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**Colorado State University Professors Partner with AgriHouse to Bring New Organic Biopesticide From Research Lab to Market to Thwart Pine-Bark Beetles**

**FORT COLLINS** – Two Colorado State University emeritus professors, working with Berthoud-based AgriHouse Inc., have helped develop a new eco-friendly EPA-registered biopesticide that can protect pine trees from bark beetles – a major threat in Colorado and across Western states.

Jim Linden, Professor Emeritus of Chemical and Biological Engineering and of Microbiology, Immunology and Pathology, and Ken Knutson, Associate Professor Emeritus of Horticulture and Landscape Architecture, helped create Organic Disease Control (ODC), a patented formula that increases the sap produced by pine trees. The increase in sap resin boosts tree resistance to the pine beetles by reducing their ability to lay eggs in pine trees.

Initial studies completed in Louisiana with the USDA Forest Service have shown that trees produce 40 percent more sap, which is the tree's natural defense against pine beetles and the blue stain fungal pathogen they carry." said Richard Stoner, president and CEO of AgriHouse, an agri-biotechnology company which is manufacturing and marketing ODC, "The ODC formula provides an organic treatment solution to increase the tree's resistance to the pine beetle infestation, a problem that to date only nature has been able to address through forest fires and lightning."

According to Stoner, AgriHouse is actively marketing ODC. Home owners can apply ODC for less than \$1 per tree. The results of the initial case study with the USDA Forest Service in Louisiana revealed a positive response within 45 days of the first application of ODC to the ground area under pine trees branches, says Stoner.

ODC includes chitosan, the exoskeleton of shellfish, as its principal ingredient. The AgriHouse team holds a patent on the ability of chitosan to induce a defense response by the plant.

It was Linden's research which recognized that ODC molecules "fit inside" receptors attached to the surface of cells in the tree root. According to Knutson, these root networks thrive in the top soil nearest to the tree's drip ring, i.e. the soil directly under the tree branches. Once the molecule adheres to the receptor, a switch is activated in the plant cell that elicits chemical responses throughout the plant and increases plant health, stimulates photosynthesis, and overcomes environmental stresses such as beetle attacks and blue stain fungus infection.

“We’ve developed an environmentally-friendly product that we believe will begin to address the pine-beetle epidemic across Colorado,” said Professor Linden. The 2008 US Forest Study showed the elevated sap output using ODC has the potential to reduce approximately 37% of the pine beetle eggs in treated trees” Linden said.

Professor Knutson comments further: “Based on research thus far, we think we have a new tool to help suppress and slow down the massive pine beetle epidemics currently raging throughout the Western United States.”

#### Research Background

Stoner and Knutson started the company in Stoner’s garage in 1992 after Linden brought the elicitor/receptor ideas to the table. Stoner, Linden, and Knutson filed for their ODC patent in 1994. The NASA sponsored Commercial Space Center at CSU completed ODC elicitation studies aboard the space shuttle and Mir Space Station in 1998. The ODC experiments on adzuki beans were the first experiments of their kind to be conducted on food crops in low-gravity. Linden and his students oversaw the entire scientific effort prior to NASA’s Atlantis launch to the MIR space station, including analysis of cellular responses to ODC elicitation of a defense-related enzyme activity. Linden and Stoner patented ODC nematode protection in 2007. The research results obtained by NASA and others led to the USDA Forest Service case study with ODC in 2008. AgriHouse is conducting additional ODC studies in Colorado on ponderosa pine with the cooperation of Professors Linden and Knutson.” Forest health researcher, Lee Pederson, a PhD entomologist, is conducting a second USDA Forest Service case study on lodgepole pine in Coeur d’Alene, Idaho in Spring 2010.

ODC is available in two sizes, a 1-ounce bottle for \$24.99 (30 treatments) and a 18.5-ounce bottle for \$249.00 (300 treatments). ODC is currently available at nurseries in Colorado and via the AgriHouse website at [www.ODCchitosan.com](http://www.ODCchitosan.com)

#### About AgriHouse

AgriHouse is a leading edge agri-biotechnology company offering advance high performance food production systems for earth and space. The company has a broad portfolio of IP and patents to deliver cost effective green technologies to increase food production, conserve water and natural resources, reduce the reliance on toxic pesticides, and allow plants to regulate their own environmental needs through intelligent bio-feed systems. The University of Colorado, Boulder, CO granted AgriHouse exclusive license to patented leaf sensor technology in January, 2010. AgriHouse received a \$150,000 grant from the National Science Foundation (NSF) to develop the leaf sensor technology for irrigation control. The leaf sensor was beta field tested by the USDA, Greeley, Colorado and at University of Colorado greenhouses in Boulder, Colorado. Stoner is known as the original creator of Aeroponics and AgriHouse offers a line of aeroponic growing systems.

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