Researchers create information technology tool for pest management

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Credit: pixabay user Brett_Hondow

The heat of summer brings to mind various timeless activities: diving into the crisp waters of a lake, sunning on the sandy shores of a beach and, for many, shucking green husks to reveal golden ears of sweet corn.

While sweet corn is a staple for many picnics and barbecues during the summer months, the process leading up to its arrival at the nearest farmers market or grocery store is one teeming with agricultural management decisions. And thanks to information technology (IT) tools, it's becoming easier than ever before for farmers to make these decisions and produce high-yielding (and delicious) crops.

One such tool from Penn State's College of Agricultural Sciences is PestWatch, a geospatial information system (GIS) pest database developed by Shelby Fleischer, a professor of entomology.

Through GIS technology, PestWatch enables users to input and view pest collection numbers and information at various locations across the country.

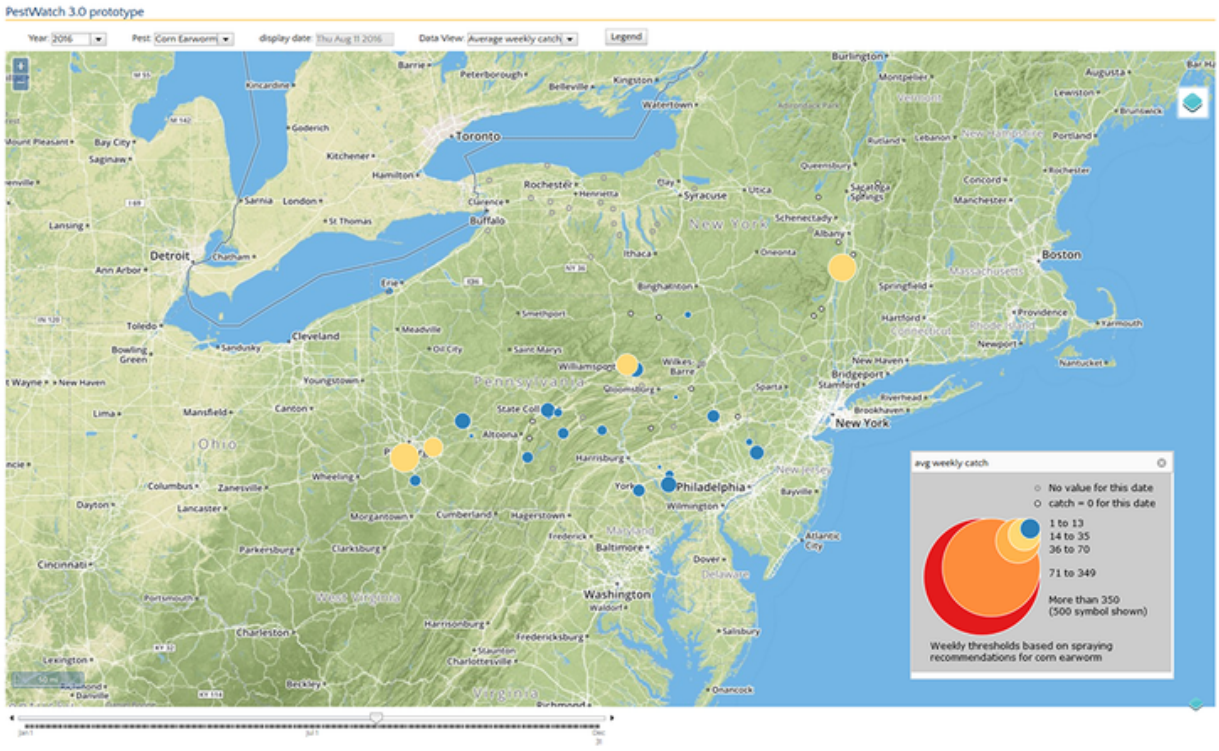
Participating farmers set up pheromone traps to attract various pests (for example, the sweet corn earworm) and monitor the number collected over time. Using the PestWatch tool, users can upload their data, which is then displayed as points on an interactive map.

Data can be filtered by location, pest type or date, and users can also view a time-lapse movie of collection numbers over a period time. Trap locations are currently localized to the northeastern United States with about 40 collection sites in Pennsylvania.

According to Fleischer, PestWatch has existed in various iterations over time, the earliest being brought online in 1999.

"The first version of PestWatch was simply inputting the data into a desktop computer and displaying it on a map as points," Fleischer said. "Eventually, we made the points interactive so when you click on any point you get a graphic of what's happened there over time."

As IT tools progressed, PestWatch transformed from a simple data collection tool to a more advanced database that promotes informed research and management decisions.



The PestWatch program lets users view trap locations as points on the interactive map. Credit: Steve Crawford

"The information technologies are making it much easier to collect and communicate these data trends," Fleischer said. "Before, there was no real way to compile all this data in an easy-to-communicate format, so now the integration of boots on the ground, monitoring and IT modeling is allowing us to sync data collection and communication together."

To bring the IT behind PestWatch to life, Fleischer works with Steve

Crawford from the Center for Environmental Informatics, a Penn State network of programmers and researchers creating innovative tools to improve agricultural and environmental research.

As the primary IT developer for the project, Crawford is always working to improve the open-source PestWatch database while keeping up with the latest technology trends, which include transitioning to a new content management system and programming language.

"I recently dropped all the programming I had learned to do for so many years to learn a new technology, HTML5," Crawford said. "The latest version of PestWatch will be moving away from Adobe Flash and will, instead, be supported by HTML5, which allows us to add extra features to the map."

One of the tool's newest features is a map overlay focused on growing degree-day data, which combines temperature and climate information to help farmers predict pest growth rates.

While these pest control decisions are just one component of agricultural management, innovative tools like PestWatch can help improve crop yield rates and increase financial efficiency for farmers across the country.

"For many farmers, they'll spray pesticides every other week regardless of whether or not they have to," Crawford said. "By using an integrated pest management tool like PestWatch, they can make more informed decisions and potentially save themselves thousands of dollars while also helping the environment."

For Crawford, working on the PestWatch project is an opportunity to influence the future of sustainable agriculture research while providing practical tools for farmers and decision makers.

"I think the tool is a great use of technology trying to improve sustainable farming and ecological research," Crawford said. "It has a much more lasting impact than using the web to post cat videos."

And although cat videos will always have their place on the internet, they don't have quite the same effect as a buttery, steaming ear of corn on a summer's day.

Provided by Pennsylvania State University

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