Oviposition preferences of *Diabrotica v. virgifera* in multiple-choice field cage trials

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Background

The western corn rootworm (*Diabrotica virgifera virgifera*, Coleoptera: Chrysomelidae) is a serious maize pest in North America and Europe.

Most damage is caused by the root feeding larvae, some damage by the silk feeding adults.

Adults are known to primarily lay their eggs into the soil of maize fields. This is, because the larvae of this pest are largely restricted in their feeding to maize.

In the USA, some populations, however, also lay eggs in non-maize crops where maize is grown the following year which then allows larval development.

Therefore, the oviposition behaviour of *D. v. virgifera* adults was studied in large multiple-choice field cages at two field sites under European conditions over three pest generations between 2009 and 2012.

Methods

The oviposition of *D. v. virgifera* was studied in two field sites in southern Hungary between 2009 and 2012. Between 9 and 23 large 9m² gauze cages were placed into each site. Each cage covered three of the 10 studied crop habitats in different combinations. 50 to 75 young female and 50 to 75 young male adults were released in each cage. Oviposition was assessed through planting maize the following year, which allowed larval development and recording of adult emergence in small cages.

Results

- Maize was clearly the most attractive crop habitat for ovipositing *D. v. virgifera* adults; and also increased maize density favoured oviposition.
- Other crops habitats, such as millet, sudangrass, and ploughed bare soil were somewhat suitable for ovipositing adults, indicating that either their vegetational characteristics or the soil conditions were suitable for oviposition.
- Harvested and grubbed winter rape with regrowth, harvested and grubbed or not grubbed winterwheat with regrowth, as well as potatoes had a small attractiveness for oviposition.
- Least suitable were harvested and grubbed peas.

- Populations most successfully grew from year to year when the entire multiple-choice cage was planted with maize. In this case, the populations doubled on average across sites and years.
- Only when sudangrass or millet were combined with maize in multiple-choice cages, still a slight population grew appeared possible.
- When maize was combined with any other crop habitat, then the oviposition of *D. v. virgifera* was so much decreased, even in maize, that the populations decreased from year to year.

Considering the fact that only cages entirely grown with maize and none of the other crop habitat combinations led to considerable population growth, it can be assumed that all crop habitats, except maize, pose little risk that pest populations would reach threshold levels when maize is grown the following year.