

Arsenic in field runoff linked to poultry litter

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Fields amended with poultry litter can accumulate significant levels of arsenic, according to studies by USDA-Agricultural Research Service (ARS) scientists and associates. These findings provide key information about the agricultural pollutants that can build up in agricultural soils over time - and possibly migrate into nearby streams and rivers.

Poultry producers have sometimes supplemented chicken feed with roxarsone, a compound containing [arsenic](#), to control parasites and promote weight gain. Most of this arsenic is excreted by the birds and then becomes mixed in with sawdust and other litter materials used in poultry houses. Farmers typically use the litter as a nutrient-rich—and free—fertilizer for amending their crop soils.

Chemist Clinton Church, who works at the ARS Pasture Systems and Watershed Management Research Unit in University Park, Pa., led this research. His partners included University Park soil scientist Peter Kleinman, support scientist Lou Saporito, research leader Ray Bryant and University of Maryland Eastern Shore scientist Arthur Allen.

For two years, the team measured arsenic levels in runoff that flowed from farm fields into seven drainage ditches in the Delmarva (Delaware, Maryland, Virginia) Peninsula, an area dominated by large-scale poultry production for decades. Runoff measurements indicated that annual arsenic losses from these fields could range from 0.004 kilograms per hectare to 0.071 kilograms per hectare. Runoff with the largest arsenic loads was recorded in a ditch closest to a main point source of the contaminant—a shed where litter was stored.

They team also tracked phosphorus runoff, as it are known to interact and compete with arsenic. During storm events, both pollutants exhibited similar behavior. However, their concentrations differed significantly between ditches and showed no seasonal patterns. This suggests that management practices for phosphorus are unlikely to be applicable to arsenic.

This study highlights the importance of controlling point sources of arsenic and other chemicals and suggests that management practices—such as properly storing dry litter and controlling litter spills outside storage facilities—can help protect local regions from the migration of arsenic and other agricultural pollutants.

Results from this research will be published in the November/December 2010 issue of the *Journal of Environmental Quality*, a publications of the American Society of Agronomy, the Crop Science Society of America, and the Soil Science Society of America.

Provided by American Society of Agronomy

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