

Understanding purchased compost products

Increasing quantities of compost are being produced for sale by commercial composting operations across Australia. Some of this compost is being promoted and marketed as a fertiliser and soil conditioner for application to farmland as an alternative to conventional inorganic fertilisers.

The following notes will help you ask the right questions and make informed decisions on the suitability of buying in and applying compost to your dairy farm.



Frequently asked questions

What are purchased compost products?

Purchased compost products are commercially produced organic products similar to potting mix, usually made from a range of various organic waste materials. Compost is supplied in bulk in a ready to use form and is applied directly to pastures, crops or soils.

As traditional methods (land fill) of disposing of organic wastes are no longer seen as sustainable options, more wastes are being diverted to composting. This is seen as an effective way of recycling the nutrients and organic matter in these wastes back to land.

Where is this compost made?

Most purchased, ready-made compost is produced in large, specialist compost production facilities run by commercial firms or waste water authorities. They are licenced and monitored by the state Environment Protection Authorities to handle waste and make compost products. They are able to produce a more consistent product of known composition made to regulatory standards compared to the making of compost on-farm.

What is it made from?

Compost products vary greatly.

It is important to understand what is in the product if you are considering applying it to your farm land. Purchased compost can be made

from a broad range of domestic, commercial and industrial waste organic materials.

Typically these include green wastes, food processing wastes, petroleum hydrocarbons and animal fats. At some production facilities, biosolids from sewerage plants are included in the compost mix.

Some composts have varying levels of contaminants such as heavy metals from the waste materials. Find out what is in any product before you buy.

What value can purchased compost have for my soil?

Understand the needs of your soil and pastures before considering the application of any product. Soil testing and good agronomic advice will help you decide on the most suitable fertilisers and soil conditioners for your farm. Be clear on your soil requirements. What nutrients or other benefits will applied compost supply? Estimate how much of each of the major nutrients is likely to be in a form available for plants to take up rather than the total content in the compost.

Doing a nutrient budget for your crop or pasture will give you an idea of what rates are needed and if any supplementary inorganic fertiliser applications are required. This should also give you an idea of the economics of the use of compost compared to inorganic fertiliser alternatives.

As a buyer of compost

What should I ask for?

- › Up to date analytical results for the product. Keep in mind that these will be on a dry matter (DM) basis, not a fresh weight or as received basis. Typically, compost as spread contains around 30% water meaning the spread product will contain only about 2/3 of the laboratory test nutrient concentration.
- › Analytical results presented in a way you can understand, e.g. nutrient content of the delivered compost expressed in kilograms of each

nutrient per cubic metre spread.

This is more useful than grams per kilogram results from the laboratory results.

- › What waste products were used to make the compost, especially any prescribed wastes such as biosolids.
- › Does the compost contain heavy metals or other contaminants that could accumulate in the soil?
- › A product specification sheet including recommendations for use.
- › Evidence that it meets the Australian Standards for compost (AS 4454), and any regulatory requirements. In particular, has the compost been pasteurised at the required temperatures for the required times?

What potential risks should I be aware of and look out for?

Heavy metals: some wastes used to make compost can contain high levels of heavy metals such as mercury and copper. These do not break down and with repeated applications can accumulate in the soil with the potential to contaminate plants and animals.

High levels of soluble salts: some composts contain high levels of salts which if applied at heavy rates have the potential to burn plants and increase soil salinity.

Herbicide residues: with green wastes from many unknown sources there is the potential risk of herbicide residues in the compost. In particular persistent herbicides such as Picloram used for long-term vegetation control can remain active in compost.

Biosecurity risks: poorly made compost runs the risk of spreading viable weed seeds and animal and human pathogens onto the farm. Ensure that the compost has been adequately pasteurised.

Impurities: such as plastic, glass, metal, rocks and twine. Urban waste sometimes contains amounts of these persistent products which then contaminate the land the compost is spread on.

High carbon to nitrogen (C/N)

ratio compost: when compost that still has a high carbon and a low nitrogen content is applied to land, microbes can use up the available soil nitrogen as they continue the composting process. This will result in nitrogen deficient pastures and crops.

Immature compost: immature compost that has not been subjected to the full composting process can contain amounts of various harmful organic substances from the partial decomposition of wastes. These substances can damage plants by what are called phytotoxic effects.

Moisture content: the moisture content of compost can be variable depending on storage conditions and compost type. Beware of high moisture content composts, especially if buying and transporting it by the tonne.

Measurement of compost: are you buying it by the tonne or cubic metre? Compost has a low bulk density, typically around 500 to 600 kilograms per cubic metre.

Has it been screened: if the compost not been screened, does it contain some excessively large particle sizes that might make it difficult to spread or not breakdown?

How much nutrient can compost supply to my pastures and crops?

Composts are chemically different to conventional inorganic fertilisers and need to be assessed differently:

- › Compost is not a reliable nitrogen (N) fertiliser. At least in the short term, other additional N fertiliser applications are often required to maintain production. Some immature or high carbon to nitrogen (C/N) ratio composts will use soil N reserves causing pastures or crops to become N deficient.

- › Compost can however be an effective source of phosphorus (P), potassium (K) and magnesium (Mg) for plant growth. However heavy applications of compost are usually required to completely replace conventional P & K fertilisers. Heavy applications can be expensive, especially with high cartage and spreading costs and can result in an imbalance of the different nutrients.
- › The concentration and amount of plant nutrient in compost is low and can be quite variable, e.g. phosphorus (P) is typically 0.2% or lower on dry weight basis.
- › For most nutrients, only a small proportion of the total nutrient content in the compost is immediately, or readily available for plant uptake. Most of these nutrients are organically bound and only a proportion are released over time as the organic matter breaks down.
- › Typical proportions of the total nutrient content that become plant available in the 2-3 year period after compost is applied to soil are: nitrogen (N)- 0 -15%, phosphorus (P)- 20-40%, potassium (K)-80-100%.
- › It is misleading to value the total content of a particular nutrient such as nitrogen (N) in compost by the cost of the equivalent amount of nutrient if bought as an inorganic chemical fertiliser such as urea. This is because only a proportion of the total content of a particular nutrient becomes available for plant use over time and still smaller amounts are immediately plant available.
- › For soils with a low carbon content (e.g. those with a long cropping history), heavy and regular compost applications (e.g. 5- 10 t/ha/year) for a number of years will increase soil carbon.
- › Large increases in the soil carbon content of such low carbon content soils can improve soil physical, chemical and biological health, for example, better soil structure, water and nutrient holding capacities.
- › Soils under long-term perennial pasture in higher rainfall areas already have high carbon levels. It is increasingly difficult to further lift the long-term carbon content of such soils, even with heavy applications of compost.

Will compost increase soil carbon levels?

Another, much publicised benefit of applying purchased compost to farms is that it can act as a soil conditioner to increase soil carbon and organic matter levels. Compost contains large amount of organic matter in various forms - some of which is broken down (“mineralised”) relatively quickly releasing nutrients, through to stable forms that will last in the soil for many years.

Summary

Test your soils, understand your nutrient needs and identify the right product for your situation.

Consider application rates and time it right to minimise losses to the environment.

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