

Proper animal waste management and the Bay

COLLEGE PARK, Md. — Which is a source of pollution to the Chesapeake Bay: A farm or a factory?

Most people would say a factory, but both answers are correct.

According to the Environmental Protection Agency (EPA), of the more than 146 million pounds of nitrogen that enters the Bay annually between March and October, 67 percent comes from nonpoint (diffuse) sources. Approximately 90 percent of the nonpoint load comes from cropland.

Like their industrial counterparts, many of today's farms are highly specialized. An individual farm may house hundreds of head of cattle or swine, or thousands of chickens.

These meat, milk and egg operations produce a staggering amount of by-product in the form of animal waste. This includes the manure, urine and waste milk produced by the animals and the bedding and wash water used to keep their quarters clean.

According to the U.S. Soil Conservation Service (SCS), over 10 million tons of manure are produced on farms each year in just Maryland.

Where does it all go? Most is put back on the land as fertilizer. Applied at recommended rates, that's enough to cover an area the size of Baltimore and Washington, and a six-mile swath in between, with a layer a half-inch thick.

Applied to cropland, animal waste is a resource for the farmer, says Whitey Secor, a resource conservationist for SCS.

It provides nutrients for crops, and improves the physical condition of the soil. It also reduces the need for expensive chemical fertilizers.

Animal waste is a problem when it is improperly handled, he says. Applied on wet or frozen ground, it easily washes off into streams and rivers.

"Animal waste contains nitrogen and phosphorus. If you let it run off or leach into water, it'll cause the

same kind of problems as chemical fertilizers," Secor says.

Nutrients like nitrogen and phosphorus do the same thing in water as they do on land — stimulate plant growth. The problem arises from overenrichment, says William Magette, an agricultural engineer at The University of Maryland.

"The nutrients in animal waste stimulate the growth of algae. When the algae die, bacteria work on the algae to decompose them and, in the process, consume oxygen from the water.

"The dead and living algae cells cause the water to cloud, blocking out the sunlight needed by submerged aquatic vegetation. These are the plants that provide food and habitat for higher level creatures like the blue crab," says Magette.

What can be done to prevent animal waste pollution?

"Proper handling is the key," says Secor. "And that means having a waste management system that handles manure, disposal problems and runoff control."

An animal waste system includes "best management practices" that are tailored to the needs of each farmer. It takes into account the type and number of animals, farm size, feed, crops, equipment and the farmer's budget.

One of the key components to a



good waste management system is storage, says Secor.

"Without storage, you're into daily spreading. When farmers do that, they tend to spread on convenient fields, perhaps because they're dry or close to the barn.

"This can overload the soil with nitrogen. Any nitrogen not taken up by the plants will leach down into the groundwater and enter a stream through subsurface flow."

With a storage structure such as a lagoon or pit, the wastes can be stored until conditions are right for disposal.

Storage also saves time and labor by eliminating the hassle of daily hauling and spreading, and saves aggravation during inclement weather.

Like commercial fertilizer, animal wastes should be applied according to plant needs. Nutrients content in manure will vary, depending on the type of animal, kind of feed, type of storage and method of application. Nutrient

content can be analyzed by a laboratory, or estimated from standard charts.

Knowing the spreader capacity and the rate of application is also important. This is especially critical with poultry manure, which is very high in nitrogen.

"Disposing of poultry manure is a problem," says Secor, "because spreaders can't be adjusted to apply it at low enough rates."

The best time to apply animal waste to fields is in the spring or fall, when it can be incorporated into the soil for use by the crop.

In fact, says Secor, SCS designs waste structures for a minimum of 180 days of storage. "This gets the farmer through the winter without having to spread on wet or frozen ground when runoff is more likely to occur."

Care should be taken to apply animal waste far enough away from streams to avoid contamination.

Erosion control is another important part of a waste management system, since phosphorus attaches itself to soil particles and enters streams, tied to sediment.

Soil conservation practices such as grass waterways, contour strip-cropping, no-till farming, or diversions may be needed to control runoff. Pastures should be fertilized to assure good plant growth to hold soil in place. And animals should be rotated among

different fields to prevent overgrazing.

Pollution can also be caused by what Secor calls "direct deposit." This happens when cattle go to a stream for water.

"What goes in one end, comes out the other. That's direct deposit," he explains.

Secor recommends providing alternative watering sources by siphoning water from a natural spring or pond to a watering trough. If a stream must be used, it should be fenced and the open areas protected with stone riprap. This will keep the animals from congregating in the stream and trampling the banks.

Cost is an important consideration in deciding whether to build a waste storage or treatment structure. The average cost of a manure storage structure for a 100-cow herd ranges from \$20,000 to \$50,000. Although the government offers various cost-share incentives, the farmer has to bear the brunt of the cost.

"Waste storage and treatment structures may not be economically feasible for all farmers," Secor says. "But every farm with animals should have a waste management system. It could be as simple as planting grass filter strips along streams or practicing good soil conservation. It'll pay off in better resource management and water quality."




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