

EFFLUENT MANAGEMENT – Compost turners and watering systems

Composting can be done with a range of machinery including front end loaders and windrow compost turners. While a front end loader may seem a good option because it is most likely available on farm, dedicated compost turners are likely to produce better compost because the windrow is mixed more thoroughly. Some turners are also able to add water to the pile during turning, improving the process and saving time.

Windrow turners

A wide range of windrow turners are available in Australia. Windrow turners come in a large range of sizes and types, including:

- Three point linkage units
- PTO driven trail behind units
- Self powered units (turner is driven off a separate engine but mounted to a tractor)
- Self propelled units

Two common examples of turners are shown in the photos below.



Photo 1. Tractor drawn windrow turner with water application during turning.



Photo 2. Self propelled windrow turner

The scale of the operation will usually determine the size of compost turner required. Three point linkage models are available for small to medium scale composting, while trailing units are suitable for larger windrows and can turn larger amounts of compost in shorter periods of time. Self-propelled turners are suitable for large scale operations where a significant amount of material needs to be turned quickly. Some features to be considered when purchasing a compost turner include:

Dimensions of windrow – Three point linkage models can generally turn a windrow of less than 3.5 m high, whereas a self-propelled turner can turn windrows from 3.6 to 7.5 m high by 1.6 to 3.3 m wide. This affects the total amount of compost that can be turned, and the total area required for composting as smaller windrows require more space because of the need for traffic alleys between the rows.

Turning rates – Turning rates will vary with the size and type of turner. Three point linkage turners are limited to a turning rate of between 200-400 m³/hr, while tractor drawn turners may have a turning rate of 400-800 m³/hr. Self-propelled turners can turn at rates of 1200 – 6500 m³/hr.

Turner Requirements – Check the power requirements of the turner in relation to your tractor. Three point linkage models will require about 50-60 horsepower while a PTO driven trailing turner may require an 80 horsepower tractor. Tractors will require a creeper gear to travel at a slow speed. Hydraulic assist features are available for turners to remove the need for a creeper gear.

Straddle vs Auger – Straddle turners turn the windrow in one pass and therefore the windrow width must conform to the width of the length of the drum.



Photo 3. Brown Bear Auger compost turner

Auger turners use paddles to lift and move the compost. As they move down the windrow, the compost is moved to one side, reducing the space between windrows. These are good for composting in small areas as it limits the need for tractor space beside the windrows.

Applying water to windrows

Water is an important ingredient that needs to be added to the windrow regularly during the composting process. There are three main methods for adding water to windrows.

- Water tankers
- Irrigation systems
- Applying water while turning (hose drawn or tractor drawn tank)

The choice of the watering system usually depends on the location of the water source in relation to the composting facility and the quality of water being used. If water needs to be accessed from a distance then tankers may be the best option, however for a co-composting operation where maximum water usage is the intention, the ideal is to install a permanent water supply system.



Photo 4. Irrigation watering system set up on a compost windrow.

Applying water during the turning process generally results in the most even application of moisture throughout the windrow. Irrigation systems must be carefully managed to ensure even, thorough wetting throughout the windrow. With effluent it is recommended that larger nozzle sizes are used to reduce blockages. Irrigation systems have the disadvantage of additional removal and set up before and after each turning, increasing the labour demands.

Purchasing a windrow turner

A major consideration when buying a compost turner is cost. The size and type of turner (three point linkage, tractor drawn or self propelled) have the largest affect on price. The prices below were collected from a range of manufacturers and suppliers in Australia to provide a general price range in 2007 (prices are shown excluding GST).

The following list of suppliers is provided as a service to farmers, it is not intended to be comprehensive, nor does FSA Consulting endorse or recommend any make or dealer over any other. Omission of any make of compost turner or dealer does not imply any opinion on behalf of FSA Consulting and buyers are encouraged to carry out their own market research.

Nufab – Three point linkage windrow turner, windrow dimensions 2.5 m wide x 1.2 m high, 200-400 m³/hr - **\$26,200** – Tractor drawn straddle turner, windrow dimensions 3.6 m wide x 1.7m high, 400-800 m³/hr – **\$52,300**

Sittler – Tractor drawn straddle turner, models 507, 509 & 512, 450-1375 m³/hr – **\$30-53,000**

Self-propelled Backhus, Nufab, Frontier, and Allu models – 1,200-6,000 m³/hr – **\$170-880,000**. Can be custom made to specification.

Extras

Hose and reel for watering – **\$12,600**

Water wagon and tank - **\$22,000**

Hydraulic assisted models (tractor drawn) – add **\$17,850** to base price

Suppliers and Dealers

Nufab Industries

Lot 27 & 28 Moore Road

P O Box 171

Dongara WA 6525

Ph 1800 671 606

Dealers for Sittler, Brown Bear and Frontier Models

Recycle and Composting Equipment Pty Ltd

P.O. Box 420

Waterford QLD 4133

Ph 1300 723 026

Ph 07-3804 7949

Dealers for Backhus models

Brentwood Recycling Systems

238 Berkeley Rd

Unanderra NSW 2526

Ph 02- 4271 7511

Some other fact sheets in this series:

Effluent Management – Co-composting for effluent disposal

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