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Waste Management
Field Handbook

Chapter 11 Waste Utilization

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Chapter 11 Waste Utilization

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651.1100 Introduction

Water and air quality protection requires proper management of organic waste from agricultural operations. Recycling of agricultural waste materials by land application for plant uptake and crop production is a traditional and proven waste utilization technique. Properly done, recycling by land application and crop uptake is an environmentally sound method of waste management.

The primary purpose of this chapter is to give information on utilization of livestock and poultry manure. It describes methods for applying animal waste to land and lists cautions and restrictions for specific methods. Other methods are discussed, but not presented.

Other waste utilization methods include handling products of solids separation and composting, biogas generation, and wetlands creation. Solids from solids separation operations can be used for bedding for livestock; they can be mixed with grains and other materials and re-fed to cattle; and they can be dried, bagged, and sold on the retail market. Liquids from the solids separation operation must be accounted for in waste management operations.

Waste materials can be used for biogas generation. The gas can be used for powering electricity generating equipment, the electricity from which can be either used onfarm or sold to a local utility. The gas can also be used directly to run heating equipment for some livestock, such as farrowing houses or pig nurseries, and for poultry operations, such as egg laying operations. The volume of waste material and the content of elements do not diminish significantly through the biogas generation process.

Composting of organic materials to reduce their reactivity or to stabilize the material is a viable waste management component. The agricultural producer must have the necessary skills and equipment to manage composting operations, and there must be a need for or use of the composted material. Waste that needs to be managed using composting techniques include dead bird carcasses (poultry) because an environmentally safe utilization alternative is not available and such highly unstable nitrogenous mate-

rial as livestock manure because adequate land is not available or the crop nutrient needs are insufficient. Sale of composted materials as nursery rooting materials or on the retail market makes composting a viable waste utilization component.

Use of constructed wetlands falls peripherally under the utilization topic in terms of providing a nutrient source for aquatic vegetation associated with the wetlands. The primary function of wetlands used in waste management systems is treatment. Effluent from wetlands should be monitored to assure that state water quality standards are being met. Influent quality of wastewater being supplied to the wetlands should be checked to assure that nutrient strength is not excessive for the aquatic vegetation involved.

Agricultural land is also the recipient of many other wastes, such as municipal wastewater and sludge, food processing waste, and waste classified as hazardous under the Resource Conservation and Recovery Act. These other wastes have widely varying characteristics requiring special design considerations that are not treated in this handbook.

Utilization of waste agrichemicals is not in the scope of this chapter. The chapter on pesticide management describes how to properly manage and dispose of waste agrichemicals (to be added).

Other than those where the waste products are used by offsite sources, waste treatment options described above have a resultant waste material that must be used on the farm. The option available to the farm owner/operator ultimately comes down to land application for recycling purposes. Consequently, this chapter's primary function is to provide information on utilization of animal manure and wastewater applied on agricultural land for crop production and environmental protection.

As a review of information presented in chapter 9, consistency of the waste controls how the waste is handled. Total solids (TS) content in the waste controls consistency. Wastes are classified in four categories according to their consistency—solid, semi-solid, slurry, and liquid. As the moisture content varies, the handling characteristics vary. Chapter 4 gives the moisture content of manure (feces and urine) as excreted; however, changes in consistency as moisture

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