

SPREADING LAYER MANURE

Layer manure (caged layer manure and barn litter) is a highly valuable nutrient source and soil conditioner when spread at suitable rates. However, good spreading techniques are needed to realise the potential value of this resource. Spreading needs to occur at the optimal time to maximise nutrient availability and minimise potential adverse soil impacts such as compaction and nutrient loss. Using the right equipment and information, simplifies management and improves production.

Spreading Rates

A nutrient budgeting process is the best way to find the optimal long-term manure spreading rate (see the 'Layer manure – setting application rates' fact sheet in this series). This process should be supported by regular soil testing and analysis of manure, as nutrient concentrations can vary significantly between farms and over time.

Once the target spreading rate is known, the spreader must be calibrated to ensure the manure is applied at the correct rate evenly across the paddock. One way to check spreader calibration is provided in the following example.

Example: Measuring Your Spreading Rate

1. Take a strip of builder's plastic or tarpaulin (ideally 10m x 2m) and lay it down in path of the spreader.
2. Run the spreader over the drop sheet at the correct operating speed.
3. Weigh manure from 1 x 1m squares at several points across the width of the spreading pattern.



4. Take the mass of manure weighed (kg/m^2) and multiply by 10,000 to convert to kg/ha .
5. Divide the result by 1000 to get tonnes (t) per ha.

This process can be repeated for several passes to check the average spreading distribution and width.

Distribution

Poor distribution of manure by spreaders can cause uneven application and irregular plant growth. Distribution can be affected by manure consistency, the type of spreader and the operator. Generally, manure with a moisture content of 25–30%

will spread best. Dust can be a problem from dry manure (<15%). However, if the moisture content exceeds about 35%, bridging will be a problem in many spreader designs. For most spreaders, an application rate of at least 2t/ha is needed to achieve an even spread. For some spreaders, higher application rates may be needed to achieve good performance. Operator efficiency may also strongly influence manure distribution.

Some spreaders alter the application rate with the forward speed of travel, which can also cause variability in application where operators are not adequately trained.

Compaction

Compaction is caused by the movement of heavy machinery across paddocks, and is most likely to occur when soils are close to field capacity. Ideally, spreading would occur when the soil is quite dry. Compaction of crop land can be reduced by:

- using controlled traffic where possible,
- minimising axle loads and tyre pressures where practical, and
- avoiding unnecessary passes across paddocks

Application frequency should be matched to nutrient requirements. In some systems, spreading on a multi-year rotation and supplementing with inorganic fertiliser may reduce compaction risk and improve operational efficiency; however, this should be determined on a site-specific basis.

Timing

The optimal timing of manure applications depends upon multiple factors. These include:

- crop or pasture nutrient requirements,
- field conditions (soil moisture),
- wind conditions, and
- timing of other management events (i.e. cultivation and sowing).

The application of layer manure 2–6 weeks before sowing (or peak pasture demand) is generally recommended to allow time for nutrient mineralisation. If the manure has been correctly composted, the timing of application is less critical. If manure has been properly composted, nutrient availability is



more predictable, and the risk of immobilisation is reduced.

Where practical, incorporation after spreading can reduce ammonia volatilisation losses and odour. Manure should not be applied when heavy rainfall is forecast, as this increases the risk of nutrient runoff and leaching.

Social and Environmental Considerations

Manure spreading can generate dust and odour that may affect neighbouring properties.

Where spreading occurs near sensitive receptors, operations should be timed to coincide with low wind speeds and, where possible, undertaken during weekdays. Communication with neighbours prior to spreading may reduce the risk of complaints. The risk of environmental harm must be considered before spreading manure. Manure should only be spread on the intended area and not allowed to enter waterways or drainage systems.

Avoid spreading manure:

- near watercourses, dams or drainage lines,

- on steep slopes where erosion may occur, or
- when heavy rainfall is forecast.

Vegetative filter strips and trees can help intercept nutrients, dusts and other particles.

Repeated manure applications can lead to nutrient accumulation, particularly phosphorus, increasing the risk of off-site movement to surface water or groundwater. Regular soil monitoring is recommended to manage this risk.

Refer to the *Egg Industry Environmental Guidelines* (Edition III, McGahan et al., 2026) for more information on risk factors associated with nutrient loss to surface and groundwater.

Food Safety and Biosecurity

Allow a minimum period between application of manure and spent litter before grazing, in accordance with relevant state or territory biosecurity regulations. In many jurisdictions, extended withholding periods may apply where manure is classified as Restricted Animal Material (RAM), and access of ruminants to treated land may be restricted.

Where applying manure to horticultural crops greater controls are required.

Only properly composted manure or treated organic products should be used, particularly where there is potential contact with edible plant parts. Products should meet appropriate microbiological standards (e.g. low levels of *E. coli*).

Maximise the time between manure application and harvest. Do not apply untreated manure where direct or indirect contact with the edible portion of the crop may occur. Manure and spent litter should not be applied to crop foliage intended for human consumption.

Refer to the Freshcare Food Safety & Quality Standard (FSQ) and the Guidelines for Fresh Produce Food Safety (Fresh Produce Safety Centre A-NZ, 2019; updated 2022), as well as relevant provisions of the Australia New Zealand Food Standards Code, for current requirements relating to the use of organic manures in food production systems.

Options for Spreading Manure

There are many options for getting manure spread, including: engaging a contractor, purchasing a spreader jointly with other farmers or purchasing a spreader for individual use. Contractors may charge on a per tonne or per hectare basis, or provide bundled services including loading, transport and spreading. Rates typically vary depending on transport distance, material characteristics and service inclusions.

As a guide, contractor rates may range from approximately \$12 to \$25 per tonne, although higher rates may apply depending on conditions.



As spreaders are used infrequently, shared ownership between farmers can reduce capital costs.

When selecting a spreader, key considerations include the type, moisture content and volume of manure to be spread. Some design features to be considered include:

- **Spreading pattern and width:** to ensure even application.
- **Vertically vs horizontally mounted beaters:** vertically mounted beaters generally spread over a wider than horizontal designs.
- **Spinners:** generally improve spread width and uniformity.
- **Floor width:** Influences the maximum moisture content that can be handled without bridging. Generally, the belt driven machines cannot spread manure with a moisture content exceeding 40%.
- **Conveyor belt vs moving floor chains:** can be either hydraulic or PTO driven; belts wear out faster than chains.
- **Rotation speed:** affects spread width and application rate.
- **Size:** Spreaders vary greatly in size, from 1t capacity to over 20t capacity. Smaller units may

be inefficient for large-scale applications, while larger trailing units are generally more suitable for on-farm use. Dual purpose units can be used for spreading other products such as lime and fertilisers, which may offset the cost, however these require a more consistent manure with lower moisture levels.

- **Price:** The size of a spreader generally determines the price. As a guide (2026 prices), smaller units (approximately 1–4 m³ capacity) may range from \$15,000 to \$40,000, while larger trailing units (approximately 10–16 m³ capacity) typically range from \$60,000 to over \$120,000.

Spreaders can also be truck mounted, pricing varies depending on the truck type and fitting costs.

References and Further Reading

Freshcare (2021) Freshcare Food Safety & Quality Standard (FSQ), Edition 4.2. Sydney: Freshcare Ltd.

Fresh Produce Safety Centre A-NZ (2019; updated 2022) Guidelines for Fresh Produce Food Safety.

McGahan, E., Wiedemann, S. G., Copley, M.-F. & Walker, L. (2026). Egg Industry Environmental Guidelines, Edition III. Australian Eggs Limited