Comparing compost to single super phosphate

Location: 10km south-east of Mount Gambier, South Australia

Objectives:

- Compare plant response from different products of the same economic value.
- Assess how compost applications compare to conventional fertiliser inputs.

Background:

This trial compares the plant response from a single super application with a compost application of the same economic value. In the same trial, different rates of compost are also compared.

Conventional management in this area involves spreading 125kg of single super per hectare. Considering the cost of product, freight and spreading, the cost of spreading 125kg of single super is the same as 1.6t/ha of compost.

This trial investigates how investing in different products compare.

Crop Type: Mixed permanent pasture

Start date: 14/08/2025

End date: 31/12/2025

Treatments:

- Control – No compost applied
- Single Super Phosphate – Spread at 125kg/ha
- AgriGro – Spread at 1.6t/ha
- AgriGro Double Rate – Spread at 3.2t/ha
- AgriGro Half Rate – Spread at 0.8t/ha

AgriGro is a high-quality base compost designed for agricultural use.

Trial Measurements:

- Biomass – measured once 6 weeks after application
- Feed quality – test on 1.6t/ha compost and single super treatments only

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Notes:

- This is a small plot trial. Larger plots will show more conclusive results.
- There were variations in the pasture composition between plots.
- Pasture composition is similar in the single super and comparable rate compost treatments. The half and double rate compost treatments can also be compared. Control had a mixture of both compositions.
- Comparisons will only be drawn from plots with similar pasture composition.
- Data collected on 12.09.25. Pasture biomasses measured using a Grass Master Pro. Feed tests were analysed by Agrifood Technology Feed Test.

Conclusion:

- Compost appears to increase pasture growth more than single super phosphate when applied at an equivalent cost.
- Expectedly, pasture growth is increased with more compost as seen in the half and double rate treatments. Although comparable rate and double rate do not follow the same trend.
- Compost improves quantity and quality of pasture compared to the single super treatment. Although the improvements are small, amplified across an entire paddock, the return on investment will be greater as the cost of product and application are the same.
- A larger trial in the new year will be conducted and the results compared with this trial.

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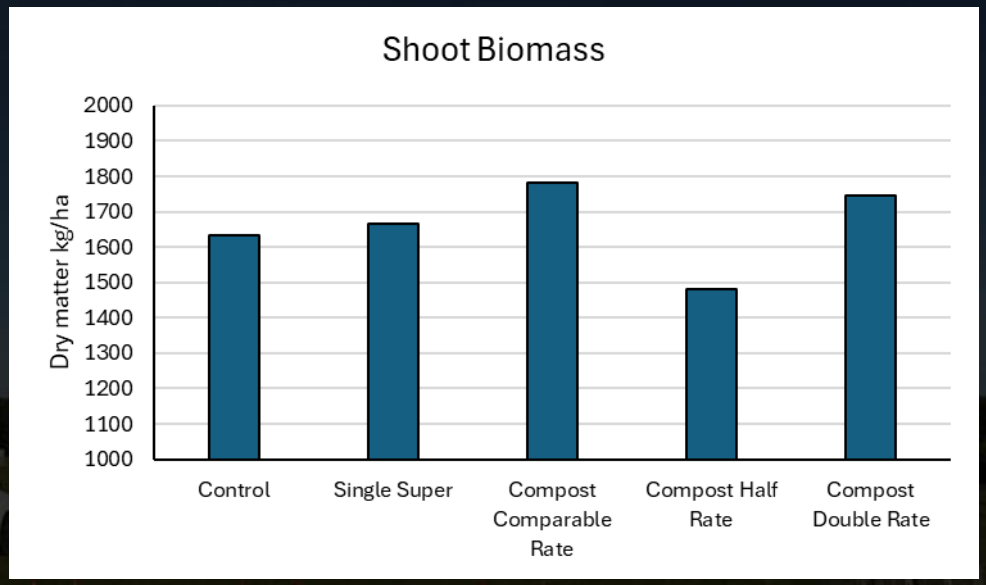
Results:

- All treatments increased pasture growth except for the half rate of compost.
- Compost increased pasture dry matter by 115kg/ha compared to the single super treatment.
- The double rate of compost had 266kg/ha more dry matter compared to the half rate of compost.
- The compost applied at 3.2t/ha (double rate) was 35kg/ha less and the 0.8t/ha (half rate) was 301kg/ha less than compost spread at 1.6t/ha. The double rate does not appear to be economically viable, but this may be due to differences in pasture composition in this small plot design.



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Results:

- Dry Matter, Crude Protein and ADF remain relatively stable in both treatments.
- Compost has a greater digestibility and ME compared to the single super sample. With both ME and digestibility increased, the feed conversion from pasture to livestock gains will be greater.
- NDF is greater in the compost sample compared to the single super sample. With a higher NDF, feed intake may be limited as livestock feel fuller from less feed. With the feed digestibility being better, and that feed having higher ME, animal performance should not be limited. Stock rate should increase.
- WSC, fat and ash all appear to be higher in the single super sample compared to the compost sample. Despite higher WSC and fat in the single super treatment, ME remains higher in the compost treatment.

	Single Super	Compost
Dry Matter	14.4%	14.6%
Crude Protein	23.0%	23.6%
ADF	23.8%	23.9%
NDF	47.9%	52.1%
Digestibility	63.2%	66.8%
ME	9.3 MJ/kg DM	9.9 MJ/kg DM
WSC	2.4%	1.3%
Fat	5.7%	5.5%
Ash	10.5%	9.8%

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Results:

- Interestingly, single super did not increase levels of phosphorus in the plant and had a lower sulfur result despite it being a phosphorus and sulfur fertiliser.
- The compost sample shows higher levels of potassium, magnesium, sodium and sulfur. However, it does have lower levels of calcium.
- The compost treatment having higher levels of these minerals in the pasture provides a more well-balanced feed for livestock.
- This suggests that compost provides both valuable nutrients to the plant and enables more efficient nutrient uptake.

	Single Super	Compost
Calcium	7 600	6 600
Potassium	16 000	17 000
Magnesium	2 300	3 200
Sodium	3 700	5 400
Phosphorus	4 100	4 100
Sulfur	2 900	3 500

All results as mg/kgDM