MARYLAND COOPERATIVE EXTENSION
UNIVERSITY OF MARYLAND
COLLEGE PARK•EASTERN SHORE

Fact Sheet

Fact Sheet 439

Using Sewage Sludge on Farmland

Sewage Sludge Use

More and more fanners are using sewage sludge as a fertilizer on farmland. Sewage sludge usually is free and can represent a significant cost savings to farmers. However, there are precautions that must be taken to maintain productive soil and prevent environmental contamination. The following is a summary of what you should know and do when you decide to use sewage sludge.

What is Sewage Sludge?

Sewage sludge is the waste product collected from municipal sewers. It is a mixture of human, commercial and industrial wastes. The sewage sludge can be in a raw state in which only some of the water has been removed or it can be the solids resulting from a chemical or biological treatment process. In either case, before sewage sludge can be applied to farmland it must be treated to prevent the spread of human diseases.

How is Use Regulated?

The Maryland Department of Environment (MDE) regulates the generation, treatment, handling, storage, distribution, disposal and use of sewage sludge. This department requires the operator of a town or city wastewater treatment plant that produces sewage sludge and the person who uses (that is collects, handles, treats, stores, transports, applies to land, or disposes of) sewage sludge to have permits.

The permits require that sewage sludge be analyzed and that users adhere to specified sewage sludge treatment methods and land application rates. These requirements are designed to minimize the impact on the environment resulting from the disposal of sewage sludge on farmland. MDE Has established acceptable treatment methods and has defined procedures for the calculation of maximum application rates.

As a farmer who receives sludge, you are not required to obtain a permit unless you transport or apply the sewage sludge yourself. This means that if you let a contractor apply sewage sludge to your land, only the contractor must have a valid permit. However, the permit is specific to your land, and your agricultural practices must comply with the permit requirements.

Why Regulate Use?

Permits issued by MDE maintain a degree of safety in the use of sewage sludge. Safety is a major concern because sewage sludge may contain heavy metals such as copper, lead, chromium and cadmium. If sewage sludge is applied to the soil in excessive amounts over a number of years, unusable crops, injured or dead plants and heavy metal pollution of rainfall run off may result. In addition, sewage sludge usually contains ample amounts of nitrogen and phosphorus, which if applied to land at excessive rates can result in surface and ground water pollution and reduced crop yield. Finally, sewage sludge can also contain measurable amounts of PCB's, other toxins and carcinogens.

Preapplication Decisions

Deciding whether or not to use sewage sludge on your farmland is not an easy decision. To help you make the decision review the considerations in the box (next page). Also contact your local Extension office for additional information.

If sewage sludge is to be applied on your farm by a contractor, he or she will be responsible for developing the information required for the permit application and the payment of application fees. The permit application requires that the state notify local governments; that citizens in the locale of the application site be allowed public information meetings on the permit; and that a prepermit site inspection and a review of all written comments prior to approval be conducted.

You should be involved in the selection of fields, crops and expected yields. Confer with your Extension office to ensure the best use of sewage sludge on your land before submitting any information for permit application.

Preapplication Considerations

- Sludge adds organic matter, which improves the physical properties of the soil.
- Sludge may contain heavy metals that build up in the soil with continued sludge applications. High amounts of these metals can be toxic to plants and have an uncertain impact on the food chain.
- Sludge may contain organic chemicals, which, when used in excess, may be toxic to some crops and can pollute the ground water.
- Sludge adds plant nutrients.
- Annual sludge applications are based on nitrogen as a limiting factor with metal accumulation limiting the number of years of application.
- The nitrogen and phosporus contents usually are very high, often resulting in high soil phosphorus levels, and possibly nitrate pollution of ground water.
- Because the potassium content in sludge usually is low, requiring a supplemental fertilizer may be necessary.
- Most crops can be grown on land which has received sludge. (However, note limitations).
- The nutrients and heavy metals in sewage sludge may be variable. The analysis provided by the contractor is at best an average of monthly samples and may not truly represent any one truckload sent to your farm.
- Years after sludge application low soil pH may allow more rapid toxic metal release to plants.
- Some food processing companies refuse to purchase products grown on sludged land.
- Sludge contractors obtain all permits, are responsible for all sludge analysis and apply sludge to your land at no cost to you.
- Odors emitted during sewage sludge application periods may cause complaints.
- You must farm your land according to the provi- sions of the permit as long as the permit is in effect.

What Does the User's Permit Specify?

A permit to apply sewage sludge specifies the land area and cannot be transferred. The land must be fanned according to the plan set forth in the permit. Deviations from this plan must receive approval by the state while the permit is in effect. The permit allows all food crops to be grown with the condition that edible food parts cannot come into contact with the sludge for at least 3 years after sewage sludge application. Tobacco cannot be grown on land that has received sewage sludge. Pastureland cannot be grazed within one month of receiving sludge.

The permit has a term of from 3 to 5 years but can be renewed if all conditions of the permit have been satisfied. Minor modifications of crop species, sludge application rates or methods, sludge analyses, haul routes or vehicles require review and approval by the state. A modified permit is issued and fees collected before such modifications can be made. All other intended modifications are considered major and require a new permit application.

The permit establishes the upper limits of application based on the nitrogen and heavy metal content with the sewage sludge. The nitrogen content of the sewage sludge must be balanced with the expected soil productivity and nitrogen requirements of the crops to be grown. Note: *You cannot request a greater application rate if the permitted rate is limited by heavy metals. However, if the upper limit is based on nitrogen you can increase that limit through an appeal process. You must have documentation of previous high crop yields or expected crop yields in addition to those used in the permit calculations.*

The permit requires specific soil pH conditions before and after the application of sewage sludge. The pH must be 6.5 or higher at the time of the sludge application and must be maintained above 6.2 for the term of the permit. Some sewage sludges contain high concentrations of lime (pH 10 or above) and should receive careful consideration before application to land that is already at an optimum soil pH. A lower soil pH may allow excessive plant uptake of heavy metals from the sewage sludge and movement of some metals within the soil.

The permit also

- limits the land slope on which sludge can be spread or injected;
- requires a soil depth to bedrock or ground water of at least 2 feet;
- requires that the sludge be incorporated into the soil unless specific practices are implemented to ensure no adverse impact of surface applications;
- defines buffer zones to property lines and other structures;
- restricts application during adverse weather and soil moisture conditions;
- establishes any other restrictions deemed necessary by the state; and
- allows state or local health officials access to the premises at reasonable times to inspect any records kept under the terms of the permit, to inspect any monitoring, management or control efforts, to sample ground or surface waters, soils, sludge or other materials used on the site and to obtain photographs.

A permit can be revoked or suspended if misrepresentations were made in the application; if violations of the health code or the permit exist; if a health official has been denied access to the premises; or if a nuisance, danger, or persistent odors exist. Sludge application will be suspended until corrective action has taken place. However, the use of land that has received sewage sludge must continue to conform to the permit requirements for the term of the permit. The state can extend the term of the permit if necessary to control land use for health or environmental reasons.

The permit holder is required to post bond to ensure that the provisions of the permit are carried out. However, the liability is limited to fulfilling the needs of the permit and is in effect only during the term of the permit. Any additional or long-term liability for future physical or environmental damage on the part of the landowner or sewage sludge user remains undefined.

What Precautions Must I Take?

- Contact MDE if you are a new landowner to determine if any previous owner of this land applied sewage sludge. The state maintains land records of sewage sludge applications.
- Make sure that you have a written agreement with sludge contractors outlining when and how sludge is to be applied; that you must be supplied with frequent summaries of the amount of sewage applied to your land and the area covered; and that you have control of your land and can stop sludge application at any time.
- Make sure that your agreement makes the contractor fully responsible for physical damage to any land, roadways, equipment, animals, humans or structures during sludge applications on your farm and outline a procedure for damage assessment and compensation.
- Do not allow application during wet soil conditions. Wet conditions promote soil compaction even with floatation type tires.
- Do not allow loaded vehicles where they can become stuck. Do not allow unloading to the soil if a vehicle does become stuck.
- Always observe what is going on and make your interests and presence known to the sludge contractor. Keep in mind that the contractor is being paid by the sewage treatment plant to dispose of sludge and that your land is the disposal site.
- Do not be afraid to complain to the contractor if you believe that something is wrong. Know who to call in the local or state regulatory agency with a complaint. Contact your Extension agent for assistance. Make sure that the truck weight tonnage delivered divided by the acres covered does not exceed the permitted rate.
- Make sure the sludge is uniformly applied. Do not be afraid to require a lesser application rate (the permitted application rate is the maximum allowable).
- Request copies of all sludge analyses and review these with your Extension agent to ensure that you understand what is being applied to your land.
- Keep records of how and what quality sludge was applied to each field so that in the long term you do not exceed the limits of toxins or metals.
- Plan your fertilizer program so that you fully account for and supplement the sludge applications. Obtain assistance from your Extension agent.
- Maintain the soil pH at near neutral levels to retard metal release.
- Maintain soil records so that you and future users or owners of your land will understand the need for soil pH control. (The degree of the liability of the landowner for future environmental or other damage resulting from sludge application to his or her land has not been established.)
- Remember that the use of sewage sludge requires a long term commitment to proper soil management.

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by

Herbert L. Brodie
Extension agricultural engineer
Departmetn of Agricultural Engineering

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