# Making Manure More Environmentally-Friendly

## *Fly Ash, Alum Shown To Stabilize Phosphorus*

PHILADELPHIA — In keeping with the increasing overall awareness of environmental issues, dairy, hog, and poultry farmers across the country face growing governmental regulation and public demand to manage a huge quantity of animal manure in an environmentally friendly manner. Using animal manure as a fertilizer is problematic because the large amount of soluble phosphorus in manure is prone to runoff losses in waterways, contributing to water-quality problems in many streams, rivers, and estuaries.

Scientists at the University of Pennsylvania's School of Veterinary Medicine have found an economical and effective way to stabilize manure phosphorus by lowering its solubility using fly ash — the fine, often airborne particles derived from the burning of coal. When fly ash materials were mixed with dairy, hog, or broiler manures, water-soluble phosphorus decreased by up to 80 percent. Another additive, alum (aluminum sulfate), also reduced water-soluble phosphorus dramatically.

Fly ash materials are easily obtainable at minimum cost from coal-combustion power plants. The results of the 2001-2002 study, which was funded by the U.S. Environmental Protection Agency's Chesapeake Bay Program, appeared in the July-August issue of the Journal of Environmental Quality by the American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America.

(Turn to Page 13)