EUROPEAN AND MEDITERRANEAN PLANT PROTECTION ORGANIZATION

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Report of the 7th Meeting of the EPPO ad hoc Panel on *Diabrotica virgifera virgifera* held jointly with the 9th International IWGO Workshop on *Diabrotica virgifera virgifera*

Belgrade, YU, 2002-11-03/05

1. Opening

A very large number of participants (approximately 100 from 25 different countries) participated in this Conference on *Diabrotica virgifera* which took place in Belgrade.

2. Situation of *Diabrotica virgifera virgifera* in the EPPO region

In summary, *D. virgifera* has continued to spread in Central Europe in 2002, mainly northwards and westwards (see Fig. 1), and the outbreak has now reached Austria and Czechia. *D. virgifera* was also found for the first time in France near Roissy, Le Bourget and Orly airports (near Paris). In Italy, eradication measures taken in the Veneto region proved to be effective and very few adults were caught, while economic damage was observed for the first time in Lombardia and a new outbreak was detected near Aviano military airport in Friuli-Venezia-Giulia. It is worth noting that many infested countries have intensified their programmes of information and training for farmers on monitoring and control of *D. virgifera*. Fig. 2 presents the area of economic activity of *D. virgifera* since 1998.

Austria

Monitoring has been conducted since 1999. In 2002, 207 pheromone traps were placed in the provinces of Burgenland, Niederösterreich, Oberösterreich, Steiermark, Kärnten, Tyrol and Wien (mainly along the borders with Slovakia and Hungary, near terrestrial transit routes, waterways, airports). *D. virgifera* was found for the first time in Austria on 2002-07-10 near the towns of Deutsch Jahrndorf and Andau in Burgenland (near the borders with Hungary and Slovakia). It was later captured at several locations in Burgenland and Niederösterreich. A total of approximately 500 adults were trapped in 65 traps. It is expected that further spread will occur in 2003. Measures will be taken to perform training, expand monitoring, impose crop rotation in infested areas, register suitable plant protection products.

Bosnia & Herzegovina

Monitoring has been conducted since 1997 in Bosnia & Herzegovina. Both spread and population density were monitored in 2002. Trapping was done at 30 permanent trapping sites and 30 new sites. The pest spread 25-30 km in all directions, i.e. about 500-1000 km^2 along river Drina (east of the country) and Bosna (centre of the country). Surprisingly, it was not trapped in the area of Velika Kladusa, where it was first found in 2001. Climatic conditions were generally favourable to the development of *D. virgifera*. Limited root damage and silk clipping was observed but there was no economically important damage. It is assumed that further spread in the east and south of the country will be hampered by mountains and the pattern of maize-growing.

Bulgaria

Monitoring was conducted using pheromone traps (15 sites) and yellow sticky traps (55 sites). The pest continued to spread slightly towards the east and south, and was found for the first time east of the town of Kneza. So far, no root damage has been observed, but adult feeding damage on silks was observed near Prevala (as in 2001), G.B. Rechka and Gramada. Because of very hot and dry conditions, the pest was not found in the regions of Lom, Vratza and Montana. High densities were observed in hills and under irrigation in Prevala, GB Rechka and Gramada. 2496 adults were caught in total.

Croatia

D. virgifera was first observed in 1995. Pheromone and yellow sticky traps were placed at 145 monitoring sites in 2002. *D. virgifera* spread 30 km westwards, in the central and southern part of the infested area, but no further spread has been observed along the Hungarian border. The total infested area is estimated at 19,000 km^2 in 2002. Heavy damage was observed for the first time in the eastern part of Croatia.

Czechia

Monitoring for *D. virgifera* started in 1999. *D. virgifera* was found for the first time in 2002. Monitoring was performed using pheromone traps at 30 sites, mainly in the south of Moravia near borders (districts of Brno, Břeclav, Hodonín, Uherské Hradiště, Znojmo) and near Prague airport. *D. virgifera* was found for the first time in the village of Čejč (district Hodonín) in July 2002. During the monitoring period, it was found in the districts of Hodonín (Lužice, Sudoměřice, Mikulcice, Straznice), Uherské Hradiště (Boršice u Blatnice) and Břeclav (Lanžhot, Hrušky) near the border. In total, 9 males were caught. It is noted that conditions for spread were very suitable in 2002 (hot summer and south-eastern winds).

France

Monitoring has been conducted since 1999. In 2002, monitoring was conducted at 284 sites throughout the country (maize fields, near airports…) using pheromone traps. *D. virgifera* was found for the first time in August near Roissy and Le Bourget airports (North of Paris), and later near Orly airport (South of Paris) (9 adults in total). A compulsory control order was officially published and monitoring was intensified to determine the extent of infestation. Three areas were defined around the two sites where the pest was trapped: an outbreak area (within a radius of 5 km), a first buffer zone (10 km) and a second buffer zone (40 km). In the outbreak area, the following requirements are made: movement of green maize and soil prohibited, compulsory cleaning of agricultural machinery, maize not to be harvested before 1st October, compulsory crop rotation, control of grass weeds, insecticide treatments. In the first buffer zone, monitoring is also intensified, crop rotation and insecticide treatments are required. Finally, in the second buffer zone, information is given to growers and crop rotation is recommended. The trapping system in place following the first findings (with 91 additional traps) caught 288 adults on 16 traps. It is noted that the first finding took place very late in the season (end of August). In other regions of France, *D. virgifera* was not found.

Germany

Monitoring has been conducted in Germany since 1997. In 2002, 319 pheromone traps were placed at 189 trapping sites in 10 Länder at sensitive places (maize fields, points of entry, ports, rail and road terminals, motorway car parks, seed breeding farms). The largest number was located in the most exposed Ländern of Baden-Württemberg and Bayern, in the south of the country. No *D. virgifera* was trapped.

Hungary

A nationwide survey has been conducted in Hungary since 1996. In 2002, the permanent monitoring network was maintained (pheromone traps and yellow sticky traps) on 42 sites of 19 infested counties, and pheromone traps were also placed in maize fields at 35 locations in non-infested parts of 7 counties. In total, approximately 34.300 adults were caught. A survey on root damage was conducted in 10 infested counties (919 fields, 40621 ha). In Baranya, Bács-Kiskun, Békés, Csongrád, Tolna, Fejér, Hadjú-Bihar, Pest, Somogy and Jász-Nagykun-Szolnok counties, larval damage was observed on 7488 ha. In Baranya, Bács-Kiskun, Békés, Csongrád, Somogy and Tolna, root damage reached the economic level on 5381 ha and plant lodging was observed in several fields.

Italy

In 2002, monitoring was conducted in already infested areas, in maize monoculture, and at potential introduction places (airports, custom stations etc.). Pheromone traps were set up in Friuli-Venezia-Giulia (130), Veneto (1000), Emilia Romagna (100), Lombardia (400) and Piemonte (440) regions.

Emilia Romagna

No *D. virgifera* was caught. Monitoring will continue.

Veneto region

It can be recalled that *D. virgifera* was first caught in 1998 near Marco Polo International airport near Venezia. In the initial outbreak area (2800 ha of cultivated land): 1) 291 pheromone traps were put in place; 2) maize monoculture was prohibited; 3) chemical treatments against adults were applied in all maize fields; 4) movement of fresh maize or soil in which maize had been grown in the previous year was prohibited; 5) maize not to be harvested before 15th September. In the buffer zone (approximately 25 000 ha of cultivated land) : 1) 357 pheromone traps were put in place in all maize fields close to the outbreak area (about 2-3 km from it), and 80 pheromone traps in monoculture maize fields in the remaining part of the buffer zone, according to a 2 x 2 km grid; 2) insecticide treatments were applied to maize fields where *D. virgifera* was caught and to neighbouring fields, i.e. approximately 120 ha twice between July and August. In the rest of the Veneto region, 218 pheromone traps were placed in sensitive sites, especially near airport facilities, in areas with a high presence of maize fields and along the border with Lombardia.

The 2002 results were as follows. In the outbreak area: 28 maize fields in monoculture (11.54 ha) were found and, according to the prohibition, were destroyed. 1 adult was caught in a field kept as set-aside in the previous year. In the buffer zone, 1 adult was caught in a field of maize in monoculture at 500 m of the outbreak area. Insecticide treatments were applied and no more catch was made. A new outbreak area of 190 ha was consequently defined.

It is concluded that the strategies implemented in the Veneto region have proved to be effective to stop *D. virgifera*, and populations were minimal in 2002. Within 5 years, there has been no significant spread from the initial outbreak area and population levels have decreased.

Piemonte and Lombardia regions

In Lombardia, many adults were captured in the provinces of Varese, Como, Lecco, Bergamo, Sondrio, Milano, Lodi, Brescia and Cremona. An economic population was detected (for the first time in Italy) in an area of some dozens of ha in the province of Como. Adult feeding damage on leaf and ears, and heavy root damage was observed. In Piemonte, *D. virgifera* was trapped in about 150.000 ha of cultivated land, including the provinces of Novara (near Lombardia), Alessandria, Biellan, Torino, Vercelli, Verbano Cusio Ossola. No significant damage was observed.

In order to slow down the spread, an area within which maize monoculture will be prohibited will be created around the limits of the Piemonte/Lombardia infestation. The programme of information on the biology of the pest and on the importance of crop rotation will be intensified.

Friuli-Venezia-Giulia region

In this region, where monitoring has been conducted since 1996, *D. virgifera* was caught for the first time in 10 traps (31 adults) in fields around the military airport of Aviano (on approximately 800 ha of cultivated land). All maize fields around the airport were treated with insecticides against adults. An eradication/containment programme will be conducted following the strategies already implemented in the Veneto region.

Romania

D. virgifera was first reported in Romania in 1996 at Nadlac (Arad county), near the Hungarian border. In 2002, monitoring was conducted in 15 infested counties, 7 non-infested counties and in 3 airport areas. Pheromone traps and yellow sticky traps were used at 165 sites. *D. virgifera* was caught in 14 counties: Alba, Arad, Bihor, Bistrita Nasaud, Caras-Severin, Cluj (new county infested in 2002), Dolj, Hunedoara, Mehedinti, Mures, Satu Mare, Salaj, Sibiu and Timis. *D. virgifera* was not caught in counties Gorj and Olt, where it had been found in previous years. Some economic damage was sporadically observed in Arad and Timis counties. Compared with 2001, population density has generally decreased in the infested areas.

Russia

The pathways for entry and areas likely to suffer damage by *D. virgifera* in Russia were studied. Natural spread is most likely to occur from Moldova (if the pest reaches this country) and southern Ukraine. Water transportation, from the estuary of Danube to ports of the Black sea, is considered as a possible pathway. In the Russian Federation, the areas likely to suffer highest damage are the regions producing grain maize, i.e. Rostov, Volgograd, Krasnodar, Stavropol, Kabardino-Balkaria. Given the annual rate of spread in Europe and control measures taken in infested countries, it is estimated that *D. virgifera* could reach Russia in 5 to 8 years.

Slovakia

D. virgifera was found for the first time in Slovakia in 2000 in the south of the country. Monitoring continued in 2002 using pheromone traps (144) and yellow sticky traps (145). A great number of adults were caught in Komárno (first finding in 2000) and Dunajská (first finding in 2001) districts, and also in new districts (Galanta, Nitra, Trnva). *D. virgifera* was caught neither in Skalica district (near the Czech border), nor in localities at the border with Ukraine (Čierna nad Tisou and Kristy). No economic damage was recorded.

Slovenia

In 2002, monitoring was conducted at 61 trapping points located near the Croatian, Austrian, Italian and Hungarian borders and in Ljubljana (airport). Since the limits of the outbreak are now approaching Slovenia, the number of pheromone traps was increased. *D. virgifera* was not caught in Slovenia in 2002, but the limit of the outbreak is close to the Slovenian borders and it is feared that it may appear next year.

Switzerland

In Switzerland, *D. virgifera* was found for the first time in 2001 in Ticino, near the border with Italy. In 2002, continuous cultivation of maize was prohibited in the infested area and monitoring was intensified. Pheromone traps were placed in 81 places (including 40 south of the Alps). *D. virgifera* was not found north of the Alps. South of the Alps, in Ticino, the number of adults captured during the monitoring period was approximately 50% more than in 2001 (3047 in total). The estimated infested area is now 1645 km^2.However, the increase is partly attributed to the larger monitoring area and higher trapping intensity. It is thought that the compulsory crop rotation has induced a reduction of populations, and that some catches were due to re-infestation from Italy. No economic damage was observed. In 2003, the crop rotation obligation will be extended to the whole Ticino and monitoring will be intensified.

Ukraine

D. virgifera was caught for the first time in 2001 in the Zakarpat'ya region, near Hungary and Romania. In 2002, monitoring was conducted using pheromone traps in 20 regions, over an area 6000 ha of 6123 districts. More attention was given to areas near Romania, Slovakia and Hungary (Odessa, Chernivtsi, Ivano-Frankivsk, Zakarpat'ya). In total, 133 adults were caught in 17 locations of 6 districts in the Zakarpat'ya region (Vynogradivska, Beregovsky, Uzhgorodsky, Mukachivskiy, Khustsky, Irshavsky). *D. virgifera* has spread 20 km northwards in 2002, but most catches were made near the border. The estimated infested area is 575 km^2. In places already infested in 2001, captures in pheromone traps were sometimes 10 times higher than in the previous year. Limited adult feeding damage was observed in some areas, but no root damage was recorded.

Yugoslavia

D. virgifera was first found in Europe near Belgrade airport in 1992. In 2002, pheromone traps and yellow sticky traps were used on 100 sites to check for the presence of *D. virgifera* and to study population density on permanent monitoring sites. *D. virgifera* spread towards the south-east, in the Pirot region, and to the south in the Prokuplje region. The estimated infested area in 2002 is 71.900 km^2. In most regions, population densities increased, but remained below the economic threshold. In southern Vojvodina, climatic conditions were not favourable (severe drought) and populations declined. Economic populations and damage increased in the north of the country.

3. Research papers

A very large number of research papers were presented during the Conference (trials on egg laying of *D. virgifera* on other crops than maize, effects of crop rotations, control in Europe etc.). Abstracts can be downloaded as a PDF file on the Web site of the Plant Protection Society of Serbia at the following address: http://www.plantprs.org.yu/skupovi/diabrotica2002.pdf.

4. Close

Warm thanks are due to Dr Spasic and her colleagues for organizing this large Conference in Belgrade.

Figure 1. Spread of *D. virgifera* in Europe from 1992 to 2002

Prepared by FAO/J. KISS and C.R. EDWARDS, based on data provided by Berger, Bertossa, Festic, Furlan, Gogu, Igrc-Barcic, Ivanova, Omelyuta; Princzinger, Reynaud, Rosca, Ruzicka, Sivcev and Sivicek.

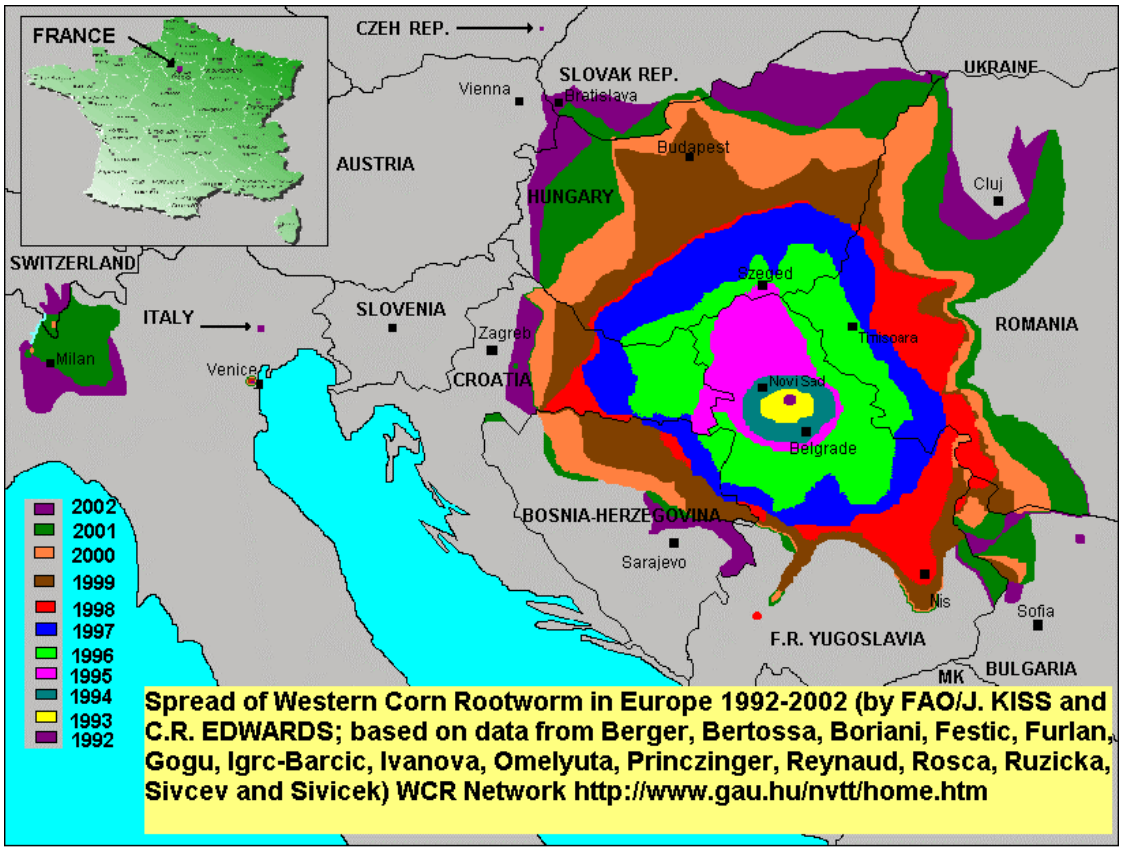
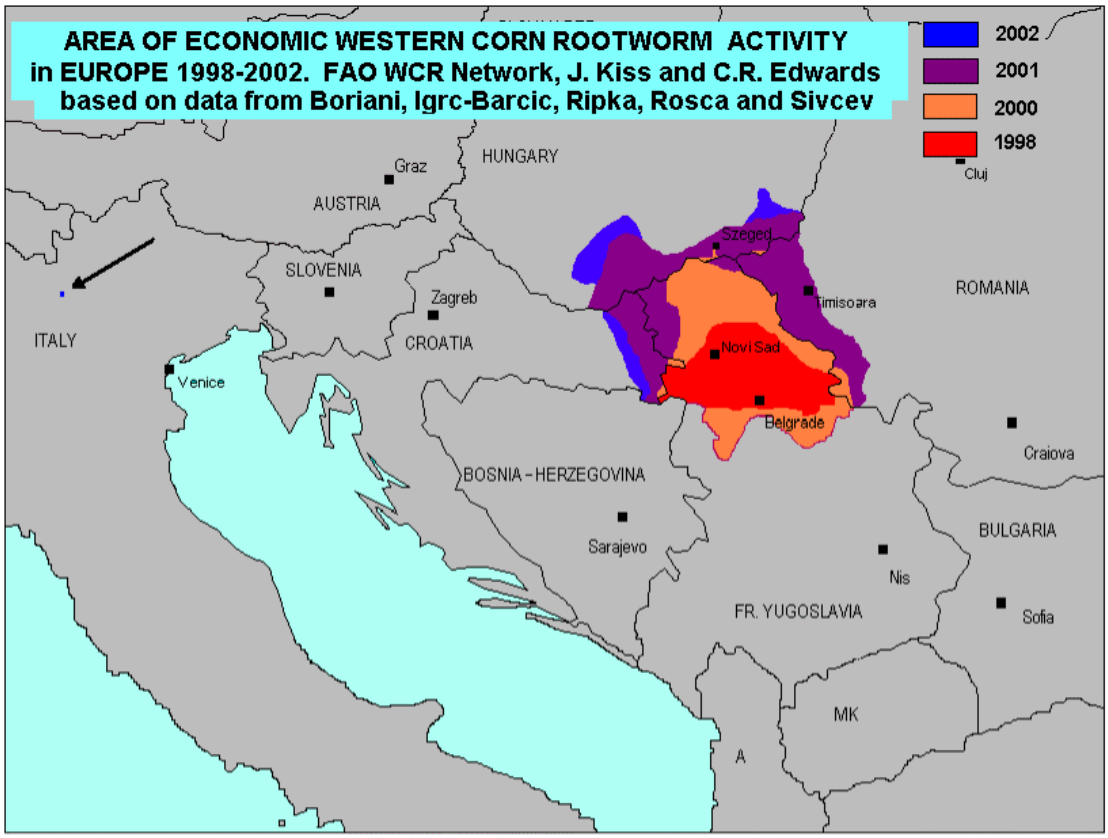


Figure 2. Area of economic activity of *D. virgifera* in Europe from 1998 to 2002

Prepared by FAO/J. KISS and C.R. EDWARDS, based on data provided by Boriani, Igrc-Barcic, Ripka, Rosca and Sivcev.



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