

# Improving Compost Use through Application Methods

R. Alexander, C. Wagner



*Dairy Compost Utilization*

In the past, inefficient application methods have been a major barrier to the increasing use of compost in agriculture and horticulture, but that barrier is rapidly fading. Not only is special equipment becoming available, but compost producers and marketers often provide spreading services in combination with compost purchases.

Spreading equipment currently available varies in size, cost, technique and purpose and the efficacy of the compost application often depends on proper equipment selection. Being more knowledgeable of application equipment increases the value of the compost purchase and allows a user to take full advantage of the benefits of a compost material. The specific application method and selection of equipment compost depends upon several factors.



*In large applications, the composted material is typically delivered to the application site in large trucks. Additional equipment is then often needed to load the compost into the unit for application.*

- Know the **characteristics of the product**. Application equipment is specially designed to handle excessively dry or moist products. Particle size is also important. Most equipment is designed for products with consistent characteristics; thus, contaminants such as stones and sticks can efficacy.
- Know the **conditions of the application area**. Compost application equipment varies in size and spreading capability. Therefore, accessibility and size of the application area is an important factor. Finally, the equipment may be self propelled, tractor pulled or manually driven, which also affects equipment selection.
- Know the **desired amount and rate of compost**. For small projects, compost may be obtained in bags, but for larger projects, compost may be obtained in bulk and transported to the site by truck. The desired rate is also important as application equipment varies in ability to accurately apply very small or very large rates.
- Know about **past experience or use of equipment**. Some equipment used to apply compost today has not been specifically designed with compost in mind. The majority of units was engineered to apply agricultural by-products, such as manure, lime, fertilizer, mulch, or sand-based mixes and was modified to apply compost.

## AGRICULTURAL APPLICATIONS

Two main types of compost applications in agriculture involve broadcast and row applications. For example, crops such as coastal Bermuda grass typically require a broadcast application in which compost is applied topically over a large area, yet specialty crops such as watermelons utilize row applications to concentrate compost in smaller, defined areas.

PREPARED IN COOPERATION WITH THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY  
AND U.S. ENVIRONMENTAL PROTECTION AGENCY

The preparation of this report was financed through grants from the U.S. Environmental Protection Agency through the Texas Commission on Environmental Quality.

Broadcast applications such as flail, slinger and spinner-type units project the compost from the rear of the spreader into the air. Flail units, which use paddles to broadcast the product from the rear of the unit, were developed to apply products with a higher solids content and are able to apply wider strips in the application area. Slinger units have a spinning drum with teeth that slings product up to 200 feet. These units can handle materials with higher moisture content such as ash, wet lime and biosolids. Spinner units rely on centrifugal force to project product from the rear of the unit. They work best on drier, denser materials that are fine in texture. Spinner units are typically used to apply compost in agricultural applications and at application rates of five to ten tons per acre or less.



*This broadcast application, utilizes a spinner unit, which projects compost from the rear of the spreader at a calibrated rate of 10 tons per acre.*

Topdressing units for broadcast applications include brush and cylinder-type units, in which a rotating, cylindrical brush projects the compost down towards the soil surface. Both broadcasting and topdressing units have the ability to apply low (1/4 to 1/2 inch layer) or high (1 inch layer) rates of compost. When rates of one inch or more are desired, piles of compost are strategically placed throughout the site and a grading blade, York rake or front-end loader/bull-dozer blade is used to spread the compost. While this method

may not provide an accurate application rate, it is typically more efficient as most large-scale compost spreading units are not able to apply rates greater than 1 inch and thus would require multiple application trips through the field.

Moisture content and particle size of the compost is very important when broadcasting compost. For example, “box spreaders” or modified agricultural spreaders (used for commercial fertilizer or lime applications) often have difficulty spreading coarse or wet compost.

Row applications use both flail and slinger-type units, which can discharge compost from the side of the unit. Flail units with a side discharge were developed to apply products possessing higher solids content in narrow strips, or rows. Tractor trailers have even been fitted with flails to allow large volumes of compost to be spread. The most common slinger unit also side discharges manure. It applies a thin layer of material between planting rows and can apply compost to a depth of 1/2 to one inch over a raised nursery bed.

## **TURFGRASS APPLICATIONS**

The best time to add organic matter in the form of compost to turfgrass is before planting or during establishment. In such cases, compost can be added at higher rates and incorporated thoroughly into the soil. Once the turfgrass is established, however, topdress applications of compost can be effective.

These topdress applications often use brush or beater drum/rotating cylinder-type units, which were designed to apply sand-based mixes for golf courses and athletic fields. Brush units use a spinning bristled brush to project

materials at the soil surface. These units can handle product with a moisture content of over 50 percent, as well as somewhat coarse materials. The units are typically used to apply a one-eighth to one-half inch layer of compost, wood chips or sand/compost blends. Beater drum/rotating cylinder type units were designed to apply thicker application rates of high bulk density (sand-based) mixes over large open turf areas. The unit is extremely versatile, having the ability to apply a  $\frac{1}{64}$  to three-inch layer of various materials. The unit is primarily used for golf course and athletic field applications and may be fitted with a finishing brush to break up product clumps and project the material more uniformly onto the soil surface. Blower type units can also apply compost for topdressing, however, obtaining accurate application rate with a blower type unit can sometimes be difficult.



*Turfgrass application units, like this one shown above, are extremely versatile and can accurately apply compost at varying rates.*

## **SPECIALIZED APPLICATIONS**

Compost is often used as a mulch material to manage erodible soils, for decorative purposes or to provide organic matter to vegetated beds. Such applications often require special placement of compost around existing plants or release of compost in inaccessible areas.



*Smaller units like this pneumatic/blower, propel compost through a wide hose which can be directed around plants and other objects. It also works well when applying compost to slopes and roadsides.*

For erosion control berm applications, a pneumatic/blower type unit works well in that it can apply materials precisely and in inaccessible areas, using a hose of up to 300 feet in length. Larger blower-type units have been used to propel the compost up to 200 feet. This newly marketed technology was designed for products with a particle size of two inches or under in length and those possessing a moisture content of no more than 40 to 45 percent. Since typical composts do not meet these requirements, it is a common practice to combine compost with wood chips, sawdust or other wood material to create a mulch-type material. Larger capacity units (truck and trailer mounted units have a 20 to 60 cubic yard capacity) can also reduce the need to reload during application, which significantly improves efficiency. In the instance when such large applications are not required, applying the material by hand or with a basket type spreader is appropriate. In addition to blower units, newer slinger-type units have recently been fitted with devices that allow them to create berms as well.

Roadside slope applications use slinger units to apply the material. These are usually larger, pull-behind and truck-mounted units for use on highway and reclamation applications. These units can handle materials at higher moisture content such as ash, wet lime and biosolids. They can treat steep slopes and sites where accessibility is limited.

## **SELECTING AN APPLICATION METHOD**

The key to efficient application of compost, as well as other products, is making sure the product being applied is compatible with the equipment being utilized. If it is not, an alternate piece of equipment should be used or the product's qualities should be modified. This typically can be accomplished by screening the product or by drying it to reduce its moisture content.

Finally, rely on the compost manufacturer and/or marketer as a resource for compost application services. Combining the compost purchase with the application service may prove to be more economical. However, if application services are not provided with your purchase, the compost producer will likely be able to direct you towards a business or individual who can meet your application needs.



*Similar to the unit equipped with a hose, this roadside application is also spread with the pneumatic/blower technology. However, in this application, the unit is equipped with a side blower allowing for more coverage and mechanized application.*