

MANURE MANAGEMENT FOR NUTRIENT CONSERVATION

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It has only been a few years since manure was considered more of a waste product than what its potential is today - a valuable replacement for expensive commercial fertilizer.

Many farmers are very concerned in changing their manure management from everyday spreading or field stockpiling to building or constructing a storage structure to be able to store and only have to spread in the spring and again in the fall. A 1400 lb cow will produce 18-20 tons of 80-85% moisture manure per year. This fresh manure will contain an average of 10 lb N, 5 lb P_2O_5 , 8 lb K_2O per ton. It has been estimated that with daily spreading and delayed incorporation a loss of 5 lb N, 2 lb P_2O_5 and 2 lb K_2O can occur. If manure is spread in the winter on side-hills, this loss usually can be much greater, especially during spring run-off periods. Prices for commercial N is 30¢/lb, P_2O_5 25¢/lb and K_2O at 15¢/lb. Using the above figures the fertilizer value of a ton of fresh manure is worth \$5.45 or \$109 per year per cow. Taking the average loss as stated above, you stand a potential loss of \$2.30 per ton, or \$46 loss per cow per year.

Besides these values, manure has much greater values in improving physical properties of the soil. This improved soil structure results in increased soil porosity for better aeration and drainage, reduces compaction and crusting, increases soil water holding capacity, protects the soil surface run-off and soil erosion, and adds trace minerals to the soil. At the present time, we have a number of manure storage structures in operation. Earthen pits with milk-house waste are perhaps the least expensive and most common. Most of these have a push-off ramp and the manure is loaded from the top. A ram pump can be incorporated to load the lagoon from the bottom. Manure from these structures is handled as a liquid.

The picket-dam storage allows the liquid portion and any rain water to seep out and the liquid portion is contained in a lagoon. The manure from these type of structures is handled as a solid. The covered storage, which uses a ram pump to load is also in use in our area. Planking is used for a gate and can be removed for unloading. Milk-house waste and rain is not allowed in this storage so that the manure is handled as a solid.

With the use of any of these storage structures, manure handling can be accomplished much more efficiently. By being able to spread continuously in the spring prior to planting and again after cutting corn, the manure can be incorporated into the soil as soon as the field is covered. By doing this, much of the ammonia N is not lost from volatilization as it does when just spread and left on the surface. Research shows that it is much more efficient and less wear and tear on equipment to spread in this manner than by everyday spreading.

With the use of liquid manure, proper agitation before unloading and complete emptying to prevent solids from settling onto the bottom and incorporation as soon as possible, is a must to conserve nutrients and to reduce odors. A spreader tank with injectors is the ideal way to handle liquid manure if your soil is not too stony.

Coming about shortly will be the installation of a methane generator where the manure passes through a digester, methane gas is produced from this breakdown of the organic matter and the remaining manure from this is stored for field application.

If you are going to substitute manure for commercial fertilizer, I feel that you are going to have to know how much manure you are applying per acre and to better determine its nutrient content. With N at 30¢ per lb and a potential loss of at least 50%, the amount applied per acre and how it is stored and how soon it is incorporated, will all determine how much commercial fertilizer you will be able to save without affecting yields.

COMPUTERIZING MASSACHUSETTS SOIL TEST REPORTS

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Soil samples being sent to the Suburban Experiment Station in Waltham for analysis will now have reports generated by the computer. In working on this project we hope we have made soil testing more meaningful to growers and home gardeners. On the following page is an example of a soil analysis report for agronomic and vegetable crops. The upper half of the report presents the actual soil test results generated from the soil sample you sent in to be analyzed. Recommendation provided to commercial growers are presently limited to the amount of limestone needed to adjust the soil pH in the plow layer to the desired level. In the future we hope to be able to incorporate recommendations for fertilizer applications. Until then advice can be sought from your regional specialist.

Comments about this report are welcomed by the authors. We realize there will be factors we have not taken into account, but these can only be detected and resolved as the system is put into operation.