

Oviposition preference by the vine weevil (*Otiorhynchus sulcatus*) in relation to red raspberry (*Rubus* spp.) cultivars

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Introduction

Adult vine weevils (*Otiorhynchus sulcatus* Fabricius.) (Coleoptera: Curculionidae) are highly polyphagous insect herbivores, capable of causing significant damage in many production systems.

Whilst adult insects have been recorded feeding upon a wide range of plant species, some plants are poor quality hosts and several studies have reported differences in egg viability and oviposition preference on particular plant species.^{1,2}

However, it is unclear how different plant cultivars affect oviposition behaviour. We investigated the oviposition behaviour of adult vine weevils on nine raspberry cultivars.

Experiments

The influence of raspberry cultivar upon the oviposition preference of the adult vine weevil was investigated using choice and no-choice experiments. Experiments were conducted in controlled temperature rooms at $22 \pm 2^\circ\text{C}$, 16:8 hours L:D. Nine raspberry cultivars were used in the experiments: Glen Ample, Glen Rosa, Glen Moy, Glen Magna, Glen Clova, Tulameen, Octavia, Malling Jewel and Wild. The wild variety is one which has been maintained at SCRI, Scotland, for several years.

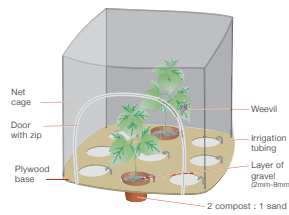


Fig. 1 Schematic of cage setup for choice cultivar experiment

For the choice experiment, one raspberry plant of each cultivar was placed in one of fifteen specially designed cages that held nine plants (Figure 1). An individual vine weevil was added to each cage, where they were left to feed and oviposit for three weeks. For the no-choice experiment ten plants from each cultivar were individually caged and a single vine weevil was introduced to the cage for the same amount of time. After three weeks, the number of eggs laid on each plant was quantified.

Results

The effect of raspberry cultivar on the oviposition decision of the vine weevil was tested using a Poisson Generalised Linear Model with a log link function. The most suitable model was then used to determine whether raspberry cultivar was significant in influencing the egg laying behaviour of the vine weevil.

Choice experiment

- Raspberry cultivar was not significant in influencing the oviposition of the vine weevil.
- The mean number of eggs laid upon a single plant during a three week period ranged from 4.15 (Glen Moy) to 13.92 (Glen Ample) (Fig 2a).

No-choice experiment

- Raspberry cultivar was not significant in influencing the oviposition of the vine weevil.
- The mean number of eggs laid upon a single plant during a three week period ranged from 40.14 (Glen Moy) to 90.75 (Tulameen) (Fig 2b).

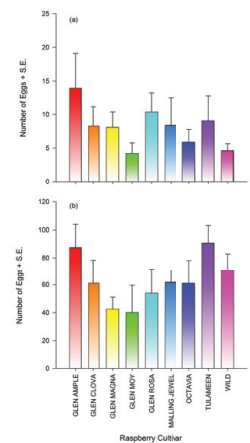


Fig 2. Mean (+ SE) number of vine weevil eggs oviposited upon different raspberry cultivar plants in a) the choice experiment and b) the no-choice experiment. No significant effects of cultivar were found in either of the experiments.

Conclusions

- Raspberry cultivar is not significant in influencing the oviposition preferences of adult vine weevils.
- Previous observations of significant differences in fecundity in relation to the adults' choice of plant have been conducted with wider ranges of plant species, thus there were greater differences for the vine weevil to select between.
- This study is the first, to our knowledge, to investigate vine weevil oviposition in relation to host plant suitability using whole plants. Previous oviposition work has been carried out with excised leaves, which may affect plant chemistry in a way that influences weevil behaviour.

References

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