



ORGANICS FACT SHEET MAY 2006

Compost and Application

Compost has proven to be an excellent product for a variety of horticultural, turf, agricultural and environmental applications. However, even with its proven effectiveness, its usage has sometimes been limited because of inefficient (therefore expensive) application methods. To use compost on many projects, end users must be able to estimate the cost of compost – delivered to the project site and applied. Remember, compost is not as efficient to apply as certain well-known products, such as dry and granulated fertiliser products, which have specialised (but inexpensive) equipment developed for their application. Compost is often moist, which causes it to 'bridge' onto itself and other materials, and it can be of irregular shape and size, depending on how it is screened.

However, thanks to the growing popularity of compost, and the experience and ingenuity of technology developers, equipment is now available which can help get compost applied on the ground efficiently and inexpensively. Whilst the majority of this equipment was not designed specifically with the intent of applying compost, much of it can still be utilised very effectively. Further, some composters in Scotland and the rest of the UK are now offering spreading services to help establish their business and help their customers more extensively utilise quality green waste compost.

The specific equipment used to apply compost, depends upon several factors, including the

- physical characteristics of the product;
- type and size of application or project; and
- field conditions

The most pertinent physical characteristics which affect the type of equipment used in the application of compost are moisture content and particle size.

The overall coarseness of the product, as well as a products content of large inert contaminants, such as stones and sticks, can limit the effectiveness of specific application equipment. Furthermore, most equipment was developed with the concept that it would apply a physically consistent product. The majority of this equipment was engineered to apply agricultural by-products (manure), chalk (lime), fertiliser, mulch, or sand-based topdressings.

However, as the majority of Scotland's PAS 100 composters manufacture a consistent product size of between <10mm and <40mm, this proves to be of less significance than some other regions.

The size of the project also influences how the product should best be applied. For small planting or mulching projects, compost may be obtained in bags and spread by hand using a rake. For larger projects, compost may be tipped on site in bulk, then applied by wheelbarrow and rakes, or spread using a tractor drawn grading blade. The accessibility and location of the site may also influence the type of application equipment which may be used.

Further, the structural stability of the soil and its moisture content may limit access of large or heavy spreading equipment. All of these issues should be kept in mind when considering how compost is to be applied.

Application Techniques

There are six basic types of spreading units used to apply compost, and they can generally be described by their mode of application: beater drum/rotating cylinder, brush, flail, pneumatic/blower, slinger, and spinner:

Beater drum/rotating cylinder type units were designed to apply heavier application rates of high bulk density (sand based) mixes over large open turf areas. The unit is extremely versatile, possessing a large volumetric capacity and having the ability to apply 3mm to a 75mm 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.



Brush type units use a rotating bristled brush to project materials towards the soil surface. For this reason, they apply materials very neatly. Brush units were developed to apply sand-based mixes onto turf for golf course and athletic field applications, but have been used extensively to apply compost in topdressing applications. Almost every golf course owns one of these spreaders. Many of the units possess quite a small volumetric capacity, but others are moderate in size. *Some newer brush units have even been designed with compost in mind (larger capacity, less expensive).* Brush type units can apply compost possessing a moisture content of over 50%, as well as somewhat coarse materials. The units are typically used to apply a 3mm to 12mm layer of compost, soil, sand, or sand based products.



Flail units use paddles to project materials (up and out) from the rear of the spreader, and were historically designed for spreading manure on farm applications. These types of units can be found in almost every farm community. They possess a moderate volumetric capacity and were developed to apply products that may be 'sticky' in nature. Flail units apply material in somewhat narrow strips, but are not as precise or neat in their application as other types of units. Manure spreaders are very common pieces of equipment, and may be easily modified (by hooding the flails) for use in topdressing compost.



Pneumatic/blower type units are probably the newest type of spreader technology being marketed. The units were originally designed to apply mulch, wood chips, sawdust and other wood type products. However, they are now commonly used in North America to apply compost (and even transport related materials to rooftops). The units are best for applying products possessing a particle size of 50mm in length or under and a maximum moisture content of 40-45%. Although operating most efficiently with products possessing specific characteristics, the unit's greatest advantage are their ability to apply materials precisely and in inaccessible areas using a hose that can be up to 100 meters in length. Larger capacity units can also reduce the need to reload during application, which significantly improves efficiency. Lorry and trailer mounted units can possess from 1 to over 30 cubic meter capacity. Blower type units can be used to apply compost for topdressing, as well as thicker applications for soil incorporation and erosion control.



Slinger type units use a rotating drum with teeth to sling materials up to distances of over 50 meters. The most common slinger units are side discharge manure spreaders, used primarily in farm or agricultural applications. Larger pull behind and lorry-mounted units also exist for use on highway and reclamation applications. These units can handle materials possessing higher bulk densities, as well as those which possess a higher moisture content, such as ash and biosolids. Side discharge manure spreaders are used primarily to apply a thin layer of material over open fields, but have also been modified to apply materials in planting rows (using shields that deflect the material downward). The larger slinger type units are used on steep slopes and sites where accessibility is limited.



Spinner type units use centrifugal force to project product from the rear of the unit. The units possess 'V' shaped hoppers and belt or chain driven floors which transport the materials to the 'spinners'. This category of spreader was designed to spread seed, lime, fertiliser, and road salt/cinder. They work best on drier, denser materials which are fine in texture. It has been shown that if the angle of the hopper walls on these units are too shallow, then wet materials can have a tendency to stick (bridge) onto them. Spinner units are typically used to apply compost in agricultural applications and at application rates of up to 10 tons per hectare or less.



Conclusions

The key to efficient application of compost is making sure that the product being applied is compatible with the equipment being utilised. If this is not the case, an alternate piece of equipment should be used, or the product's characteristics should be modified. Product characteristics can typically be modified by screening, or by drying. Furthermore, the application equipment being utilised should fit the overall project requirements. If the application site is prone to compaction, consider fitting the spreading equipment with floatation tyres to reduce the weight per square centimeter.

History has shown that as the composting industry grows, more compost producers and marketers get involved in product application, to make it easier for their customers to use the product in a greater variety of applications. Some composters offer spreading services, while others identify companies that can provide this service to their customers. Some composters even lease equipment to their customers, or allow them to borrow it under particular circumstances. The next time you consider using compost on a particular project, ask your compost supplier if they can provide you input regarding the best method to 'get it on the ground'.

Ron Alexander is the President of R. Alexander Associates, Inc., a company specialising in organic recycled product and market development (www.alexassoc.net). He works in N. America and Europe, often assisting Remade Scotland.

Remade Scotland

Caledonian Environment Centre
Glasgow Caledonian University
3rd Floor
Drummond House
Glasgow
G3 6RN

Tel: +44 141 273 1416
Fax: +44 141 582 0451
E-Mail: remade@gcal.ac.uk