

Preliminary observations on the biology and management of western corn rootworm (*Diabrotica virgifera virgifera*) in Italy

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INTRODUCTION

Western corn rootworm (WCR) (*Diabrotica virgifera virgifera*) (Coleoptera: Chrysomelidae) is one of the major pest of corn (*Zea mays*). This pest was introduced to Europe in 1992, in Serbia (Sivcev *et al.*, 1994), and then spread rapidly in many countries. In Italy, WCR was first recorded in Veneto, in 1998 (Furlan *et al.*, 1998), and it is now present in virtually all northern regions. The highest population density is in Lombardy, where crop damage has been observed since 2002 (Boriani *et al.*, 2002; Jucker, 2004).

Because of the great importance of corn for Lombard agriculture, a research project (funded by a grant from the Regione Lombardia) started in 2003–4, with the aim of extending the knowledge of WCR in our region.

Preliminary data (obtained in the first research year) on the biology of WCR, on the evaluation of different trapping system and on agronomic management measures are reported here.

MATERIALS AND METHODS

In 2004, observations on the pest were made in three different localities in Lombardy. Pre-imaginal stages were monitored by collecting soil samples, from June onwards, in order to obtain biology information. To monitor adults, six types of trap were compared, with three replicates: yellow sticky trap (Pherocon AM and Csalomon YST), PAL and PALs (Csalomon), Novapher Dvv-n and Dvv-l (produced by Novapher, Italy). Pheromone and kairomone baits were replaced every 5 weeks. Traps were set in June and examined weekly.

To determine the larval host-range of WCR, barley (*Hordeum vulgare*), rye (*Secale cereale*) and wheat (*Triticum aestivum*) were sown on 7 November 2003; also, alfalfa (*Medicago sativa*) and soybean (*Glycine max*) and were sown on 10 May 2004. Each plot had been cultivated with corn during the previous year. Three emergence cages (3 × 3 × 2 m) containing a yellow sticky trap were placed on each plot, and examined weekly from late June up to harvest. Further, summer corn was sown on 8 August 2004, and the presence of adults monitored by means of yellow sticky traps in emergence cages.

RESULTS AND DISCUSSION

Larvae were found from the end of June until the end of July. The first specimens collected were 2nd and 3rd instar larvae, suggesting that egg hatch had begun in at least the first half of June. Pupae were present from the end of June onwards. Adults first appeared at the end of June and continued to be found up to the beginning of October.

According to mean captures, flight curves for both pheromone- and kairomone-baited traps showed three distinct peaks: at the beginning of July, at the beginning and at the end of August. These fluctuations were probably due to structural problems. Novapher traps (experimental traps) showed a similar trend to PAL traps, with less-intense fluctuations. Further, the same trend was shown by Novapher Dvv-l traps that were baited with a long-lasting pheromone, set at the beginning of the season and never changed. Csalomon YST traps demonstrated the same trend as PAL and PALs traps. Pherocon AM traps caught up to 20 times more adults than the Csalomon YST traps, exceeding the damage threshold; Csalomon YST catches were always below threshold levels.

Crop rotation was confirmed as an efficient control practice for WCR, because no adults were caught on the traps in the emergence cages. Some adults were collected in the summer corn, which might indicate that a few eggs can hatch very late in the season; as a consequence, delayed sowing would not be effective in eradicating WCR. Moreover, because of the presence of fresh vegetation and silks, summer corn is very attractive to ovipositing females. For these reasons summer corn must be excluded from crop rotation options.

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REFERENCES

- Boriani M; Bettoni D; Notarangelo N (2002). Primi danni da Diabrotica su mais in Italia. *Informatore agrario* **31**, 61.
- Furlan L; Vettorazzo M; Ortez A; Frausin C (1998). *Diabrotica virgifera virgifera* è già arrivata in Italia. *Informatore fitopatologico* **12**, 43-44.
- Jucker C (2004). Il punto sulla Diabrotica in Europa. *Informatore agrario* **6**, 136-142.
- Sivcev I; Manojlovic Krnjajic S; Dimic N; Draganic M; Baca F; Kaitovic Z; Sekulic R; Keresi T (1994). Distribution and harmful effect of *Diabrotica virgifera virgifera* LeConte (Coleoptera, Chrysomelidae), a new maize pest in Yugoslavia. *Zastita bilija* **1**, 19-26.