

Catching bugs with LED lights

The European tarnished plant bug is a pest for growers. LED lights under a water trap can put a stop to this.

The European tarnished plant bug (*Lygus rugulipennis* Poppius) is a serious problem for farmers who grow crops such as aubergines, cucumbers and chrysanthemums. The bugs damage the flower buds, causing fruit deformation or rejection and big losses as a result. Restrictions in the use of pesticides makes catching the bugs the only option. This is currently done using pheromones, but with limited success.

Pheromones (sexual attractants) only catch a fraction of the bugs and only the males. Entomologist Rob van Tol can catch 20 to 30 times as many using a trap with light and water. And he gets both male and female bugs. The trap consists of a tub with a transparent bottom, illuminated from below by white LED light. The bugs are attracted to the light, get into the water and drown.

White light

The use of light to lure insects into water is not new. However, Van Tol explains that previous methods lit the water from above. 'This causes reflection and polarization of the light, which actually repels the insects.' To tackle this issue, Van Tol mounted the LED light under the water. This has the added benefit of protecting the light from the greenhouse sprinklers. Tests in chrysanthemum growers' greenhouses proved the trap works. And surprisingly, it works best with ordinary white LED light. 'That's surprising and frustrating,' says Van Tol. Frustrating because he has no idea why. Wind tunnel tests in the lab show that the bugs have a marked preference for UV-A light (340-



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400 nm) over other colours.

'In the greenhouse, what works best is all colours combined, i.e. white light,' Van Tol explains. 'In the wind tunnel, a single colour, UV-A, works best. That's odd. We

'All colours combined, i.e. white light, works best in the greenhouse'

don't yet know why this is. Perhaps the brightness of the light is relevant. In the wind tunnel, the bugs are released close to the light, while the distance to the trap in the greenhouse may be many metres.'

Test case

Whatever the reason, the result still stands: the light-plus-water trap works. In follow-up studies, Van Tol aims to optimize the setup. 'What proportion of

the bugs flying into the greenhouse can we catch? Can we catch large numbers of bugs, and if so, how many traps do we need per square metre? And importantly, do the results outweigh the investment?'

European tarnished plant bugs must be caught when they migrate, which occurs for a few weeks twice a year in the spring and autumn. It is then that they enter the greenhouse through the open roof vents. Timely detection is of the essence. Van Tol: 'I am currently involved in a new project in which we'll be monitoring pest insects using automatic detection. The light-plus-water trap for European tarnished plant bugs is one of the possible test cases.' RK