(78%)
15	B	37-39 [BBCH]	FUNG		2.00	L/HA	11 cd
	B	37-39 [BBCH]	FUNG		0.50	L/HA	(89%)
16	B	37-39 [BBCH]	FUNG		1.25	L/HA	13 cd
							(86%)
17	B	37-39 [BBCH]	FUNG		1.50	L/HA	35 c
							(63%)
18	B	37-39 [BBCH]	FUNG		1.00	L/HA	18 cd
							(81%)
19	B	37-39 [BBCH]	FUNG		0.8	L/HA	34 c
							(64%)
20	A	31 [BBCH]	FUNG		1.00	L/HA	21 cd
	B	37-39 [BBCH]	FUNG		2.00	L/HA	(78%)
21	A	31 [BBCH]	FUNG		1.00	L/HA	21 cd
	B	37-39 [BBCH]	FUNG		2.00	L/HA	(78%)
22	A	31 [BBCH]	FUNG		0.30	L/HA	75 b
	B	37-39 [BBCH]	FUNG		0.30	L/HA	(21%)
23	A	31 [BBCH]	FUNG		0.50	L/HA	88 ab
	B	37-39 [BBCH]	FUNG		0.50	L/HA	(8%)
LSD (P=.05)							15.0
Standard Deviation							10.6
CV							48.03
Grand Mean							22.15
Bartlett's X2							47.681
P(Bartlett's X2)							0.001*
Replicate F							1.469
Replicate Prob(F)							0.2309
Treatment F							25.941
Treatment Prob(F)							0.0001

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

ZZXXAA

Rating Date	14/6/06	14/6/06	14/6/06						
SE Name	%LEAF1	%LEAF2	%LEAF3						
Pest Type	D Disease	D Disease	D Disease						
Pest Code	ZZXXAA	ZZXXAA	ZZXXAA						
Pest Stage	mixed	mixed	mixed						
Crop Code	HORVW	HORVW	HORVW						
BBCH Scale Type	BCER	BCER	BCER						
Crop Variety	Marado	Marado	Marado						
Crop Stage	73	73	73						
Crop Stage Scale	BBCH	BBCH	BBCH						
Part Rated	LEAF1 P	LEAF2 P	LEAF3 P						
Rating Data Type	COVAR	COVAR	COVAR						
Rating Unit	%AREA	%AREA	%AREA						
Sample Size	1	1	1						
Sample Size Unit	LEAF	LEAF	LEAF						
Number of Subsamples	10	10	10						
Footnote Number	1	1	1						
Assessed By	REDEBEL	REDEBEL	REDEBEL						
Days After Last Applic.	41	41	41						
Trt-Eval Interval	56 DA-A	56 DA-A	56 DA-A						
ARM Action Codes	P	APC	APC						
Number of Decimals	1	0	0						
Trt No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Rate Unit	19	22	25
1	AB		CHK	Untreated Check			3.4 a	16 ab (0%)	97 a (0%)
2	A	31 [BBCH]	FUNG		2.00	L/HA	0.7 a	1 c	4 e
	B	37-39 [BBCH]	FUNG		1.50	L/HA		(92%)	(96%)
	B	37-39 [BBCH]	FUNG		0.50	L/HA			
3	A	31 [BBCH]	FUNG		2.00	L/HA	0.4 a	0 c	8 e
	B	37-39 [BBCH]	FUNG		2.00	L/HA		(97%)	(92%)
	B	37-39 [BBCH]	FUNG		0.50	L/HA			
4	A	31 [BBCH]	FUNG		2.00	L/HA	0.2 a	1 c	6 e
	B	37-39 [BBCH]	FUNG		2.00	L/HA		(95%)	(94%)
	B	37-39 [BBCH]	FUNG		0.50	L/HA			
5	A	31 [BBCH]	FUNG		2.00	L/HA	0.6 a	3 c	16 de
	B	37-39 [BBCH]	FUNG		2.00	L/HA		(79%)	(84%)
	B	37-39 [BBCH]	FUNG		1.00	L/HA			
6	A	31 [BBCH]	FUNG		2.00	L/HA	0.4 a	1 c	6 e
	B	37-39 [BBCH]	FUNG		1.25	L/HA		(94%)	(93%)
7	A	31 [BBCH]	FUNG		0.60	L/HA	2.2 a	4 bc	9 e
	A	31 [BBCH]	FUNG		1.00	L/HA		(73%)	(91%)
	B	37-39 [BBCH]	FUNG		0.60	L/HA			
	B	37-39 [BBCH]	FUNG		1.00	L/HA			
8	A	31 [BBCH]	FUNG		1.50	L/HA	2.8 a	6 abc	17 cde
	A	31 [BBCH]	FUNG		1.00	L/HA		(61%)	(82%)
	B	37-39 [BBCH]	FUNG		1.50	L/HA			
	B	37-39 [BBCH]	FUNG		1.00	L/HA			
9	A	31 [BBCH]	FUNG		2.00	L/HA	1.4 a	5 bc	11 e
	A	31 [BBCH]	FUNG		1.00	L/HA		(68%)	(89%)
	B	37-39 [BBCH]	FUNG		2.00	L/HA			
	B	37-39 [BBCH]	FUNG		1.00	L/HA			
10	A	31 [BBCH]	FUNG		0.60	L/HA	1.8 a	5 bc	8 e
	A	31 [BBCH]	FUNG		1.00	L/HA		(72%)	(92%)
	B	37-39 [BBCH]	FUNG		0.60	L/HA			
	B	37-39 [BBCH]	FUNG		1.00	L/HA			
11	A	31 [BBCH]	FUNG		1.20	L/HA	0.6 a	1 c	6 e
	B	37-39 [BBCH]	FUNG		1.20	L/HA		(92%)	(93%)

Rating Date		14/6/06	14/6/06	14/6/06					
SE Name		%LEAF1	%LEAF2	%LEAF3					
Pest Type		D Disease	D Disease	D Disease					
Pest Code		ZZXXAA	ZZXXAA	ZZXXAA					
Pest Stage		mixed	mixed	mixed					
Crop Code		HORVW	HORVW	HORVW					
BBCH Scale Type		BCER	BCER	BCER					
Crop Variety		Marado	Marado	Marado					
Crop Stage		73	73	73					
Crop Stage Scale		BBCH	BBCH	BBCH					
Part Rated		LEAF1 P	LEAF2 P	LEAF3 P					
Rating Data Type		COVAR	COVAR	COVAR					
Rating Unit		%AREA	%AREA	%AREA					
Sample Size		1	1	1					
Sample Size Unit		LEAF	LEAF	LEAF					
Number of Subsamples		10	10	10					
Footnote Number		1	1	1					
Assessed By		REDEBEL	REDEBEL	REDEBEL					
Days After Last Applic.		41	41	41					
Trt-Eval Interval		56 DA-A	56 DA-A	56 DA-A					
ARM Action Codes		P	APC	APC					
Number of Decimals		1	0	0					
Trt No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Rate Unit	19	22	25
12	B	37-39 [BBCH]	FUNG		0.80	L/HA	1.3 a	6 abc (61%)	10 e (90%)
	B	37-39 [BBCH]	FUNG		1.00	L/HA			
13	B	37-39 [BBCH]	FUNG		1.50	L/HA	2.6 a	8 abc (51%)	23 cde (76%)
	B	37-39 [BBCH]	FUNG		1.00	L/HA			
14	B	37-39 [BBCH]	FUNG		2.00	L/HA	2.3 a	6 abc (60%)	27 cde (72%)
	B	37-39 [BBCH]	FUNG		1.00	L/HA			
15	B	37-39 [BBCH]	FUNG		2.00	L/HA	1.1 a	1 c (93%)	14 de (86%)
	B	37-39 [BBCH]	FUNG		0.50	L/HA			
16	B	37-39 [BBCH]	FUNG		1.25	L/HA	0.5 a	1 c (94%)	14 de (86%)
17	B	37-39 [BBCH]	FUNG		1.50	L/HA	0.7 a	2 c (90%)	36 cd (63%)
18	B	37-39 [BBCH]	FUNG		1.00	L/HA	0.9 a	2 c (85%)	19 cde (81%)
19	B	37-39 [BBCH]	FUNG		0.8	L/HA	1.6 a	8 abc (53%)	40 c (59%)
20	A	31 [BBCH]	FUNG		1.00	L/HA	1.1 a	3 c (82%)	22 cde (77%)
	B	37-39 [BBCH]	FUNG		2.00	L/HA			
21	A	31 [BBCH]	FUNG		1.00	L/HA	2.0 a	3 c (80%)	23 cde (76%)
	B	37-39 [BBCH]	FUNG		2.00	L/HA			
22	A	31 [BBCH]	FUNG		0.30	L/HA	0.8 a	11 abc (34%)	76 b (22%)
	B	37-39 [BBCH]	FUNG		0.30	L/HA			
23	A	31 [BBCH]	FUNG		0.50	L/HA	3.0 a	18 a (-12%)	88 ab (9%)
	B	37-39 [BBCH]	FUNG		0.50	L/HA			
LSD (P=.05)							2.21	7.6	15.0
Standard Deviation							1.56	5.4	10.6
CV							112.13	108.51	42.23
Grand Mean							1.39	4.98	25.16
Bartlett's X2							72.163	99.895	28.648
P(Bartlett's X2)							0.001*	0.001*	0.155
Replicate F							14.569	9.648	4.817
Replicate Prob(F)							0.0001	0.0001	0.0043
Treatment F							1.457	3.124	24.585
Treatment Prob(F)							0.1223	0.0002	0.0001

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

ERYSGH

Rating Date		4/5/06	4/5/06	4/5/06	4/5/06	
SE Name		%LEAF1	%LEAF2	%LEAF3	%LEAF4	
Pest Type		D Disease	D Disease	D Disease	D Disease	
Pest Code		ERYSGH	ERYSGH	ERYSGH	ERYSGH	
Pest Stage		mixed	mixed	mixed	mixed	
Crop Code		HORVW	HORVW	HORVW	HORVW	
BBCH Scale Type		BCER	BCER	BCER	BCER	
Crop Variety		Marado	Marado	Marado	Marado	
Crop Stage		39	39	39	39	
Crop Stage Scale		BBCH	BBCH	BBCH	BBCH	
Part Rated		LEAF1 P	LEAF2 P	LEAF3 P	LEAF4 P	
Rating Data Type		COVAR	COVAR	COVAR	COVAR	
Rating Unit		%AREA	%AREA	%AREA	%AREA	
Sample Size		1	1	1	1	
Sample Size Unit		LEAF	LEAF	LEAF	LEAF	
Number of Subsamples		10	10	10	10	
Footnote Number						
Assessed By		REDEBEL	REDEBEL	REDEBEL	REDEBEL	
Days After Last Applic.		0	0	0	0	
Trt-Eval Interval		15 DA-A	15 DA-A	15 DA-A	15 DA-A	
ARM Action Codes		P	P	P	P	
Number of Decimals		1	1	1	1	
Trt No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Unit
1	AB		CHK	Untreated Check	0.0	0.0
					0.1	0.8

Green Leaf Surface

Rating Date								26/6/06
SE Name								%GREEN
Pest Type								
Pest Code								
Pest Stage								
Crop Code								HORVW
BBCH Scale Type								BCER
Crop Variety								Marado
Crop Stage								77
Crop Stage Scale								BBCH
Part Rated								LEAF1
Rating Data Type								GREEN
Rating Unit								%AREA
Sample Size								1
Sample Size Unit								LEAF
Number of Subsamples								10
Footnote Number								
Assessed By								REDEBEL
Days After Last Applic.								53
Tri-Eval Interval								68 DA-A
ARM Action Codes								P
Number of Decimals								0
Tri No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Rate Unit		
1	AB		CHK	Untreated Check			27 1 bc	
2	A	31 [BBCH]	FUNG		2.00	L/HA	4 abc	
	B	37-39 [BBCH]	FUNG		1.50	L/HA		
	B	37-39 [BBCH]	FUNG		0.50	L/HA		
3	A	31 [BBCH]	FUNG		2.00	L/HA	7 abc	
	B	37-39 [BBCH]	FUNG		2.00	L/HA		
	B	37-39 [BBCH]	FUNG		0.50	L/HA		
4	A	31 [BBCH]	FUNG		2.00	L/HA	10 abc	
	B	37-39 [BBCH]	FUNG		2.00	L/HA		
	B	37-39 [BBCH]	FUNG		0.50	L/HA		
5	A	31 [BBCH]	FUNG		2.00	L/HA	7 abc	
	B	37-39 [BBCH]	FUNG		2.00	L/HA		
	B	37-39 [BBCH]	FUNG		1.00	L/HA		
6	A	31 [BBCH]	FUNG		2.00	L/HA	5 abc	
	B	37-39 [BBCH]	FUNG		1.25	L/HA		
7	A	31 [BBCH]	FUNG		0.60	L/HA	13 abc	
	A	31 [BBCH]	FUNG		1.00	L/HA		
	B	37-39 [BBCH]	FUNG		0.60	L/HA		
	B	37-39 [BBCH]	FUNG		1.00	L/HA		
8	A	31 [BBCH]	FUNG		1.50	L/HA	9 abc	
	A	31 [BBCH]	FUNG		1.00	L/HA		
	B	37-39 [BBCH]	FUNG		1.50	L/HA		
	B	37-39 [BBCH]	FUNG		1.00	L/HA		
9	A	31 [BBCH]	FUNG		2.00	L/HA	10 abc	
	A	31 [BBCH]	FUNG		1.00	L/HA		
	B	37-39 [BBCH]	FUNG		2.00	L/HA		
	B	37-39 [BBCH]	FUNG		1.00	L/HA		
10	A	31 [BBCH]	FUNG		0.60	L/HA	16 a	
	A	31 [BBCH]	FUNG		1.00	L/HA		
	B	37-39 [BBCH]	FUNG		0.60	L/HA		
	B	37-39 [BBCH]	FUNG		1.00	L/HA		
11	A	31 [BBCH]	FUNG		1.20	L/HA	9 abc	
	B	37-39 [BBCH]	FUNG		1.20	L/HA		

Rating Date								26/6/06
SE Name								%GREEN
Pest Type								
Pest Code								
Pest Stage								
Crop Code								HORVW
BBCH Scale Type								BCER
Crop Variety								Marado
Crop Stage								77
Crop Stage Scale								BBCH
Part Rated								LEAF1
Rating Data Type								GREEN
Rating Unit								%AREA
Sample Size								1
Sample Size Unit								LEAF
Number of Subsamples								10
Footnote Number								
Assessed By								REDEBEL
Days After Last Applic.								53
Trt-Eval Interval								68 DA-A
ARM Action Codes								P
Number of Decimals								0
Trt No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Unit	27	
12	B	37-39 [BBCH]	FUNG		0.80	L/HA	15 ab	
	B	37-39 [BBCH]	FUNG		1.00	L/HA		
13	B	37-39 [BBCH]	FUNG		1.50	L/HA	3 abc	
	B	37-39 [BBCH]	FUNG		1.00	L/HA		
14	B	37-39 [BBCH]	FUNG		2.00	L/HA	4 abc	
	B	37-39 [BBCH]	FUNG		1.00	L/HA		
15	B	37-39 [BBCH]	FUNG		2.00	L/HA	9 abc	
	B	37-39 [BBCH]	FUNG		0.50	L/HA		
16	B	37-39 [BBCH]	FUNG		1.25	L/HA	4 abc	
17	B	37-39 [BBCH]	FUNG		1.50	L/HA	5 abc	
18	B	37-39 [BBCH]	FUNG		1.00	L/HA	12 abc	
19	B	37-39 [BBCH]	FUNG		0.8	L/HA	7 abc	
20	A	31 [BBCH]	FUNG		1.00	L/HA	3 bc	
	B	37-39 [BBCH]	FUNG		2.00	L/HA		
21	A	31 [BBCH]	FUNG		1.00	L/HA	2 bc	
	B	37-39 [BBCH]	FUNG		2.00	L/HA		
22	A	31 [BBCH]	FUNG		0.30	L/HA	1 bc	
	B	37-39 [BBCH]	FUNG		0.30	L/HA		
23	A	31 [BBCH]	FUNG		0.50	L/HA	0 c	
	B	37-39 [BBCH]	FUNG		0.50	L/HA		
LSD (P=.05)								7.5
Standard Deviation								5.3
CV								77.88
Grand Mean								6.8
Bartlett's X2								50.394
P(Bartlett's X2)								0.001*
Replicate F								1.017
Replicate Prob(F)								0.3909
Treatment F								2.916
Treatment Prob(F)								0.0004

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Harvest Results

Rating Date							11/7/06	13/7/06	13/7/06
SE Name							GRAIN YIELD	GRAIN ANALYS	GRAIN ANALYS
Pest Type									
Pest Code									
Pest Stage									
Crop Code							HORVW	HORVW	HORVW
BBCH Scale Type							BCER	BCER	BCER
Crop Variety							Marado	Marado	Marado
Crop Stage							99	99	99
Crop Stage Scale							BBCH	BBCH	BBCH
Part Rated							GRAIN C	GRAIN C	GRAIN C
Rating Data Type							YIELD15%	MOIST	SPEWEI
Rating Unit							T-MET	%	KG
Sample Size							1		100
Sample Size Unit							HA		L
Number of Subsamples							1	1	1
Footnote Number									
Assessed By							REDEBEL	REDEBEL	REDEBEL
Days After Last Applic.							68	70	70
Tri-Eval Interval							83 DA-A	85 DA-A	85 DA-A
ARM Action Codes							TY2 APOC	APOC	APOC
Number of Decimals							3	1	1
Tri No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Rate Unit	33	29	30
1	AB		CHK	Untreated Check			7.918 c (100%)	13.3 gh (100%)	62.6 b (100%)
2	A	31 [BBCH]	FUNG		2.00	L/HA	9.106 ab (115%)	14.1 b-f (105%)	64.5 a (103%)
	B	37-39 [BBCH]	FUNG		1.50	L/HA			
	B	37-39 [BBCH]	FUNG		0.50	L/HA			
3	A	31 [BBCH]	FUNG		2.00	L/HA	9.595 a	14.4 a-e	64.1 a
	B	37-39 [BBCH]	FUNG		2.00	L/HA	(121%)	(108%)	(102%)
	B	37-39 [BBCH]	FUNG		0.50	L/HA			
4	A	31 [BBCH]	FUNG		2.00	L/HA	9.451 ab	14.4 a-e	64.3 a
	B	37-39 [BBCH]	FUNG		2.00	L/HA	(119%)	(108%)	(103%)
	B	37-39 [BBCH]	FUNG		0.50	L/HA			
5	A	31 [BBCH]	FUNG		2.00	L/HA	9.244 ab	14.4 a-e	64.8 a
	B	37-39 [BBCH]	FUNG		2.00	L/HA	(117%)	(108%)	(104%)
	B	37-39 [BBCH]	FUNG		1.00	L/HA			
6	A	31 [BBCH]	FUNG		2.00	L/HA	9.318 ab	14.4 a-e	64.5 a
	B	37-39 [BBCH]	FUNG		1.25	L/HA	(118%)	(108%)	(103%)
7	A	31 [BBCH]	FUNG		0.60	L/HA	9.601 a	15.0 a	64.6 a
	A	31 [BBCH]	FUNG		1.00	L/HA	(121%)	(112%)	(103%)
	B	37-39 [BBCH]	FUNG		0.60	L/HA			
	B	37-39 [BBCH]	FUNG		1.00	L/HA			
8	A	31 [BBCH]	FUNG		1.50	L/HA	9.367 ab	14.6 a-d	64.2 a
	A	31 [BBCH]	FUNG		1.00	L/HA	(118%)	(109%)	(103%)
	B	37-39 [BBCH]	FUNG		1.50	L/HA			
	B	37-39 [BBCH]	FUNG		1.00	L/HA			
9	A	31 [BBCH]	FUNG		2.00	L/HA	9.342 ab	14.7 abe	64.3 a
	A	31 [BBCH]	FUNG		1.00	L/HA	(118%)	(110%)	(103%)
	B	37-39 [BBCH]	FUNG		2.00	L/HA			
	B	37-39 [BBCH]	FUNG		1.00	L/HA			
10	A	31 [BBCH]	FUNG		0.60	L/HA	9.542 ab	14.8 ab	64.7 a
	A	31 [BBCH]	FUNG		1.00	L/HA	(121%)	(111%)	(103%)
	B	37-39 [BBCH]	FUNG		0.60	L/HA			
	B	37-39 [BBCH]	FUNG		1.00	L/HA			
11	A	31 [BBCH]	FUNG		1.20	L/HA	9.464 ab	14.0 c-g	64.6 a
	B	37-39 [BBCH]	FUNG		1.20	L/HA	(120%)	(105%)	(103%)

							11/7/06	13/7/06	13/7/06
							GRAIN YIELD	GRAIN ANALYS	GRAIN ANALYS
Rating Date									
SE Name									
Pest Type									
Pest Code									
Pest Stage									
Crop Code							HORVW	HORVW	HORVW
BBCH Scale Type							BCER	BCER	BCER
Crop Variety							Marado	Marado	Marado
Crop Stage							99	99	99
Crop Stage Scale							BBCH	BBCH	BBCH
Part Rated							GRAIN C	GRAIN C	GRAIN C
Rating Data Type							YIELD15%	MOIST	SPEWEI
Rating Unit							T-MET	%	KG
Sample Size							1		100
Sample Size Unit							HA		L
Number of Subsamples							1	1	1
Footnote Number									
Assessed By							REDEBEL	REDEBEL	REDEBEL
Days After Last Applic.							68	70	70
Tri-Eval Interval							83 DA-A	85 DA-A	85 DA-A
ARM Action Codes							TY2 APOC	APOC	APOC
Number of Decimals							3	1	1
Tri	Appl	Growth	Type	Treatment	Rate				
No.	Code	Stage		Name	Rate	Unit	33	29	30
12	B	37-39 [BBCH]	FUNG		0.80	L/HA	9.293 ab	14.5 a-d	64.2 a
	B	37-39 [BBCH]	FUNG		1.00	L/HA	(117%)	(109%)	(103%)
13	B	37-39 [BBCH]	FUNG		1.50	L/HA	9.192 ab	14.0 c-g	64.0 a
	B	37-39 [BBCH]	FUNG		1.00	L/HA	(116%)	(105%)	(102%)
14	B	37-39 [BBCH]	FUNG		2.00	L/HA	8.987 ab	14.2 b-f	64.6 a
	B	37-39 [BBCH]	FUNG		1.00	L/HA	(113%)	(107%)	(103%)
15	B	37-39 [BBCH]	FUNG		2.00	L/HA	9.181 ab	14.2 b-f	64.2 a
	B	37-39 [BBCH]	FUNG		0.50	L/HA	(116%)	(107%)	(103%)
16	B	37-39 [BBCH]	FUNG		1.25	L/HA	9.059 ab	14.1 b-f	64.0 a
							(114%)	(106%)	(102%)
17	B	37-39 [BBCH]	FUNG		1.50	L/HA	9.149 ab	13.9 d-g	65.1 a
							(116%)	(104%)	(104%)
18	B	37-39 [BBCH]	FUNG		1.00	L/HA	8.932 b	14.1 b-f	64.3 a
							(113%)	(106%)	(103%)
19	B	37-39 [BBCH]	FUNG		0.8	L/HA	9.100 ab	13.9 d-g	64.6 a
							(115%)	(104%)	(103%)
20	A	31 [BBCH]	FUNG		1.00	L/HA	9.148 ab	13.7 e-h	63.6 a
	B	37-39 [BBCH]	FUNG		2.00	L/HA	(116%)	(103%)	(102%)
21	A	31 [BBCH]	FUNG		1.00	L/HA	9.073 ab	13.6 fgh	63.8 a
	B	37-39 [BBCH]	FUNG		2.00	L/HA	(115%)	(102%)	(102%)
22	A	31 [BBCH]	FUNG		0.30	L/HA	8.268 c	13.3 gh	62.3 b
	B	37-39 [BBCH]	FUNG		0.30	L/HA	(104%)	(100%)	(100%)
23	A	31 [BBCH]	FUNG		0.50	L/HA	8.204 c	13.2 h	62.5 b
	B	37-39 [BBCH]	FUNG		0.50	L/HA	(104%)	(99%)	(100%)
LSD (P=.05)							0.3398	0.44	0.91
Standard Deviation							0.2403	0.31	0.64
CV							2.64	2.19	1.0
Grand Mean							9.11	14.1	64.09
Bartlett's X2							33.865	17.039	29.823
P(Bartlett's X2)							0.051	0.761	0.123
Replicate F							5.572	1.151	2.228
Replicate Prob(F)							0.0018	0.3350	0.0931
Treatment F							13.028	9.459	5.198
Treatment Prob(F)							0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Rating Date							13/7/06
SE Name							GRAIN ANALYS
Pest Type							
Pest Code							
Pest Stage							
Crop Code							HORVW
BBCH Scale Type							BCER
Crop Variety							Marado
Crop Stage							99
Crop Stage Scale							BBCH
Part Rated							GRAIN C
Rating Data Type							TGW
Rating Unit							G
Sample Size							1000
Sample Size Unit							SEED
Number of Subsamples							1
Footnote Number							
Assessed By							REDEBEL
Days After Last Applic.							70
Trt-Eval Interval							85 DA-A
ARM Action Codes							T1 APOC
Number of Decimals							1
Trt No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Rate Unit	
1	AB		CHK	Untreated Check			32
							39.9 b (100%)
2	A	31 [BBCH]	FUNG		2.00	L/HA	43.3 a
	B	37-39 [BBCH]	FUNG		1.50	L/HA	(109%)
	B	37-39 [BBCH]	FUNG		0.50	L/HA	
3	A	31 [BBCH]	FUNG		2.00	L/HA	43.2 a
	B	37-39 [BBCH]	FUNG		2.00	L/HA	(108%)
	B	37-39 [BBCH]	FUNG		0.50	L/HA	
4	A	31 [BBCH]	FUNG		2.00	L/HA	44.0 a
	B	37-39 [BBCH]	FUNG		2.00	L/HA	(110%)
	B	37-39 [BBCH]	FUNG		0.50	L/HA	
5	A	31 [BBCH]	FUNG		2.00	L/HA	43.8 a
	B	37-39 [BBCH]	FUNG		2.00	L/HA	(110%)
	B	37-39 [BBCH]	FUNG		1.00	L/HA	
6	A	31 [BBCH]	FUNG		2.00	L/HA	44.0 a
	B	37-39 [BBCH]	FUNG		1.25	L/HA	(110%)
7	A	31 [BBCH]	FUNG		0.60	L/HA	44.6 a
	A	31 [BBCH]	FUNG		1.00	L/HA	(112%)
	B	37-39 [BBCH]	FUNG		0.60	L/HA	
	B	37-39 [BBCH]	FUNG		1.00	L/HA	
8	A	31 [BBCH]	FUNG		1.50	L/HA	44.3 a
	A	31 [BBCH]	FUNG		1.00	L/HA	(111%)
	B	37-39 [BBCH]	FUNG		1.50	L/HA	
	B	37-39 [BBCH]	FUNG		1.00	L/HA	
9	A	31 [BBCH]	FUNG		2.00	L/HA	43.5 a
	A	31 [BBCH]	FUNG		1.00	L/HA	(109%)
	B	37-39 [BBCH]	FUNG		2.00	L/HA	
	B	37-39 [BBCH]	FUNG		1.00	L/HA	
10	A	31 [BBCH]	FUNG		0.60	L/HA	44.6 a
	A	31 [BBCH]	FUNG		1.00	L/HA	(112%)
	B	37-39 [BBCH]	FUNG		0.60	L/HA	
	B	37-39 [BBCH]	FUNG		1.00	L/HA	
11	A	31 [BBCH]	FUNG		1.20	L/HA	44.2 a
	B	37-39 [BBCH]	FUNG		1.20	L/HA	(111%)
12	B	37-39 [BBCH]	FUNG		0.80	L/HA	43.9 a
	B	37-39 [BBCH]	FUNG		1.00	L/HA	(110%)
13	B	37-39 [BBCH]	FUNG		1.50	L/HA	43.6 a
	B	37-39 [BBCH]	FUNG		1.00	L/HA	(109%)

Rating Date							13/7/06
SE Name							GRAIN ANALYS
Pest Type							
Pest Code							
Pest Stage							
Crop Code							HORVW
BBCH Scale Type							BCER
Crop Variety							Marado
Crop Stage							99
Crop Stage Scale							BBCH
Part Rated							GRAIN C
Rating Data Type							TGW
Rating Unit							G
Sample Size							1000
Sample Size Unit							SEED
Number of Subsamples							1
Footnote Number							
Assessed By							REDEBEL
Days After Last Applic.							70
Tri-Eval Interval							85 DA-A
ARM Action Codes							T1 APOC
Number of Decimals							1
Trt No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Unit	
							32
14	B	37-39 [BBCH]	FUNG		2.00	L/HA	44.2 a
	B	37-39 [BBCH]	FUNG		1.00	L/HA	(111%)
15	B	37-39 [BBCH]	FUNG		2.00	L/HA	43.7 a
	B	37-39 [BBCH]	FUNG		0.50	L/HA	(110%)
16	B	37-39 [BBCH]	FUNG		1.25	L/HA	43.3 a
							(109%)
17	B	37-39 [BBCH]	FUNG		1.50	L/HA	44.8 a
							(112%)
18	B	37-39 [BBCH]	FUNG		1.00	L/HA	43.7 a
							(110%)
19	B	37-39 [BBCH]	FUNG		0.8	L/HA	43.7 a
							(110%)
20	A	31 [BBCH]	FUNG		1.00	L/HA	43.5 a
	B	37-39 [BBCH]	FUNG		2.00	L/HA	(109%)
21	A	31 [BBCH]	FUNG		1.00	L/HA	43.2 a
	B	37-39 [BBCH]	FUNG		2.00	L/HA	(108%)
22	A	31 [BBCH]	FUNG		0.30	L/HA	39.8 b
	B	37-39 [BBCH]	FUNG		0.30	L/HA	(100%)
23	A	31 [BBCH]	FUNG		0.50	L/HA	40.2 b
	B	37-39 [BBCH]	FUNG		0.50	L/HA	(101%)
LSD (P=.05)							1.28
Standard Deviation							0.91
CV							2.1
Grand Mean							43.35
Bartlett's X2							27.957
P(Bartlett's X2)							0.177
Replicate F							1.401
Replicate Prob(F)							0.2505
Treatment F							9.571
Treatment Prob(F)							0.0001

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Appendix 1: Plot Data Summary

								27/4/06	4/5/06	4/5/06	4/5/06	4/5/06
								PHYTOTOX	%LEAF1	%LEAF2	%LEAF3	%LEAF4
								D Disease	D Disease	D Disease	D Disease	
								PYRNTE	PYRNTE	PYRNTE	PYRNTE	
								mixed	mixed	mixed	mixed	
								HORVW	HORVW	HORVW	HORVW	
								BCER	BCER	BCER	BCER	
								Marado	Marado	Marado	Marado	
								32	39	39	39	
								BBCH	BBCH	BBCH	BBCH	
								PLANT C	LEAF1 P	LEAF2 P	LEAF3 P	LEAF4 P
								PHYGEN	COVAR	COVAR	COVAR	COVAR
								%UNCK	%AREA	%AREA	%AREA	%AREA
								1	1	1	1	1
								PLOT	LEAF	LEAF	LEAF	LEAF
								1	10	10	10	10
								REDEBEL	REDEBEL	REDEBEL	REDEBEL	REDEBEL
								8	0	0	0	0
								8 DA-A	15 DA-A	15 DA-A	15 DA-A	15 DA-A
								P	P	P	P	P
								0	1	1	1	1
Trt	Appl	Growth	Treatment		Rate							
No.	Code	Stage	Type	Name	Rate	Unit	Plot	1	2	3	4	5
1	AB		CHK	Untreated Check			101	0	0.0	0.1	2.6	4.4
							217	0	0.0	0.1	2.0	3.0
							304	0	0.0	0.0	2.5	1.5
							415	0	0.0	0.0	1.7	1.0
							Mean =	0	0.0	0.1	2.2	2.5
2	A	31 [BBCH]	FUNG		2.00	L/HA	102	0				
	B	37-39 [BBCH]	FUNG		1.50	L/HA	220	0				
	B	37-39 [BBCH]	FUNG		0.50	L/HA	310	0				
							418	0				
							Mean =	0				
3	A	31 [BBCH]	FUNG		2.00	L/HA	103	0				
	B	37-39 [BBCH]	FUNG		2.00	L/HA	209	0				
	B	37-39 [BBCH]	FUNG		0.50	L/HA	308	0				
							423	0				
							Mean =	0				
4	A	31 [BBCH]	FUNG		2.00	L/HA	104	0				
	B	37-39 [BBCH]	FUNG		2.00	L/HA	212	0				
	B	37-39 [BBCH]	FUNG		0.50	L/HA	302	0				
							417	0				
							Mean =	0				
5	A	31 [BBCH]	FUNG		2.00	L/HA	105	0				
	B	37-39 [BBCH]	FUNG		2.00	L/HA	204	0				
	B	37-39 [BBCH]	FUNG		1.00	L/HA	314	0				
							420	0				
							Mean =	0				
6	A	31 [BBCH]	FUNG		2.00	L/HA	106	0				
	B	37-39 [BBCH]	FUNG		1.25	L/HA	223	0				
							318	0				
							405	0				
							Mean =	0				
7	A	31 [BBCH]	FUNG		0.60	L/HA	107	0				
	A	31 [BBCH]	FUNG		1.00	L/HA	201	0				
	B	37-39 [BBCH]	FUNG		0.60	L/HA	320	0				
	B	37-39 [BBCH]	FUNG		1.00	L/HA	422	0				
							Mean =	0				

Rating Date	27/4/06								
SE Name	PHYTOTOX								
Pest Type	%LEAF1								
Pest Code	D Disease								
Pest Stage	PYRNTE								
Crop Code	mixed								
BBCH Scale Type	HORVW								
Crop Variety	BCER								
Crop Stage	Marado								
Crop Stage Scale	32								
Part Rated	BBCH								
Rating Data Type	PLANT C								
Rating Unit	PHYGEN								
Sample Size	%UNCK								
Sample Size Unit	1								
Number of Subsamples	PLOT								
Footnote Number	1								
Assessed By	REDEBEL								
Days After Last Applic.	8								
Tri-Eval Interval	8 DA-A								
ARM Action Codes	P								
Number of Decimals	0								
Yr	Appl	Growth	Treatment	Rate					
No	Code	Stage	Type Name	Rate Unit Plot	1	2	3	4	5
8	A	31 [BBCH]	FUNG	1.50 L/HA 108	0				
	A	31 [BBCH]	FUNG	1.00 L/HA 215	0				
	B	37-39 [BBCH]	FUNG	1.50 L/HA 312	0				
	B	37-39 [BBCH]	FUNG	1.00 L/HA 401	0				
				Mean =	0				
9	A	31 [BBCH]	FUNG	2.00 L/HA 109	0				
	A	31 [BBCH]	FUNG	1.00 L/HA 222	0				
	B	37-39 [BBCH]	FUNG	2.00 L/HA 316	0				
	B	37-39 [BBCH]	FUNG	1.00 L/HA 404	0				
				Mean =	0				
10	A	31 [BBCH]	FUNG	0.60 L/HA 110	0				
	A	31 [BBCH]	FUNG	1.00 L/HA 219	0				
	B	37-39 [BBCH]	FUNG	0.60 L/HA 306	0				
	B	37-39 [BBCH]	FUNG	1.00 L/HA 412	0				
				Mean =	0				
11	A	31 [BBCH]	FUNG	1.20 L/HA 111	0				
	B	37-39 [BBCH]	FUNG	1.20 L/HA 203	0				
				317	0				
				419	0				
				Mean =	0				
12	B	37-39 [BBCH]	FUNG	0.80 L/HA 112	0				
	B	37-39 [BBCH]	FUNG	1.00 L/HA 211	0				
				309	0				
				406	0				
				Mean =	0				
13	B	37-39 [BBCH]	FUNG	1.50 L/HA 113	0				
	B	37-39 [BBCH]	FUNG	1.00 L/HA 216	0				
				323	0				
				411	0				
				Mean =	0				
14	B	37-39 [BBCH]	FUNG	2.00 L/HA 114	0				
	B	37-39 [BBCH]	FUNG	1.00 L/HA 218	0				
				319	0				
				409	0				
				Mean =	0				

Rating Date	27/4/06	4/5/06	4/5/06	4/5/06	4/5/06							
SE Name	PHYTOTOX	%LEAF1	%LEAF2	%LEAF3	%LEAF4							
Pest Type	D Disease	D Disease	D Disease	D Disease	D Disease							
Pest Code	PYRNTE	PYRNTE	PYRNTE	PYRNTE	PYRNTE							
Pest Stage	mixed	mixed	mixed	mixed	mixed							
Crop Code	HORVW	HORVW	HORVW	HORVW	HORVW							
BBCH Scale Type	BCER	BCER	BCER	BCER	BCER							
Crop Variety	Marado	Marado	Marado	Marado	Marado							
Crop Stage	32	39	39	39	39							
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH							
Part Rated	PLANT C	LEAF1 P	LEAF2 P	LEAF3 P	LEAF4 P							
Rating Data Type	PHYGEN	COVAR	COVAR	COVAR	COVAR							
Rating Unit	%UNCK	%AREA	%AREA	%AREA	%AREA							
Sample Size	1	1	1	1	1							
Sample Size Unit	PLOT	LEAF	LEAF	LEAF	LEAF							
Number of Subsamples	1	10	10	10	10							
Footnote Number												
Assessed By	REDEBEL	REDEBEL	REDEBEL	REDEBEL	REDEBEL							
Days After Last Applic	8	0	0	0	0							
Tri-Eval Interval	8 DA-A	15 DA-A	15 DA-A	15 DA-A	15 DA-A							
ARM Action Codes	P	P	P	P	P							
Number of Decimals	0	1	1	1	1							
Tri	Appl	Growth	Treatment	Rate								
No.	Code	Stage	Type	Name	Rate	Unit	Plot	1	2	3	4	5
15	B	37-39 [BBCH]	FUNG	██████	2.00	L/HA	115	0				
	B	37-39 [BBCH]	FUNG	██████	0.50	L/HA	221	0				
							303	0				
							416	0				
							Mean =	0				
16	B	37-39 [BBCH]	FUNG	██████	1.25	L/HA	116	0				
							210	0				
							322	0				
							413	0				
							Mean =	0				
17	B	37-39 [BBCH]	FUNG	██████	1.50	L/HA	117	0				
							213	0				
							307	0				
							403	0				
							Mean =	0				
18	B	37-39 [BBCH]	FUNG	██████	1.00	L/HA	118	0				
							206	0				
							321	0				
							410	0				
							Mean =	0				
19	B	37-39 [BBCH]	FUNG	██████	0.8	L/HA	119	0				
							208	0				
							301	0				
							421	0				
							Mean =	0				
20	A	31 [BBCH]	FUNG	██████	1.00	L/HA	120	0				
	B	37-39 [BBCH]	FUNG	██████	2.00	L/HA	205	0				
							313	0				
							408	0				
							Mean =	0				
21	A	31 [BBCH]	FUNG	██████	1.00	L/HA	121	0				
	B	37-39 [BBCH]	FUNG	██████	2.00	L/HA	207	0				
							311	0				
							414	0				
							Mean =	0				

Rating Date	27/4/06	4/5/06	4/5/06	4/5/06	4/5/06							
SE Name	PHYTOTOX	%LEAF1	%LEAF2	%LEAF3	%LEAF4							
Pest Type		D Disease	D Disease	D Disease	D Disease							
Pest Code		PYRNTE	PYRNTE	PYRNTE	PYRNTE							
Pest Stage		mixed	mixed	mixed	mixed							
Crop Code	HORVW	HORVW	HORVW	HORVW	HORVW							
BBCH Scale Type	BCER	BCER	BCER	BCER	BCER							
Crop Variety	Marado	Marado	Marado	Marado	Marado							
Crop Stage	32	39	39	39	39							
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH							
Part Rated	PLANT C	LEAF1 P	LEAF2 P	LEAF3 P	LEAF4 P							
Rating Data Type	PHYGEN	COVAR	COVAR	COVAR	COVAR							
Rating Unit	%UNCK	%AREA	%AREA	%AREA	%AREA							
Sample Size	1	1	1	1	1							
Sample Size Unit	PLOT	LEAF	LEAF	LEAF	LEAF							
Number of Subsamples	1	10	10	10	10							
Footnote Number												
Assessed By	REDEBEL	REDEBEL	REDEBEL	REDEBEL	REDEBEL							
Days After Last Applic	8	0	0	0	0							
Tri-Eval Interval	8 DA-A	15 DA-A	15 DA-A	15 DA-A	15 DA-A							
ARM Action Codes	P	P	P	P	P							
Number of Decimals	0	1	1	1	1							
Tri No	Appl Code	Growth Stage	Type	Treatment Name	Rate	Rate Unit	Plot	1	2	3	4	5
22	A	31 [BBCH]	FUNG		0.30	L/HA	122	0				
	B	37-39 [BBCH]	FUNG		0.30	L/HA	214	0				
							305	0				
							402	0				
							Mean =	0				
23	A	31 [BBCH]	FUNG		0.50	L/HA	123	0				
	B	37-39 [BBCH]	FUNG		0.50	L/HA	202	0				
							315	0				
							407	0				
							Mean =	0				

Rating Date	4/5/06	4/5/06	4/5/06	4/5/06	15/5/06						
SE Name	%LEAF1	%LEAF2	%LEAF3	%LEAF4	PHYTOTOX						
Pest Type	D Disease	D Disease	D Disease	D Disease							
Pest Code	ERYSGH	ERYSGH	ERYSGH	ERYSGH							
Pest Stage	mixed	mixed	mixed	mixed							
Crop Code	HORVW	HORVW	HORVW	HORVW	HORVW						
BBCH Scale Type	BCER	BCER	BCER	BCER	BCER						
Crop Variety	Marado	Marado	Marado	Marado	Marado						
Crop Stage	39	39	39	39	65						
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH						
Part Rated	LEAF1 P	LEAF2 P	LEAF3 P	LEAF4 P	PLANT C						
Rating Data Type	COVAR	COVAR	COVAR	COVAR	PHYGEN						
Rating Unit	%AREA	%AREA	%AREA	%AREA	%UNCK						
Sample Size	1	1	1	1	1						
Sample Size Unit	LEAF	LEAF	LEAF	LEAF	PLOT						
Number of Subsamples	10	10	10	10	1						
Footnote Number											
Assessed By	REDEBEL	REDEBEL	REDEBEL	REDEBEL	REDEBEL						
Days After Last Applic.	0	0	0	0	11						
Trt-Eval Interval	15 DA-A	15 DA-A	15 DA-A	15 DA-A	26 DA-A						
ARM Action Codes	P	P	P	P	P						
Number of Decimals	1	1	1	1	0						
Trt	Appl	Growth	Treatment	Rate	Rate	Plot	6	7	8	9	10
No.	Code	Stage	Type	Name	Rate	Unit					
1	AB		CHK	Unreated Check			101	0.0	0.0	0.0	0.7
							217	0.0	0.0	0.3	1.1
							304	0.0	0.0	0.0	0.6
							415	0.0	0.0	0.0	0.7
							Mean =	0.0	0.0	0.1	0.8
2	A	31 [BBCH]	FUNG		2.00	L/HA	102				0
	B	37-39 [BBCH]	FUNG		1.50	L/HA	220				0
	B	37-39 [BBCH]	FUNG		0.50	L/HA	310				0
							418				0
							Mean =				0
3	A	31 [BBCH]	FUNG		2.00	L/HA	103				0
	B	37-39 [BBCH]	FUNG		2.00	L/HA	209				0
	B	37-39 [BBCH]	FUNG		0.50	L/HA	308				0
							423				0
							Mean =				0
4	A	31 [BBCH]	FUNG		2.00	L/HA	104				0
	B	37-39 [BBCH]	FUNG		2.00	L/HA	212				0
	B	37-39 [BBCH]	FUNG		0.50	L/HA	302				0
							417				0
							Mean =				0
5	A	31 [BBCH]	FUNG		2.00	L/HA	105				0
	B	37-39 [BBCH]	FUNG		2.00	L/HA	204				0
	B	37-39 [BBCH]	FUNG		1.00	L/HA	314				0
							426				0
							Mean =				0
6	A	31 [BBCH]	FUNG		2.00	L/HA	106				0
	B	37-39 [BBCH]	FUNG		1.25	L/HA	223				0
							318				0
							405				0
							Mean =				0
7	A	31 [BBCH]	FUNG		0.60	L/HA	107				0
	A	31 [BBCH]	FUNG		1.00	L/HA	201				0
	B	37-39 [BBCH]	FUNG		0.60	L/HA	320				0
	B	37-39 [BBCH]	FUNG		1.00	L/HA	422				0
							Mean =				0

Rating Date	4/5/06	4/5/06	4/5/06	4/5/06	15/5/06							
SE Name	%LEAF1	%LEAF2	%LEAF3	%LEAF4	PHYTOTOX							
Pest Type	D Disease	D Disease	D Disease	D Disease								
Pest Code	ERYSGH	ERYSGH	ERYSGH	ERYSGH								
Pest Stage	mixed	mixed	mixed	mixed								
Crop Code	HORVW	HORVW	HORVW	HORVW	HORVW							
BBCH Scale Type	BCER	BCER	BCER	BCER	BCER							
Crop Variety	Marado	Marado	Marado	Marado	Marado							
Crop Stage	39	39	39	39	65							
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH							
Part Rated	LEAF1 P	LEAF2 P	LEAF3 P	LEAF4 P	PLANT C							
Rating Data Type	COVAR	COVAR	COVAR	COVAR	PHYGEN							
Rating Unit	%AREA	%AREA	%AREA	%AREA	%UNCK							
Sample Size	1	1	1	1	1							
Sample Size Unit	LEAF	LEAF	LEAF	LEAF	PLOT							
Number of Subsamples	10	10	10	10	1							
Footnote Number												
Assessed By	REDEBEL	REDEBEL	REDEBEL	REDEBEL	REDEBEL							
Days After Last Applic	0	0	0	0	11							
Trt-Eval Interval	15 DA-A	15 DA-A	15 DA-A	15 DA-A	26 DA-A							
ARM Action Codes	P	P	P	P	P							
Number of Decimals	1	1	1	1	0							
Trt No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Unit	Plot	6	7	8	9	10
8	A	31 [BBCH]	FUNG	[REDACTED]	1.50	L/HA	108					0
	A	31 [BBCH]	FUNG	[REDACTED]	1.00	L/HA	215					0
	B	37-39 [BBCH]	FUNG	[REDACTED]	1.50	L/HA	312					0
	B	37-39 [BBCH]	FUNG	[REDACTED]	1.00	L/HA	401					0
					Mean =							0
9	A	31 [BBCH]	FUNG	[REDACTED]	2.00	L/HA	109					0
	A	31 [BBCH]	FUNG	[REDACTED]	1.00	L/HA	222					0
	B	37-39 [BBCH]	FUNG	[REDACTED]	2.00	L/HA	316					0
	B	37-39 [BBCH]	FUNG	[REDACTED]	1.00	L/HA	404					0
					Mean =							0
10	A	31 [BBCH]	FUNG	[REDACTED]	0.60	L/HA	110					0
	A	31 [BBCH]	FUNG	[REDACTED]	1.00	L/HA	219					0
	B	37-39 [BBCH]	FUNG	[REDACTED]	0.60	L/HA	306					0
	B	37-39 [BBCH]	FUNG	[REDACTED]	1.00	L/HA	412					0
					Mean =							0
11	A	31 [BBCH]	FUNG	[REDACTED]	1.20	L/HA	111					0
	B	37-39 [BBCH]	FUNG	[REDACTED]	1.20	L/HA	203					0
							317					0
							419					0
					Mean =							0
12	B	37-39 [BBCH]	FUNG	[REDACTED]	0.80	L/HA	112					0
	B	37-39 [BBCH]	FUNG	[REDACTED]	1.00	L/HA	211					0
							309					0
							406					0
					Mean =							0
13	B	37-39 [BBCH]	FUNG	[REDACTED]	1.50	L/HA	113					0
	B	37-39 [BBCH]	FUNG	[REDACTED]	1.00	L/HA	216					0
							323					0
							411					0
					Mean =							0
14	B	37-39 [BBCH]	FUNG	[REDACTED]	2.00	L/HA	114					0
	B	37-39 [BBCH]	FUNG	[REDACTED]	1.00	L/HA	218					0
							319					0
							409					0
					Mean =							0

Rating Date	SE Name	Pest Type	Pest Code	Pest Stage	Crop Code	BBCH Scale Type	Crop Variety	Crop Stage	Crop Stage Scale	Part Rated	Rating Data Type	Rating Unit	Sample Size	Sample Size Unit	Number of Subsamples	Footnote Number	Assessed By	Days After Last Applic	Tri-Eval Interval	ARM Action Codes	Number of Decimals	
4/5/06		D Disease	ERYSGH	mixed	HORVW	BCER	Marado	39	BBCH	LEAF1 P	COVAR	%AREA	1	LEAF	10		REDEBEL	0	15 DA-A	P	1	
4/5/06		D Disease	ERYSGH	mixed	HORVW	BCER	Marado	39	BBCH	LEAF2 P	COVAR	%AREA	1	LEAF	10		REDEBEL	0	15 DA-A	P	1	
4/5/06		D Disease	ERYSGH	mixed	HORVW	BCER	Marado	39	BBCH	LEAF3 P	COVAR	%AREA	1	LEAF	10		REDEBEL	0	15 DA-A	P	1	
4/5/06		D Disease	ERYSGH	mixed	HORVW	BCER	Marado	39	BBCH	LEAF4 P	COVAR	%AREA	1	LEAF	10		REDEBEL	0	15 DA-A	P	1	
15/5/06		PHYTOTOX			HORVW	BCER	Marado	65	BBCH	PLANT C	PHYGEN	%UNCK	1	PLOT	1		REDEBEL	11	26 DA-A	P	0	
Tri	Appl	Growth	Type	Treatment	Rate	Rate	Unit	Plot	6	7	8	9	10									
15	B	37-39 [BBCH]	FUNG		2.00	L/HA		115						0								
	B	37-39 [BBCH]	FUNG		0.50	L/HA		221						0								
								303						0								
								416						0								
								Mean =						0								
16	B	37-39 [BBCH]	FUNG		1.25	L/HA		116						0								
								210						0								
								322						0								
								413						0								
								Mean =						0								
17	B	37-39 [BBCH]	FUNG		1.50	L/HA		117						0								
								213						0								
								307						0								
								403						0								
								Mean =						0								
18	B	37-39 [BBCH]	FUNG		1.00	L/HA		118						0								
								206						0								
								321						0								
								410						0								
								Mean =						0								
19	B	37-39 [BBCH]	FUNG		0.8	L/HA		119						0								
								208						0								
								301						0								
								421						0								
								Mean =						0								
20	A	31 [BBCH]	FUNG		1.00	L/HA		120						0								
	B	37-39 [BBCH]	FUNG		2.00	L/HA		205						0								
								313						0								
								408						0								
								Mean =						0								
21	A	31 [BBCH]	FUNG		1.00	L/HA		121						0								
	B	37-39 [BBCH]	FUNG		2.00	L/HA		207						0								
								311						0								
								414						0								
								Mean =						0								

Rating Date	4/5/06	4/5/06	4/5/06	4/5/06	15/5/06							
SE Name	%LEAF1	%LEAF2	%LEAF3	%LEAF4	PHYTOTOX							
Pest Type	D Disease	D Disease	D Disease	D Disease								
Pest Code	ERYSGH	ERYSGH	ERYSGH	ERYSGH								
Pest Stage	mixed	mixed	mixed	mixed								
Crop Code	HORVW	HORVW	HORVW	HORVW	HORVW							
BBCH Scale Type	BCER	BCER	BCER	BCER	BCER							
Crop Variety	Marado	Marado	Marado	Marado	Marado							
Crop Stage	39	39	39	39	65							
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH							
Part Rated	LEAF1 P	LEAF2 P	LEAF3 P	LEAF4 P	PLANT C							
Rating Data Type	COVAR	COVAR	COVAR	COVAR	PHYGEN							
Rating Unit	%AREA	%AREA	%AREA	%AREA	%UNCK							
Sample Size	1	1	1	1	1							
Sample Size Unit	LEAF	LEAF	LEAF	LEAF	PLOT							
Number of Subsamples	10	10	10	10	1							
Footnote Number												
Assessed By	REDEBEL	REDEBEL	REDEBEL	REDEBEL	REDEBEL							
Days After Last Applic	0	0	0	0	11							
Tri-Eval Interval	15 DA-A	15 DA-A	15 DA-A	15 DA-A	26 DA-A							
ARM Action Codes	P	P	P	P	P							
Number of Decimals	1	1	1	1	0							
Tri No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Rate Unit	Plot	6	7	8	9	10
22	A	31 [BBCH]	FUNG		0.30	L/HA	122					0
	B	37-39 [BBCH]	FUNG		0.30	L/HA	214					0
							305					0
							402					0
							Mean =					0
23	A	31 [BBCH]	FUNG		0.50	L/HA	123					0
	B	37-39 [BBCH]	FUNG		0.50	L/HA	202					0
							315					0
							407					0
							Mean =					0

Rating Date	22/5/06	22/5/06	22/5/06	22/5/06	22/5/06							
SE Name	%LEAF1	%LEAF2	%LEAF3	%LEAF1	%LEAF2							
Pest Type	D Disease	D Disease	D Disease	D Disease	D Disease							
Pest Code	PYRNTE	PYRNTE	PYRNTE	RHYNSE	RHYNSE							
Pest Stage	mixed	mixed	mixed	mixed	mixed							
Crop Code	HORVW	HORVW	HORVW	HORVW	HORVW							
BBCH Scale Type	BCER	BCER	BCER	BCER	BCER							
Crop Variety	Marado	Marado	Marado	Marado	Marado							
Crop Stage	69	69	69	69	69							
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH							
Part Rated	LEAF1 P	LEAF2 P	LEAF3 P	LEAF1 P	LEAF2 P							
Rating Data Type	COVAR	COVAR	COVAR	COVAR	COVAR							
Rating Unit	%AREA	%AREA	%AREA	%AREA	%AREA							
Sample Size	1	1	1	1	1							
Sample Size Unit	LEAF	LEAF	LEAF	LEAF	LEAF							
Number of Subsamples	10	10	10	10	10							
Footnote Number												
Assessed By	REDEBEL	REDEBEL	REDEBEL	REDEBEL	REDEBEL							
Days After Last Applie	18	18	18	18	18							
Tri-Eval Interval	33 DA-A	33 DA-A	33 DA-A	33 DA-A	33 DA-A							
ARM Action Codes	P	P	APC	P	P							
Number of Decimals	1	1	0	1	1							
Tri	Appl	Growth	Treatment	Rate	Rate	Plot	11	12	13	14	15	
No.	Code	Stage	Type	Name	Rate	Unit						
1	AB		CHK	Untreated Check			101	17	58	12	00	00
							217	01	35	6	00	00
							304	02	16	8	00	00
							415	03	22	4	00	00
							Mean =	06	3.3	8	00	00
2	A	31 [BBCH]	FUNG		2.00	L/HA	102	0.0	0.9	0	0.0	0.0
	B	37-39 [BBCH]	FUNG		1.50	L/HA	220	0.0	0.9	2	0.0	0.0
	B	37-39 [BBCH]	FUNG		0.50	L/HA	310	0.0	0.0	0	0.0	0.0
							418	0.0	0.8	1	0.0	0.0
							Mean =	0.0	0.7	1	0.0	0.0
3	A	31 [BBCH]	FUNG		2.00	L/HA	103	0.1	0.5	1	0.0	0.0
	B	37-39 [BBCH]	FUNG		2.00	L/HA	209	0.0	0.5	1	0.0	0.0
	B	37-39 [BBCH]	FUNG		0.50	L/HA	308	0.0	0.0	1	0.0	0.0
							423	0.0	1.0	0	0.0	0.0
							Mean =	0.0	0.5	1	0.0	0.0
4	A	31 [BBCH]	FUNG		2.00	L/HA	104	0.0	1.4	1	0.0	0.0
	B	37-39 [BBCH]	FUNG		2.00	L/HA	212	0.0	0.7	6	0.0	0.0
	B	37-39 [BBCH]	FUNG		0.50	L/HA	302	0.0	0.0	1	0.0	0.0
							417	0.0	0.0	0	0.0	0.0
							Mean =	0.0	0.5	2	0.0	0.0
5	A	31 [BBCH]	FUNG		2.00	L/HA	105	0.5	0.6	1	0.0	0.0
	B	37-39 [BBCH]	FUNG		2.00	L/HA	204	0.0	0.0	0	0.0	0.0
	B	37-39 [BBCH]	FUNG		1.00	L/HA	314	0.0	0.0	1	0.0	0.0
							420	0.0	0.0	2	0.0	0.0
							Mean =	0.1	0.2	1	0.0	0.0
6	A	31 [BBCH]	FUNG		2.00	L/HA	106	0.0	0.2	2	0.0	0.0
	B	37-39 [BBCH]	FUNG		1.25	L/HA	223	0.0	0.7	0	0.0	0.0
							318	0.0	0.3	1	0.0	0.0
							405	0.0	0.5	1	0.0	0.0
							Mean =	0.0	0.4	1	0.0	0.0
7	A	31 [BBCH]	FUNG		0.60	L/HA	107	0.0	1.2	2	0.0	0.0
	A	31 [BBCH]	FUNG		1.00	L/HA	201	0.0	0.1	0	0.0	0.0
	B	37-39 [BBCH]	FUNG		0.60	L/HA	320	0.0	0.0	0	0.0	0.0
	B	37-39 [BBCH]	FUNG		1.00	L/HA	422	0.0	0.1	1	0.0	0.0
							Mean =	0.0	0.4	1	0.0	0.0

Rating Date	22/5/06	22/5/06	22/5/06	22/5/06	22/5/06							
SE Name	%LEAF1	%LEAF2	%LEAF3	%LEAF1	%LEAF2							
Pest Type	D Disease	D Disease	D Disease	D Disease	D Disease							
Pest Code	PYRNTE	PYRNTE	PYRNTE	RHYNSE	RHYNSE							
Pest Stage	mixed	mixed	mixed	mixed	mixed							
Crop Code	HORVW	HORVW	HORVW	HORVW	HORVW							
BBCH Scale Type	BCER	BCER	BCER	BCER	BCER							
Crop Variety	Marado	Marado	Marado	Marado	Marado							
Crop Stage	69	69	69	69	69							
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH							
Part Rated	LEAF1 P	LEAF2 P	LEAF3 P	LEAF1 P	LEAF2 P							
Rating Data Type	COVAR	COVAR	COVAR	COVAR	COVAR							
Rating Unit	%AREA	%AREA	%AREA	%AREA	%AREA							
Sample Size	1	1	1	1	1							
Sample Size Unit	LEAF	LEAF	LEAF	LEAF	LEAF							
Number of Subsamples	10	10	10	10	10							
Footnote Number												
Assessed By	REDEBEL	REDEBEL	REDEBEL	REDEBEL	REDEBEL							
Days After Last Applic	18	18	18	18	18							
Tri-Eval Interval	33 DA-A	33 DA-A	33 DA-A	33 DA-A	33 DA-A							
ARM Action Codes	P	P	APC	P	P							
Number of Decimals	1	1	0	1	1							
Trt No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Rate Unit	Plot	11	12	13	14	15
8	A	31 [BBCH]	FUNG		1.50	L/HA	108	0.1	0.4	3	0.0	0.0
	A	31 [BBCH]	FUNG		1.00	L/HA	215	0.1	0.5	1	0.0	0.0
	B	37-39 [BBCH]	FUNG		1.50	L/HA	312	0.0	1.1	0	0.0	0.0
	B	37-39 [BBCH]	FUNG		1.00	L/HA	401	0.0	0.0	1	0.0	0.0
				Mean =				0.1	0.5	1	0.0	0.0
9	A	31 [BBCH]	FUNG		2.00	L/HA	109	0.3	1.4	4	0.0	0.0
	A	31 [BBCH]	FUNG		1.00	L/HA	222	0.0	0.1	2	0.0	0.0
	B	37-39 [BBCH]	FUNG		2.00	L/HA	316	0.0	0.0	1	0.0	0.0
	B	37-39 [BBCH]	FUNG		1.00	L/HA	404	0.0	0.3	0	0.0	0.0
				Mean =				0.1	0.5	2	0.0	0.0
10	A	31 [BBCH]	FUNG		0.60	L/HA	110	0.0	1.2	2	0.0	0.0
	A	31 [BBCH]	FUNG		1.00	L/HA	219	0.0	0.1	0	0.0	0.0
	B	37-39 [BBCH]	FUNG		0.60	L/HA	306	0.0	0.0	1	0.0	0.0
	B	37-39 [BBCH]	FUNG		1.00	L/HA	412	0.0	0.0	0	0.0	0.0
				Mean =				0.0	0.3	1	0.0	0.0
11	A	31 [BBCH]	FUNG		1.20	L/HA	111	0.4	1.8	5	0.0	0.0
	B	37-39 [BBCH]	FUNG		1.20	L/HA	203	0.0	1.0	2	0.0	0.0
							317	0.1	0.7	3	0.0	0.0
							419	0.0	0.5	0	0.0	0.0
				Mean =				0.1	1.0	2	0.0	0.0
12	B	37-39 [BBCH]	FUNG		0.80	L/HA	112	0.1	3.1	5	0.0	0.3
	B	37-39 [BBCH]	FUNG		1.00	L/HA	211	0.0	0.0	4	0.0	0.0
							309	0.0	0.0	2	0.0	0.0
							406	0.0	0.3	2	0.0	0.0
				Mean =				0.0	0.9	3	0.0	0.1
13	B	37-39 [BBCH]	FUNG		1.50	L/HA	113	0.0	1.8	5	0.0	0.0
	B	37-39 [BBCH]	FUNG		1.00	L/HA	216	0.0	0.6	3	0.0	0.0
							323	0.0	0.0	2	0.0	0.0
							411	0.0	0.0	3	0.0	0.0
				Mean =				0.0	0.6	3	0.0	0.0
14	B	37-39 [BBCH]	FUNG		2.00	L/HA	114	0.3	1.9	4	0.0	0.0
	B	37-39 [BBCH]	FUNG		1.00	L/HA	218	0.0	1.2	6	0.0	0.0
							319	0.0	0.3	3	0.0	0.0
							409	0.0	1.8	3	0.0	0.0
				Mean =				0.1	1.3	4	0.0	0.0

Rating Date						22/5/06	22/5/06	22/5/06	22/5/06	22/5/06	
SE Name						%LEAF1	%LEAF2	%LEAF3	%LEAF1	%LEAF2	
Pest Type						D Disease	D Disease	D Disease	D Disease	D Disease	
Pest Code						PYRNTE	PYRNTE	PYRNTE	RHYNSE	RHYNSE	
Pest Stage						mixed	mixed	mixed	mixed	mixed	
Crop Code						HORVW	HORVW	HORVW	HORVW	HORVW	
BBCH Scale Type						BCER	BCER	BCER	BCER	BCER	
Crop Variety						Marado	Marado	Marado	Marado	Marado	
Crop Stage						69	69	69	69	69	
Crop Stage Scale						BBCH	BBCH	BBCH	BBCH	BBCH	
Part Rated						LEAF1 P	LEAF2 P	LEAF3 P	LEAF1 P	LEAF2 P	
Rating Data Type						COVAR	COVAR	COVAR	COVAR	COVAR	
Rating Unit						%AREA	%AREA	%AREA	%AREA	%AREA	
Sample Size						1	1	1	1	1	
Sample Size Unit						LEAF	LEAF	LEAF	LEAF	LEAF	
Number of Subsamples						10	10	10	10	10	
Footnote Number											
Assessed By						REDEBEL	REDEBEL	REDEBEL	REDEBEL	REDEBEL	
Days After Last Applic.						18	18	18	18	18	
Trt-Eval Interval						33 DA-A	33 DA-A	33 DA-A	33 DA-A	33 DA-A	
ARM Action Codes						P	P	APC	P	P	
Number of Decimals						1	1	0	1	1	
Trt Appl											
Growth											
Treatment											
Rate											
Rate Unit											
Plot											
No.							11	12	13	14	15
Code											
Stage											
Type											
Name											
Rate											
Unit											
Plot											
15 B	37-39 [BBCH]	FUNG		2.00 L/HA	115	0.4	0.8	5	0.0	0.0	
B	37-39 [BBCH]	FUNG		0.50 L/HA	221	0.0	0.5	4	0.0	0.0	
					303	0.0	0.8	5	0.0	0.0	
					416	0.0	0.4	4	0.0	0.0	
					Mean =	0.1	0.6	5	0.0	0.0	
16 B	37-39 [BBCH]	FUNG		1.25 L/HA	116	0.4	1.3	4	0.0	0.0	
					210	0.0	0.0	5	0.0	0.0	
					322	0.0	0.0	2	0.0	0.0	
					413	0.0	0.0	2	0.0	0.0	
					Mean =	0.1	0.3	3	0.0	0.0	
17 B	37-39 [BBCH]	FUNG		1.50 L/HA	117	0.0	3.0	7	0.0	0.0	
					213	0.2	1.6	9	0.0	0.0	
					307	0.0	1.0	4	0.0	0.0	
					403	0.0	0.9	5	0.0	0.0	
					Mean =	0.1	1.6	6	0.0	0.0	
18 B	37-39 [BBCH]	FUNG		1.00 L/HA	118	0.5	1.2	5	0.0	0.0	
					206	0.0	1.6	7	0.0	0.0	
					321	0.0	0.0	4	0.0	0.0	
					410	0.0	0.0	3	0.0	0.0	
					Mean =	0.1	0.7	5	0.0	0.0	
19 B	37-39 [BBCH]	FUNG		0.8 L/HA	119	0.5	2.2	9	0.0	0.0	
					208	0.0	1.3	6	0.0	0.0	
					301	0.0	0.6	5	0.0	0.0	
					421	0.1	3.1	4	0.0	0.0	
					Mean =	0.2	1.8	6	0.0	0.0	
20 A	31 [BBCH]	FUNG		1.00 L/HA	120	0.0	0.2	1	0.0	0.0	
B	37-39 [BBCH]	FUNG		2.00 L/HA	205	0.0	0.6	1	0.0	0.0	
					313	0.0	0.1	1	0.0	0.0	
					408	0.0	0.8	1	0.0	0.0	
					Mean =	0.0	0.4	1	0.0	0.0	
21 A	31 [BBCH]	FUNG		1.00 L/HA	121	0.0	0.7	2	0.0	0.0	
B	37-39 [BBCH]	FUNG		2.00 L/HA	207	0.0	0.1	1	0.0	0.0	
					311	0.0	0.6	1	0.0	0.0	
					414	0.0	0.8	2	0.0	0.0	
					Mean =	0.0	0.6	2	0.0	0.0	

Rating Date	22/5/06	22/5/06	22/5/06	22/5/06	22/5/06	
SE Name	%LEAF1	%LEAF2	%LEAF3	%LEAF1	%LEAF2	
Pest Type	D Disease	D Disease	D Disease	D Disease	D Disease	
Pest Code	PYRNTE	PYRNTE	PYRNTE	RHYNSE	RHYNSE	
Pest Stage	mixed	mixed	mixed	mixed	mixed	
Crop Code	HORVW	HORVW	HORVW	HORVW	HORVW	
BBCH Scale Type	BCER	BCER	BCER	BCER	BCER	
Crop Variety	Marado	Marado	Marado	Marado	Marado	
Crop Stage	69	69	69	69	69	
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH	
Part Rated	LEAF1 P	LEAF2 P	LEAF3 P	LEAF1 P	LEAF2 P	
Rating Data Type	COVAR	COVAR	COVAR	COVAR	COVAR	
Rating Unit	%AREA	%AREA	%AREA	%AREA	%AREA	
Sample Size	1	1	1	1	1	
Sample Size Unit	LEAF	LEAF	LEAF	LEAF	LEAF	
Number of Subsamples	10	10	10	10	10	
Footnote Number						
Assessed By	REDEBEL	REDEBEL	REDEBEL	REDEBEL	REDEBEL	
Days After Last Applic.	18	18	18	18	18	
Ttr-Eval Interval	33 DA-A	33 DA-A	33 DA-A	33 DA-A	33 DA-A	
ARM Action Codes	P	P	APC	P	P	
Number of Decimals	1	1	0	1	1	
Ttr Appl Growth	Treatment	Rate				
No Code Stage Type Name	Rate Unit Plot					
22 A 31 [BBCH] FUNG	0.30 L/HA 122	0.4	1.1	8	0.0	0.0
B 37-39 [BBCH] FUNG	0.30 L/HA 214	0.9	2.0	6	0.0	0.0
	305	0.0	1.7	4	0.0	0.0
	402	1.1	0.9	5	0.0	0.0
	Mean =	0.6	1.4	6	0.0	0.0
23 A 31 [BBCH] FUNG	0.50 L/HA 123	0.1	3.0	8	0.0	0.0
B 37-39 [BBCH] FUNG	0.50 L/HA 202	0.1	2.1	3	0.0	0.0
	315	0.1	2.2	9	0.0	0.0
	407	0.8	2.1	6	0.0	0.0
	Mean =	0.3	2.4	7	0.0	0.0

Rating Date	22/5/06	14/6/06	14/6/06	14/6/06	14/6/06							
SE Name	%LEAF3	%LEAF1	%LEAF1	%LEAF1	%LEAF2							
Pest Type	D Disease	D Disease	D Disease	D Disease	D Disease							
Pest Code	RHYNSE	PYRNTE	RHYNSE	ZZXXAA	PYRNTE							
Pest Stage	mixed	mixed	mixed	mixed	mixed							
Crop Code	HORVW	HORVW	HORVW	HORVW	HORVW							
BBCH Scale Type	BCER	BCER	BCER	BCER	BCER							
Crop Variety	Marado	Marado	Marado	Marado	Marado							
Crop Stage	69	73	73	73	73							
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH							
Part Rated	LEAF3 P	LEAF1 P	LEAF1 P	LEAF1 P	LEAF2 P							
Rating Data Type	COVAR	COVAR	COVAR	COVAR	COVAR							
Rating Unit	%AREA	%AREA	%AREA	%AREA	%AREA							
Sample Size	1	1	1	1	1							
Sample Size Unit	LEAF	LEAF	LEAF	LEAF	LEAF							
Number of Subsamples	10	10	10	10	10							
Footnote Number				1								
Assessed By	REDEBEL	REDEBEL	REDEBEL	REDEBEL	REDEBEL							
Days After Last Applic.	18	41	41	41	41							
Tri-Eval Interval	33 DA-A	56 DA-A	56 DA-A	56 DA-A	56 DA-A							
ARM Action Codes	P	APC	P	P	APC							
Number of Decimals	1	0	1	1	0							
Tri No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Rate Unit	Plot	16	17	18	19	20
1	AB		CHK	Untreated Check			101	0.5	21	4.0	3.3	21
							217	0.1	19	0.0	8.5	32
							304	0.6	25	3.2	1.3	48
							415	0.0	28	0.8	0.6	56
							Mean =	0.3	23	2.0	3.4	39
2	A	31 [BBCH]	FUNG		2.00	L/HA	102	0.0	10	1.3	0.5	7
	B	37-39 [BBCH]	FUNG		1.50	L/HA	220	0.0	5	1.0	2.0	6
	B	37-39 [BBCH]	FUNG		0.50	L/HA	310	0.0	2	0.0	0.0	6
							418	0.0	2	0.3	0.1	6
							Mean =	0.0	5	0.7	0.7	6
3	A	31 [BBCH]	FUNG		2.00	L/HA	103	0.0	6	0.0	0.0	8
	B	37-39 [BBCH]	FUNG		2.00	L/HA	209	0.0	6	0.0	1.0	6
	B	37-39 [BBCH]	FUNG		0.50	L/HA	308	0.0	3	0.0	0.3	4
							423	0.0	1	0.1	0.2	2
							Mean =	0.0	4	0.0	0.4	5
4	A	31 [BBCH]	FUNG		2.00	L/HA	104	1.0	13	0.0	0.5	9
	B	37-39 [BBCH]	FUNG		2.00	L/HA	212	0.0	7	0.0	0.0	6
	B	37-39 [BBCH]	FUNG		0.50	L/HA	302	0.0	1	0.1	0.2	3
							417	0.0	2	0.1	0.1	4
							Mean =	0.3	5	0.1	0.2	5
5	A	31 [BBCH]	FUNG		2.00	L/HA	105	0.0	5	0.0	1.3	10
	B	37-39 [BBCH]	FUNG		2.00	L/HA	204	0.0	5	0.0	0.5	8
	B	37-39 [BBCH]	FUNG		1.00	L/HA	314	0.0	3	0.3	0.6	7
							420	0.0	2	0.0	0.1	5
							Mean =	0.0	4	0.1	0.6	7
6	A	31 [BBCH]	FUNG		2.00	L/HA	106	0.1	14	0.3	1.0	5
	B	37-39 [BBCH]	FUNG		1.25	L/HA	223	0.0	3	0.0	0.0	5
							318	0.0	4	0.3	0.5	8
							405	0.0	1	0.0	0.0	2
							Mean =	0.0	5	0.2	0.4	5
7	A	31 [BBCH]	FUNG		0.60	L/HA	107	0.2	7	0.0	3.1	5
	A	31 [BBCH]	FUNG		1.00	L/HA	201	0.0	1	0.5	4.8	3
	B	37-39 [BBCH]	FUNG		0.60	L/HA	320	0.0	2	0.2	0.5	2
	B	37-39 [BBCH]	FUNG		1.00	L/HA	422	0.0	2	0.2	0.2	3
							Mean =	0.1	3	0.2	2.2	3

Rating Date	22/5/06	14/6/06	14/6/06	14/6/06	14/6/06							
SE Name	%LEAF3	%LEAF1	%LEAF1	%LEAF1	%LEAF2							
Pest Type	D Disease	D Disease	D Disease	D Disease	D Disease							
Pest Code	RHYNSE	PYRNTE	RHYNSE	ZZXXAA	PYRNTE							
Pest Stage	mixed	mixed	mixed	mixed	mixed							
Crop Code	HORVW	HORVW	HORVW	HORVW	HORVW							
BBCH Scale Type	BCER	BCER	BCER	BCER	BCER							
Crop Variety	Marado	Marado	Marado	Marado	Marado							
Crop Stage	69	73	73	73	73							
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH							
Part Rated	LEAF3 P	LEAF1 P	LEAF1 P	LEAF1 P	LEAF2 P							
Rating Data Type	COVAR	COVAR	COVAR	COVAR	COVAR							
Rating Unit	%AREA	%AREA	%AREA	%AREA	%AREA							
Sample Size	1	1	1	1	1							
Sample Size Unit	LEAF	LEAF	LEAF	LEAF	LEAF							
Number of Subsamples	10	10	10	10	10							
Footnote Number												
Assessed By	REDEBEL	REDEBEL	REDEBEL	REDEBEL	REDEBEL							
Days After Last Applic	18	41	41	41	41							
Trt-Eval Interval	33 DA-A	56 DA-A	56 DA-A	56 DA-A	56 DA-A							
ARM Action Codes	P	APC	P	P	APC							
Number of Decimals	1	0	1	1	0							
Trt No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Unit	Plot	16	17	18	19	20
8	A	31 [BBCH]	FUNG		1.50	L/HA	108	0.5	6	0.5	4.5	5
	A	31 [BBCH]	FUNG		1.00	L/HA	215	0.0	15	0.0	6.5	8
	B	37-39 [BBCH]	FUNG		1.50	L/HA	312	0.0	1	0.1	0.1	3
	B	37-39 [BBCH]	FUNG		1.00	L/HA	401	0.0	1	0.9	0.0	2
				Mean =				0.1	6	0.4	2.8	4
9	A	31 [BBCH]	FUNG		2.00	L/HA	109	0.1	4	0.0	3.0	4
	A	31 [BBCH]	FUNG		1.00	L/HA	222	0.0	5	0.0	2.0	5
	B	37-39 [BBCH]	FUNG		2.00	L/HA	316	0.0	2	0.2	0.4	4
	B	37-39 [BBCH]	FUNG		1.00	L/HA	404	0.0	1	0.2	0.2	2
				Mean =				0.0	3	0.1	1.4	4
10	A	31 [BBCH]	FUNG		0.60	L/HA	110	0.0	4	0.0	3.5	3
	A	31 [BBCH]	FUNG		1.00	L/HA	219	0.0	3	0.0	3.0	6
	B	37-39 [BBCH]	FUNG		0.60	L/HA	306	0.0	2	0.1	0.2	2
	B	37-39 [BBCH]	FUNG		1.00	L/HA	412	0.0	1	0.1	0.5	1
				Mean =				0.0	2	0.1	1.8	3
11	A	31 [BBCH]	FUNG		1.20	L/HA	111	0.0	4	0.0	1.2	5
	B	37-39 [BBCH]	FUNG		1.20	L/HA	203	0.0	4	0.0	0.5	5
							317	0.0	3	0.2	0.1	6
							419	0.0	3	0.0	0.6	5
				Mean =				0.0	4	0.1	0.6	5
12	B	37-39 [BBCH]	FUNG		0.80	L/HA	112	1.9	3	0.6	2.5	3
	B	37-39 [BBCH]	FUNG		1.00	L/HA	211	0.0	5	0.0	2.5	4
							309	0.0	2	0.1	0.1	2
							406	0.0	2	0.1	0.0	6
				Mean =				0.5	3	0.2	1.3	4
13	B	37-39 [BBCH]	FUNG		1.50	L/HA	113	0.0	7	0.5	1.5	7
	B	37-39 [BBCH]	FUNG		1.00	L/HA	216	0.0	12	0.0	8.5	12
							323	0.0	2	0.3	0.3	6
							411	0.0	3	0.0	0.2	4
				Mean =				0.0	6	0.2	2.6	7
14	B	37-39 [BBCH]	FUNG		2.00	L/HA	114	0.1	9	0.0	2.8	12
	B	37-39 [BBCH]	FUNG		1.00	L/HA	218	0.0	9	0.0	5.0	8
							319	0.0	3	0.0	1.1	8
							409	0.0	2	0.3	0.2	10
				Mean =				0.0	6	0.1	2.3	9

Rating Date	22/5/06	14/6/06	14/6/06	14/6/06	14/6/06							
SE Name	%LEAF3	%LEAF1	%LEAF1	%LEAF1	%LEAF2							
Pest Type	D Disease	D Disease	D Disease	D Disease	D Disease							
Pest Code	RHYNSE	PYRNTE	RHYNSE	ZZXXAA	PYRNTE							
Pest Stage	mixed	mixed	mixed	mixed	mixed							
Crop Code	HORVW	HORVW	HORVW	HORVW	HORVW							
BBCH Scale Type	BCER	BCER	BCER	BCER	BCER							
Crop Variety	Marado	Marado	Marado	Marado	Marado							
Crop Stage	69	73	73	73	73							
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH							
Part Rated	LEAF3 P	LEAF1 P	LEAF1 P	LEAF1 P	LEAF2 P							
Rating Data Type	COVAR	COVAR	COVAR	COVAR	COVAR							
Rating Unit	%AREA	%AREA	%AREA	%AREA	%AREA							
Sample Size	1	1	1	1	1							
Sample Size Unit	LEAF	LEAF	LEAF	LEAF	LEAF							
Number of Subsamples	10	10	10	10	10							
Footnote Number												
Assessed By	REDEBEL	REDEBEL	REDEBEL	REDEBEL	REDEBEL							
Days After Last Applic.	18	41	41	41	41							
Trt-Eval Interval	33 DA-A	56 DA-A	56 DA-A	56 DA-A	56 DA-A							
ARM Action Codes	P	APC	P	P	APC							
Number of Decimals	1	0	1	1	0							
Trt No	Appl Code	Growth Stage	Type	Treatment Name	Rate	Unit	Plot	16	17	18	19	20
15	B	37-39 [BBCH]	FUNG	██████	2.00	L/HA	115	0.7	4	0.0	0.0	9
	B	37-39 [BBCH]	FUNG	██████	0.50	L/HA	221	0.0	4	0.0	2.8	6
							303	0.0	2	0.2	0.5	5
							416	0.0	7	0.6	1.1	3
							Mean =	0.2	4	0.2	1.1	6
16	B	37-39 [BBCH]	FUNG	██████	1.25	L/HA	116	0.0	5	0.0	1.5	7
							210	0.0	5	0.0	0.0	6
							322	0.0	7	0.2	0.2	4
							413	0.0	1	0.1	0.1	2
							Mean =	0.0	4	0.1	0.5	5
17	B	37-39 [BBCH]	FUNG	██████	1.50	L/HA	117	0.0	5	0.0	1.5	14
							213	0.0	6	0.5	1.0	12
							307	0.0	1	0.2	0.2	6
							403	0.0	2	0.2	0.0	5
							Mean =	0.0	3	0.2	0.7	9
18	B	37-39 [BBCH]	FUNG	██████	1.00	L/HA	118	0.6	6	0.1	1.5	7
							206	0.0	6	0.0	1.0	10
							321	0.0	2	0.3	0.4	7
							410	0.0	0	1.0	0.5	4
							Mean =	0.2	3	0.4	0.9	7
19	B	37-39 [BBCH]	FUNG	██████	0.8	L/HA	119	0.5	5	0.0	3.1	6
							208	0.0	6	0.0	2.0	6
							301	0.0	2	0.5	0.7	6
							421	0.0	3	0.4	0.5	17
							Mean =	0.1	4	0.2	1.6	8
20	A	31 [BBCH]	FUNG	██████	1.00	L/HA	120	0.0	8	0.0	4.0	12
	B	37-39 [BBCH]	FUNG	██████	2.00	L/HA	205	0.0	6	0.0	0.0	11
							313	0.0	3	0.3	0.2	6
							408	0.0	3	0.4	0.2	12
							Mean =	0.0	5	0.2	1.1	10
21	A	31 [BBCH]	FUNG	██████	1.00	L/HA	121	0.0	6	0.0	3.8	11
	B	37-39 [BBCH]	FUNG	██████	2.00	L/HA	207	0.0	10	0.0	3.0	12
							311	0.0	4	0.1	1.0	10
							414	0.0	3	0.1	0.2	7
							Mean =	0.0	6	0.1	2.0	10

Rating Date		22/5/06	14/6/06	14/6/06	14/6/06	14/6/06
SE Name		%LEAF3	%LEAF1	%LEAF1	%LEAF1	%LEAF2
Pest Type		D Disease	D Disease	D Disease	D Disease	D Disease
Pest Code		RHYNSE	PYRNTE	RHYNSE	ZZXXAA	PYRNTE
Pest Stage		mixed	mixed	mixed	mixed	mixed
Crop Code		HORVW	HORVW	HORVW	HORVW	HORVW
BBCH Scale Type		BCER	BCER	BCER	BCER	BCER
Crop Variety		Marado	Marado	Marado	Marado	Marado
Crop Stage		69	73	73	73	73
Crop Stage Scale		BBCH	BBCH	BBCH	BBCH	BBCH
Part Rated		LEAF3 P	LEAF1 P	LEAF1 P	LEAF1 P	LEAF2 P
Rating Data Type		COVAR	COVAR	COVAR	COVAR	COVAR
Rating Unit		%AREA	%AREA	%AREA	%AREA	%AREA
Sample Size		1	1	1	1	1
Sample Size Unit		LEAF	LEAF	LEAF	LEAF	LEAF
Number of Subsamples		10	10	10	10	10
Footnote Number					1	
Assessed By		REDEBEL	REDEBEL	REDEBEL	REDEBEL	REDEBEL
Days After Last Applic.		18	41	41	41	41
Trit-Eval Interval		33 DA-A	56 DA-A	56 DA-A	56 DA-A	56 DA-A
ARM Action Codes		P	APC	P	P	APC
Number of Decimals		1	0	1	1	0
Trit	Appl	Growth	Treatment	Rate		
No.	Code	Stage	Type Name	Rate Unit Plot	16	17
22	A	31 [BBCH]	FUNG	0.30 L/HA 122	0.0	24
	B	37-39 [BBCH]	FUNG	0.30 L/HA 214	0.0	26
				305	0.0	9
				402	0.0	21
				Mean =	0.0	20
23	A	31 [BBCH]	FUNG	0.50 L/HA 123	0.1	21
	B	37-39 [BBCH]	FUNG	0.50 L/HA 202	0.0	27
				315	0.0	14
				407	0.0	15
				Mean =	0.0	19
						18
						19
						20
						46
						29
						16
						38
						32
						32
						55
						40
						42
						42

Rating Date	14/6/06	14/6/06	14/6/06	14/6/06	14/6/06							
SE Name	%LEAF2	%LEAF2	%LEAF3	%LEAF3	%LEAF3							
Pest Type	D Disease	D Disease	D Disease	D Disease	D Disease							
Pest Code	RHYNSE	ZZXXAA	PYRNTE	RHYNSE	ZZXXAA							
Pest Stage	mixed	mixed	mixed	mixed	mixed							
Crop Code	HORVW	HORVW	HORVW	HORVW	HORVW							
BBCH Scale Type	BCER	BCER	BCER	BCER	BCER							
Crop Variety	Marado	Marado	Marado	Marado	Marado							
Crop Stage	73	73	73	73	73							
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH							
Part Rated	LEAF2 P	LEAF2 P	LEAF3 P	LEAF3 P	LEAF3 P							
Rating Data Type	COVAR	COVAR	COVAR	COVAR	COVAR							
Rating Unit	%AREA	%AREA	%AREA	%AREA	%AREA							
Sample Size	1	1	1	1	1							
Sample Size Unit	LEAF	LEAF	LEAF	LEAF	LEAF							
Number of Subsamples	10	10	10	10	10							
Footnote Number												
Assessed By	REDEBEL	REDEBEL	REDEBEL	REDEBEL	REDEBEL							
Days After Last Applic.	41	41	41	41	41							
Tri-Eval Interval	56 DA-A	56 DA-A	56 DA-A	56 DA-A	56 DA-A							
ARM Action Codes	APC	APC	APC	APC	APC							
Number of Decimals	0	0	0	0	0							
Tri	Appl	Growth	Type	Treatment	Rate	Rate	Plot	21	22	23	24	25
No	Code	Stage		Name	Rate	Unit						
1	AB		CHK	Untreated Check			101	5	6	100	100	100
							217	10	29	84	80	86
							304	32	29	100	100	100
							415	2	3	100	100	100
							Mean =	12	16	96	95	97
2	A	31 [BBCH]	FUNG		2.00	L/HA	102	2	1	19	3	1
	B	37-39 [BBCH]	FUNG		1.50	L/HA	220	0	4	20	10	14
	B	37-39 [BBCH]	FUNG		0.50	L/HA	310	0	0	13	1	1
							418	0	0	17	1	0
							Mean =	1	1	17	4	4
3	A	31 [BBCH]	FUNG		2.00	L/HA	103	1	1	13	2	1
	B	37-39 [BBCH]	FUNG		2.00	L/HA	209	0	1	20	11	10
	B	37-39 [BBCH]	FUNG		0.50	L/HA	308	0	0	29	20	20
							423	0	0	8	0	1
							Mean =	0	0	17	8	8
4	A	31 [BBCH]	FUNG		2.00	L/HA	104	0	1	14	0	0
	B	37-39 [BBCH]	FUNG		2.00	L/HA	212	1	2	18	11	11
	B	37-39 [BBCH]	FUNG		0.50	L/HA	302	0	0	14	11	11
							417	0	0	12	1	1
							Mean =	0	1	14	6	6
5	A	31 [BBCH]	FUNG		2.00	L/HA	105	0	5	9	0	11
	B	37-39 [BBCH]	FUNG		2.00	L/HA	204	0	7	8	1	10
	B	37-39 [BBCH]	FUNG		1.00	L/HA	314	1	1	31	20	22
							420	0	1	33	23	21
							Mean =	0	3	20	11	16
6	A	31 [BBCH]	FUNG		2.00	L/HA	106	0	2	10	0	5
	B	37-39 [BBCH]	FUNG		1.25	L/HA	223	0	1	8	0	0
							318	1	1	25	21	20
							405	0	0	9	0	0
							Mean =	0	1	13	5	6
7	A	31 [BBCH]	FUNG		0.60	L/HA	107	0	8	6	1	18
	A	31 [BBCH]	FUNG		1.00	L/HA	201	0	8	6	0	15
	B	37-39 [BBCH]	FUNG		0.60	L/HA	320	0	1	6	1	4
	B	37-39 [BBCH]	FUNG		1.00	L/HA	422	0	0	6	1	0
							Mean =	0	4	6	1	9

Rating Date	14/6/06	14/6/06	14/6/06	14/6/06	14/6/06
SE Name	%LEAF2	%LEAF2	%LEAF3	%LEAF3	%LEAF3
Pest Type	D Disease	D Disease	D Disease	D Disease	D Disease
Pest Code	RHYNSE	ZZXXAA	PYRNTE	RHYNSE	ZZXXAA
Pest Stage	mixed	mixed	mixed	mixed	mixed
Crop Code	HORVW	HORVW	HORVW	HORVW	HORVW
BBCH Scale Type	BCER	BCER	BCER	BCER	BCER
Crop Variety	Marado	Marado	Marado	Marado	Marado
Crop Stage	73	73	73	73	73
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH
Part Rated	LEAF2 P	LEAF2 P	LEAF3 P	LEAF3 P	LEAF3 P
Rating Data Type	COVAR	COVAR	COVAR	COVAR	COVAR
Rating Unit	%AREA	%AREA	%AREA	%AREA	%AREA
Sample Size	1	1	1	1	1
Sample Size Unit	LEAF	LEAF	LEAF	LEAF	LEAF
Number of Subsamples	10	10	10	10	10
Footnote Number	1	1	1	1	1
Assessed By	REDEBEL	REDEBEL	REDEBEL	REDEBEL	REDEBEL
Days After Last Applic.	41	41	41	41	41
Trt-Eval Interval	56 DA-A	56 DA-A	56 DA-A	56 DA-A	56 DA-A
ARM Action Codes	APC	APC	APC	APC	APC
Number of Decimals	0	0	0	0	0
Trt. Appl. Growth	Treatment	Rate			
No. Code Stage Type Name	Rate Unit Plot	21	22	23	24
8 A 31 [BBCH] FUNG	1.50 L/HA 108	0	10	17	11
A 31 [BBCH] FUNG	1.00 L/HA 215	0	14	36	31
B 37-39 [BBCH] FUNG	1.50 L/HA 312	0	1	11	2
B 37-39 [BBCH] FUNG	1.00 L/HA 401	1	0	12	3
Mean =		0	6	19	12
9 A 31 [BBCH] FUNG	2.00 L/HA 109	0	8	5	1
A 31 [BBCH] FUNG	1.00 L/HA 222	0	10	3	1
B 37-39 [BBCH] FUNG	2.00 L/HA 316	1	2	8	12
B 37-39 [BBCH] FUNG	1.00 L/HA 404	1	1	4	1
Mean =		0	5	5	4
10 A 31 [BBCH] FUNG	0.60 L/HA 110	0	8	5	1
A 31 [BBCH] FUNG	1.00 L/HA 219	0	9	8	0
B 37-39 [BBCH] FUNG	0.60 L/HA 306	1	1	5	2
B 37-39 [BBCH] FUNG	1.00 L/HA 412	1	0	9	1
Mean =		0	5	6	1
11 A 31 [BBCH] FUNG	1.20 L/HA 111	0	2	9	1
B 37-39 [BBCH] FUNG	1.20 L/HA 203	0	2	14	0
	317	0	0	24	11
	419	1	0	27	11
Mean =		0	1	18	6
12 B 37-39 [BBCH] FUNG	0.80 L/HA 112	0	10	6	1
B 37-39 [BBCH] FUNG	1.00 L/HA 211	1	12	13	0
	309	0	3	13	2
	406	1	1	29	11
Mean =		0	6	15	3
13 B 37-39 [BBCH] FUNG	1.50 L/HA 113	0	13	26	11
B 37-39 [BBCH] FUNG	1.00 L/HA 216	0	15	61	50
	323	1	1	47	11
	411	1	3	25	1
Mean =		1	8	39	18
14 B 37-39 [BBCH] FUNG	2.00 L/HA 114	2	8	34	31
B 37-39 [BBCH] FUNG	1.00 L/HA 218	0	14	32	20
	319	0	4	45	21
	409	1	1	52	12
Mean =		1	6	41	21

Rating Date	14/6/06	14/6/06	14/6/06	14/6/06	14/6/06								
SE Name	%LEAF2	%LEAF2	%LEAF3	%LEAF3	%LEAF3								
Pest Type	D Disease	D Disease	D Disease	D Disease	D Disease								
Pest Code	RHYNSE	ZZXXAA	PYRNTE	RHYNSE	ZZXXAA								
Pest Stage	mixed	mixed	mixed	mixed	mixed								
Crop Code	HORVW	HORVW	HORVW	HORVW	HORVW								
BBCH Scale Type	BCER	BCER	BCER	BCER	BCER								
Crop Variety	Marado	Marado	Marado	Marado	Marado								
Crop Stage	73	73	73	73	73								
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH								
Part Rated	LEAF2 P	LEAF2 P	LEAF3 P	LEAF3 P	LEAF3 P								
Rating Data Type	COVAR	COVAR	COVAR	COVAR	COVAR								
Rating Unit	%AREA	%AREA	%AREA	%AREA	%AREA								
Sample Size	1	1	1	1	1								
Sample Size Unit	LEAF	LEAF	LEAF	LEAF	LEAF								
Number of Subsamples	10	10	10	10	10								
Footnote Number		1			1								
Assessed By	REDEBEL	REDEBEL	REDEBEL	REDEBEL	REDEBEL								
Days After Last Applic.	41	41	41	41	41								
Trit-Eval Interval	56 DA-A	56 DA-A	56 DA-A	56 DA-A	56 DA-A								
ARM Action Codes	APC	APC	APC	APC	APC								
Number of Decimals	0	0	0	0	0								
Trit Appl Growth	Treatment	Rate											
No	Code	Stage	Type	Name	Rate	Unit	Plot	21	22	23	24	25	
15	B	37-39	[BBCH]	FUNG		2.00	L/HA	115	0	1	18	11	15
	B	37-39	[BBCH]	FUNG		0.50	L/HA	221	0	3	7	0	6
								303	1	0	33	21	21
								416	0	0	30	11	12
								Mean =	0	1	22	11	14
16	B	37-39	[BBCH]	FUNG		1.25	L/HA	116	0	3	30	20	23
								210	1	0	17	10	11
								322	0	0	30	20	21
								413	0	0	15	1	1
								Mean =	0	1	23	13	14
17	B	37-39	[BBCH]	FUNG		1.50	L/HA	117	0	2	45	30	32
								213	0	3	60	50	52
								307	1	0	50	41	40
								403	0	2	36	20	20
								Mean =	0	2	48	35	36
18	B	37-39	[BBCH]	FUNG		1.00	L/HA	118	0	5	44	31	33
								206	1	1	34	20	21
								321	1	1	38	10	11
								410	0	2	28	11	11
								Mean =	0	2	36	18	19
19	B	37-39	[BBCH]	FUNG		0.8	L/HA	119	1	14	27	21	34
								208	0	14	57	50	61
								301	2	2	39	25	24
								421	0	1	69	41	41
								Mean =	1	8	48	34	40
20	A	31	[BBCH]	FUNG		1.00	L/HA	120	1	11	24	12	17
	B	37-39	[BBCH]	FUNG		2.00	L/HA	205	0	0	32	20	20
								313	0	1	35	31	31
								408	1	1	59	21	21
								Mean =	0	3	37	21	22
21	A	31	[BBCH]	FUNG		1.00	L/HA	121	2	6	25	12	17
	B	37-39	[BBCH]	FUNG		2.00	L/HA	207	0	5	61	50	53
								311	2	1	30	12	13
								414	0	1	29	11	10
								Mean =	1	3	36	21	23

Rating Date		14/6/06	14/6/06	14/6/06	14/6/06	14/6/06				
SE Name		%LEAF2	%LEAF2	%LEAF3	%LEAF3	%LEAF3				
Pest Type		D Disease	D Disease	D Disease	D Disease	D Disease				
Pest Code		RHYNSE	ZZXXAA	PYRNTE	RHYNSE	ZZXXAA				
Pest Stage		mixed	mixed	mixed	mixed	mixed				
Crop Code		HORVW	HORVW	HORVW	HORVW	HORVW				
BBCH Scale Type		BCER	BCER	BCER	BCER	BCER				
Crop Variety		Marado	Marado	Marado	Marado	Marado				
Crop Stage		73	73	73	73	73				
Crop Stage Seale		BBCH	BBCH	BBCH	BBCH	BBCH				
Part Rated		LEAF2 P	LEAF2 P	LEAF3 P	LEAF3 P	LEAF3 P				
Rating Data Type		COVAR	COVAR	COVAR	COVAR	COVAR				
Rating Unit		%AREA	%AREA	%AREA	%AREA	%AREA				
Sample Size		1	1	1	1	1				
Sample Size Unit		LEAF	LEAF	LEAF	LEAF	LEAF				
Number of Subsamples		10	10	10	10	10				
Footnote Number			1			1				
Assessed By		REDEBEL	REDEBEL	REDEBEL	REDEBEL	REDEBEL				
Days After Last Applie		41	41	41	41	41				
T _{tr} -Eval Interval		56 DA-A	56 DA-A	56 DA-A	56 DA-A	56 DA-A				
ARM Action Codes		APC	APC	APC	APC	APC				
Number of Decimals		0	0	0	0	0				
T _{tr} Appl										
Growth										
Treatment										
Rate										
Rate Unit										
Plot										
21										
22										
23										
24										
25										
22 A	31 [BBCH]	FUNG		0.30 L/HA	122	30	31	100	100	100
B	37-39 [BBCH]	FUNG		0.30 L/HA	214	10	10	82	70	70
					305	2	1	65	70	70
					402	1	1	91	61	62
					Mean =	11	11	84	75	76
23 A	31 [BBCH]	FUNG		0.50 L/HA	123	10	11	94	90	91
B	37-39 [BBCH]	FUNG		0.50 L/HA	202	40	40	96	90	90
					315	11	11	94	80	80
					407	11	11	98	90	92
					Mean =	18	18	95	88	88

Rating Date	SE Name	26/6/06 %LEAF1	26/6/06 %GREEN	11/7/06 GRAIN WEIGHT	13/7/06 GRAIN ANALYS						
Pest Type		D Disease									
Pest Code		PYRNTE									
Pest Stage		mixed									
Crop Code		HORVW	HORVW	HORVW	HORVW						
BBCH Scale Type		BCER	BCER	BCER	BCER						
Crop Variety		Marado	Marado	Marado	Marado						
Crop Stage		77	77	89	99						
Crop Stage Scale		BBCH	BBCH	BBCH	BBCH						
Part Rated		LEAF1 P	LEAF1	GRAIN C	GRAIN C						
Rating Data Type		COVAR	GREEN	WEIGHT	MOIST						
Rating Unit		%AREA	%AREA	KG	%						
Sample Size		1	1	15 2							
Sample Size Unit		LEAF	LEAF	M2							
Number of Subsamples		10	10	1	1						
Footnote Number											
Assessed By		REDEBEL	REDEBEL	REDEBEL	REDEBEL						
Days After Last Applic.		53	53	68	70						
Tri-Eval Interval		68 DA-A	68 DA-A	83 DA-A	85 DA-A						
ARM Action Codes		APC	P	+	APOC						
Number of Decimals		0	0	2	1						
Tri No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Rate Unit	Plot	26	27	28	29
1	AB		CHK	Untreated Check							
								101	17	1	12.10
								217	20	5	11.40
								304	15	0	11.99
								415	11	0	11.72
								Mean =	16	1	11.80
2	A	31 [BBCH]	FUNG		2.00	L/HA	102	17	5	13.74	14.2
	B	37-39 [BBCH]	FUNG		1.50	L/HA	220	11	2	13.57	14.3
	B	37-39 [BBCH]	FUNG		0.50	L/HA	310	16	1	13.72	13.7
								418	13	9	13.72
								Mean =	14	4	13.69
3	A	31 [BBCH]	FUNG		2.00	L/HA	103	12	3	14.23	14.9
	B	37-39 [BBCH]	FUNG		2.00	L/HA	209	12	4	14.23	14.1
	B	37-39 [BBCH]	FUNG		0.50	L/HA	308	16	14	14.24	14.3
								423	14	7	15.23
								Mean =	13	7	14.48
4	A	31 [BBCH]	FUNG		2.00	L/HA	104	14	17	14.40	14.3
	B	37-39 [BBCH]	FUNG		2.00	L/HA	212	17	9	13.82	14.0
	B	37-39 [BBCH]	FUNG		0.50	L/HA	302	17	2	14.32	14.5
								417	14	14	14.49
								Mean =	15	10	14.26
5	A	31 [BBCH]	FUNG		2.00	L/HA	105	16	7	14.10	14.6
	B	37-39 [BBCH]	FUNG		2.00	L/HA	204	18	7	13.80	14.2
	B	37-39 [BBCH]	FUNG		1.00	L/HA	314	13	3	13.71	14.3
								420	16	10	14.20
								Mean =	16	7	13.95
6	A	31 [BBCH]	FUNG		2.00	L/HA	106	9	2	13.89	14.4
	B	37-39 [BBCH]	FUNG		1.25	L/HA	223	9	15	13.82	14.7
								318	13	1	13.95
								405	15	3	14.58
								Mean =	11	5	14.06
7	A	31 [BBCH]	FUNG		0.60	L/HA	107	11	14	14.92	15.1
	A	31 [BBCH]	FUNG		1.00	L/HA	201	13	16	15.13	14.2
	B	37-39 [BBCH]	FUNG		0.60	L/HA	320	18	6	13.99	15.6
	B	37-39 [BBCH]	FUNG		1.00	L/HA	422	12	16	14.31	15.0
								Mean =	13	13	14.59

Rating Date								26/6/06	26/6/06	11/7/06	13/7/06
SE Name								%LEAF1	%GREEN	GRAIN WEIGHT	GRAIN ANALYS
Pest Type								D Disease			
Pest Code								PYRNTE			
Pest Stage								mixed			
Crop Code								HORVW	HORVW	HORVW	HORVW
BBCH Scale Type								BCER	BCER	BCER	BCER
Crop Variety								Marado	Marado	Marado	Marado
Crop Stage								77	77	89	99
Crop Stage Scale								BBCH	BBCH	BBCH	BBCH
Part Rated								LEAF1 P	LEAF1	GRAIN C	GRAIN C
Rating Data Type								COVAR	GREEN	WEIGHT	MOIST
Rating Unit								%AREA	%AREA	KG	%
Sample Size								1	1	152	
Sample Size Unit								LEAF	LEAF	M2	
Number of Subsamples								10	10	1	1
Footnote Number											
Assessed By								REDEBEL	REDEBEL	REDEBEL	REDEBEL
Days After Last Applic.								53	53	68	70
Tri-Eval Interval								68 DA-A	68 DA-A	83 DA-A	85 DA-A
ARM Action Codes								APC	P	+	APOC
Number of Decimals								0	0	2	1
Tri No	Appl Code	Growth Stage	Type	Treatment Name	Rate	Rate Unit	Plot	26	27	28	29
8	A	31 [BBCH]	FUNG		1.50	L/HA	108	15	9	14.17	14.6
	A	31 [BBCH]	FUNG		1.00	L/HA	215	10	7	14.08	14.7
	B	37-39 [BBCH]	FUNG		1.50	L/HA	312	8	1	13.78	14.5
	B	37-39 [BBCH]	FUNG		1.00	L/HA	401	10	19	14.62	14.4
							Mean =	11	9	14.16	14.6
9	A	31 [BBCH]	FUNG		2.00	L/HA	109	10	11	14.80	14.7
	A	31 [BBCH]	FUNG		1.00	L/HA	222	15	5	13.85	15.0
	B	37-39 [BBCH]	FUNG		2.00	L/HA	316	18	11	13.80	14.3
	B	37-39 [BBCH]	FUNG		1.00	L/HA	404	10	15	14.12	14.6
							Mean =	13	10	14.14	14.7
10	A	31 [BBCH]	FUNG		0.60	L/HA	110	11	7	14.30	15.1
	A	31 [BBCH]	FUNG		1.00	L/HA	219	17	28	14.14	14.8
	B	37-39 [BBCH]	FUNG		0.60	L/HA	306	15	11	14.60	14.7
	B	37-39 [BBCH]	FUNG		1.00	L/HA	412	14	21	14.82	14.5
							Mean =	14	16	14.47	14.8
11	A	31 [BBCH]	FUNG		1.20	L/HA	111	8	12	14.40	14.3
	B	37-39 [BBCH]	FUNG		1.20	L/HA	203	14	11	14.07	13.6
							317	16	4	13.62	13.8
							419	14	11	14.75	14.1
							Mean =	13	9	14.21	14.0
12	B	37-39 [BBCH]	FUNG		0.80	L/HA	112	11	4	14.37	14.2
	B	37-39 [BBCH]	FUNG		1.00	L/HA	211	15	3	13.82	14.3
							309	14	31	14.32	15.1
							406	14	23	13.68	14.5
							Mean =	13	15	14.05	14.5
13	B	37-39 [BBCH]	FUNG		1.50	L/HA	113	14	3	14.29	13.7
	B	37-39 [BBCH]	FUNG		1.00	L/HA	216	11	1	13.20	13.7
							323	16	4	13.81	14.2
							411	14	5	13.92	14.3
							Mean =	13	3	13.81	14.0
14	B	37-39 [BBCH]	FUNG		2.00	L/HA	114	16	2	14.17	13.7
	B	37-39 [BBCH]	FUNG		1.00	L/HA	218	23	3	12.11	14.6
							319	18	6	13.75	14.1
							409	9	5	14.09	14.4
							Mean =	16	4	13.53	14.2

								26/6/06	26/6/06	11/7/06	13/7/06
								%LEAF1	%GREEN	GRAIN WEIGHT	GRAIN ANALYS
								D Disease			
								PYRNTE			
								mixed			
								HORVW	HORVW	HORVW	HORVW
								BCER	BCER	BCER	BCER
								Marado	Marado	Marado	Marado
								77	77	89	99
								BBCH	BBCH	BBCH	BBCH
								LEAF1 P	LEAF1	GRAIN C	GRAIN C
								COVAR	GREEN	WEIGHT	MOIST
								%AREA	%AREA	KG	%
								1	1	15.2	
								LEAF	LEAF	M2	
								10	10	1	1
								REDEBEL	REDEBEL	REDEBEL	REDEBEL
								53	53	68	70
								68 DA-A	68 DA-A	83 DA-A	85 DA-A
								APC	P	+	APOC
								0	0	2	1
Tri	Appl	Growth	Treatment	Rate	Rate	Plot					
No.	Code	Stage	Type	Name	Unit		26	27	28	29	
15	B	37-39 [BBCH]	FUNG		2.00 L/HA	115	17	10	13.97	14.2	
	B	37-39 [BBCH]	FUNG		0.50 L/HA	221	9	11	13.26	14.1	
						303	13	13	14.17	14.3	
						416	19	4	13.90	14.2	
						Mean =	14	9	13.83	14.2	
16	B	37-39 [BBCH]	FUNG		1.25 L/HA	116	15	1	13.75	13.9	
						210	17	7	13.40	13.7	
						322	11	6	13.15	14.2	
						413	11	1	14.19	14.5	
						Mean =	13	4	13.62	14.1	
17	B	37-39 [BBCH]	FUNG		1.50 L/HA	117	16	4	13.69	14.1	
						213	9	9	13.64	13.8	
						307	13	2	13.71	13.7	
						403	11	6	13.86	13.9	
						Mean =	12	5	13.73	13.9	
18	B	37-39 [BBCH]	FUNG		1.00 L/HA	118	16	8	13.58	14.0	
						206	19	10	13.03	13.7	
						321	15	23	13.83	14.4	
						410	14	7	13.30	14.3	
						Mean =	16	12	13.44	14.1	
19	B	37-39 [BBCH]	FUNG		0.8 L/HA	119	15	5	13.61	13.8	
						208	24	6	13.45	13.8	
						301	15	10	13.71	13.6	
						421	17	8	13.82	14.2	
						Mean =	18	7	13.65	13.9	
20	A	31 [BBCH]	FUNG		1.00 L/HA	120	12	1	13.84	14.3	
	B	37-39 [BBCH]	FUNG		2.00 L/HA	205	13	0	13.92	13.4	
						313	16	3	13.59	13.5	
						408	10	7	13.42	13.5	
						Mean =	13	3	13.69	13.7	
21	A	31 [BBCH]	FUNG		1.00 L/HA	121	12	2	13.40	13.8	
	B	37-39 [BBCH]	FUNG		2.00 L/HA	207	17	1	13.82	13.4	
						311	17	6	13.54	13.6	
						414	11	1	13.48	13.4	
						Mean =	14	2	13.56	13.6	

Rating Date		26/6/06	26/6/06	11/7/06	13/7/06						
SE Name		%LEAF1	%GREEN	GRAIN WEIGHT	GRAIN ANALYS						
Pest Type		D Disease									
Pest Code		PYRNTE									
Pest Stage		mixed									
Crop Code		HORVW	HORVW	HORVW	HORVW						
BBCH Scale Type		BCER	BCER	BCER	BCER						
Crop Variety		Marado	Marado	Marado	Marado						
Crop Stage		77	77	89	99						
Crop Stage Scale		BBCH	BBCH	BBCH	BBCH						
Part Rated		LEAF1 P	LEAF1	GRAIN C	GRAIN C						
Rating Data Type		COVAR	GREEN	WEIGHT	MOIST						
Rating Unit		%AREA	%AREA	KG	%						
Sample Size		1	1	15.2							
Sample Size Unit		LEAF	LEAF	M2							
Number of Subsamples		10	10	1	1						
Footnote Number											
Assessed By		REDEBEL	REDEBEL	REDEBEL	REDEBEL						
Days After Last Applic.		53	53	68	70						
Tri-Eval Interval		68 DA-A	68 DA-A	83 DA-A	85 DA-A						
ARM Action Codes		APC	P	+	APOC						
Number of Decimals		0	0	2	1						
Tri No.	Appl Code	Growth Stage	Treatment Type	Treatment Name	Rate	Rate Unit	Plot	26	27	28	29
22	A	31 [BBCH]	FUNG		0.30	L/HA	122	10	0	12.33	13.5
	B	37-39 [BBCH]	FUNG		0.30	L/HA	214	14	0	12.08	13.5
							305	22	3	12.20	13.2
							402	18	3	12.67	13.0
							Mean =	16	1	12.32	13.3
23	A	31 [BBCH]	FUNG		0.50	L/HA	123	10	1	12.18	13.4
	B	37-39 [BBCH]	FUNG		0.50	L/HA	202	14	0	12.24	13.3
							315	21	0	12.00	12.8
							407	14	0	12.41	13.2
							Mean =	15	0	12.21	13.2

Rating Date					13/7/06	13/7/06	13/7/06			
SE Name					GRAIN ANALYS	GRAIN ANALYS	GRAIN ANALYS			
Pest Type										
Pest Code										
Pest Stage										
Crop Code					HORVW	HORVW	HORVW			
BBCH Scale Type					BCER	BCER	BCER			
Crop Variety					Marado	Marado	Marado			
Crop Stage					99	99	99			
Crop Stage Scale					BBCH	BBCH	BBCH			
Part Rated					GRAIN C	GRAIN C	GRAIN C			
Rating Data Type					SPEWEI	COUNT	TGW			
Rating Unit					KG	NUMBER	G			
Sample Size					100	50	1000			
Sample Size Unit					L	G	SEED			
Number of Subsamples					1	1	1			
Footnote Number										
Assessed By					REDEBEL	REDEBEL	REDEBEL			
Days After Last Applic					70	70	70			
Tri-Eval Interval					85 DA-A	85 DA-A	85 DA-A			
ARM Action Codes					APOC	+	TJ APOC			
Number of Decimals					1	0	1			
Tri No.	Appl Code	Growth Stage	Treatment Type	Treatment Name	Rate	Rate Unit	Plot	30	31	32
1	AB		CHK	Untreated Check			101	63.1	1256	39.8
							217	62.4	1250	40.0
							304	62.4	1285	38.9
							415	62.4	1228	40.7
							Mean =	62.6	1255	39.9
2	A	31 [BBCH]	FUNG		2.00	L/HA	102	65.4	1159	43.1
	B	37-39 [BBCH]	FUNG		1.50	L/HA	220	64.4	1165	42.9
	B	37-39 [BBCH]	FUNG		0.50	L/HA	310	63.8	1146	43.6
							418	64.4	1149	43.5
							Mean =	64.5	1155	43.3
3	A	31 [BBCH]	FUNG		2.00	L/HA	103	64.0	1187	42.1
	B	37-39 [BBCH]	FUNG		2.00	L/HA	209	63.7	1168	42.8
	B	37-39 [BBCH]	FUNG		0.50	L/HA	308	64.2	1115	44.8
							423	64.6	1159	43.1
							Mean =	64.1	1157	43.2
4	A	31 [BBCH]	FUNG		2.00	L/HA	104	63.7	1142	43.8
	B	37-39 [BBCH]	FUNG		2.00	L/HA	212	63.5	1124	44.5
	B	37-39 [BBCH]	FUNG		0.50	L/HA	302	65.3	1149	43.5
							417	64.8	1129	44.3
							Mean =	64.3	1136	44.0
5	A	31 [BBCH]	FUNG		2.00	L/HA	105	64.6	1144	43.7
	B	37-39 [BBCH]	FUNG		2.00	L/HA	204	65.7	1151	43.4
	B	37-39 [BBCH]	FUNG		1.00	L/HA	314	64.2	1123	44.5
							420	64.8	1152	43.4
							Mean =	64.8	1143	43.8
6	A	31 [BBCH]	FUNG		2.00	L/HA	106	64.5	1141	43.8
	B	37-39 [BBCH]	FUNG		1.25	L/HA	223	63.7	1139	43.9
							318	65.1	1128	44.3
							405	64.5	1135	44.1
							Mean =	64.5	1136	44.0
7	A	31 [BBCH]	FUNG		0.60	L/HA	107	64.8	1103	45.3
	A	31 [BBCH]	FUNG		1.00	L/HA	201	64.0	1160	43.1
	B	37-39 [BBCH]	FUNG		0.60	L/HA	320	64.7	1095	45.7
	B	37-39 [BBCH]	FUNG		1.00	L/HA	422	64.8	1130	44.2
							Mean =	64.6	1122	44.6

Rating Date		13/7/06		13/7/06		13/7/06				
SE Name		GRAIN ANALYS		GRAIN ANALYS		GRAIN ANALYS				
Pest Type										
Pest Code										
Pest Stage										
Crop Code		HORVW		HORVW		HORVW				
BBCH Scale Type		BCER		BCER		BCER				
Crop Variety		Marado		Marado		Marado				
Crop Stage		99		99		99				
Crop Stage Scale		BBCH		BBCH		BBCH				
Part Rated		GRAIN C		GRAIN C		GRAIN C				
Rating Data Type		SPEWEI		COUNT		TGW				
Rating Unit		KG		NUMBER		G				
Sample Size		100		50		100				
Sample Size Unit		L		G		SEED				
Number of Subsamples		1		1		1				
Footnote Number										
Assessed By		REDEBEL		REDEBEL		REDEBEL				
Days After Last Applic.		70		70		70				
Trt-Eval Interval		85 DA-A		85 DA-A		85 DA-A				
ARM Action Codes		APOC		+		TI APOC				
Number of Decimals		1		0		1				
Trt No	Appl Code	Growth Stage	Type	Treatment Name	Rate	Rate Unit	Plot	30	31	32
8	A	31 [BBCH]	FUNG		1.50	L/HA	108	64.1	1120	44.6
	A	31 [BBCH]	FUNG		1.00	L/HA	215	63.9	1113	44.9
	B	37-39 [BBCH]	FUNG		1.50	L/HA	312	64.2	1138	43.9
	B	37-39 [BBCH]	FUNG		1.00	L/HA	401	64.6	1144	43.7
					Mean =			64.2	1129	44.3
9	A	31 [BBCH]	FUNG		2.00	L/HA	109	64.3	1121	44.6
	A	31 [BBCH]	FUNG		1.00	L/HA	222	64.1	1186	42.2
	B	37-39 [BBCH]	FUNG		2.00	L/HA	316	64.1	1106	45.2
	B	37-39 [BBCH]	FUNG		1.00	L/HA	404	64.5	1191	42.0
					Mean =			64.3	1151	43.5
10	A	31 [BBCH]	FUNG		0.60	L/HA	110	64.7	1099	45.5
	A	31 [BBCH]	FUNG		1.00	L/HA	219	64.9	1106	45.2
	B	37-39 [BBCH]	FUNG		0.60	L/HA	306	64.6	1158	43.2
	B	37-39 [BBCH]	FUNG		1.00	L/HA	412	64.4	1128	44.3
					Mean =			64.7	1123	44.6
11	A	31 [BBCH]	FUNG		1.20	L/HA	111	64.1	1132	44.2
	B	37-39 [BBCH]	FUNG		1.20	L/HA	203	64.3	1129	44.3
							317	64.8	1146	43.6
							419	65.0	1123	44.5
					Mean =			64.6	1133	44.2
12	B	37-39 [BBCH]	FUNG		0.80	L/HA	112	63.9	1163	43.0
	B	37-39 [BBCH]	FUNG		1.00	L/HA	211	64.1	1142	43.8
							309	64.0	1132	44.2
							406	64.7	1115	44.8
					Mean =			64.2	1138	43.9
13	B	37-39 [BBCH]	FUNG		1.50	L/HA	113	64.1	1164	43.0
	B	37-39 [BBCH]	FUNG		1.00	L/HA	216	63.5	1189	42.1
							323	65.0	1145	43.7
							411	63.4	1095	45.7
					Mean =			64.0	1148	43.6
14	B	37-39 [BBCH]	FUNG		2.00	L/HA	114	63.8	1136	44.0
	B	37-39 [BBCH]	FUNG		1.00	L/HA	218	64.6	1150	43.5
							319	65.3	1136	44.0
							409	64.8	1100	45.5
					Mean =			64.6	1131	44.2

								13/7/06	13/7/06	13/7/06
								GRAIN ANALYS	GRAIN ANALYS	GRAIN ANALYS
Rating Date										
SE Name										
Pest Type										
Pest Code										
Pest Stage										
Crop Code								HORVW	HORVW	HORVW
BBCH Scale Type								BCER	BCER	BCER
Crop Variety								Marado	Marado	Marado
Crop Stage								99	99	99
Crop Stage Scale								BBCH	BBCH	BBCH
Part Rated								GRAIN C	GRAIN C	GRAIN C
Rating Data Type								SPEWEI	COUNT	TGW
Rating Unit								KG	NUMBER	G
Sample Size								100	50	1000
Sample Size Unit								L	G	SEED
Number of Subsamples								1	1	1
Footnote Number										
Assessed By								REDEBEL	REDEBEL	REDEBEL
Days After Last Applic								70	70	70
Trt-Eval Interval								85 DA-A	85 DA-A	85 DA-A
ARM Action Codes								APOC	+	T1 APOC
Number of Decimals								1	0	1
Trt	Appl	Growth	Treatment	Rate	Rate	Unit	Plot	30	31	32
No	Code	Stage	Type	Name	Rate	Unit	Plot			
15	B	37-39 [BBCH]	FUNG	██████	2.00	L/HA	115	64.0	1154	43.3
	B	37-39 [BBCH]	FUNG	██████	0.50	L/HA	221	62.6	1116	44.8
							303	66.2	1142	43.8
							416	64.0	1171	42.7
							Mean =	64.2	1146	43.7
16	B	37-39 [BBCH]	FUNG	██████	1.25	L/HA	116	63.3	1154	43.3
							210	63.7	1185	42.2
							322	64.9	1136	44.0
							413	63.9	1142	43.8
							Mean =	64.0	1154	43.3
17	B	37-39 [BBCH]	FUNG	██████	1.50	L/HA	117	65.3	1155	43.3
							213	63.9	1084	46.1
							307	64.5	1130	44.2
							403	66.5	1101	45.4
							Mean =	65.1	1118	44.8
18	B	37-39 [BBCH]	FUNG	██████	1.00	L/HA	118	65.0	1157	43.2
							206	63.8	1148	43.6
							321	64.7	1170	42.7
							410	63.5	1104	45.3
							Mean =	64.3	1145	43.7
19	B	37-39 [BBCH]	FUNG	██████	0.8	L/HA	119	64.4	1113	44.9
							208	64.1	1154	43.3
							301	65.1	1174	42.6
							421	64.8	1142	43.8
							Mean =	64.6	1146	43.7
20	A	31 [BBCH]	FUNG	██████	1.00	L/HA	120	64.1	1144	43.7
	B	37-39 [BBCH]	FUNG	██████	2.00	L/HA	205	63.6	1145	43.7
							313	62.9	1161	43.1
							408	63.7	1146	43.6
							Mean =	63.6	1149	43.5
21	A	31 [BBCH]	FUNG	██████	1.00	L/HA	121	64.0	1172	42.7
	B	37-39 [BBCH]	FUNG	██████	2.00	L/HA	207	64.0	1198	41.7
							311	63.7	1128	44.3
							414	63.4	1133	44.1
							Mean =	63.8	1158	43.2

								13/7/06	13/7/06	13/7/06
								GRAIN ANALYS	GRAIN ANALYS	GRAIN ANALYS
Rating Date										
SE Name										
Pest Type										
Pest Code										
Pest Stage										
Crop Code								HORVW	HORVW	HORVW
BBCH Scale Type								BCER	BCER	BCER
Crop Variety								Marado	Marado	Marado
Crop Stage								99	99	99
Crop Stage Scale								BBCH	BBCH	BBCH
Part Rated								GRAIN C	GRAIN C	GRAIN C
Rating Data Type								SPEWEI	COUNT	TGW
Rating Unit								KG	NUMBER	G
Sample Size								100	50	1000
Sample Size Unit								L	G	SEED
Number of Subsamples								1	1	1
Footnote Number										
Assessed By								REDEBEL	REDEBEL	REDEBEL
Days After Last Applic								70	70	70
Tri-Eval Interval								85 DA-A	85 DA-A	85 DA-A
ARM Action Codes								APOC	+	Ti APOC
Number of Decimals								1	0	1
Tri	Appl	Growth		Treatment	Rate					
No.	Code	Stage	Type	Name	Rate	Unit	Plot	30	31	32
22	A	31 [BBCH]	FUNG		0.30	L/HA	122	62.7	1233	40.6
	B	37-39 [BBCH]	FUNG		0.30	L/HA	214	61.3	1274	39.2
							305	62.3	1269	39.4
							402	62.8	1244	40.2
							Mean =	62.3	1255	39.8
23	A	31 [BBCH]	FUNG		0.50	L/HA	123	62.1	1249	40.0
	B	37-39 [BBCH]	FUNG		0.50	L/HA	202	63.6	1254	39.9
							315	61.5	1251	40.0
							407	62.7	1220	41.0
							Mean =	62.5	1244	40.2

Rating Date								11/7/06
SE Name								GRAIN YIELD
Pest Type								
Pest Code								
Pest Stage								
Crop Code								HORVW
BBCH Scale Type								BCER
Crop Variety								Marado
Crop Stage								99
Crop Stage Scale								BBCH
Part Rated								GRAIN C
Rating Data Type								YIELD15%
Rating Unit								T-MET
Sample Size								1
Sample Size Unit								HA
Number of Subsamples								1
Footnote Number								
Assessed By								REDEBEL
Days After Last Applic								68
Tri-Eval Interval								83 DA-A
ARM Action Codes								TY2 APOC
Number of Decimals								3
Tri No	Appl Code	Growth Stage	Type	Treatment Name	Rate	Unit	Plot	33
1	AB		CHK	Untreated Check			101 217 304 415	8.157 7.641 8.027 7.847
							Mean =	7.918
2	A	31 [BBCH]	FUNG	██████	2.00	L/HA	102	9.125
	B	37-39 [BBCH]	FUNG	██████	1.50	L/HA	220	9.001
	B	37-39 [BBCH]	FUNG	██████	0.50	L/HA	310 418	9.164 9.133
							Mean =	9.106
3	A	31 [BBCH]	FUNG	██████	2.00	L/HA	103	9.373
	B	37-39 [BBCH]	FUNG	██████	2.00	L/HA	209	9.461
	B	37-39 [BBCH]	FUNG	██████	0.50	L/HA	308 423	9.446 10.102
							Mean =	9.595
4	A	31 [BBCH]	FUNG	██████	2.00	L/HA	104	9.552
	B	37-39 [BBCH]	FUNG	██████	2.00	L/HA	212	9.199
	B	37-39 [BBCH]	FUNG	██████	0.50	L/HA	302 417	9.476 9.578
							Mean =	9.451
5	A	31 [BBCH]	FUNG	██████	2.00	L/HA	105	9.320
	B	37-39 [BBCH]	FUNG	██████	2.00	L/HA	204	9.164
	B	37-39 [BBCH]	FUNG	██████	1.00	L/HA	314 420	9.094 9.397
							Mean =	9.244
6	A	31 [BBCH]	FUNG	██████	2.00	L/HA	106	9.203
	B	37-39 [BBCH]	FUNG	██████	1.25	L/HA	223 318 405	9.124 9.307 9.637
							Mean =	9.318
7	A	31 [BBCH]	FUNG	██████	0.60	L/HA	107	9.804
	A	31 [BBCH]	FUNG	██████	1.00	L/HA	201	10.048
	B	37-39 [BBCH]	FUNG	██████	0.60	L/HA	320	9.139
	B	37-39 [BBCH]	FUNG	██████	1.00	L/HA	422	9.414
							Mean =	9.601

Rating Date				11/7/06	
SE Name				GRAIN YIELD	
Pest Type					
Pest Code					
Pest Stage					
Crop Code				HORVW	
BBCH Scale Type				BCER	
Crop Variety				Marado	
Crop Stage				99	
Crop Stage Scale				BBCH	
Part Rated				GRAIN C	
Rating Data Type				YIELD15%	
Rating Unit				T-MET	
Sample Size				1	
Sample Size Unit				HA	
Number of Subsamples				1	
Footnote Number					
Assessed By				REDEBEL	
Days After Last Applic				68	
Trt-Eval Interval				83 DA-A	
ARM Action Codes				TY2 APOC	
Number of Decimals				3	
Trt No.	Appl Code	Growth Stage	Treatment Type	Rate Rate Unit Plot	33
8	A	31 [BBCH]	FUNG	1.50 L/HA 108	9.366
	A	31 [BBCH]	FUNG	1.00 L/HA 215	9.296
	B	37-39 [BBCH]	FUNG	1.50 L/HA 312	9.119
	B	37-39 [BBCH]	FUNG	1.00 L/HA 401	9.686
Mean =					9.367
9	A	31 [BBCH]	FUNG	2.00 L/HA 109	9.771
	A	31 [BBCH]	FUNG	1.00 L/HA 222	9.112
	B	37-39 [BBCH]	FUNG	2.00 L/HA 316	9.154
	B	37-39 [BBCH]	FUNG	1.00 L/HA 404	9.333
Mean =					9.342
10	A	31 [BBCH]	FUNG	0.60 L/HA 110	9.397
	A	31 [BBCH]	FUNG	1.00 L/HA 219	9.325
	B	37-39 [BBCH]	FUNG	0.60 L/HA 306	9.639
	B	37-39 [BBCH]	FUNG	1.00 L/HA 412	9.807
Mean =					9.542
11	A	31 [BBCH]	FUNG	1.20 L/HA 111	9.552
	B	37-39 [BBCH]	FUNG	1.20 L/HA 203	9.409
					317
					419
Mean =					9.464
12	B	37-39 [BBCH]	FUNG	0.80 L/HA 112	9.543
	B	37-39 [BBCH]	FUNG	1.00 L/HA 211	9.167
					309
					406
Mean =					9.293
13	B	37-39 [BBCH]	FUNG	1.50 L/HA 113	9.545
	B	37-39 [BBCH]	FUNG	1.00 L/HA 216	8.817
					323
					411
Mean =					9.192
14	B	37-39 [BBCH]	FUNG	2.00 L/HA 114	9.465
	B	37-39 [BBCH]	FUNG	1.00 L/HA 218	8.005
					319
					409
Mean =					8.987

Rating Date								11/7/06
SE Name								GRAIN YIELD
Pest Type								
Pest Code								
Pest Stage								
Crop Code								HORVW
BBCH Scale Type								BCER
Crop Variety								Marado
Crop Stage								99
Crop Stage Scale								BBCH
Part Rated								GRAIN C
Rating Data Type								YIELD15%
Rating Unit								T-MET
Sample Size								1
Sample Size Unit								HA
Number of Subsamples								1
Footnote Number								
Assessed By								REDEBEL
Days After Last Applic.								68
Tri-Eval Interval								83 DA-A
ARM Action Codes								TY2 APOC
Number of Decimals								3
Tri No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Unit	Plot	33
15	B	37-39 [BBCH]	FUNG	██████	2.00	L/HA	115	9.277
	B	37-39 [BBCH]	FUNG	██████	0.50	L/HA	221	8.816
							303	9.399
							416	9.231
							Mean =	9.181
16	B	37-39 [BBCH]	FUNG	██████	1.25	L/HA	116	9.163
							210	8.951
							322	8.733
							413	9.390
							Mean =	9.059
17	B	37-39 [BBCH]	FUNG	██████	1.50	L/HA	117	9.102
							213	9.100
							307	9.158
							403	9.236
							Mean =	9.149
18	B	37-39 [BBCH]	FUNG	██████	1.00	L/HA	118	9.039
							206	8.703
							321	9.163
							410	8.822
							Mean =	8.932
19	B	37-39 [BBCH]	FUNG	██████	0.8	L/HA	119	9.080
							208	8.974
							301	9.168
							421	9.178
							Mean =	9.100
20	A	31 [BBCH]	FUNG	██████	1.00	L/HA	120	9.180
	B	37-39 [BBCH]	FUNG	██████	2.00	L/HA	205	9.330
							313	9.099
							408	8.985
							Mean =	9.148
21	A	31 [BBCH]	FUNG	██████	1.00	L/HA	121	8.940
	B	37-39 [BBCH]	FUNG	██████	2.00	L/HA	207	9.263
							311	9.055
							414	9.035
							Mean =	9.073

Rating Date									11/7/06
SE Name									GRAIN YIELD
Pest Type									
Pest Code									
Pest Stage									
Crop Code									HORVW
BBCH Scale Type									BCER
Crop Variety									Marado
Crop Stage									99
Crop Stage Scale									BBCH
Part Rated									GRAIN C
Rating Data Type									YIELD15%
Rating Unit									T-MET
Sample Size									1
Sample Size Unit									HA
Number of Subsamples									1
Footnote Number									
Assessed By									REDEBEL
Days After Last Applic									68
Trt-Eval Interval									83 DA-A
ARM Action Codes									TY2 APOC
Number of Decimals									3
Trt No.	Appl Code	Growth Stage	Type	Treatment Name	Rate	Unit	Plot		33
22	A	31 [BBCH]	FUNG		0.30	L/HA	122		8.255
	B	37-39 [BBCH]	FUNG		0.30	L/HA	214		8.088
							305		8.196
							402		8.532
							Mean =		8.268
23	A	31 [BBCH]	FUNG		0.50	L/HA	123		8.164
	B	37-39 [BBCH]	FUNG		0.50	L/HA	202		8.214
							315		8.099
							407		8.337
							Mean =		8.204

List Of codes UsedPest Type

D, Disease, G-BYR-F = Plant disease, such as a fungus, bacteria, or virus

Pest Code

PYRNTE = Pyrenophora teres|Net blotch of barley|

ERYSGH = Erysiphe graminis f. sp. hordei|Powdery mildew of barley|

RHYNSE = Rhynchosporium secalis|Leaf blotch of cereals|

ZZXXAA = Unknown nonparasitic causal factor|Unknown nonparasitic causal factor|

Crop Code

HORVW, BCER, Marado, = Hordeum vulgare (winter)|Winter barley

Crop Stage

32 = Node 2 at least 2 cm above node 1|BCER

39 = Flag leaf stage - flag leaf fully unrolled, ligule just visible|BCER

65 = Full flowering - 50% of anthers mature|BCER

69 = End of flowering - all spikelets have finished flowering, some dry anthers remain|BCER

73 = Early milk|BCER

77 = Late milk|BCER

89 = Fully ripe - grain hard, difficult to divide with thumbnail|BCER

99 = Harvested product|BCER

Crop Stage Scale

BBCH = BBCH UNIFORM PLANT STAGES

Part Rated

PLANT = PLANT / PLANT BIOMASS (includes Shrub, Tree, Turf)|

LEAF1 = LEAF - FIRST|

LEAF2 = LEAF - SECOND|

LEAF3 = LEAF - THIRD|

LEAF4 = LEAF - Fourth|

GRAIN = GRAIN|

C = Crop is Part Rated

P = Pest is Part Rated

Rating Data Type

PHYGEN = PHYTOTOXICITY - GENERAL INJURY

COVAR = COVERAGE AREA

GREEN = GREEN LEAF AREA

MOIST = MOISTURE

SPEWEI = SPECIFIC WEIGHT

TGW = THOUSAND GRAINS WEIGHT

YIELD15% = YIELD ADJUSTED FOR A MOISTURE CONTENT OF 15%

Rating Unit

%UNCK = PERCENT OF UNTREATED CHECK

%AREA = PERCENT OF AREA

KG = KILOGRAM

% = PERCENT

G = GRAM(S)

T-MET = TON (METRIC=1000KG)

Sample Size Unit

PLOT = PLOT OR PLOTS

LEAF = LEAF OR LEAFS

M2 = SQUARE METER

L = LITER

G = GRAM(S)

SEED = PLANT SEED(S)

HA = HECTARE

Assessed By

REDEBEL = Redebel s.a, Rue de Chassart 4, B-6221 Saint Amand

ARM Action Codes

P = Rating scale of 0 to 100 (e.g. % control or injury)

APC = Automatic percent control (Control forced to 0% on AOV Means Table)

+ = Only positive values (0 to 3 402823E38)

APOC = Automatic percent control (Control forced to 100% on AOV Means Table)

T1 = $50 * 1000 / (c - 1)$

TY2 = $0.6578947 * [28] * (100 - [29]) / 85$

Footnote 1: Taches Léopard

Appendix 2 : Statement of GEP Compliance



MINISTÈRE DES CLASSES MOYENNES ET DE L'AGRICULTURE

Administration de la Qualité des Matières
premières et du Secteur végétal (DGA)

Service Qualité des Matières premières et
Analyses

Correspondant : **Hélène Klinkenberg**
Ingénieur
tél. 02 208 38 84

REDEBEL S.A.
rue de Chassart 4
6221 SAINT-AMAND

à : helene.klinkenberg@redobel.fr

Votre lettre du	Vos références	Nos références	Annexe(s)	Date
		411 140/02		

agréant comme station ou laboratoire effectuant certains essais et analyses en rapport avec des pesticides à usage agricole, (renouvellement)

1/3

Madame, Monsieur,

En application des dispositions de l'arrêté ministériel du 7 avril 1995 concernant l'agrément de stations ou laboratoires qui effectuent certains essais et analyses en rapport avec des pesticides à usage agricole, la société

REDEBEL S.A. rue de Chassart, 4 6221 SAINT-AMAND

est agréée sous le n° 1 SL.

L'agrément est valable pour les essais suivants :

1. L'efficacité des pesticides à usage agricole et les effets de ces produits sur le rendement des végétaux et produits végétaux, comme indiqué dans le tableau 1.
2. Les effets des pesticides à usage agricole sur la qualité des végétaux et des produits végétaux comme indiqué dans le tableau 2, mais uniquement pour la partie de l'essai au champ, la partie de l'essai au laboratoire devant être sous-traitée auprès d'une station ou d'un laboratoire ayant obtenu l'agrément à cette fin.
3. La phytotoxicité des pesticides à usage agricole à l'égard des végétaux et des produits végétaux traités et leur incidence sur les cultures voisines dans la rotation, ainsi que les autres végétaux, en ce compris les cultures limitrophes, comme indiqué dans le tableau 3.



WTC III - Boulevard S. Bolivar - 30 - 8^e étage - 1000 Bruxelles
Tel. 02 208 32 11 - Fax 02 208 36 66

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Tableau 1 : efficacité

	herbicide	fongicide	insecticide, acaricide	régulateur de croissance	répulsif/lupin
arboriculture fruitière	AC	AE	A	A	
céréales	A	AD	ACD	AD	A
betteraves	A	AD	ACD	AD	
potatoes de terre	A	AD	ACD	ABD	
maïs	A	AD	ADC	AD	
colza	A	AD	ADC	AD	
prairies	A	AD	ACD	AD	
chicorées industrielles et witloof	A	ADA ₂	ADC	ABD	
légumineuses	A	AD	ADC	AD	
graminées	A	AD	ACD	AD	
cultures légumières de plein air	A	ADE	ADCE	ADÉ	
petits fruits et fraises de plein air	AC	ADE	ACE	AE	
cultures protégées (en serre)	AC	ADE	ACDE	ADE	
cultures ornementales de plein air (cultures florales, arbres et arbustes d'ornement, gazons)	AC	ADÉ	ACDE	ADE	
sylviculture	AC	ADE	ACDE	ADE	
produits végétaux stockés		BA	AB	AB	
zones non cultivées	AC				
plantes médicinales	A	AD	AD	A	

A = pulvérisation
B = nébulisation

C = microgranulés
D = semences traitées

E = trempage ou arrosage
A₂ = pulvérisation sur les racines
avant le forçage en hydroponique

Tableau 2 : effets sur la qualité

	herbicide	fongicide	insecticide, acaricide	régulateur de croissance
céréales	A	A	A	A
betteraves	A	A	A	
potatoes de terre	A	A	A	
maïs	A	A	A	
chicorées	A	A	A	

A = pulvérisation

Tableau 3 : phytotoxicité

	herbicide	fongicide	insecticide, acaricide	stimulateur	régulateur de croissance	désherbant	répulsif lapin
arboriculture fruitière	AC	AB	A	ACE	AE		
grandes cultures							
céréales	A	AD	ACE	ACE	AD		A
légumineuses	A	AD	ACE	ACE	AD		
poisens de terre	A	AD	ACE	AE	ABD		
maïs	A	AD	ACE	ACE	AD		
colza	A	AD	ACE	ACE	AD		
poisens	A	AD	ACE	ACE	AD		
plantes industrielles et vivaces	A	AD ₂	ACE	ACE	ABD		
légumineuses	A	AD	ACE	ACE	AE		
poisens	A	AD	ACE	ACE	AD		
cultures légumières de plein air	A	AD	ACE	ACE	AD		
petits fruits en plein air	AC	AD	ACE	AC	AE		
cultures protégées	AL	AD	ACE	ACE	AD	ABD	
cultures ornementales de plein air	AC	AD	ACE	ACE	AD		
arboriculture	AC	AD	ACE	ACE	AD		
produits végétaux stockés		BA	AD		AD		
plantes médicinales	A	AD	AD	ACE	A		

A = pulvérisation

B = arrosage

C = mouillage

D = semences traitées

E = treillage ou arrosage

A₂ = pulvérisation sur les hautes tiges et
forage en hydroponique

Cet agrément est valable du 21/01/2002 au 21/01/2007.

Remarque importante

Au cas où d'autres types de traitements ou d'essais (mode d'application ou type de produit ou culture) doivent être réalisés, il est nécessaire de fournir au service "Qualité des Matières premières et Analyses" les documents suivants:

- une preuve que le matériel indispensable à ces essais est disponible
- les "S.O.P." détaillées concernant l'usage de ce matériel
- une demande d'extension de cette agrément

Les stations ou laboratoires agréés en application de l'A.M. du 07/04/95 précité sont des services ou organismes d'essais officiellement reconnus, remplissant au moins les conditions du point 2.2 de l'introduction à l'annexe III de la Directive 91/414/CEE du Conseil du 15 juillet 1991 concernant la mise sur le marché des produits phytopharmaceutiques.

Au nom du Ministre de l'Agriculture et des Classes moyennes

Pour le Directeur général,

pour le Conseiller général, *Dr*
Docteur

M. G. HOUINS

H. Fontière
M. H. FONTIÈRE



Appendix 3 : Soil Analysis



CENTRE PROVINCIAL DE L'AGRICULTURE ET DE LA RURALITE.

STATION PROVINCIALE D'ANALYSES AGRICOLES.

17, rue Saint-Nicolas B-1310 La Hulpe
Tél: 02/656 09 70 - Fax: 02/652 03 08
Membre de REQUASUD

Redebel SA

Rue de Chassart, 4

6221 Saint-Amand

GRANULOMETRIC SOIL ANALYSIS REPORT

(BA N° G08/0240)

Sampling day:	24/05/2006	Name of the parcel:	R060-06F	Chemistry analysis nr:	T06/1551
Reception day:	24/05/2006	Texture:	Silt loam	Granulometric analysis nr:	G08/0240
Printing day:	13/06/2006			Sample state:	Ben
Analyses days:	From 24/05/2006 to 13/06/2006		Simpler	La demandeur	

1. Phytotechnical information

Previous cultivation:

Planned cultivation: Unknown cultivation

2. Results

Granulometric results expressed on dried decarbonated soil.

Clay % < 0,002 mm	Silt % 0,002 - 0,02 mm	Loam % 0,02 - 0,05 mm	Thin sand % 0,05 - 0,2 mm	Rough sand % 0,2 - 2 mm
16,9	26,8	50,2	5,5	0,6

Analysis under accreditation Beltest.
 Method: Granulometry: Derived from NF X31-107
 Sample preprocessing: Derived from ISO 11464
 The uncertainty on the result is available on simple request.

Results of the chemistry analyses.

pH_KCl	pH_water	Organic carbon in g/kg	Humus %	Humus theoretically needed %	Calculated crusting index	The soil is: *
6,2	6,8	14	2,7		1,76	quite crusty
NF ISO 10390	NF ISO 10380	Derived from NF 1521 10864	Calculated value: Organic carbon x 2	Calculated value	Calculated value	

* Calculated and interpreted on the basis of a formula established by the "Station Agronomique de l'Alsace" of Lehn, 1950, France.



N° 341-T

This report only concerns the sample analysed. This report shall be produced in its entirety.

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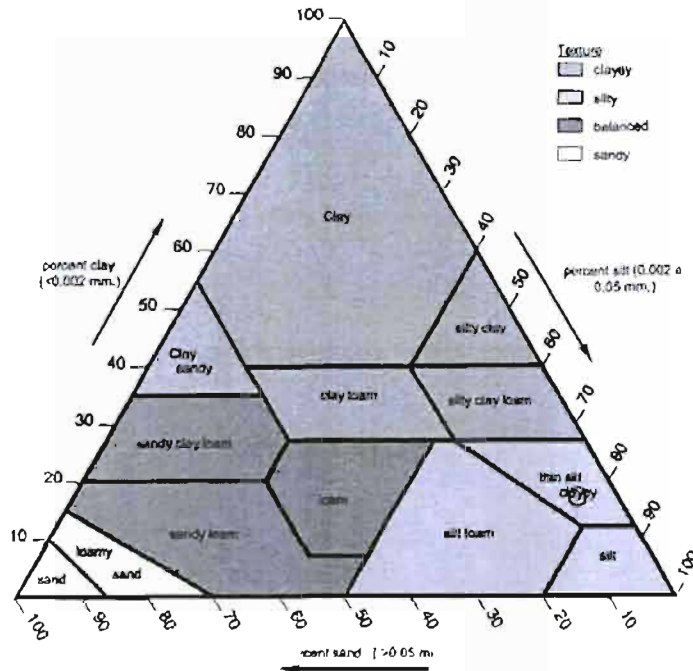
(BA N° G06/0240)

Redebel SA
Rue de Chassart 4
6221 Saint-Amand

3. Soil texture triangle

The texture (or granulometric composition) express the relatives proportions of the mineral particles of the soil sift at 2 mm. Those particles are classified in several categories of size.

The results are reported on the present triangle in order to identify the texture of the soil.



American classification. (U.S.D.A. 1951 Soil Survey Manual U.S. Dept. Agriculture, Handbook n°18, Washington D.C., 503 p.)

Clay % < 0.002 mm	Silt and loam % 0.002 - 0.05 mm	Thin and rough sand % 0.05 - 2 mm
16,9	77,0	6,1

The Responsible for the Soils-Products Department,
The first Agronomical Engineer.
Ir. P. COUTISSE



N° 341-T

This report only concerns the sample analysed. This report must be produced in its integrity

(BA N° GC6/0240)

Redebel SA
Rue de Chassart, 4
6221 Saint-Amand

4. Advice non under accreditation.

The soil is: **Silt loam quite crusty**

The texture of the soil is silty

The soil is quite crusty, it shows some risks of structural instability.

For any further information, do not hesitate to contact us at the following number: 02/656.09.70

The Responsible for the Agronomical Department,
The first Agronomical Engineer,
Ir. A. Deschamps.





CENTRE PROVINCIAL DE L'AGRICULTURE ET DE LA RURALITE
STATION PROVINCIALE D'ANALYSES AGRICOLES.

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Tél 027556 09 70 - Fax 027552 03 08
Membre de REQUASUD



Redebel SA

Rue de Chassart, 4
6221 Saint-Amand

SOIL ANALYSES REPORT

(SA Nr T06/1551)

Sampling day:	24/05/20	Name of the parcel:	R060-06F	Chemistry analysts nr:	T06/1551
Reception day:	24/05/20			Box nr:	
Printing day:	28/06/20	Texture:	Loam		
Analysis days:	Du 24/05/2006 au 28/05/2006	Sampler:	La demandeur	Sample state:	Bon

ANALYSIS RESULTS**1. Phytotechnical information**

Previous cultivation:

Planned cultivation: Unknown cultivation

2. Board results

Sample preprocessing: Derived from ISO 11454

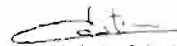
Extractive medium (carbon and phosphorus): Ammonium Acetate, EDTA, pH=8,5

Elements	Rates in mg/100g	Methods
Phosphorus P	9	Fluoro Alami & Absorption Spectrometry
Water soluble P	0,2	
Potassium K	20	
Magnesium Mg	15	
Sodium Na	3	
Calcium Ca	190	
↳ pH_KCl:	↳ 6,2	NF ISO 10390
↳ Carbone organique	↳ 14 g/kg	Derived from NF ISO 10664
Humus	2,7 %	Calculated value: Organic carbon x 1,3

Elements	Methods	Rates	Units
Iron Fe	Flame Atomic Absorption Spectrometry		mg/kg
Manganese Mn			mg/kg
Copper Cu			mg/kg
Zinc Zn			mg/kg
↳ Total nitrogen	Derived from NF ISO 13478	↳	%
Carbon/Nitrogen	Calculated value		-
Sodium chloride	Atom method		mg NaCl/100g
Saline concentration	Derived from ISO 11265		µS/cm
↳ pH_water:	NF ISO 10390	↳ 6,8	-
Cationic exchanging capacity	Derived from NF X31-130	↳ 11,3	meq/100g

The uncertainty on the accreditation result is available on www.cermet.be

↳ Analysis under accreditation Beltest.


The Responsible for the Soils-Products Department,
The first Agronomical Engineer,
Ir P. COUTISSE



N° 341-T

This report only concerns the sample analysed. This report must be produced in its integrity.

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