

Dispersal and oviposition behaviour of *Diabrotica virgifera virgifera* in non-maize crops to improve advice and guidelines for crop rotation

Verbreitungs- und Eiablageverhalten von *Diabrotica virgifera virgifera* in Nicht-Mais-Kulturen zur Verbesserung von Beratung und Richtlinien für den Fruchtwechsel

Stefan Toepfer^{1,3}, Michael Zellner², Tim Haye³, Ulrich Kuhlmann³

¹ CABI, c/o Plant Protection Directorate, Hodmezovasarhely, Hungary

² Bavaria State Research Centre for Agriculture, Freising, Germany

³ CABI, Delemont, Switzerland

* Corresponding author, stoepfer@gmx.net

DOI 10.5073/jka.2014.444.032

Adults of the maize pest *Diabrotica virgifera virgifera* are known to perform inter-field movements to crops other than maize, mostly to access protein-rich food sources. In the USA, some populations also lay eggs into non-maize crops where maize is grown the following year which will allow larval development.

Crop rotation experiments aimed at investigating to what extent dispersing adults may also lay eggs in uninfested fields of 11 different crop habitats in Europe, and consequently may reduce the efficacy of rotation as a control measure.

Mass releases of beetles and their recaptures in crop rotation experiments at two study sites in southern Hungary in 2009, 2010, 2011 and 2012, revealed that less than 10% of the entire population in the infested maize fields disperses towards uninfested crop habitats, including maize. When not including uninfested maize in the analyses, then less than 5% of the entire population from the infested maize fields disperses towards non-maize crop habitats. Maize was the most attractive crop for the dispersing *D. virgifera virgifera*, regardless of whether males and females were considered separately or together. Second most attractive were ploughed bare soils or harvested and grubbed peas. *Sorghum* (Millet), *Sorghum* (sudan grass), potatoes, soybean, sugar beet as well as harvested and grubbed rape or winter wheat were of minor importance.

Most dispersing adults also laid eggs. Less than 20% of the entire *D. virgifera virgifera* population in the study sites emerged from maize as a result of oviposition into uninfested crop habitats the previous year. It appeared that the majority of the *D. virgifera virgifera* population from infested maize fields was ovipositing over the entire maize area, regardless of whether the maize was their natal field or not. When not including uninfested maize in the analyses, then less than 15% of the entire *D. virgifera virgifera* population in the study sites emerged from maize as a result of oviposition into uninfested crop habitats, e.g. *Sorghum* (sudan grass), sugar beet and others.

Despite of some extent of dispersal and oviposition into non-maize crops, it can be concluded that, according to the current state of knowledge, any crop can be rotated with maize to successfully manage this invasive alien maize pest in Europe.

This study was funded by the Bavarian State Ministry of Food, Agriculture and Forestry.