

Poultry Litter Could Be Fertilizer Alternative

WOOSTER, Ohio — Poultry is big business in Ohio — the state ranks first in the nation in egg production alone.

That also means Ohio ranks pretty high in something else, too — the production of poultry litter. Farmers need a safe, economical way to put that material use.

Researchers from the Ohio Agricultural Research and Development Center, including Warren Dick in the School of Natural Resources and agronomists Jay Johnson and Donald Eckert, are searching for environmentally sound ways to use it on the farm.

Poultry litter — a mixture of manure and bedding material — contains significant amounts of nutrients that are essential for plant growth. The nutrients found in poultry litter are the same as those found in commercial fertilizers. Most important are the macronutrients nitrogen, phosphorus

and potassium. These nutrients, however, may not be present in the same ratio as needed in a fertilizer program for crops.

The chemical composition of poultry litter and soil factors can both influence the amount of nutrients released and the rate at which they are released. "In general, net nitrogen mineral release seems to be more rapid from fresh poultry litter applied to coarser textured soils than from aged or composted litter applied to fine textured soils," Dick said.

There are several possible poultry litter application strategies. "One is to apply litter so soil will receive the desired amounts of phosphorus, and then add commercial potassium and nitrogen fertilizers as needed," Dick said. "Another method is to apply enough litter so that the proper amount of nitrogen will be released into the soil. The second

method increases the risk of oversupplying phosphorus and potassium — and that could be adversely affect soil and water quality."

The best method to determine the appropriate rate of application of poultry litter is to have it tested in a soil testing laboratory. The amount of nutrient per unit volume of litter can be calculated from the nutrient and moisture content of the sample.

The nutrients in poultry litter depend upon the type of bedding that was used and the feed source. For example, calcium supplements are fed to egg layers. These supplements increase the pH in the litter, and in turn, increase the potential for nitrogen to be lost as ammonia gas.

Dick recommends farmers develop a field priority system to maximize the nutrient value of the litter. The system should be based on fields that require larger

amounts of nitrogen for crop growth, those that have the lowest phosphorus and potassium soil tests, and those that will benefit from organic amendments added to the soil.

"The time of application is extremely important," Dick said. "A fall application will allow the litter to decompose and release nutrients for the next year's crop. On the other hand, fall applications also provide the greatest potential for nitrogen and other soluble nutrients to be lost by leaching and denitrification. Spring applications may interfere with other types of farm applications."

If possible, the litter should be tilled into the soil immediately after application to avoid gaseous losses of nitrogen and runoff of other nutrients. "This is especially important for egg layer litter which has a high pH."

For no-tillage crop production,

Dick said it may be possible to try timing applications just before a rainstorm, or use subsurface placement to apply the litter. Buffer strips may need to be used to protect surface waters when the litter is not tilled into the soil.

The nitrogen in poultry litter is primarily available the first year after its applied. The ammonium nitrogen and approximately 1/3 to 1/2 of the organic nitrogen will be available the first year after application. "Some of the nitrogen may be lost to leaching, incorporated into soil organic matter, or will remain fixed in the soil," Dick said.

The amount of nitrogen available the second year depends upon how the crop was grown and the climatic conditions of the previous year. "A soil treated once will carry over almost no nitrogen the next year, but soil treated annually for five or more years may carry over more than 10 percent of the applied nitrogen," Dick said.

Testing the soil is the best way to determine how much or how little to use and when or if to use poultry litter. Bray P1 soil-test phosphorus levels should not be greater than 30 PAM in the top eight inches of soil. If the soil tests exceed this level, special precautions should be taken.

"In general, it is best to avoid litter application rates that add more phosphorus to soil than is removed by the crop," Dick said.

For more information on poultry litter as a soil amendment, contact your local county office of Ohio State University Extension, or write to Warren Dick, School of Natural Resources, Ohio Agricultural Research and Development Center, 1680 Madison Ave., Wooster, Ohio 44691.

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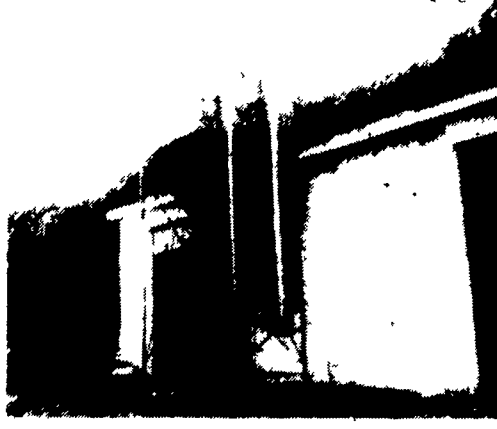
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