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TOP STORY

Tools for monitoring: Pheromones improve efficiency of pest traps

By SUE ROESLER, The Prairie Star
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Dr. Gadi V.P. Reddy, entomologist/ecologist at Montana State University's Western Triangle Agricultural Research Center about pheromones as a pest management tool.

Farmers need an array of management tools to deal with yield-robbing insects - pea leaf weevil, wheat stem sawfly, wireworms/click beetles, and others - and pheromone traps can be one of those amazing tools.

“The use of pheromones has not been well studied in the Northern Plains, so we’ve been looking at the different ways pheromones can be used in Integrated Pest Management programs,” said Dr. Gadi V.P. Reddy, entomologist/ecologist at Montana State University's Western Triangle Agricultural Research Center.

Dr. Anamika Sharma, WTARC entomologist/ecologist, is working with Gadi on pheromone monitoring techniques and using pheromones with traps in field.

“With pheromone traps, we can monitor and estimate how many insects are in the field,” Sharma said.

Pheromones are like a mating 'perfume,' made up of chemicals that attract the mating partner of an insect.

“Pheromones are chemicals which help in communication within the species,” Gadi said. “We use them for monitoring, trapping, mating disruption, and attract and kill methods.”

In order to use pheromones in traps, a chemist makes up the compounds in the lab after dissecting the insect’s glands.

“Chemists can identify the compounds, synthesize the pheromones for us and give it to us for use with monitoring traps,” Gadi said.

AT WTARC, Gadi realized pheromones were important for pest management.

“We obtained a grant from USDA-Western SARE and are working with Extension agents and professionals to learn about pheromone-based monitoring techniques,” he said.

As part of the grant, Gadi and Anamika invited entomologists, and professors from MSU, NDSU and Canada, to speak on pheromone trapping and research.

They also invited County Extension agents and other ag professionals to come and learn about pheromones.

“County agents have direct contact with farmers. They will take what they learned here and go back and teach farmers in their region about how they can use pheromones and monitoring techniques,” Gadi said.

All kinds of insects can be monitored with pheromones and traps, including the wheat stem sawfly.

Wheat stem sawfly pheromone traps attract only the male.

“If you remove one sex from the field there is no chance of more population,” he said.

Pheromone traps that attracted the males demonstrate the sawfly is in the farm field, but scientists wanted to make the traps even more attractive to sawflies.

“Not all insects react as well to pheromone - some react more to color. A trap with both will attract the most insect partners,” Anamika said.

They looked at different colors - red, white and yellow - to see which would attract more wheat stem sawflies.

“We found that the yellow-colored traps were more attractive, but we still needed to add the pheromone to attract the right insects,” Gadi said.

What about the wheat midge? Significant damage to spring wheat crops has been reported because of the midge.

Pheromone traps have been used for the last few years to monitor the wheat midge's flight across Montana and North Dakota.

“Pheromones attract the midge's partner insect to a monitoring trap in the field, where it is trapped,” Gadi said.

Researchers and County Extension agents mark the population down on the pestweb site at <https://pestweb.montana.edu/Owbm/Home> for both Montana and North Dakota.

Gadi and team have used the traps every year since MSU came out with their midge monitoring maps.

“We have been monitoring the wheat midge with pheromone traps every year and marking down the data on where there was more population of wheat midges in the state,” Gadi said. “We’ve seen that the wheat midge has been spreading.”

Trap crops can be used to attract pea leaf weevils, as well. Pheromone attractants can be placed in the trap crops to attract even greater numbers of pea leaf weevils.

“A trap crop can be grown around the main crop to attract as many pea leaf weevil as possible,” Gadi said.

In Canada, scientists have been using lima beans as a trap crop for pea leaf weevil.

“We’re discovering there are many different ways we can use pheromones - in traps and trap crops,” he added.

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