

Approaches to model the dispersal of the Western corn rootworm

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The Western corn rootworm (*Diabrotica virgifera virgifera*) is one of the most important pests on maize in the world and endemic to North America. In 1992, *Diabrotica virgifera virgifera* was first detected in Europe close to the Airport of Belgrade. Since then the Western corn rootworm has actively spread through Europe. In 2007, first beetles were caught in pheromone traps in Germany. The previous spread of *Diabrotica* in Europe as well as in North America varied from year to year and from region to region. This shows that dispersal is effected by regional conditions. Hence, a dispersal model should be developed which integrates all relevant regional conditions. The model will consist of the following four components: situation of *Diabrotica*, regional spread, long distance flights and global spread. The component "situation of *Diabrotica*" will include the

population development of the Western corn rootworm under regional conditions. The second component of the model, "regional spread", will contain all flights over short distances. The direction of the flights depends on corn growing because the Western corn rootworm follows maize over short distances. Additionally, barrier cells, like cities, are integrated in the component. The Western corn rootworm, however, does not follow maize directly when the beetle flies over long distances and no barriers exist. This behavior is regarded in the component "long distance flights". Furthermore, the Western corn rootworm was detected far away behind the established spread line because of hitchhiking on various means of transport. This fact will be taken into account in the component "global spread".