CSU researchers say shell serum could save trees from bark beetles

By Bruce Finley
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Richard Stoner, left, president of ArgiHouse, and Jim Linden, a microbiologist at Colorado State University, are two of the men behind a new idea to thwart the pine beetle. (Joe Amon, The Denver Post)

Colorado scientists are liquefying crab and shrimp shells shipped from Iceland to produce a serum which, when poured on pine trees, appears to prevent bark beetles from killing the trees.

The Colorado State University scientists who helped develop the serum propose aerial spraying to treat forests across the Rocky Mountain West, where beetles have ravaged millions of acres. But so far, they have been unable to attract the support of the U.S. Forest Service for widespread application.

"We don't find any downside to it," said CSU microbiologist Jim Linden, one of two scientists guiding commercial production at a factory near Loveland.

Dousing healthy lodgepole pines with the gold-colored serum "certainly is part of the toolbox of ways to counteract the beetle," Linden said. "It is inexpensive and safe."

This is the latest of several methods scientists have proposed to try to combat proliferating pine beetles. Others advocate spraying forests with insecticides, distracting beetles with pheromones and bombarding beetles with recorded beetle sounds that can drive them to crazed self-destruction.

NASA sponsored the initial research that led to developing the serum, which contains chitosan — a carbohydrate found in the shells of crabs, shrimp and the pine beetles themselves. Chitosan can stimulate trees' secretion of sap, which can block beetles from eating into the bark, where they lay eggs and spread a blue fungus that clogs and chokes trees.

A Forest Service experiment in 2003, using loblolly pines in Louisiana, found that chitosan could boost tree defenses.

Linden and CSU horticulturist Ken Knutson are guiding the brewing of a patented chitosan mix at the AgriHouse factory in Berthoud.

AgriHouse found a large supply of mercury-free, partially crushed crab and shrimp shells in Iceland and has had several loads sent to the factory, said company president Richard Stoner.

But nobody has moved toward wide application of chitosan for beetle control, Stoner said.

"What has the Forest Service done for us? They've just let the trees die," Stoner said. "I've offered it up to government agencies to address the pine beetle epidemic. I just want somebody to start using it. We've got a huge problem."

Federal decision-makers in Colorado could not be reached for comment.

"We're not testing it here," said agency spokesman Steve Segin. "We have our own researchers and scientists who need to vet this kind of stuff."

In Idaho, however, Forest Service entomologist Lee Pederson said he is looking into testing chitosan on lodgepoles this summer.

At CSU, research began in the 1990s after NASA sent plants on space shuttle flights — for experiments aimed at understanding how food could be grown on long missions. Fungus repeatedly infected NASA plants. NASA tapped Linden, who supervised investigations of beetles, fungus and sap.

AgriHouse has begun selling its patented "Organic Disease Control" mix at nurseries. Stoner said landowners can apply it for less than $1 per tree, pouring the mix directly beneath branches, and that three applications should suffice to treat a tree.

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