The effect of *Diabrotica*-resistant corn cultivars on the larval development in lab-based studies

Der Einfluss Diabrotica-*resistenter Maissorten auf die Larvenentwicklung in Laboruntersuchungen*

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The aim of the project was to investigate the influence of *Diabrotica*-resistant corn cultivars on larval development and hatching rate of *Diabrotica virgifera virgifera*. Three laboratory trials under quarantine conditions were conducted. Resistant (Sunrise Group, variety No. 4, 6 and 7) and non-resistant (No. 1, 2, 3 and 5) corn cultivars were planted. Beside two uninfected control pots up to 15 replicates of each cultivar were used. After the plants had reached the BBCH 13 stage freshly hatched larvae of *Diabrotica* were transferred into the pots. After a period of 21 days, the trials were evaluated, in order to prevent the development of adult beetles: plants were measured, weighed, and the length of their roots was determined. Surviving larvae of *Diabrotica* were collected from the soil and roots, counted, and also weighed. The number and weight of the larvae found was compared between resistant and non-resistant corn cultivars. During the first two trials mainly the plants of the Sunrise cultivar showed clear symptoms of a heavy infection with *Fusarium* (Fig. 1). Plants of other cultivars were less infected.

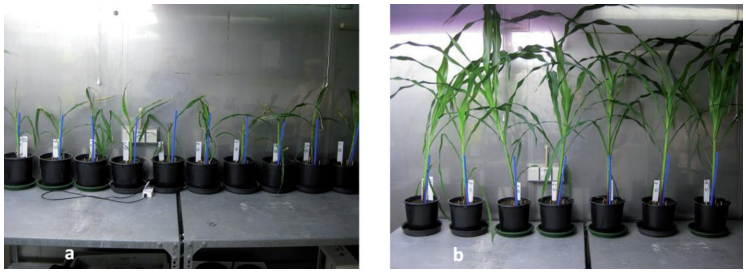

Fig. 1 Different plant length and weight of the *Fusarium* infected sunrise variety No. 4 (a) in comparison to the non resistant variety No. 1 (b) at the same time.

Abb. 1 *Unterschiede in Pflanzenlänge und –gewicht zwischen der mit* Fusarium *infizierten Sunrise-Sorte Nr. 4 (a) und der nicht resistenten Sorte Nr. 1 (b) im gleichen Versuchszeitraum.*

In the first experiment the *Fusarium*-infected varieties No. 4, 6 and 7 showed a reduced plant growth and plant weight. Nevertheless the highest number and weight of larvae were found for cultivar No. 1 and 7. The lowest number of larvae was found for cultivar No. 4. For the non-resistant cultivar No. 2, 3 and 5, no significant differences in larval size and weight were found. The second trial showed comparable results: The larvae of cultivars No. 4 and 6 were smaller and lighter than larvae from other cultivars. The survival rate of larvae of the second trial was lower than in the first trial. The highest weight of larvae was found for cultivar No. 3, 5 and 7. Resistance of the Sunrise cultivars was not confirmed by these results. With the last experiment the larval development at different plant stages of a non-resistant cultivar (RONALDINIO) was tested. Unfortunately, these plants were also infected with *Fusarium*. This trial showed contrasting result: more and larger larvae were detected on the youngest and smallest plants. This illustrates, that a valid interpretation of these results is still difficult. All laboratory trials were more or less influenced by the infection with *Fusarium* which caused a reduced plant growth depending on the cultivar used. It is not clear which influence the fungal infection and the developmental stage of the maize had on the larval development.

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