

# Monsanto Hopes to Sow Benefits by Tagging Seed Packets

The company's Agracetus division is set to launch a pilot next month to evaluate RFID for tracking cases of experimental seeds.

By Mary Catherine O'Connor

Dec. 26, 2007—[Monsanto](#), a multinational provider of bioengineered agricultural products, is planning to launch a technology trial in which it will evaluate the use of passive RFID tags to identify individual seed packets shipped from its [Agracetus](#) research and development facility in Middleton, Wis., to its network of test farms, where new, genetically engineered seed is tested.

The goal of the RFID trial, according to Patrick Richgels, an IT specialist with Monsanto, is to determine if using the tags (instead of the bar codes it currently uses) to identify the packets will significantly reduce the amount of time employees spend shipping each case of seeds to the farms.

In order to learn RFID fundamentals and examine whether Monsanto could benefit from the technology, Richgels joined the [UW RFID Industry Workgroup](#), which is comprised of representatives from a range of industries and meets monthly at the [University of Wisconsin's RFID Lab](#) (see [University of Wisconsin Debuts RFID Lab](#)). The group shares ideas and research around RFID from a business perspective, and also takes part in collaborative research projects and experimentation using RFID.

After attending a number of workgroup meetings and learning the ins and outs of RFID and how other companies were employing it, Richgels worked with Alfonso Gutierrez, the lab's director, to establish a feasibility study within the lab. During these tests, Richgels and the lab staff experimented with both high-frequency (HF) tags, compliant with the ISO 15693 standard, and ultrahigh-frequency (UHF) tags, compliant with the EPC Gen 2 standard, to see how well they could be read on tightly packed, individually tagged seed packets.

The cases Agracetus ships to research farms typically measure 16 inches wide by 24 inches long and carry up to 235 seed packets, so being able to read the individual, tagged packets inside the case was vital. The feasibility tests proved encouraging enough for Richgels to schedule the Agracetus pilot, which he says is set to begin in January 2008 and will last up to six months.

During the pilot, Richgels' team will hand-apply adhesive labels with integrated RFID tags to each packet of seed it ships to the test farms. The serial number the lab staff encodes to each tag will also be printed on the label, both in a bar code and numerals. To verify the contents of each shipment, the team will read the tag on each packet by placing each packed case in front of a fixed-position reader, then record how long it takes to read all the serial numbers. At the test farms, the packets will be received manually, using bar-code scanners to collect each packet's ID.

"After the pilot," Richgels says, "if the performance [of the RFID technology] is proven, we will outfit each

[test farm] with RFID read stations." During the trial, the Agracetus participants will benefit through a faster shipping process, but if the RFID tags are used and read by the test farms as well, the benefits will be spread out to both shipping and receiving the seeds.

In addition, Richgels hopes to use the RFID tags to perform inventory of tagged packets at both the Agracetus location and the test farms, and to locate specific packets within inventory. In preparation for the pilot, Richgels has worked with systems integrator Miles Technology and Avery Dennison's Atlanta Technical Center to select the hardware and software to be used.

As they did for the in-lab feasibility tests, Richgels and his staff will apply both HF and UHF passive tags to the packets for the pilot, to gauge the performance of both. Because HF tags are known to be significantly better-performing than UHF, with faster read rates, Richgels says that when many tags were being interrogated close to one another, he expected HF to win out. However, the lab's feasibility tests didn't show that to be the case. "I expected HF to have a definite advantage over UHF, but in the end it was marginal," he says.

Large groups of HF tags could be read faster than the same number of tagged packets with UHF tags, but Richgels says speed isn't vital to the application he has in mind. "For us, taking five seconds, versus 20 seconds, to read a box of packets...that doesn't make much difference," he says. Either, Richgels adds, would be a tremendous improvement over the 20 minutes or more that staff members currently spend manually scanning each packet's bar code.

Richgels says he is interested in testing HF tags with phase jitter modulation—a method of changing a radio wave's phase to communicate data, created to address applications in which large numbers of tightly packed tags must be read quickly—but says he has no specific plans to do so as part of the upcoming pilot. In addition, Richgels expresses an interest in possibly experimenting with using passive tags to determine location, so that employees could find specific packet within a case by querying for the unique ID number encoded to its RFID tag. Once the pilot is complete, tag price, performance and functionality will all factor into the final tag selection process.

RELATED\_ARTICLES According to Lynn Pias, Monsanto's global manufacturing information technology lead, the seed packet test is likely just one of many RFID projects Monsanto is planning, since it recently joined the advisory board of the University of Arkansas' RFID Research Center and is working to develop pilot ideas with the group. Pias and William Schulz, who heads the Monsanto's global supply chain optimization/analytics efforts, are both representing Monsanto on the advisory board.

The center, housed in the Information Technology Research Institute at the school's Sam M. Walton College of Business, has managed RFID research projects and studies for the likes of Wal-Mart, Tyson Foods and logistics firm J.B. Hunt. According to a press statement released by the RFID Research Center, Monsanto is supporting the center as a way of connecting with developing RFID applications, to share its experiences with the technology with other companies, and because it is interested in how RFID could improve the efficiency of its supply chain and improve customer service.

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