

**International workshop on
"Western Corn Rootworm in Europe 95"
Gödöllő (HU), 1995-11-08**

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The International Workshop on "Western Corn Rootworm in Europe 95" was held at the University of Agricultural Sciences of Gödöllő (HU), in 1995-11-08. A large number of participants (approximately 70) from Eastern and Central European countries participated in this meeting and expressed their great concern about the spread of *Diabrotica virgifera* in Europe. This Workshop follows a previous meeting organized by IWGO in Graz (AU), 1995-03-20/21, at which it was decided to organize a monitoring programme in the countries at risk. This Workshop in Hungary gave the opportunity to present the situation in Serbia where the pest was first introduced, to show the results of the monitoring programme carried out in the countries at risk, to reflect on possible means of control and possible international action against this dangerous maize pest.

Situation of Diabrotica virgifera in Serbia (YU)

Dr Keresi (YU) presented the situation of *Diabrotica virgifera* in Serbia, in 1995. It can be recalled that *D. virgifera* was observed for the first time in the vicinity of Surcin airport, near Belgrade, on a small maize plot (0,5 ha) in July 1992. It is thought that it may have been introduced in 1990, by air transport, from North America. The pest multiplied and spread during 1993 and 1994. The main direction of spread was towards the north-west. In general, the main movement of the populations follows the prevailing winds (see EPPO RS 95/116). Monitoring of the pest populations has continued in 1995, by visual inspections and use of cucurbitacin traps. During this year, spread of *D. virgifera* was observed towards the north (40-50 km compared to 1994), towards the west (10 km) and the east (10 km) (see figure 1). The density of the pest, as well as the intensity of attack, diminishes with the distance from the first focus near Surcin airport. Dr Sivcev (YU) added that the damage observed in Serbia is still not very significant. In 1992, only 0,5 ha was concerned, with a medium attack. In 1993, *D. virgifera* occupied a much larger area (110.000 ha) but damage was seen only on 6 ha. As 1993 was a very dry and warm year more than 80 % of the plants in these 6 ha were severely damaged and no harvest was obtained. In 1994, the infested area reached 200.000 ha, and approximately 60 ha were damaged. The intensity of the damage was moderate, and a harvest could be obtained. In 1995, 275 ha of maize was damaged, and the intensity of damage can be considered as low to medium. Dr Sivcev noted that in Serbia, 50 to 70 % of maize is grown in monoculture which is a favorable factor for the development of *D. virgifera*. For the moment, the only control method applied in practice is crop rotation, essentially with wheat and sunflower. He pointed out that *D. virgifera* has not been observed on these crops. However, as chemical control would be needed in the future, several trials on insecticide efficacy have been carried out in 1994-1995. Trials were done on plots of 100 m²

with 4 replicates, in fields where more than 20 beetles per plant can be found. The economic threshold is approximately 1 adult per plant. Treatments were made before sowing, at sowing or during the growing season. The best results were obtained respectively, before sowing with terbufos, lindane and bifenthrin; at sowing with terbufos, chlormephos, lindane and bifenthrin; during the growing season with carbosulfan, terbufos and phorate. Dr Sivcev pointed out that the best protection is obtained with a treatment at sowing.

Situation in Hungary

As a follow-up of the previous meeting in Graz (AU), Dr Princzinger (HU) explained that a monitoring programme has been implemented in Hungary. Traps have been placed along the borders with Croatia, Serbia and Romania (along 400 km of borders) and also at entry points near airports or seaports. Cucurbitacin and sex pheromone traps have been used. At the end of June 1995, the first adult was caught in Csongrad county, near the Serbian border (see EPPO RS 95/157) in a cucurbitacin trap. Later in August, *D. virgifera* was caught (by sex pheromone traps) at four other sites along the border with Serbia and also with Romania (Csongrad and Békés counties). No form of damage was seen. However, according to Dr Vonica (RO), *D. virgifera* has not yet been found in Romania. Monitoring of pest populations in the south of Hungary will certainly continue during the next maize-growing season. One question remains, which is why no adult was found in the North of Serbia though some were caught in Hungary. Dr Princzinger felt that perhaps wind or road transport could have brought the pest to the south of Hungary.

Dr Tóth explained that, in Hungary, they have prepared a sex pheromone trap which is highly and specifically attractive for *D. virgifera*. This trap is more attractive than the cucurbitacin trap. It is transparent in order not to attract other non-target pests. Several types of traps have been designed, triangular or flat traps (but they use the same chemical substance). Flat traps appear to be more efficient. For reliable detection, traps should be replaced at 4-5-week intervals. Dr Tóth stressed that Hungary is ready to sell these traps at cost-production price to countries which are at risk and want to implement a monitoring programme for *D. virgifera*.

Situation in Croatia

Dr Barcic (HR) explained that a monitoring programme was also set up in Croatia after the previous meeting in Graz. 150 cucurbitacin traps, 200 bait traps and 200 yellow sticky traps were placed in maize fields in Croatia. In addition to this, information was circulated through the distribution of 500 leaflets and 15000 posters to agronomists and farmers to help them to recognize the pest whenever found. In July 1995, one adult *D. virgifera* was trapped at Bosnjaci near Zupanja (see EPPO RS 96/005), which is situated 30 km from Serbia and 5 km from Bosnia. No other insect has been found since then. Traps were given to Bosnian colleagues but due to the difficult situation prevailing in this region, no information could then be obtained on their results. In 1996, monitoring will continue and more traps will be placed in this region (Vukovarsko-srijemska Zupanija) near Serbia and Bosnia.

The sudden and dramatic shift of the western corn rootworm to corn following soybeans in USA

Dr Edwards (US) recalled that *D. virgifera* is native to North America and possibly northern Mexico. In the US corn belt, two species are present: *D. virgifera virgifera* and *D. barberi*. He noted that it would be preferable to call the western corn rootworm *D. virgifera virgifera* (and not only *D. virgifera*) in order to avoid confusion with another subspecies *D. virgifera zea*. In 1945, in Nebraska, the first economic infestations were reported and since then the insect moved towards the eastern coast, mainly with prevailing winds. Again, Dr Edwards stressed that *D. virgifera* is not transported by maize seeds. In USA, until recently *D. virgifera* was essentially a problem on continuous maize crops. But during recent years in Indiana, problems of *D. virgifera* are being seen on maize grown in rotation with soybean. Dr Edwards recalled that, over the last twenty years, the main method of control used in USA was crop rotation. In Indiana, 85 % of maize fields are in rotation with soybean. The first significant indication of damage in maize in rotation with soybean appeared in 1993. However, it is possible that this problem in fact appeared in the late 1980s. Recent surveys have shown that 59 growers out of 400 had problems with *D. virgifera* in their first-year corn. Dr Edwards explained what could be the probable causes of such a change in behaviour: 1) a new race of *D. virgifera* could now be adapted to the corn/soybean rotation; 2) under high population pressure, natural spread is occurring; 3) planting of maize and hatching of *D. virgifera* are out of synchrony; 4) pest could be attracted by soybean; 5) the presence of maize residues (as there is no tillage) in soybean fields could attract beetles; 6) other reasons ? Research studies are being carried out in USA, both in the field to get information on economic thresholds, and in the laboratory as free-choice tests to determine whether maize residues could be a factor in this new problem, and DNA fingerprinting studies to analyse genetic composition of the populations. Specimens from Serbia will be included in the genetic studies to try to elucidate their possible origin.

Presentations from the chemical and seed industry

At the end of this meeting, several chemical companies presented products which could be effective against *D. virgifera*, with active ingredients such as: acetamiprid, carbofuran, bifenthrin, chlorpyrifos, imidacloprid, terbufos, phorate. A representative from the seed company Pioneer said that for the moment no resistant hybrid or cultivar can be offered on the market.

Multi-country coordination of efforts to deal with the western corn rootworm

Dr Berger explained that, after the previous meeting organized in Graz, with the help of Dr Edwards, cucurbitacin traps and pinned specimens have been given to several countries which are at risk so that they can start a monitoring programme. Leaflets containing information about the pest have also been prepared and distributed in several countries (Austria, Bulgaria, Bosnia-Herzegovina, Croatia, Germany, Greece, Hungary, Italy, Poland, Romania, Serbia, Slovak Republic, Slovenia and Ukraine). Cucurbitacin traps have been placed in the following countries: Austria (5 traps), Bulgaria (100), Bosnia-Herzegovina (20), Croatia (150), Greece (5), Hungary (120), Poland (5), Romania (5), Serbia (10). In addition to this, yellow sticky traps have been placed. In Ukraine, 290.000 ha of maize in 21 regions have been visually inspected and no *D. virgifera* has been found. This monitoring programme should continue in 1996 and reinforced in countries at risk like Romania, Bulgaria, Bosnia-Herzegovina and Slovenia.

The participants discussed the action which could be taken at international level against *D. virgifera*. Dr Berger informed the participants that FAO is in principle ready to support some work on *D. virgifera*, the only condition being to have a regional project with a detailed programme. Recommendations were made during the meeting (see Appendix), including in particular the follow-up of the monitoring programme and the establishment of an international laboratory supported by FAO in Hungary. It was generally felt that international cooperation was highly needed in this field, as well as cooperation on training and information exchange, and that further international meetings were necessary. In addition, EPPO proposed to organize an ad hoc Panel on *D. virgifera*, which would meet jointly with IWGO, the first meeting to a workshop to be organized in 1996-10-08/09, in Croatia.

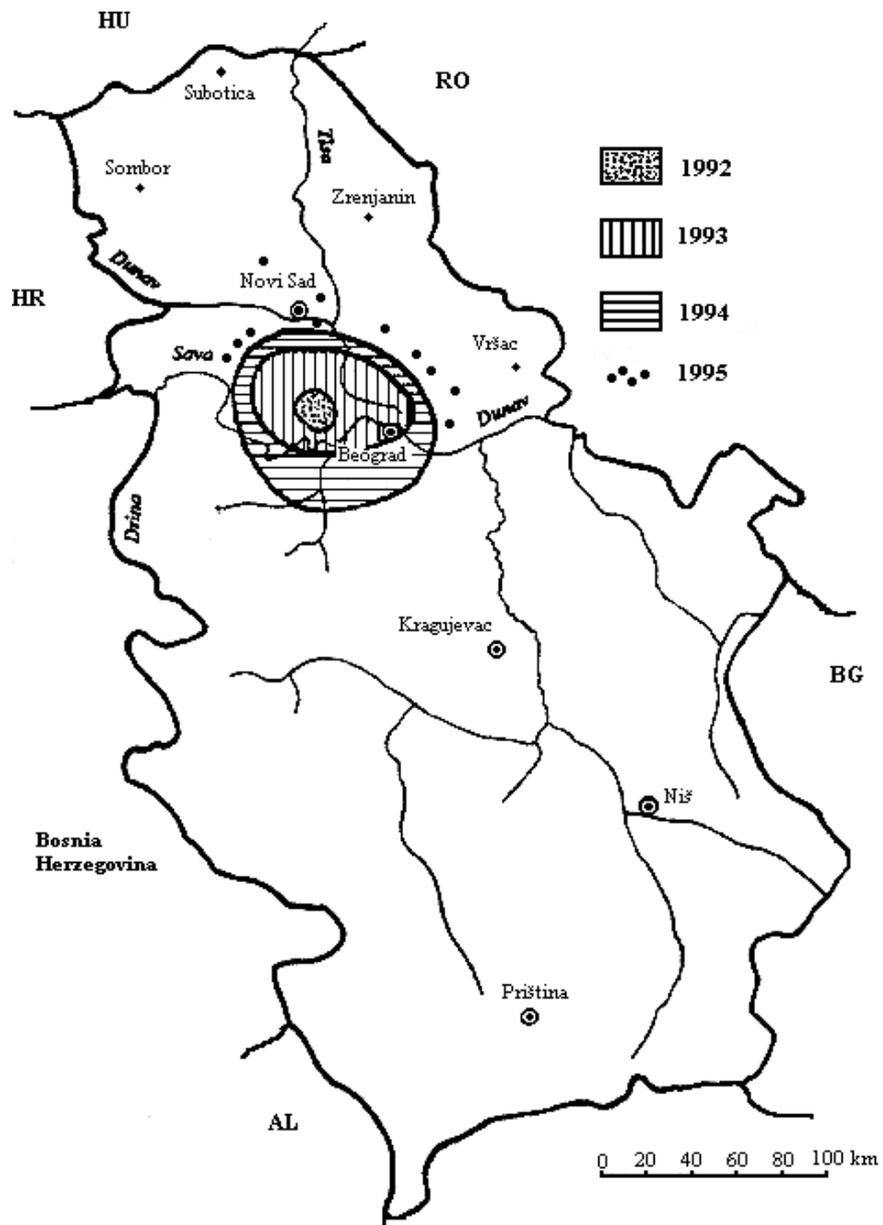
APPENDIX

Conclusions and recommendations made by the Workshop

- 1) *Diabrotica virgifera* has been added to the EPPO A2 quarantine list, because this is the only possible way of taking any regulatory measure aimed at slowing spread (e.g. prohibition of new planting, decision on chemical control etc.). This should not mean any restrictions on the trade of commodities (seeds, foodstuffs)*.
- 2) The monitoring programme will be continued with more observation sites along the border zone and will include a second ring with fewer sites.
- 3) Croatia is invited to join the FAO project submitted by Hungary. In order to complete a joint regional project, support will be requested from the FAO Regional Office, recently opened in Budapest. All countries threatened by *D. virgifera* are welcome to participate in this project.
- 4) In the south of Hungary near the Serbian border, at Hódmezővásárhely, a special operating laboratory has been set up, it is intended that this should become an international laboratory within the framework of the project and Hungary proposes, that with the support of FAO, training courses for experts from other countries should be organized. It is important that experts from countries at risk should be able to work on *D. virgifera* at this laboratory. Prof. R. Edwards should be a consultant for this laboratory.
- 5) The development of sex pheromone traps and related observations should continue. Instead of the 26 traps of 1995, several hundred traps should be used in 1996. On the basis of the 1995 results, participants at the Workshop are recommended to use sex pheromone traps for the international monitoring system in 1996. As in 1995, multiple sources of financing for 1996 should be sought in the coming months. It is also recommended that the Croatian bait traps should be tested in comparative studies.
- 6) The registration documents (labels) of all soil insecticides marketed for use in Hungary which have shown activity against *Diabrotica virgifera* will be extended to include this insect (limited permit for 1 year).
- 7) Since initial action on *D. virgifera* has been taken under government responsibility, farmers will not themselves pay for insecticides. Therefore, these have to be funded in other ways (possibly FAO).
- 8) Information services should operate intensively in areas at risk (lectures, posters, etc.). Training on *D. virgifera* should be included at all levels of national agricultural education.
- 9) In all countries concerned, the services involved in the programme should seek wide cooperation with other experts and institutions (regulatory agencies, universities, training institutions, production units, farmers' unions, pesticide manufacturers and distributors).

* EPPO note: EPPO does not consider that such commodities present a significant potential pathway for spread of *D. virgifera*.

Figure 1



Dynamics of the spread of *Diabrotica virgifera* in Yugoslavia (Serbia) during the period 1992-1994.

Map from: Baca, F.; Camprag, D.; Keresi, T.; Krnjajic, S.; Manoflovic, B.; Sekulic, R.; Sicev, I. (1995) Kukuruzna zlatica. *Diabrotica virgifera virgifera* Leconte. Edited by Camprag, D. Drustvo za zastitu bilja Srbije, Beograd, 112 pp.

The EPPO Secretariat has slightly modified this map to add the foci found in 1995.