

## **A new method for efficacy testing of control measures against adult *Diabrotica* in maize**

*Eine neue Methode für die Prüfung der Wirksamkeit von Pflanzenschutzmaßnahmen gegen Diabrotica-Käfer im Mais*

**Alois Egartner<sup>1,\*</sup>, Udo Heimbach<sup>2</sup>, Giselher Grabenweger<sup>3</sup>,**

<sup>1</sup> Institute for Sustainable Plant Production, Agency for Health and Food Safety (AGES), Vienna, Austria

<sup>2</sup> Institute for Plant Protection in Field Crops and Grassland, Julius Kühn-Institute (JKI), Braunschweig, Germany

<sup>3</sup> Institute for Sustainable Plant Production, Agency for Health and Food Safety (AGES), Vienna, Austria;  
current address: Ecological Plant Protection, Agroscope Reckenholz-Tänikon (ART), Zurich, Switzerland

\* Corresponding author, [alois.egartner@ages.at](mailto:alois.egartner@ages.at)

DOI 10.5073/jka.2014.444.027

Testing the efficacy of pesticides in the field is often accomplished by assessing densities of pest insects by attracting and catching them in traps. However, these methods do not show the direct effect of the control measure to be tested, e.g. the mortality caused by the insecticide. In fact, they show the abundance of alive insects, which is indirectly affected by the tested treatment together with many other factors, including mobility of the test species. This may be a challenge with highly mobile study subjects, like the western corn rootworm, *Diabrotica virgifera virgifera* (WCR).

A field method for direct determination of mortality of WCR beetles after treating the fields with insecticides is described. Monocrop maize fields with heavy *Diabrotica* infestation were treated with a neonicotinoid insecticide and compared to untreated control fields. Efficacy of the treatment was assessed with yellow sticky traps and with the newly developed method for mortality assessment: the latter consisted of cotton panels mounted between the stems of four corn plants of two neighbouring rows, in order to collect dead beetles dropping from the plants beyond the covered area.

After insecticide application, the number of dead beetles collected with panels in the treated plots was significantly higher than those in the control plots only 1 day and 3 days after application. However, no differences were found 7, 14 and 21 days after application. At the same time and in the same fields, the number of beetles caught with yellow sticky traps dropped significantly after insecticide application. Differences between treated plots and control plots were significant 1, 3 and also 7 days after treatment. Results of yellow sticky traps therefore suggested longer activity of the insecticide than proved by the mortality assessment with panels. Direct mortality assessment methods may therefore be important tools for validation of control measures in field tests.

The results of these studies have been published in detail in the Journal of Cultivated Plants, **64** (9), 2012, 342-347.

The project was funded by the German Ministry of Food, Agriculture and Consumer Protection (BMELV) within the German *Diabrotica* research program.