

Dispersion behavior and oviposition of adult western corn rootworm after an early maize harvest

Ausbreitungs- und Eiablageverhalten von Maiswurzelbohlerkäfern nach früher Maisernte

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An early harvest of maize, at a time when flight period of the pest is still in progress, may trigger migratory flights of adults out of the harvested plots into adjacent maize fields. If the migrating beetles are females, they may lay a considerable portion of their egg load into the invaded fields. This harvest-driven migration may therefore be disadvantageous in eradication or containment programmes against the quarantine pest insect.

In the presented experiments, migratory flights of western corn rootworm adults in relation to different dates of maize harvest were investigated. We monitored fluctuations of the corn rootworm adult populations with yellow sticky traps in several maize fields in close vicinity to each other. Traps were installed on maize plants before harvest and on pegs on the stubble fields after harvest. Captured beetles were counted weekly. In addition, alive females were caught and brought to the lab where they were held in cages with oviposition substrate and nutritional supply. After death of these females, eggs were sieved out of samples of the substrate and counted to calculate oviposition rates. In addition, separate samples of the substrate were hibernated and used for analysis of the emergence rates of *Diabrotica* larvae after diapause in the following spring.

The abundance of active adults in the maize fields decreased steadily at the end of the flight period of the pest. Population levels dropped significantly after harvest in the stubble field. However, we were not able to prove an increase of the population levels in maize fields close to the harvested plots. Consequently, evidence for migratory flights of adults in the course of the harvest was not found. Reasons may be that the majority of the beetles die during the harvesting process. In addition, beetles were found to be active on the stubble fields for weeks. This shows that a small fraction of the population remains on their native plots despite harvest or moves back into the stubble fields after harvest. Moreover, the fraction of the pest population which was forced to migrate by the harvest of single plots may be very small in comparison to the total population in an infested region. Population fluctuations as a consequence of harvesting small parts of the total maize area may therefore be superimposed by other factors with stronger impact on overall population dynamics in infested regions.

Results show that an early start of the maize harvest has negligible impact on the fluctuations of western corn rootworm populations in regions where the pest is established since years. Consequently, it is unlikely that early harvesting of maize impairs the efficacy of containment programmes in infested zones.

However, *Diabrotica* females caught at the end of the flight period of the pest were still able to lay a considerable amount of eggs. In addition, these eggs proved to be viable and larvae emerged after diapause in the following spring. It is therefore clear that females are able to found a population in recently invaded areas right to the end of the flight period, independent from their age. These results have to be taken in consideration in eradication programmes of isolated outbreaks of western corn rootworm.

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