The control of black vine weevils (*Otiorhynchus sulcatus*)

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Background

Larvae of black vine weevils (*Otiorhynchus sulcatus*) cause damage on a wide range of hardy ornamentals, by feeding on the roots. In Dutch nursery stock this is a major pest. To limit the damage to an acceptable level, it is advised to control both the larvae and the adults. Larvae may be controlled using entomopathogenic nematodes or *Metarhizium anisopliae*. Controlling the adults is more difficult: since 2004 in the Netherlands no insecticide was available anymore for this purpose. Therefore, WUR and DLV Plant tested many insecticides in lab, cage and field experiments. So far it resulted in one new insecticide (indoxacarb) that many growers are using. The research is continued, since there is a risk of the insect becoming resistant when many growers apply the same insecticide for many successive years.

Figure 1. Taxus field with vine weevil damage

Figure 2. vine weevil larvae

Objective

- Finding a new insecticide to control black vine weevil adults
- Establishing a faster control of the weevils (before egg laying starts, so within four weeks)

Materials and methods

- In 2011 untreated adult weevils were collected at nurseries.
- Cage experiment: complete random block design, with 4 blocks and 7 treatments
- 6 plants of *Euonymus fortunei* 'Darts Blanket' per cage
- 30 weevils per cage were inserted (15 June)
- Treatment: crop spraying at 16 June, 27 June and 7 July, around 22.00 h; thiamethoxam (systemic) was sprayed (16 June) and poured onto the pots (27 June)
- In 2012 a similar experiment is being done

Figure 3. cage experiment 2011

Figure 4. adult vine weevil

Results

Cage experiment 2011

- All treatments: < 50% of the weevils were killed within four weeks.
- In cages treated with bifenthrin, AD, thiamethoxam and indoxacarb significantly more weevils died within four and within 5.5 weeks than in untreated cages (GLM with binomial distribution).
- The same treatments resulted in less feeding damage than in the untreated control (Linear Model).

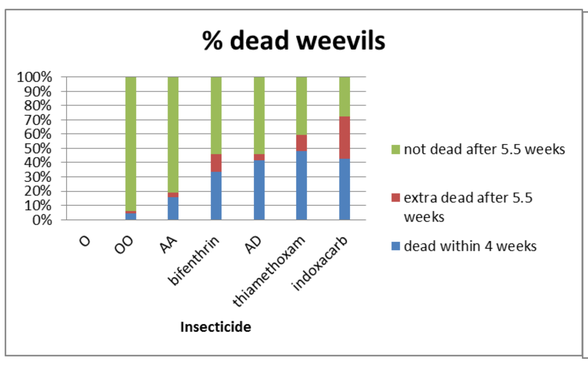

Figure 5. % of dead weevils 4 and 5.5 weeks after the first treatment. O = untreated without weevils, OO = untreated with weevils, AA and AD = codes for new insecticides

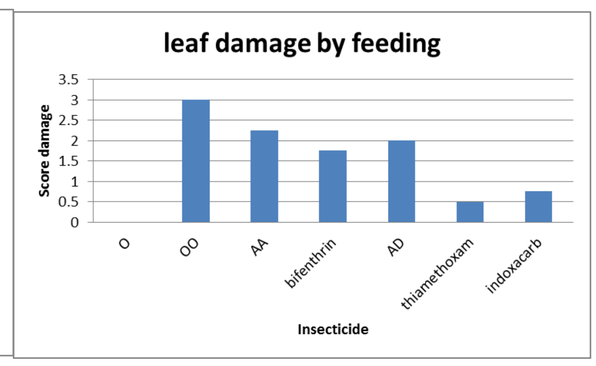

Figure 6. Leaf damage in September 2011. Score key: see figure 7.

Figure 7. Score key feeding damage**:** 0 = no leaf damage, 1 = little damage, 2 = moderate damage, 3 = severe damage

Cage experiment 2012

Results not yet available

Conclusions

- Bifenthrin, AD and thiamethoxam killed black vine weevils and partially prevented feeding damage, at a similar level as indoxacarb.
- These insecticides will not prevent the weevils from egg laying, as less than 50% of the weevils were killed within 4 weeks.

Our other work on vine weevils

- Development of trap and lure for adult vine weevils
- Lure and infect of adult vine weevils

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