

Trapping insects by color: Will it work in Montana?

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Red and green traps attract more sweetpotato weevils than other colors, and a Montana State University researcher who made that discovery wants to know if Montana insects react the same way.

Gadi V.P. Reddy, superintendent and entomologist/ecologist at MSU's Western Triangle Agricultural Research Center at Conrad, said the lessons he learned in Guam and published in the Jan. 2 issue of the *Annals of the Entomological Society of America* will be tested on some of the major pests that destroy Montana's wheat, barley and canola.

Those [insects](#) include adult click beetles (wireworms), flea beetles and wheat stem sawfly. The wheat stem sawfly is the most destructive wheat pest in Montana. Wireworms—tiny white larvae that turn into click beetles – are second only to wheat stem sawfly for insects that damage wheat and barley in Montana. Flea beetles target canola.

Reddy and his collaborators from the University of Guam (Nirupa Gadi, Rosalie Kikuchi, Jenelyn Batista and others) discovered the relationship between colors and trap effectiveness while developing a trapping system for the sweetpotato weevil. They used a variety of traps that used pheromones to attract the insects. Pheromones are chemicals that insects secrete or excrete to trigger a response in other insects of the same species.

Previous studies showed that the sweetpotato weevil, when outdoors, preferred red traps over gray, green, brown, blue, white, yellow or black, with light red being more attractive than other shades of red, so Reddy and his collaborators conducted a new study. That one was conducted indoors, to see if the weevils reacted any differently. Since the sweetpotato weevil is a pest in both the field (outdoors) and storage (indoors),

Reddy said the results are useful in managing the weevil pests.

The scientists discovered that red traps are best when the weevils are outdoors and green traps are most effective when sweetpotato weevils are inside warehouses, greenhouses or other covered spaces. With or without pheromone lures, green traps caught significantly more adult sweetpotato weevils than traps of any other color.

The scientists don't know why color makes a difference, but they will pursue that question in future studies, Reddy said, noting that insects use chromatic cues to identify colors. In the meantime, he has already started testing different colored traps in Montana.

Montana doesn't grow sweet-potatoes and its insects are different from those found in Guam, but the technology to trap them is the same, said Reddy who came to MSU from Guam in June 2012.

Sweet-potatoes are a six-month crop grown in the southern United States, Guam, Hawaii, China and many other areas of the world. The sweetpotato weevil, *Cylas formicarius*, is one of the most serious insects causing damage to sweet-potatoes in the world, Reddy and Gadi said in their newly published paper. They added that without proper and effective control, weevil populations are likely to cause a huge or complete loss of sweetpotato production in sweetpotato growing areas.

Crop damage can range from 30 to 40 percent in the United States to 60 or 70 percent in Guam, to 70 to 100 percent in some African countries, such as Uganda and Nigeria, Reddy said.

"Consequently, there is an urgent need for development of eco-friendly control methods for this weevil," Reddy and Gadi wrote in their paper. "Although some control methods are effective, toxic pesticides applications are detrimental and

damaging to our environment. Although pheromone [traps](#) are currently being used, no effective control of this [weevil](#) was achieved."

Provided by Montana State University

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