

Compost for Wine-Grape Growers

Fact Sheet 2: Why Use Compost?



Australian soils generally have low natural fertility, low organic matter levels and are fragile to intensive agricultural practices.

Farming practices have led to problems like compaction and erosion, which eventually lead to lower soil productivity. These problems are exacerbated when soils are depleted in organic matter. Less productive soils require higher inputs of fertilisers, pesticides and water - at a cost to the grower and the environment.

Compost trials across Australia have shown improved soil moisture levels and other aspects of soil quality including, soil organic matter, moisture holding capacity, bulk density, cation exchange capacity and pH. Grape yields in many trials have been improved without any detriment to fruit quality.

Compost is not a 'silver bullet' solution, but it can be an important tool for improving soil quality and crop performance.

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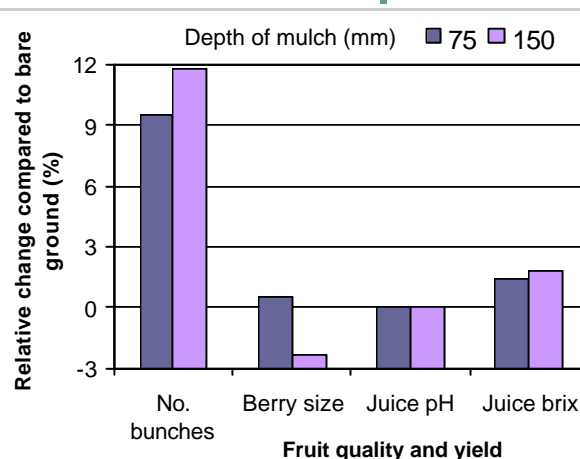
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What makes compost so valuable?

Compost is a versatile material that can improve the physical, chemical and biological fertility of soil.

In Australian viticulture, compost is used most frequently as a mulch under vine. While soil structure also improves, the main benefits attributed to mulching are improvements in soil water content and weed control.

Compost contains and contributes to the development of soil humus, which is an advanced state in the decomposition of organic matter. Humus is responsible for many of the benefits usually attributed to soil organic matter and compost. These benefits are outlined below.



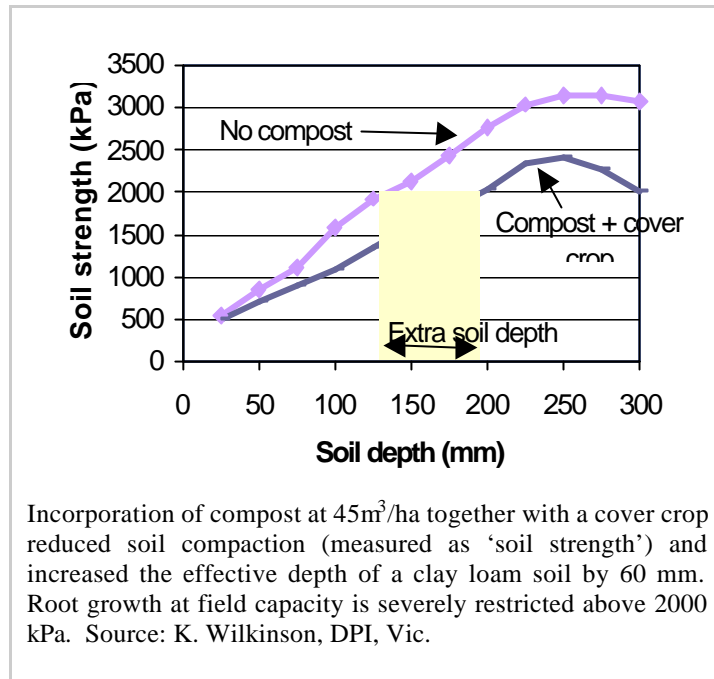
Trials in South Australia with composted mulches showed large yield increases in young vines without a reduction in fruit quality. The yield increases were found to be due to an increase in the number of bunches surviving at harvest. Source: After Buckerfield & Webster, Aust Grapegrower and Winemaker Oct 2001



Quality composts can:

Improve Soil Structure

Incorporation of organic matter reduces soil bulk density by promoting the formation of soil aggregates ('clods') which improve the friability of the soil.



Heavy soils become more 'open' or porous and their workability, aeration, drainage and potential moisture availability improves. Composts used on lighter soils improve water holding capacity as well as aeration and drainage.

Improve nutrient management

Compost contains a range of nutrients and trace elements required for most crops.

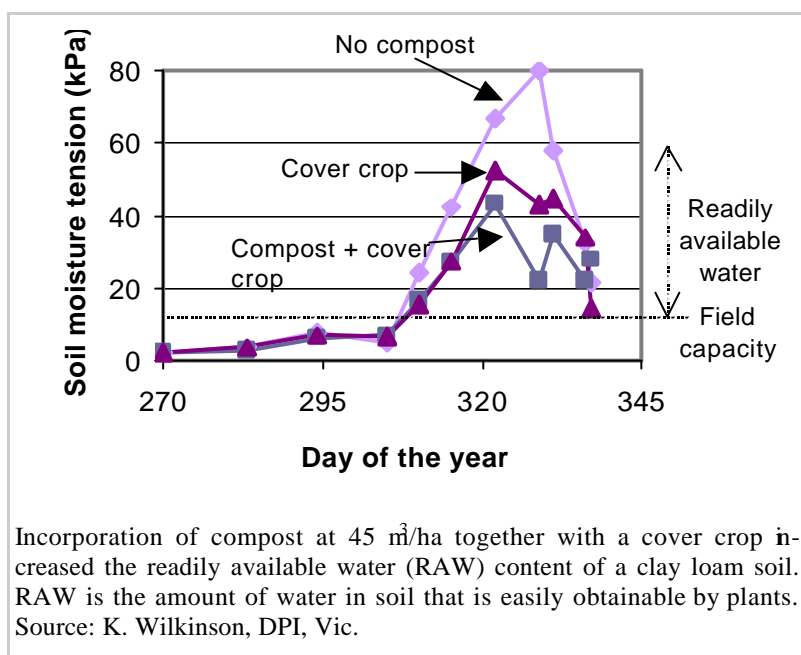
Many of these nutrients are not immediately available to a crop because they are bound up in organic matter. Nutrients become available as a result of the ongoing decomposition of soil organic matter. Though composted mulches are not normally needed for their nutrient content, they can provide useful quantities of nutrients. Repeated application of compost could quickly supply all the nutrient requirements of vines, especially when it is used in combination with cover crops. Organic matter in the soil holds on to nutrients, keeping these in the root zone where plants can use them. This means less nutrients lost, lower demand for fertilisers, and less potential pollution of waterways and groundwater from nutrient run-off.

Quality composts can:



Increase soil moisture

Use of compost as a mulch under vine reduces evaporation. Conservatively, a 10% reduction in irrigation water requirements can be expected from mulching. Additional improvements in soil water content also result when soil organic matter levels increase from the use of mulch or when compost is incorporated. This is due to improvements in soil aggregation. Soil aggregates create a vast network of pores that range in size from fine capillaries to relatively large voids. These capillaries together with humic substances greatly increase soil moisture holding capacity.



Support beneficial soil organisms

Soils with high organic matter content usually support a vast number of organisms ranging from relatively large worms and arthropods to nematodes, fungi, protozoa and bacteria.

These organisms play important roles in nutrient cycling and soil aggregation. Biologically active soils are less likely to support disease-causing organisms. Compost has been shown to contain certain micro-organisms that can suppress or kill disease causing organisms such as root rots and nematodes. Trials in vineyards have shown increases in earthworm activity in soils under composted mulches. Earthworms assist soil aeration, moisture penetration and the incorporation of organic matter from decomposing compost into the soil profile.

Reduce weed growth with mulching

Compost helps control weeds when it is used as a mulch under vine. It can reduce the need for spraying by more than half over the life of the mulch (about 3 years).



Quality composts can:

Reduce soil temperature fluctuations with mulching

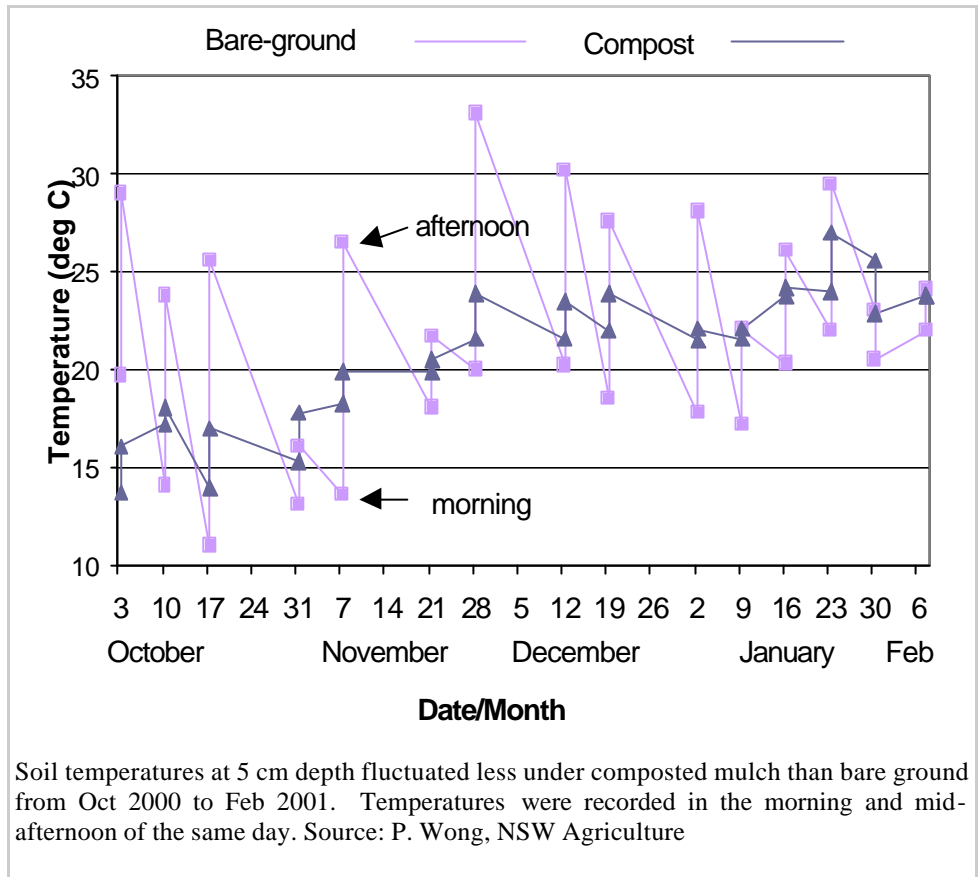
Compost helps reduce the extremes of soil temperature when it is used as a mulch under vine. This reduces the stress on the vine, especially during summer, and reduces the likelihood of crop losses.

Further information is available from:

Primary Industries
Research Victoria (PIRVic)
Knoxfield Centre, Private
Bag 15, Ferntree Gully
Delivery Centre, Victoria
3156. Phone: 9210 9222
www.dpi.vic.gov.au

EcoRecycle Victoria
Level 2, 478 Albert St. East
Melbourne 3002
Phone: 9639 3322
www.ecorecycle.vic.gov.au

Department of Agriculture,
Western Australia,
Locked Bag 4, Bentley
Delivery Centre,
Western Australia 6983
Phone: 08 9368 3333
www.agric.wa.gov.au



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Very large yield increases have been observed in some cases with the use of composted mulch under young vines. These yield increases occurred without detriment to fruit quality. Under these conditions, the use of compost is highly profitable.

In most cases only small yield increases are needed to cover the cost of mulch application. Alternatively, compost can be used profitably to improve productivity in the parts of a vineyard where the vines are really struggling.