



FactSheet

Extension

Ohio State University Extension Fact Sheet

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Horse Manure Management The Nitrogen Enhancement System

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Introduction

Ohio has a large number of horses stabled in suburban counties near each large city. Managing horse manure in suburban areas is often a problem because land, to properly store and utilize the manure for crop production, is limited. In addition, when horse manure is mixed with sawdust or wood chips, and spread on farm fields, it often stunts crop growth. Since farmers don't want to stunt their crops, the horse owner has few good options for disposing of manure. Frequently, it is simply stacked outside until the pile gets so big that a neighbor complains and the manure must be hauled to a landfill.

Why Does Horse Manure Stunt Crops?

Actually it doesn't; but sawdust or wood shavings do. These wood products are the most common bedding used for horses. When horse manure and sawdust (or shavings) are put on soil the microorganisms in the soil start to break them down. Unfortunately, these wood products have a lot of carbon that the microorganisms use for energy but not enough nitrogen to build protein. In other words, the microorganisms have an unbalanced diet and they need nitrogen. They find that nitrogen in the soil and they collect it more efficiently than plants do. In fact, they do it so well that the plants growing in the soil can't find enough nitrogen to grow properly. That's called an "induced nitrogen deficiency" and it stunts crops.

The Nitrogen Enhancement System

The horse owner or the farmer can add nitrogen fertilizer to the manure/sawdust mix or to the soil. The added nitrogen can be used by the soil microorganisms to break down the manure/sawdust mixture. Therefore, they won't need to steal soil nitrogen from the growing crops. The fertilizer should be added to the manure prior to spreading it on the soil. Another option is to work the fertilizer into the soil after the manure has been applied.

What Kind of Fertilizer and How Much?

Use only ammonium nitrate fertilizer with an analysis of 34-0-0 or ammonium sulfate with an analysis of 21-0-0. Other types of fertilizers (especially urea) can be lost into the air in a manure pile and do no good. Add about 10 pounds of ammonium nitrate or ammonium sulfate per ton of horse manure/sawdust mix. This is about 1/3 pound (about 1/2 cup) of ammonium nitrate or ammonium sulfate per 1,000-pound horse per day.

Add the ammonium nitrate as the stalls are cleaned. Simply pick a stall clean with a manure fork, then add about 1/2 cup of ammonium nitrate or ammonium sulfate (for a 1,000-pound horse) to the manure and bedding in the wheelbarrow or spreader. Adjust the amount of ammonium nitrate or ammonium sulfate if the horse is much smaller or larger than 1,000 pounds. For example, only about 1/4 cup of ammonium nitrate or ammonium sulfate per day would be needed for a 500-pound pony. Apply the ammonium nitrate or ammonium sulfate to the manure only after it has been removed from the stall.

Manure Storage

After the ammonium nitrate or ammonium sulfate has been added to the manure/sawdust mixture it can be held in proper storage for several months without losing the nitrogen. It can then be brought out of storage and spread when the field and crop conditions are best. Manure should be stored at least 50 feet from any drainage-way or water-course and a grass filter strip should be used to limit runoff. Check with your local Soil and Water Conservation District or the Natural Resource Conservation Service for technical help on a wide variety of resource management questions including manure application, utilization and storage. In some cases, the state or federal government may be willing to cost-share, with the stable owner, on the construction of a manure storage structure.

Application Rate

The amount of horse manure/sawdust that can be safely applied to a soil is based primarily on the nutrient needs of the crop, the soil nutrient levels, and the nutrient content of the manure/sawdust mixture. For more information on calculating manure application rates and managing manure systems see the following Ohio State University Extension publications:

- [Ohio Livestock Manure & Wastewater Management Guide, Bulletin 604](#)
- [Land Application of Waste... Spreading and Injection, AEX-707](#)
- [Land Application of Animal Manure, AGF-208](#)
- [Application of Organic Materials on Soils Used for Crop Production, AGF-211](#)

These publications should be available through your local county office of Ohio State University Extension.

Once amended with ammonium nitrate or ammonium sulfate, horse manure and sawdust bedding can be beneficial for soils and crops. Like other organic materials, it contains nutrients for plant growth and can improve the general condition of the soil.

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