



**Cyantraniliprole insecticide seed treatment:
a new and unique tool for integrated pest management in oilseed rape
in Europe**

Anita van Nieuwenhoven, September 21, 2017

Cyantraniliprole Seed Treatment DuPont™ Lumiposa®

- A new mode of action for winter oilseed rape
- Targets early season pests Cabbage Root Fly, Cabbage Stem Flea Beetle, Cabbage Flea Beetle and Turnip Sawfly
- Offers fast-acting protection up to the BBCH 13 or 14 stage
- Strong plant establishment and vigour
- Protecting yield potential
- Safe and convenient pest management tool
- Favorable environmental profile and seed safety



No insecticide ST



Cyantraniliprole ST
20 days after sowing

Source: DuPont, Germany (2014)

Cyantraniliprole Seed Treatment

Target crop	Winter oilseed rape
Target pests	<i>Psylliodes</i> spp., <i>Phyllotreta</i> spp., <i>Delia radicum</i> , <i>Athalia rosae</i>
Active ingredient	Cyantraniliprole Chemical class: anthranilic diamide (IRAC Group 28)
Dose rate	<ul style="list-style-type: none"> • 50 µg active ingredient per seed • 0.080 ml per 1000 seeds • 1.6L/100 kg of seeds with TSW of 5.0 • Maximum 500.000 seeds / ha
Formulation	625 g/L FS
Registration status	<ul style="list-style-type: none"> • First regulatory approval in Poland (zRMS) end of April 2017

Cyantraniliprole ST (DuPont™ Lumiderm™) also used in Canada on canola.

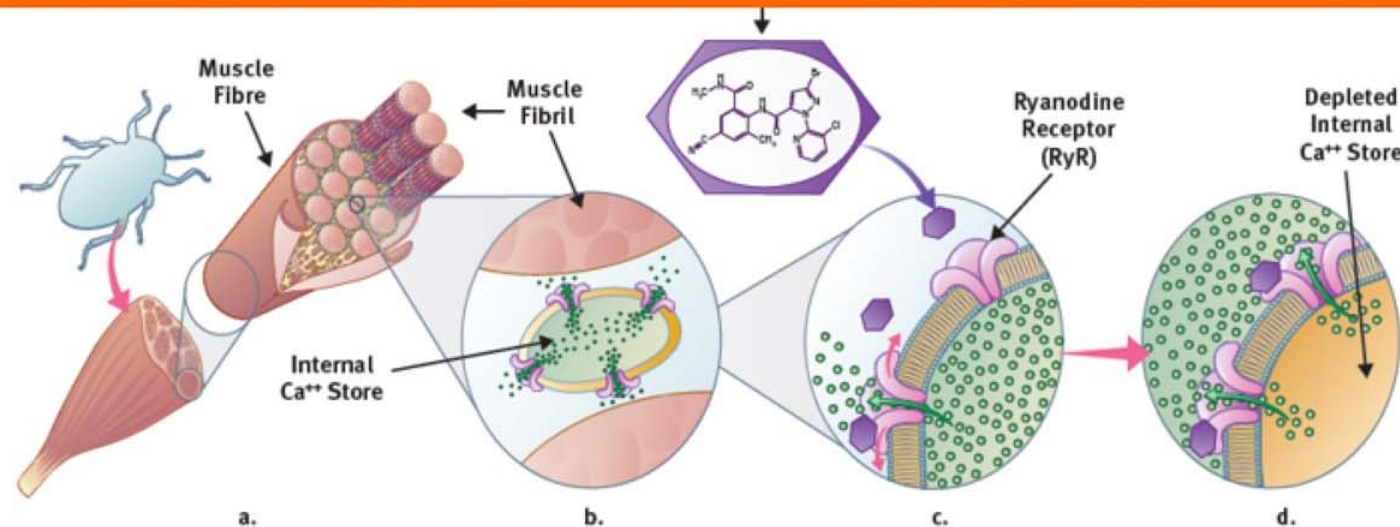
First launched in 2014, currently used on 24% of the canola acreage.

Different use:

spring versus winter crop, different pest spectrum, used in conjunction with standard insecticide seed treatment, at lower rate.

New mode of action for seed dressings

Cyantraniliprole impacts insect behaviour by impairing muscle function



- Cyantraniliprole selectively binds to insect RyRs causing uncontrolled release of calcium and uncoordinated contractions
- Depletion of internal calcium stores prevents further muscle contractions
- Normal contraction is triggered by the release of calcium from intracellular stores, regulated by ryanodine receptors
- Muscles are composed of muscle fibres with bundles of fibrils



New mode of action for seed dressings

1. Untreated



2. Treated with Cyantraniliprole Seed Treatment



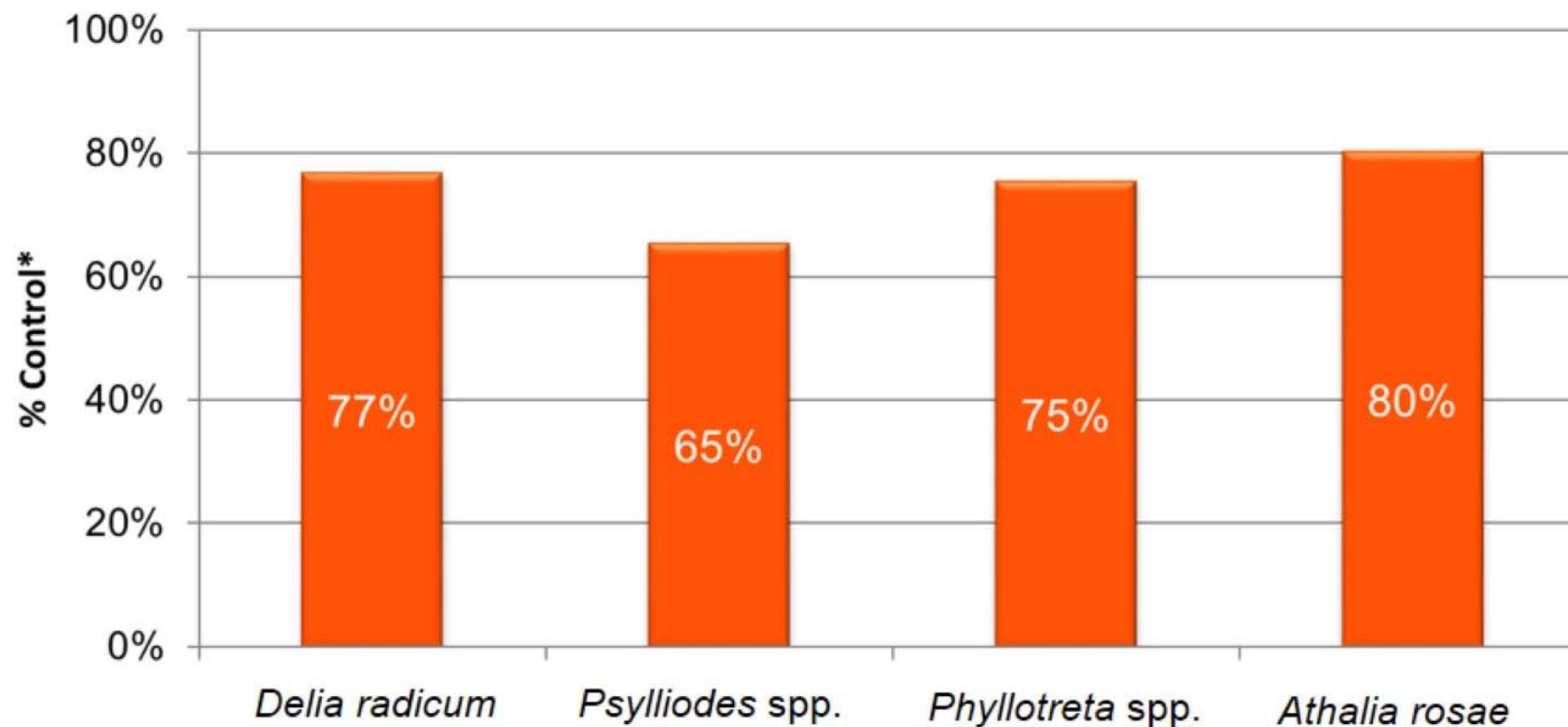
0hr

2hr

40-60hr

DuPont™ Lumiposa®
insecticide seed treatment

Control of key pests in WOSR

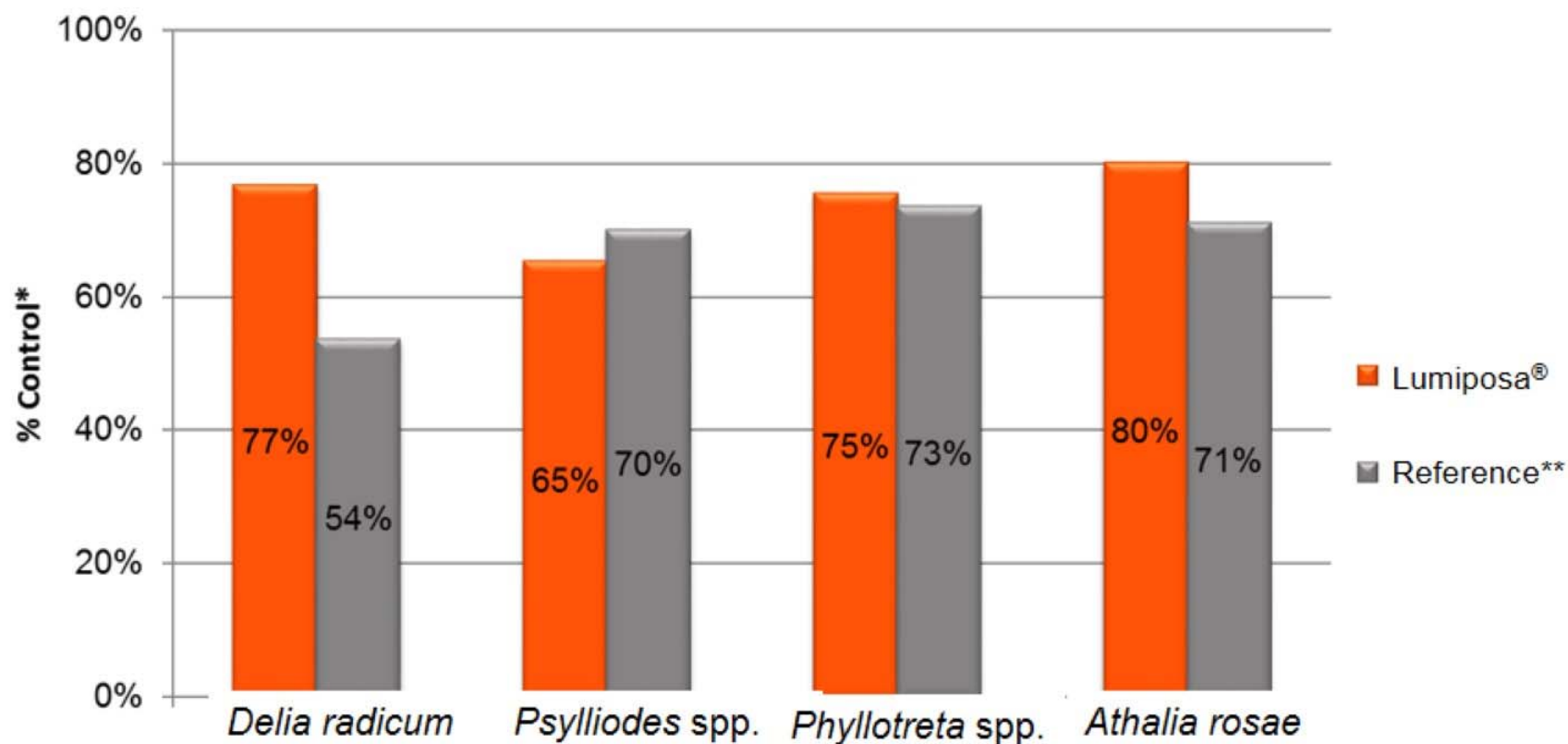


59 DuPont trials across countries (2009-2015),
not all pests occurred in all trials

All field trials with sufficient natural infestation of the pest. Timing of infestation varied between trials. No foliar follow up application was applied in any of these trials to control these pests.

*control of damage for *Delia*, *Psylliodes* and *Phyllotreta* and % control of larvae for *Athalia*

Control of key pests in WOSR



59 DuPont trials across countries (2009-2015),
not all pests occurred in all trials

Lumiposa® can provide a new solution for seed treatment control of key pests in winter oilseed rape.

*control of damage for *Delia*, *Psylliodes* and *Phyllotreta* and % control of larvae for *Athalia*

**Reference: suspended insecticide seed treatment with thiamethoxam

Protection against cabbage root fly (*Delia radicum*)

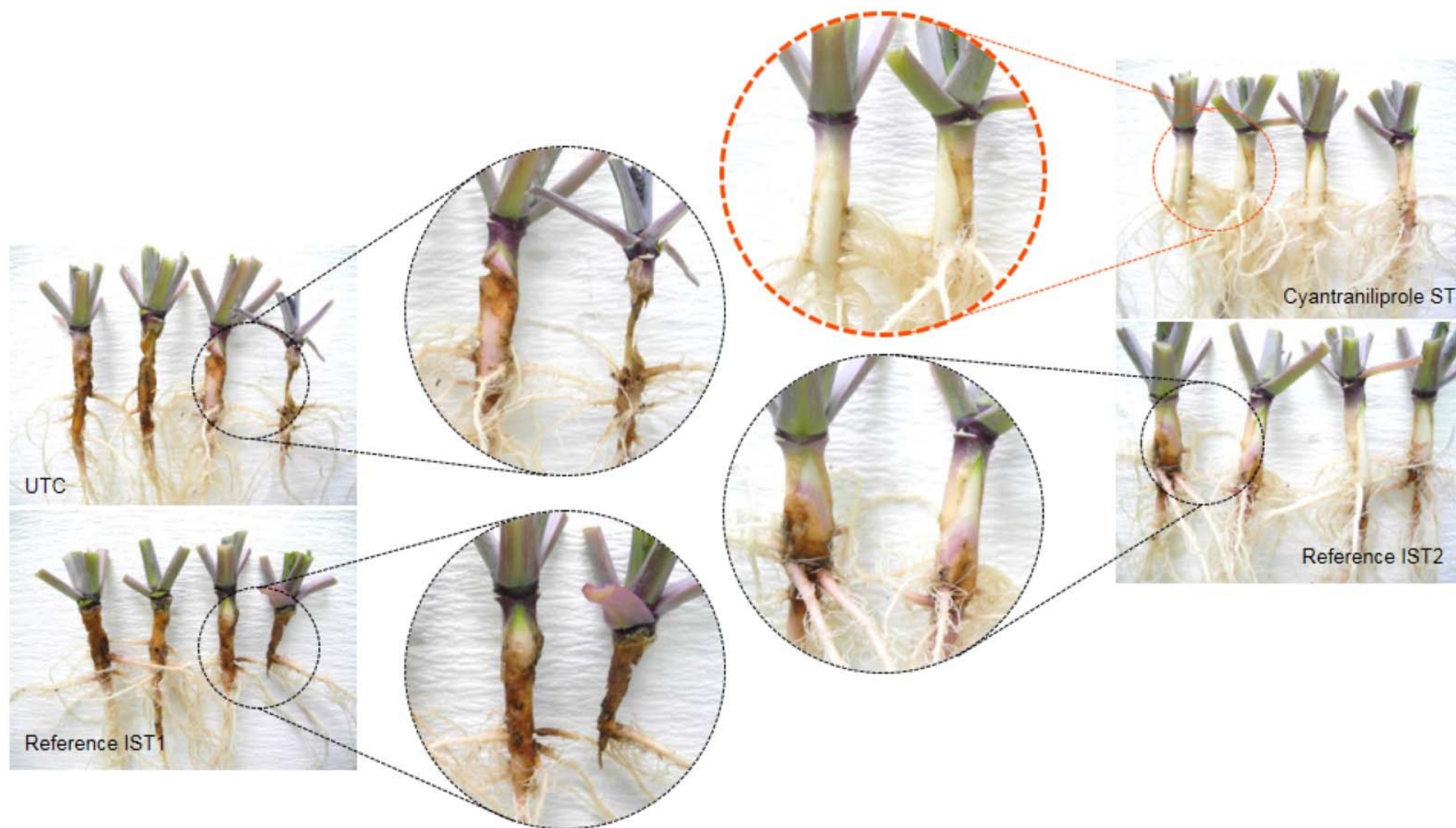


No insecticide ST



Cyantraniliprole ST

Source: DuPont, France (2013)



Source: DuPont growth chamber trials, France (2015)
 Plants artificially infested with *Delia radicum* eggs (10/plant) at BBCH12

References: suspended IST with thiamethoxam (IST1) or clothianidin + *beta*-cyfluthrin (IST2)

Protection against cabbage stem flea beetles (*Psylliodes* spp.)



Source: DuPont, Germany (2014)

Protection against flea beetles (*Phyllotreta* spp.), BBCH 11



No insecticide ST



Cyantraniliprole ST



Protection against flea beetles (*Phyllotreta* spp.), BBCH 13



No insecticide ST

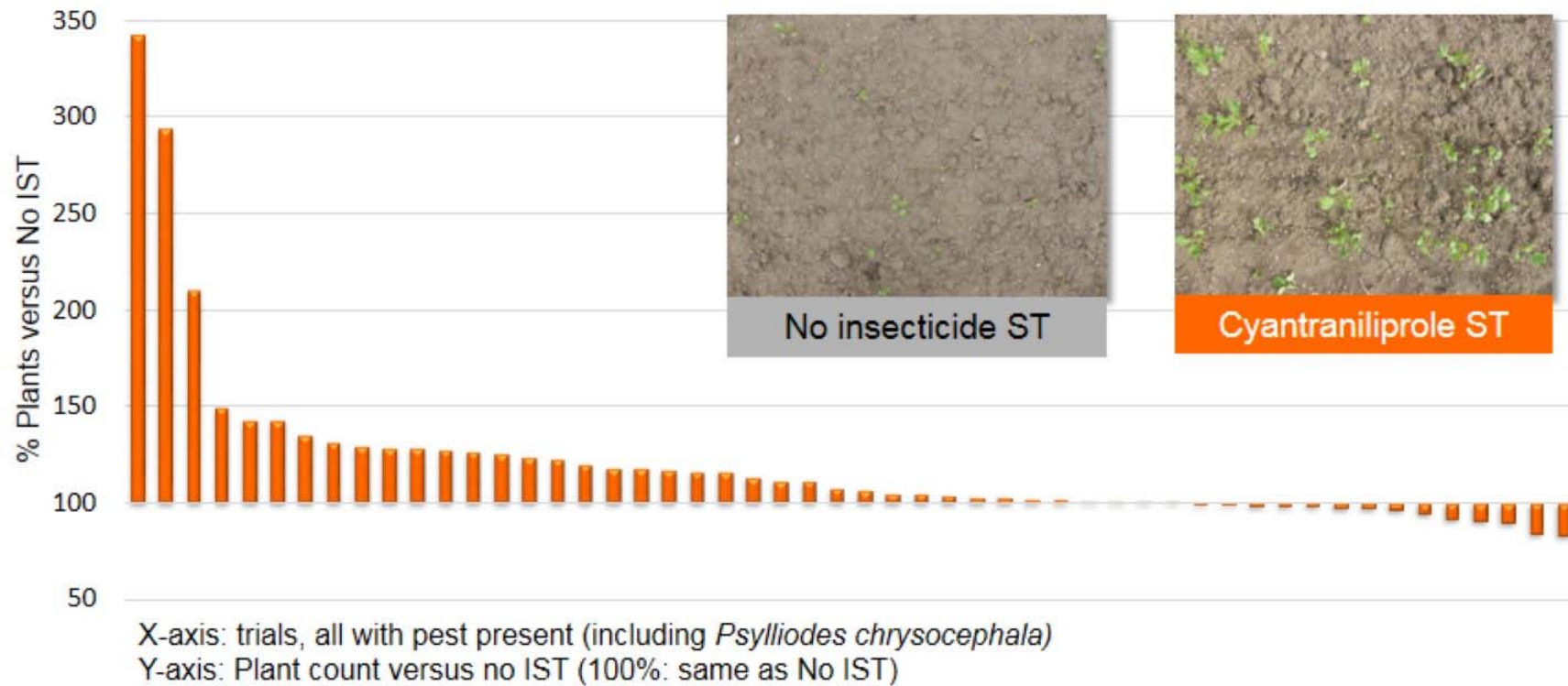


Cyantraniliprole ST



Better crop establishment

← 73% of cases better than untreated →



Source: DuPont, 52 trials across countries (2009-2015)

More vigorous plants for better crop establishment



Source: DuPont, 44 trials across countries (2009-2015)

X-axis: trials, all with pest present (including *Psylliodes chrysocephala*)
 Y-axis: vigour improvement versus no IST (scale -5 to 5)

A new tool in an Integrated Pest Management program

Cyantraniliprole ST selectively controls pests that feed on plant tissue.

Cyantraniliprole ST is unlikely to pose a risk to pollinators and beneficial arthropods because of the product's toxicity profile and the low to no exposure levels when following label instructions.

Cyantraniliprole ST protects the seedling up to BBCH 13 or 14 stage.

In case of high infestations, additional foliar applications of insecticides can be needed.



Resistance management Group 28 insecticides

- Avoid using the same mode of action on consecutive generations of insect pests.
- Including the seed treatment, make no more than two applications of cyantraniliprole or other Group 28 products per generation to the same insect species on a crop or within a 30 day period (count planting date as day 1 if using treated seed).
- Application to the next generation of target pest(s) must be with an effective product with a different mode of action (non-Group 28 insecticide).
- Incorporate IPM techniques into the overall pest management program.
- Monitor insect populations for product effectiveness in case of reduced of efficacy.

Monitoring/baseline susceptibility *Psylliodes chrysocephala*

- Method set up and validated by BTL in 2015
- Based on IRAC Method #027
 - Glass vials coated
 - 4 replicates of 8 adults
 - Incubation in the dark at 20°C
 - Evaluation 96 hours later



Cyantraniliprole tested side by side with Lambda cyhalothrin

2016: 5 populations tested (2 UK, 3 DE)

2017: ongoing, 8 so far collected (5UK, 3 PL, pending: HU, DE, FR)

Monitoring/baseline susceptibility *Delia radicum*

Based on IRAC Method #026 Version 1 (May 2011)

- Test unit:
 - 1 treated dental wick 2cm
 - in 40ml plastic container
 - Lid perforated with one hole 2mm diameter
- Insecticide solution with 100g/L sucrose
- 8 or 6 reps of 5 *D. radicum* adults, less than 7 days old
- Infestation in cool chamber (5-8°C)
- Incubation at 17°C/20°C +/-1°C, 16/8 D/N, 60% RH, no direct or uneven light.
- Evaluation 96 and 144 hours later



Method robust for adults less than 7 days old.

Method to be validated (ongoing)

Conclusion

- Cyantraniliprole ST is a new insecticide seed treatment product for WOSR
- It provides protection against key pests in WOSR, thus improving crop establishment
- A new Mode of Action for seed treatment: an additional tool for resistance management and IPM
- Based on several studies, Cyantraniliprole ST poses low risk to pollinators and beneficial arthropods if applied according to label recommendations



Questions?

Thank you



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DuPont™ Lumiposa®
insecticide seed treatment



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