

# Pesticide impresses researchers



Kansas State University researcher Bhadriraju Subramanyam is testing the effectiveness of a "green label" pesticide called Spinosad on the lesser grain borer in stored wheat. So far, field trials of the new pesticide, which could replace environmentally harmful organophosphates, have shown the new chemical to be almost 100 percent effective.

Jeff Tuttle/The Wichita Eagle

■ Spinosad, a "green label" pesticide for use in stored grains, is proving quite successful against lesser and greater grain borers.

BY PHYLIS JACOBS GRIEKSPoor  
The Wichita Eagle

They call it the "lesser" grain borer. But it's hardly a "lesser" problem for those who store wheat and mill flour.

There is, in fact, no greater wheat predator than the lesser grain borer,

which destroys from 5 percent to 10 percent of the nation's stored grain every year.

But now, a Kansas State University professor's research is proving that a "green label" pesticide called Spinosad is highly effective against the lesser grain borer, as well as other insect enemies of stored grain. "Green label" pesticides consist of natural organic materials, rather than manufactured chemicals.

Spinosad comes at a critical time for the grain industry because of two factors:

■ The clock is ticking on use of the

organophosphates, the most commonly used type of pesticide. Sales of Reldan, the most common chemical registered for use on stored wheat against the lesser grain borer, are scheduled to end Dec. 31, 2003, with use banned by the end of 2004.

■ The lesser grain borer is becoming increasingly resistant to Reldan. Resistant borers mean more live insects in grain, more eggs and more larvae. That leads to greater losses in available milling-quality grain and an increased risk of insect body parts in milled flour — both things the industry would rather avoid.

Bhadriraju Subramanyam ("Subi" to his colleagues at K-State) has been looking for alternatives to organophosphate pesticides for more than a decade.

Since 1998, he has dedicated his research primarily to Spinosad, a byproduct of bacteria that is lethal to grain borers while proving safe for mammals and the environment.

It is already approved for use on more than 250 field crops in the U.S. and is registered in 52 countries, but not for use on stored grain.

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## PESTICIDE

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Subramanyam's research is the only testing on Spinosad on stored grain in North America.

Subramanyam and his post-doctoral research associate Mike Toews have worked with Paul Flinn and Franklin Arthur, research entomologists with the USDA's Grain Marketing and Production Research Center in Manhattan, to test the product on wheat stored in farm bins.

The results have been astonishing, he said.

"We have no lesser grain borers in the treated wheat. Every month for four months, we have added 400 insects to each bin. We put in lesser grain borers, rusty grain beetles and red flour beetles. So far we have nearly a 100 percent kill rate," he said. "What really surprised us was Spinosad in the laboratory tests was not all that effective against red flour beetles. But in field tests it has been. We also expected the effectiveness to degrade over time. So far, it hasn't."

Dow Chemical owns the active ingredient in Spinosad. When, or if, Dow seeks an EPA label for Spinosad on stored grain will depend on Spinosad's performance in farm trials in Kansas and neighboring states.

A substantial grant from Dow is

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Bhadriraju Subramanyam,  
K-State researcher

allowing Subramanyam to expand his research into possible other uses for Spinosad, including using it to protect bird seed and dog and cat food from insect contamination.

The Kansas Wheat Commission has also contributed \$129,000 to the research and the USDA added \$199,525 for the farm-stored-grain study.

Scientists in other countries are also studying more uses for the chemical. A separate study in Kenya shows that it also kills the larger grain borer, which is a previously unstoppable grain pest in Africa.

"We felt vindicated when we heard that," Subramanyam said. "Some people had suspected our results because they thought nothing can be that good. Then we found out that it's also knocking the socks off the larger grain borer."