

Exploiting the aggregation pheromone of strawberry blossom weevil *Anthonomus rubi* Herbst (Coleoptera: Curculionidae): Part 1. Development of lure and trap

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Abstract

This study was the first part of a project to assess the applicability of the male-produced, aggregation pheromone of the strawberry blossom weevil, *Anthonomus rubi*, for commercial monitoring and control. An optimised pheromone lure and trap were developed. Low-cost, robust and reliable polyethylene sachet dispensers containing 100 µl of a blend of grandlures I, II and (±)-lavandulol in the naturally occurring 1:4:1 ratio were shown to have constant release rates of 0.64 and 0.96 mg/day at 20 and 27 °C, respectively and a life of over 8 weeks in the field. Field experiments showed that increasing the release rate by approximately five times marginally increased attractiveness but a four times reduction in the release rate significantly decreased attractiveness. It was concluded that the standard release rate was satisfactory. Male *A. rubi* weevils were shown to produce the *R* enantiomer of lavandulol, but it was also demonstrated that the *S* enantiomer is not repellent and that low-cost racemic (±)-lavandulol is equally attractive. Although (–)-germacrene-D showed a weak synergistic effect when added to the pheromone components, inclusion in a commercial lure was uneconomic. Two further experiments examined the effect of reducing the amount of grandlure I, a costly chemical, in the blend. Although the results of one of these experiments was inconclusive, in the other it was found that reducing the amount of grandlure I by a factor of four did not decrease attractiveness significantly, though the ratio of males to females decreased significantly. A four times reduction in grandlure I content gives a 40% reduction in the cost of the chemicals in the lures. Experiments were carried out to develop an effective and practical trap design. Various modifications of the sticky board trap used in the original work were compared with boll weevil, funnel, delta and sticky stake designs. Most weevils were caught with the sticky stake design, made from a pointed wooden stake inserted vertically into the ground with a band of polybutene sticker around the circumference and a plastic board fixed horizontally on top of the stake to provide protection of the sticky surface from rain. A lure was hung from one corner of the board.

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1. Introduction

The strawberry blossom weevil, *Anthonomus rubi* Herbst, is an important pest of early season strawberries

throughout Western and Central Europe. After laying an egg in an unopened flower bud, the female walks a few millimeters down the flower stalk and partially severs it with her rostrum (Jary, 1932; Alford, 1984). The flower bud withers and often falls from the plant. The larva develops within the damaged bud, pupates, and the adult emerges early in summer. The emerged

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