Researcher of the IBMCP in the greenhouses of the UPV | Photo source UPV

MODIFIED PLANTS FIGHT PESTS AND PROTECT CROPS

AGRICULTURE & ENERGY

Researchers have developed plants that can produce and release insect pheromones that keep pests away

Spotted: A team of researchers from the Valencia Polytechnic University (UPV) and the Spanish National Research Council (CSIC) has developed genetically-modified plants that could reduce the need for pesticides. The plants have been engineered to release insect sex pheromones that can naturally repel pests.

The researchers worked with the Nicotiana Benthamiana plant, a close relative of tobacco and a common plant used in the 'pharming' of monoclonal antibodies and other recombinant proteins for drug development. It is also the most widely-used experimental host in plant virology. The plants were genetically modified to produce volatile compounds such as moth pheromones, effectively turning the plants into pheromone biofactories.

The pheromones produced by the plant are then released into the air. This would allow the plants to be used for pest control by, for example, causing sexual confusion in male pests, preventing them from finding females and mating. This would then lead to a reduction in the pest population.

Diego Orzáez, a researcher at UPV's Institute of Molecular and Cellular Biology of Plants, explained that the new method could eventually lead to a more efficient way to control some pests. "So far, these pheromones have been obtained by chemical synthesis, and released into the environment by means of biodispensers in order to attract or confuse the insects," he says. "What we have achieved is for a model plant to release the pheromone, which is an unquestionably important step towards crop protection, although it is still too early to transfer these results to the field."

Although pesticides cause a great deal of environmental damage, they are also an important tool in growing sufficient crops to feed global populations. This is why we are seeing a growing number of research teams working on ways to deliver pesticides in more targeted ways – to reduce their effects on non-target plants and animals. Springwise has recently covered a number of innovations in this area, including a bee delivery system for organic fungicides and the use of light to strengthen plants' natural resistance.

Written By: Lisa Magloff

2nd December 2021
Website: upv.es/en
Contact: upv.es/entidades/ACOM/

Download PDF

Takeaway:

While the use of genetically modified crops is controversial, so is the use of pesticides. If the modified plants were developed and approved, they might represent a way to reduce the use of pesticides, which can have many unintended environmental side effects. This method would also be easily reversible – simply remove the 'plant pesticides' and the effects on the target pests will disappear. The next step the researchers are taking will be to improve the plants' capacity to emit pheromones. A paper on the study was recently published in the journal *BioDesign Research*.