

# [HYDROSEEDING]

**M**aryland farmers are finding themselves up to their heads in ... well, you know what. During the growing season and winter, they have nowhere to spread their chicken litter, which consists mostly of manure. Until spring rolls around, they are left with a huge pile of it.

This chicken litter naturally raises an erosion control concern when it rains, especially when the nutrients are running down into the groundwater and eventually contaminating the Chesapeake Bay. That is why the Dorchester Soil Conservation District (DSCD) is helping the University of Maryland (UM) College of Agriculture and Natural Resources find new ways to keep nutrient loss at bay.

## Keeping Nutrient Loss at Bay

Maryland searches for new erosion control methods to protect the Chesapeake Bay

By Bryce Goodell

### The Scoop on Coops

Chicken litter is a mixture of manure, feathers, wood shavings, etc. It starts in poultry sheds, which generally include a roof and clay-filled bottom to prevent manure from getting wet and nutrients from seeping into the soil. The manure in these sheds can continually build for up to three years, and what may start as a thin base of wood shavings can develop into a layer of chicken litter more than a foot thick.

When litter is removed from a poultry shed, it usually gets stockpiled in a field—sometimes for up to six months—until it can be spread prior to planting crops. The problem is that

when it rains, nutrients run off a pile and are subsequently flushed into the Chesapeake Bay.

### Nutrient Loss

DSCD recommends keeping manure at least 50 ft away from ditches and waterways in order to protect the bay water from contamination, but nutrients do not typically travel more than a few feet to the side of a stockpile; they go straight down into the groundwater. To confront this contamination problem, federal and state regulators started recommending that farmers cover their litter stockpiles with plastic to protect them from the rain. While it seems like a simple solution, it causes a few problems.

cake, which it otherwise does naturally. When rain falls on an exposed pile, nutrients are initially lost.

“People assume there is nutrient loss, but they aren’t sure how much,” said Jim Newcomb, Jr., district manager for DSCD. That is why UM is conducting research to determine best management practices for mitigating nutrient loss.

### Mitigation Research

Multiple litter piles along the East Coast are being tested in this experiment. Some piles are covered with plastic; some are placed on pads; one pile is covered with hydroseeding consumables; and another is a control to see how many nutrients are lost in an exposed pile. Probes are placed



*A tackifier and paper mulch slurry is one of several chicken litter pile erosion solutions being tested at UM.*

First, to cover a litter stockpile with plastic and anchor it with tires is time-consuming. Next, the plastic is prone to getting blown around and ripped. Then, when the litter is finally spread, the large sheet of plastic is thrown away and clogs the landfill. Worse yet, plastic may actually contribute to nutrient loss.

As manure is moved and stockpiled in a field, it tends to generate heat. Then, when the pile is covered in cold temperatures, the rising heat from the pile contacts the cold plastic and moisture condensates. The condensation runs down the pile, and nutrients are lost into the ground. Furthermore, the plastic sheet does not allow the litter pile to form an outer

approximately 4 to 5 ft beneath each one, and the university periodically draws samples to test nutrient loss.

The experiment includes a few types of pads, which consist of an impervious material that is laid down in a field, and litter piles are placed on top. The first is made of concrete, a material that is certainly waterproof but very expensive. Next is a soil cement pad, which is a slightly cheaper alternative. The other type is composed of clay, which may prevent nutrients from reaching the groundwater, but in Maryland good clay is hard to find. Pads may prevent nutrients from running straight down, but runoff occurs if nutrients reach the end of the pad, according to Newcomb.

The team also wanted to find a way that allowed the litter to create its own cake naturally while giving the pile a protective coating. "That's where the hydroseeding idea came in," Newcomb said. "We wanted something that was sticky and would create a shell."

After talking with Wolbert and Master, a Finn equipment dealer in Edgewood, Md., the research team decided to try using a Finn HydroSeeder to spray StikPlus on a litter stockpile. StikPlus combines Finn's HydroStik and FiberPlus consumables, resulting in a specially blended tackifier that enhances the physical bonding of fibers. The product is often used in temporary erosion control applications, where it is mixed with mulch and then sprayed on steep slopes to prevent wind or rain from washing away dirt and seed prior to germination. The slurry is biodegradable, so it gradually decomposes as new vegetation grows.

"I thought we should double the recommended amount," Newcomb said, considering the chicken litter was not a typical application for StikPlus. "But the researcher said, 'No, let's just do the normal rate.'"

The product was mixed with seven bales of paper mulch and sprayed over 100 tons of chicken litter. To apply the slurry, the DSCD borrowed the county's hydroseeder, which had been funded by the district for highway seeding and landfill projects. When the crew was finished, a .25-in. layer of the green slurry covered the pile.

A few weeks after the application, the area received rain. DSCD staff discovered that the litter was still creating an outer cake as desired; about 8 in. into the pile, they found moist manure. "The water that's soaking into the pile isn't taking nutrients with it," said Newcomb. "But the real question is if the StikPlus is repelling water." UM has not yet disclosed sensor-reading findings.

The litter pile will be gone in May 2009, and the university wraps up its research shortly thereafter. Newcomb, however, hopes to continue testing other products, including an alternative daily cover used by landfills. While the results on

hydroseeding consumables are still not available, the DSCD may have found a sticky solution to a sticky situation. **SWS**

**Bryce Goodell is public relations writer for The Promersberger Co. Goodell can be reached at 701.492.9194 or by e-mail at [bryce@promersberger.com](mailto:bryce@promersberger.com).**

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