ARS, industry cooperation yields device to detect insects in stored wheat

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A laboratory milling device for improving stored grain management has been developed by Agricultural Research Service (ARS) scientists and an industry cooperator.

The system, called the "insect-o-graph," can detect internal insects in wheat that are not visible to the eye or that cannot be detected by usual grading methods. The device, built by National Manufacturing, Inc. (NMI), of Lincoln, Neb., was based on ARS-developed technology.

ARS engineers Tom Pearson and Dan Brabec, in the Engineering and Wind Erosion Research Unit of the agency's Center for Grain and Animal Health Research at Manhattan, Kan., developed the device, which uses electrical conductance signals to monitor wheat as it's milled. If a seed containing an insect is crushed, an electrical spike occurs. The software counts the number of insects in a kilogram sample. This system can detect low levels of infestations such as five to 10 infested seeds out of 30,000 good seeds.

Tracking insect infestations in stored grain is important to ensure grain quality because insect colonies can multiply rapidly over weeks or months, and consume and damage grain as the colonies grow. Insect damage reduces the grain's value, and the grain also requires additional cleaning to remove the insects and damaged kernels.

Grain companies inspect grain as it comes into their facilities and before storage. Before unloading a truck or railcar of grain, a few minutes are

taken to sample the load and inspect the grain. The insect-o-graph can estimate the number of live insects hidden in a one-kilogram grain sample in about one minute.

The device was developed under a formal Cooperative Research and Development Agreement (CRADA) with NMI, and in collaboration with the food manufacturing company General Mills, as part of efforts by ARS to transfer its technology from the laboratory to the marketplace for the benefit of consumers.

A paper describing this work was accepted for publication in the *Journal of Stored Product Research* in 2010 and will be published soon.

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