

AI in pest control increases its efficiency and environmental impact

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The losses suffered by Brazilian agriculture owing to crop pests and diseases amount to R\$55 billion per year, according to data from the Brazilian Agricultural Research Corporation (EMBRAPA). Agrosmart, a digital agriculture company based in Campinas, São Paulo State, plans to change this situation using Internet of Things (IoT) technology. Agrosmart is developing a connected application that will help farmers apply the right amount of agrochemical at the right time in order to combat pests more cost-effectively and with less environmental impact.

Led by agronomist Marcus Vinicius Sato, Agrosmart's project is based on a set of techniques known as [integrated pest management](#) (IPM), developed in the 1960s to enhance the effectiveness and efficiency of pest control by integrating an array of tools such as chemical pesticides, biological agents (predators and bacteria, for example), light traps and synthetic pheromones.

"The project entails using artificial intelligence to identify and quantify insects," Sato says. Pheromones will attract insects to strategically distributed traps equipped with sensors around the plantation. The sensors, connected to on-board electronic systems, will transmit the data to an internet server, where images will be processed and insects counted and identified. Depending on the number of insects per square meter, agrochemicals may or may not be used. The farmer will receive a ready-made report on these data via smartphone or tablet.

Sato says connection to the internet will be possible even in areas at a

considerable distance from a major city, although this is one of the main challenges for the project. "Internet access in remote rural areas is very difficult. In some places, 3G doesn't work even in the city center," he says. "However, Agrosmart has surmounted this connectivity barrier with customized solutions for every region. If 3G isn't available, we use satellite technology."

Smart traps produced abroad use machine learning technology to identify insects, but they cost too much for Brazilian farmers. "We want to develop a more affordable product," he says.

Agrosmart is already testing prototypes, and the system is highly reliable, especially when well-established pheromones are used to attract the target insect. "So far, the worst error rate we've recorded is 5 percent," Sato says. Different kinds of bait will also be tested. "Part of the project's budget is for travel. We plan to test the system on the properties of farmers with whom we already have relationships in São Paulo State, southern Minas Gerais, Mato Grosso do Sul and Rio Grande do Sul," he adds.

Agrosmart's researchers expect to validate the data and finish the app within 18 months.

Provided by FAPESP

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