Inspired by nature: Development of sticky particles for plant defense against insects.

Institute of Biology Leiden, Above-Belowground interactions group 3rd Floor

Glandular trichomes are plant hairs that contain sticky or repellent metabolites that act as a physical and chemical defense against insects. In our project we create sticky particles (trichome mimics) that we spray on plants in order to defend them.

From left to right: Our inspiration are plants with sticky trichomes (1), Chrysanthemum is our model crop that we want to protect (2), Western Flower Thrips (*Frankliniella occidentalis*) is our model pest insect (3, 4). True bugs and predatory mites are the natural enemies of western flower thrips, some of which are adapted to life on sticky plants. (5)

Possibilities for a bachelor project include:

- (1) Investigate population dynamics of thrips and how the induced defense of chrysanthemum against thrips changes after application of sticky particles (full plant assay with thrips and if time permits, metabolomic analysis of induced chrysanthemum leaves).
- (2) Investigate if commercially used predator insects are negatively affected by sticky particles and how well they can walk on sticky surfaces (Petri-dish / plant assays with predators and sticky particles, possibly using plants with sticky trichomes. Behavioral assessment of predators is desired, perhaps by video recording and analysis.
- (3) Investigate another question related to sticky particles e.g. attraction of thrips and predators towards volatiles of treated plants.

Level: **Bachelor or Master**

Recommended for students with an interest in ecology, pest management, entomology, organic chemistry

More info: https://www.nwo.nl/projecten/nwa116018071-0 (or google 'trichome mimics')

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