

Scientists hope tiny insect can help save soybeans

July 9 2009, By WAYNE ORTMAN , Associated Press Writer

(AP) -- An insect no bigger than a comma is being studied as a natural predator that farmers could use instead of chemicals to protect the nation's soybean crop from aphids.

The question for university researchers across the Midwest is whether the tiny Asian insect can survive harsh winters here.

Researchers are exploring a number of ways to combat aphids without costly spraying. The insects can destroy up to 40 percent of a farmer's crop, threatening a soybean industry worth \$27.3 billion last year.

Such destruction could have big consequences for consumers. [Soybean oil](#) is used for cooking and as diesel fuel. The cooking oil is found in margarine and a vast number of other foods. High-protein soybean meal is fed to chickens, hogs and cattle that end up in the supermarket.

Aphids, also from Asia, suck the nutrients from soybean plants and emit a sticky residue called honeydew that can produce leaf mold.

Under ideal conditions, aphids produce eight to 12 young per day. In four days, those young also are reproducing, said David Ragsdale, professor of entomology at the University of Minnesota and manager of the project.

"It's an arms race, and the best way to get a hold on this is to make sure there are enough natural enemies out there to slow this reproduction,"

Ragsdale said.

The Iowa-based North Central Soybean Research Program has committed about \$3 million since 2001 to aphid research, including the development of a soybean plant naturally resistant to the insects, said David Wright, the group's director of research.

Another possibility researchers are looking at is *Binodoxys communis*, a tiny, parasitic insect that inserts an egg into the aphid. The egg hatches into a larva that kills the aphid, feeds on it and emerges as an adult from what becomes a mummified aphid shell.

Nets are set over soybean plants in dozens of test fields in the Dakotas, Illinois, Iowa, Michigan, Minnesota, Ohio and Wisconsin, so aphid populations can build. Researchers then introduce the parasites, which reproduce in several generations to increase their numbers before the netting is removed.

This summer, fields with test sites in 2008 will be checked for new mummies to see if the parasites survived the winter to attack aphids again.

So far, the results haven't been encouraging, Ragsdale said.

"It may not be the right species," he said. "There are 11 to 15 other species that are in various stages of being evaluated in quarantine labs here and with the USDA in Newark, Delaware."

Kelley Tilmon, a researcher and Extension entomologist at South Dakota State University, said it's not realistic to expect natural predators to wipe out aphids. But if they can be used instead of one insecticide treatment on 5 percent of the state's soybean acreage, it would save producers about \$2.3 million a year, Tilmon said.

The research is funded in part by farmers like David Iverson, who contributes 50 cents for every \$100 in soybean sales to a federally authorized program for soybean promotion and research.

"The last six years, I've had to spray for aphids and it (infestation) definitely reached economic thresholds," said Iverson, who grows about 800 acres of soybeans near Astoria in east central South Dakota.

With insecticide costing \$10 to \$15 per acre, it can add \$8,000 or more to his costs. But the difference between spraying and not spraying can be 10 bushels or more per acre at harvest, said Iverson, president of the South Dakota [Soybean](#) Research and Promotion Council.

To get U.S. Department of Agriculture approval to release the parasite for aphid control, researchers will have to prove it will feed on aphids and not cause other environmental problems. But none of that matters if the parasite can't make it through the winter.

"Then, obviously we're going to have to go to Plan B, and Plan B is looking at a couple other parasitoid wasps for possible release," Wright said.

On the Net:

[http://www.planthealth.info/biological\(underscore\)control\(underscore\)bi_nodoxys.htm](http://www.planthealth.info/biological(underscore)control(underscore)bi_nodoxys.htm)

©2009 The Associated Press. All rights reserved. This material may not be published, broadcast, rewritten or redistributed.

Citation: Scientists hope tiny insect can help save soybeans (2009, July 9) retrieved 24 April 2024 from <https://phys.org/news/2009-07-scientists-tiny-insect-soybeans.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.