

MACHINERY AND EQUIPMENT

Composting significant amounts of material will require machinery for handling and processing composting materials. A range of specialist composting equipment is available; however, existing farm machinery such as front-end loaders may also be repurposed for use in composting operations. The type of equipment selected will depend on factors such as the scale of the operation, the characteristics of the materials being composted, and the intended end use of the compost (e.g. on-farm use or sale). As such, equipment requirements may vary depending on the objectives of the composting system.

Front end loaders

Front end loaders are commonly used in on-farm composting for material handling and windrow management. While smaller tractor-mounted loaders may have limited capacity for large-scale operations, larger machines such as telehandlers or dedicated loaders are well suited. These machines are used to move, load and mix materials, and to form and turn windrows.



In some commercial composting operations, large front-end loaders are used as the primary machinery for both handling and turning, demonstrating that they can be an effective alternative to dedicated windrow turners. Larger machines may have bucket capacities of around 5 m³, allowing them to handle significant volumes of material.

Although less efficient than dedicated windrow turners, front end loaders are often adequate for on-farm systems. Longer composting timeframes can offset their lower turning efficiency.

Feedstock pre-processing

In some situations, pre-processing of compost feedstocks may

improve performance, particularly where fibrous carbon sources such as straw (or hay) are used. Long straw can be slow to decompose, making mixing more difficult and reducing final product quality. Reducing particle length prior to composting can improve mixing and promote more uniform decomposition.

Bale processing or straw chopping equipment, commonly used in livestock systems, may be repurposed for composting where available on-farm. These machines can break apart bales and reduce straw length, assisting with feedstock preparation, particularly on farms using straw-based bedding.

However, investment in dedicated processing equipment may not be justified solely for composting, particularly for smaller operations. These machines can be relatively slow and add an extra handling step. In many cases, acceptable outcomes can be achieved without pre-processing, as windrow turners can assist in breaking up particles/ fibrous material during turning.

Compost windrow turners

A range of windrow turners is available, suited to different scales of operation. For on-farm composting, tractor-driven or PTO-driven turners are most common and widely available in Australia. More specialised equipment, such as self-propelled

Table 1: Indicative 2026 pricing for specialised composting windrow turners*

Turner type	Typical windrow size (m)	Processing capacity (m ³ /hr)	Tractor requirement (HP)	Indicative cost (AUD)
Small 3-point linkage	1.0–1.5 high × 1.5–2.5 wide	200–400	50–80 HP	\$35,000–\$60,000
Medium PTO / trailed	1.5–2.5 high × 2.5–3.5 wide	400–1,200	80–120 HP	\$40,000–\$100,000
Large PTO / trailed	2.0–3.0 high × 3.0–4.0 wide	1,000–2,500+	100–150+ HP	\$80,000–\$150,000+
Self-propelled (commercial)	3.0–4.0+ high × 4.0–6.0+ wide	2,000–6,500+	N/A (dedicated engine)	\$200,000–\$500,000+

*Indicative costs are based on recent Australian listings and may vary depending on machine size, condition (new or used), and supplier.

straddle turners, is typically used in large-scale commercial operations. These machines can turn larger windrows and achieve high throughput, but involve a substantial capital investment, often costing several hundred thousand dollars.

On-farm systems generally use smaller windrows due to operational scale and material characteristics, making PTO-driven turners well suited. In addition to improving aeration, windrow turners help break up clumps and distribute materials more uniformly. This is particularly beneficial when composting poultry manures, which can be sticky and difficult to mix effectively using a front-end loader alone.

Windrow turners are available in a range of sizes, and selection should be matched to the scale of the operation, windrow dimensions and required processing capacity. Where capital investment is a constraint, contractors may provide windrow turning services using mobile equipment.

Suppliers, cost and tractor requirements

A number of manufacturers and suppliers provide tractor-driven windrow turners suitable for

on-farm composting in Australia, including locally manufactured units and imported equipment available through Australian distributors. Examples include JPH Equipment, EZ Machinery, and other suppliers of PTO-driven or trailed compost turners. A range of models is available to suit different price-points, windrow sizes and operational scales (*Table 1*).

Tractor power requirements depend on the size of the turner. Smaller linkage-mounted units may require approximately 50–80 horsepower, while larger PTO-driven or trailed machines may require 80–150 horsepower or more. In some cases, tractors may require low-speed (creeper) gearing or hydraulic drive systems to achieve suitable operating speeds during turning

Water application systems

Water may be applied at different stages of composting. During feedstock preparation, sprinklers or spray systems can be used to wet materials prior to forming windrows, helping achieve a more uniform moisture content before composting begins.

A range of water delivery systems may be used on-farm, including water carts or tanks mounted on

trucks or trailers, fitted with spray bars or hoses for direct application to windrows. Repurposed farm equipment (e.g. tankers or trucks) may be suitable where available.

More integrated systems are also available, including tanks towed with windrow turners or turners fitted with spray systems that apply water during turning. These improve efficiency by combining turning and moisture addition in a single pass.

The choice of system will depend on the scale of the operation, water availability and required level of process control. Smaller systems may rely on manual application, while larger operations may benefit from integrated or higher-capacity systems.

Water application

Some windrow turners can add water to windrows using a trailing hose system. This is ideal for medium to large scale operations and improves operational efficiency. Alternatively, some windrow turners can tow a water tanker that will supply water during turning, and this may be more appropriate for small operations without water infrastructure.

Table 2. Indicative 2026 pricing for compost screening equipment*

Screen type	Typical size / configuration	Throughput (m ³ /hr)	Power requirement	Indicative cost (AUD)
Medium trommel (mobile)	2–4 m drum, towable or tracked	20–80	15–50 kW or diesel engine	\$80,000–\$150,000
Large trommel (commercial)	4–6 m+ drum, high-capacity mobile	50–150+	50 kW+ or large diesel engine	\$150,000–\$300,000+
Medium vibrating screen	Multi-deck or mobile unit	20–60	10–30 kW	\$20,000–\$80,000
Large vibrating screen	Industrial multi-deck system	50–150+	30 kW+	\$80,000–\$200,000+

*Indicative costs are based on equipment available through Australian suppliers and listings and may vary depending on condition (new or used), specification and supplier. Throughput will vary depending on material type, moisture content and particle size distribution.

Screening

Screening of composted material may be required to remove oversized or undesirable materials such as stones, wood or long straw, and to produce a more uniform product. The need for screening depends on the intended end use (route to market) and the characteristics of the feedstocks.

Where compost is sold directly to end users (e.g. farmers or landscaping markets), screening may be needed to meet product quality expectations. Where material is supplied to another processor, further processing may occur off-site and on-farm screening may not be necessary. For compost reused on-farm, screening requirements will depend on the application method, as some spreaders may be sensitive to larger particles that can cause blockages or bridging.

In many on-farm systems, particularly where relatively uniform materials such as manures are composted, screening may not be required. This should be considered when assessing investment in screening equipment.



Where screening is required, a range of equipment is available (Table 2), with the most common types being rotating drums (trommel screens) and vibrating screens. Selection should be matched to throughput, particle size requirements and scale of operation.

Temperature monitoring equipment

Compost temperatures are typically measured using probe thermometers inserted into the windrow to assess internal conditions. Probes are commonly around 1 metre in length, allowing measurement at depth within the compost mass.

Most on-farm systems use manual probes, either analogue (dial-type) or digital. Some digital units include simple logging functions within the handheld reader. Probes are typically constructed from stainless steel with a pointed tip and a handle or display unit.

Temperature probes are relatively low-cost compared to other composting equipment. Simple analogue or basic digital probes are generally suitable for on-farm use, with selection based on durability, probe length and ease of use. Prices typically range from around \$100 to over \$500 for a durable compost temperature probe.