

First occurrence of western corn root worm beetles in the federal states Hesse and Rhineland-Palatinate (Germany), 2011

Erstauftreten des Westlichen Maiswurzelbohrers in den Bundesländern Hessen und Rheinland-Pfalz (Deutschland), 2011

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Summary

In 2011, western corn root worm beetles were detected in the federal states Hesse (Groß-Gerau) and Rhineland-Palatinate (Bodenheim) for the first time. Control measures based on commission decision 2003/766/EG (Byrne, 2003) were conducted after detection in PAL-traps. Focus and safety zones were established. In Hesse, both focus and safety zones were treated with the insecticide Biscaya, due to the high number of 50 beetles which were detected in the PAL-traps. Since in Rhineland-Palatinate, only one beetle had been captured, only the focus zone was treated with the insecticide. After insecticide treatment, new PAL-traps were arranged like a close grid over the infested areas in both federal states. In each maize field in the focus- and safety zone further traps were placed and checked weekly until September 30th by supporting staff. Until the end of the monitoring in 2011 (September 30th) further beetles were detected in the south of the area (district of Groß-Gerau, Hesse), where the first infestation had been discovered. However, in Rhineland-Palatinate no further beetles were detected that year. By the end of the monitoring 354 beetles in Hesse and one beetle in Rhineland-Palatinate had been captured in total. Subsequently the demarked zones in Hesse were extended. Taking into account the local circumstances, the new focus zone was delimited to include all the areas where beetles had been detected as well as the surrounding maize fields. In the focus zones the cultivation of maize was forbidden for the consecutive two years and a crop rotation with at least 50 percent maize was established in the safety zones. In 2012 no further beetles were captured in the infested region.

Key words: *Diabrotica virgifera virgifera* LeConte, first occurrence, Hesse, Rhineland-Palatinate, eradication

Zusammenfassung

Der Westliche Maiswurzelbohrer (*Diabrotica virgifera virgifera* LeConte) trat in den Bundesländern Hessen (Groß-Gerau) und Rheinland-Pfalz (Bodenheim) erstmalig im Jahr 2011 auf. Die in der Kommissions-Entscheidung 2003/766/EG vorgeschriebenen Bekämpfungsmaßnahmen (Byrne, 2003) wurden umgehend durchgeführt. Befalls- und Sicherheitszonen wurden eingerichtet. In Hessen wurde wegen der hohen Zahl von 50 gefangenen Käfern sowohl die Befalls- als auch die Sicherheitszone mit dem Insektizid Biscaya behandelt. Da in Rheinland-Pfalz nur ein Käfer gefunden wurde, ist hier ausschließlich die Befallszone mit dem Insektizid behandelt worden. Im Anschluss an die Insektizidbehandlung wurden PAL-Fallen in den Befallsgebieten beider Länder engmaschig platziert- in jedem Maisfeld wurden PAL-Fallen aufgehängt. Alle Fallen wurden bis zum 30. September 2011 wöchentlich durch zusätzlich eingestellte Hilfskräfte kontrolliert. Bis zum Ende des Monitorings wurden südlich von Groß-Gerau, dem Ort des Erstfundes, weitere Käfer gefunden, sodass in Hessen insgesamt 354 Käfer festgestellt worden sind. Auf Rheinland-Pfälzischer Seite sind keine Käfer mehr hinzu gekommen. Die hessische Befallszone wurde unter Berücksichtigung der örtlichen Verhältnisse so ausgeweitet, dass alle Befallsstandorte einschließlich der umliegenden Nachbarmaisflächen eingeschlossen waren. Als Auflage darf in den Befallszonen beider Länder in den Jahren 2012 und 2013 kein Mais angebaut werden. In den Sicherheitszonen darf kein Mais nach Mais folgen. Im Jahr 2012 traten in den Befallsgebieten der Länder Rheinland Pfalz und Hessen, in denen 2011 Maiswurzelbohrer festgestellt wurde, keine Käfer mehr auf.

Stichwörter: Maiswurzelbohrer, Erstauftreten, Hessen, Rheinland-Pfalz, Ausrottung

1. Introduction

Diabrotica virgifera virgifera LeConte has been monitored in **Hesse** and **Rhineland-Palatinate** since 1999. According to Commission Decision 2003/766/EG (BYRNE, 2003) the intended regular monitoring was conducted every year from July to October. Pheromone traps (PAL) were placed in endangered areas as airports, train and truck terminals, ports, central markets, motorway stations and especially in maize fields. In 2011 186 traps have been used for the regular monitoring in Hesse and 106 traps in Rhineland-Palatinate. The presence of *Diabrotica virgifera virgifera* LeConte was detected for the first time in Hesse on August 24th and 25th 2011 in a cornfield located in Groß-Gerau, Wallerstädten. 50 beetles were identified in pheromone traps as a result of the survey. A possible source of introduction could be tourism, because a camping site is located near the outbreak area. There are no other high risk areas nearby like truck companies, ports, motorway stations etc. where the organism could have been introduced. In the local authority region of Groß-Gerau, the region where the beetle was detected first, 14 pheromone traps had been placed every year. As the safety zone in Hesse extended into the area of Rhineland-Palatinate a more intense survey at the Rhine riverbank was established. In this context one beetle was detected on May 5th 2011 in the district of Bodenheim (Rhineland-Palatinate). In the following methods section, measures applied are described in more detail.

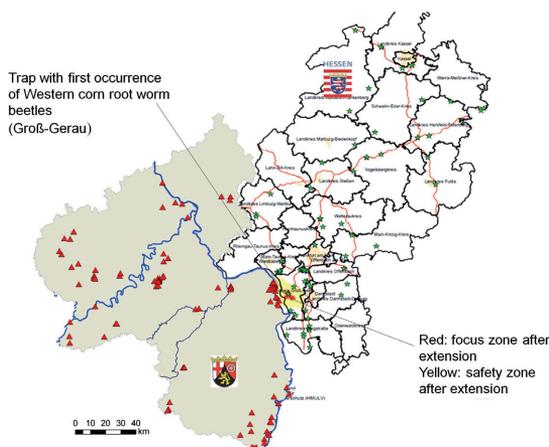


Fig. 1 Distribution of trap locations (2011) in Hesse (stars) and Rhineland-Palatinate (triangles).

Abb. 1 Verteilung der Fallenstandorte (2011) in Hessen (Sterne) und Rheinland-Pfalz (Dreiecke).

2. Methods

From August 31st to September 6th, 2011, 216 ha maize were treated in the focus and safety zone in Hesse with Biscaya (application dose 0.3 l/ha) by a contractor. Both silage maize for biogas plants and grain corn were treated. Because of the high number of captured beetles, the safety zone was also treated. At this time sweet corn had already been harvested.

The district of Bodenheim in Rhineland-Palatinate is a traditional region of grape-vine with a minor percentage of maize and other agricultural crops. For this reason only 17 ha maize fields in the focus zone were treated with Biscaya (application dose 0.3 l/ha). The treatment was applied on September 9th 2011 by a contractor. A large part of silage maize had already been harvested at this time.

Traps (PAL traps) were arranged like a grid over the infested areas in both federal states. In each maize field in the focus- and safety zone further traps were placed and checked weekly until September 30th by supporting staff. During this auxiliary monitoring another 173 traps in Hesse and 30 traps in Rhineland-Palatinate were added to the traps of the basic monitoring.

In the focus zones the cultivation of Maize was completely forbidden for the consecutive two years and a crop rotation with at least 50 percent maize percentage was established in the safety zones.

Until September 30th further beetles were caught in the grid of pheromone traps in the south of the area (in the district of Groß-Gerau) where the first infestation was discovered.

After one beetle was found on September 5th 2011 in Rhineland-Palatinate in a PALI-trap, one part of the safety zone of Rhineland-Palatinate extended into hessian territory. The area was included into the Hessian survey. No more beetles were detected here, neither in the infested area of Rhineland-Palatinate.

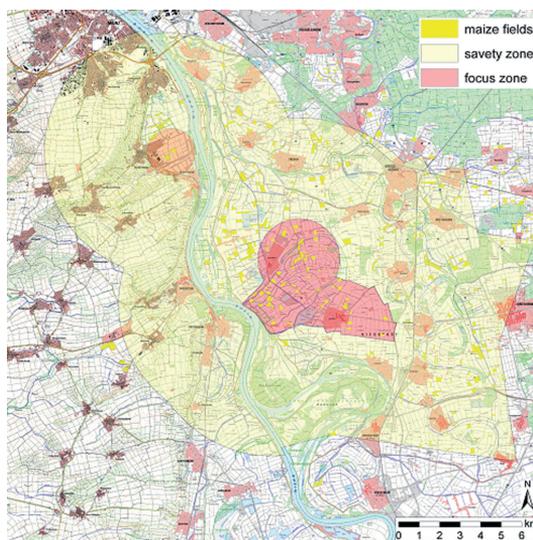


Fig. 2 Infested area of Hesse and Rhineland-Palatinate 2011.

Abb. 2 Befallsregion von Hessen und Rheinland-Pfalz 2011.

3. Results and discussion

By the end of the monitoring 354 beetles in Hesse and one beetle in Rhineland-Palatinate had been captured in total. Subsequently the demarked zones in Hesse were extended. Taking into account the local circumstances, the new focus zone was delimited to include all the areas where beetles had been detected (31) as well as the surrounding maize fields. The new safety zone in Hesse was established around the new focus zone in a 5 km radius and extended then into the district of Darmstadt-Dieburg. No further eradication measures were applied in the new demarked zones because of the treatment in the first safety zone. The area of the extended focus zone had also been treated already. Since harvest was almost completed no further areas had to be treated. The established zones in Rhineland-Palatinate were not extended, due to no further captures of beetles.

It is expected, that eradication can be achieved in the infested areas of both federal states. Particularly the guidelines for crop-rotation established in these areas will hopefully prove to be effective to eradicate this serious maize pest. However, in 2012 no further captures were observed in the infested region. Although the aims of the control measures in the infested area of Groß-Gerau and Bodenheim were achieved in 2012, a worrying situation was determined for southern located areas in the Upper Rhine Valley of Rhineland-Palatinate: three more focus and safety zones had been established in the districts of Leimersheim, Dannstadt-Schauernheim and Hördt due to overall seven new trap captures of western corn root worm beetles in 2012 (data not presented).

References

BYRNE, D., 2003: Commission decision of 24 October 2003 on emergency measures to prevent the spread within the Community of *Diabrotica virgifera* LeConte (notified under document number C (2003) 3880) (2003/766/EC). Official journal of the European Union L 275/49.