

Media Relations

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K-STATE ADVANCED MANUFACTURING INSTITUTE DEVELOPS PATENTED PHOSPHORUS RECOVERY SYSTEM TO ASSIST KANSAS FEEDLOTS AND FARMERS

MANHATTAN -- The bioprocessing team at Kansas State University's Advanced Manufacturing Institute in collaboration with the Kansas Environmental Management Associates, has developed a new patented process for recovering excess phosphorus from feedlot waste streams to create a slow release granule fertilizer.

A patent application has been published for "Fluidized Bed Precipitator With Optimized Solids Settling And Solids Handling Features For Use In Recovering Phosphorus From Wastewater."

"Over the past few years, the Environmental Protection Agency has been working on legislation to limit the level of phosphorus in crop field runoff," said Gina Becker, AMI bioprocessing team leader. "One of their main concerns is the use of wastewater from concentrated feeding operations. As a result of legislation, people in the industry across the nation are looking for economical ways to reduce phosphorus levels prior to applying it to fields."

Protecting the environment while assisting feedlot operators and farmers became a goal for K-State's Advanced Manufacturing Institute when DT Search and Designs, a technology development company in Saint Joseph, Mo., came for assistance in developing a multi-pronged water treatment process for concentrated animal feeding operations, Becker said.

"Through an initial market research project, we found that phosphorus reduction was becoming a large issue for many concentrated animal feeding operations," Becker said.

Becker said the Advanced Manufacturing Institute facilitated a meeting between DT Search and Designs and KLA Environmental Services, who formed a joint venture called Kansas Environmental Management Associates. This company sponsored the development and is working to commercialize the technology, Becker said.

"In the first phase of the project, we developed a phosphorus recovery process on the bench-scale in a laboratory," Becker said. "Once this proved successful, we developed a pilot scale version that operated on a K-State feeding operation pond, called a lagoon. After this testing was complete, we moved to a fully automated farm-scale process at Supreme Cattle Feeders in Liberal, Kan.

"For each phase, the system design was refined to account not only for engineering scale-up issues, such as changes in mixing, settling and heat and material transfer dynamics, but also for practical matters associated with moving from a controlled laboratory to an outdoor operating feedlot," Becker said. "The system is designed to reduce phosphorous levels between 40 and 60 percent, depending on the initial ion concentrations and nutrient management requirements of any particular feeding operation."

According to Kylo Heller, director of development at Kansas Environmental Management Associates, "The system solves two problems; it helps feedlots cost effectively remove phosphorus and meet EPA regulations, and the granules allow for more efficient phosphorus distribution from high concentration areas to low concentration areas. Kansas feedlots benefit from this process because it allows them to be competitive in an industry where regulatory compliance costs are increasingly burdensome and it concentrates the phosphorus so that it is easier to transport further distances."

Angela Kreps, president of KansasBio, said, "I have been an advocate of the phosphorus recovery system since the initial discussions and am encouraged by the work of the Advanced Manufacturing Institute and Kansas Environmental Management Associates. Phosphorus recovery creates innovation in value-added agriculture, and I appreciate the benefits it specifically provides to rural Kansas."

Rich McKee, senior vice president of the Kansas Livestock Association said, "We found the staff at the Advanced Manufacturing Institute to be genuinely invested in our projects. The AMI team is professional, caring and dedicated. They have been a pleasure to work with."

Other partners with similar interests in phosphorus reduction include the Kansas Livestock Association, KLA Environmental Services, Inc., Kansas Bioscience Authority, Kansas Corn Commission, Missouri Life Science Research Board, United States Department of Agriculture and the Environmental Protection Agency.

The Advanced Manufacturing Institute is a part of K-State's College of Engineering and a Kansas Technology Enterprise Corporation Center of Excellence that provides engineering and business services to develop products and processes. More information on the institute is available online at <http://www.amisuccess.com>.



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