

Development of odor-based strategies to control seed-eating weevils in clover seed production

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Progress of the project is as planned. Four students/assistants and one postdoc (the latter financed by SLF) have contributed to the project. The applicants and other personnel have met seven times for planning and reporting of results.

We have focused on 1) field-collection of weevils, 2) scent collection and chemical identification of clover volatiles, 3) electrophysiology and 4) behavioral studies in the lab. 1) To explore the arrival time of weevils to the field, we used passive traps in three red clover fields and three white clover fields in south Skåne (one each at an organic farm). We emptied traps once per week during the flight period of weevils. We also noted the degree of flowering in the field. 2) In two of the fields described above (one for each clover species) we also performed regular scent collections, allowing us to compare scents and other field data. Chemical analyses of clover volatiles are ongoing (and satisfactory so far) using gas chromatography - mass spectrometry. 3) To find potential weevil attractants, we performed electrophysiological screening using the most abundant species in white clover fields, *Apion flavipes*. Best results were obtained when recording responses from individual olfactory neurons (Single Sensillum Recording - SSR). Preliminary results indicate that the weevils respond to a large set of compounds. Identification of these compounds is necessary for bioassays. 4) Furthermore, we are developing bioassays in the lab, e.g. Y-tube olfactometers, to study weevil behavior, and the results so far indicate that they are attracted to clover volatiles. Currently, we are trying to make weevils reproduce in the lab, aiming for an all-year resource of insects.

During the fieldwork communication with involved farmers worked well. To inform about the project, we started a homepage (<http://www.lu.se/pheromonegroup/research/control-of-pest-insects-in-clover-seed-production>), and published/are in the process of publishing two articles in "Ekologiskt Lantbruk" (issue 7, 2011) and "Svensk Frötidning" (submitted 2/2).