New Process Makes Swine Wastewater Environmentally Friendly

WASHINGTON, D.C. — Agriculture Secretary Ann M. Veneman announced recently that USDA scientists have developed a process that can remove phosphorus from swine production wastewater and turn it into a solid, marketable fertilizer, while converting the leftover effluent into a liquid crop fertilizer that is more environmentally friendly than manure.

"This technology is a good example of how agricultural research can provide benefits to everyone through environmental protection and improvement," said Veneman. "This research provides an opportunity to help farmers better protect the environment and enhance the soil they use for planting."

The process was developed by soil scientists Matias Vanotti, Ariel Szogi and Patrick Hunt at the Coastal Plains Soil, Water and Plant Research Center, operated by USDA's Agricultural Research Service in Florence, S.C. ARS is the chief scientific research agency of USDA.

The new process has several positive implications. Removing phosphorus from wastewater can cut down on any excess phosphorus that may run off into streams and rivers. Excess amounts of phosphorus can lead to oxygen depletion in water bodies.

During processing, hydrated lime precipitates most of the phosphorus in the wastewater as a solid and converts it into a marketable phosphate fertilizer. This phosphorus could be a boon to the fertilizer industry, because world reserves of the nutrient are limited.

Another benefit is that the high pH achieved by the process destroys disease-causing pathogens present in the leftover liquid.

Meanwhile, the effluent contains a nitrogen-to-phosphorus ratio greater than 12 to 1-ideal for crop irrigation, which requires an 8-to-1 ratio. Regular manure offers a nitrogen-to-phosphorus ratio of 4 to 1.

This higher nitrogen-phosphorus ratio translates into less excess phosphorus on land on which the treated wastewater is applied.

A patent application has been submitted for the combined nitrogen- and phosphorus-removal processes, which will be tested through next summer at a full-scale demonstration facility that opened earlier this month in Duplin County, N.C.