



SFF project 09/152 2007-2012

COMPOST FACT SHEET

BACKGROUND

- Transpacific Industries (TPI) and Living Earth produce large quantities of organic compost from Timaru and Christchurch plants. Canterbury farmers can now source this material in quantities required for large-scale paddock application.
- Between 2007 and 2012 Plant & Food Research carried out numerous field trials to test this compost on a variety of crops within large-scale paddock trials.



WHY SHOULD YOU USE COMPOST?

- Composting is an aerobic biological process that converts garden and food waste into a stable organic product suitable for transportation and ideal for paddock application.
- Commercially produced compost can provide a valuable source of soil organic matter and slow release nutrients.
- Applying good quality compost to agricultural crops has been shown to increase crop yields and soil C levels.
- Composts that are 100 % weed free and conform to New Zealand Standard NZS4454 are available.

APPLICATION RATES

Recent trials in Canterbury have shown:

- Regular applications (every 1-2 years) of 8-12 t/ha compost are the most profitable.
- If applying 25-50 t/ha compost, reapplications should be made every 3-4 years.
- Over a 3-year cropping rotation a one-off application of 50 t/ha is more profitable than 25 t/ha.
- Compost can be soil incorporated or left on soil surface in no tillage systems.





CASE STUDIES

The cost-benefit analyses were based on standard costs of production for each crop. The calculations assumed a fixed cost for the compost (\$12.50/t) and spreading (\$6.50/ha). The break-even freight rate (\$/t) is the cut off point above which higher freight costs would not be profitable. Scenarios are considered profitable if returns are greater or the same as standard practice*. The cost-benefit analyses does not take into consideration the financial value associated with soil structural and water holding capacity improvements that may result from adding organic matter to the soil.

Forage brassica cropping

Application rate (t/ha)	Time frame	N fertiliser (% of recommended rate)	Yield increase above standard practice*(%)	Break-even freight rate (\$/t)
12 (one-off)	1-year rotation	60	13	\$14.60
50 (one-off)	2-year rotation	100	31	\$8.30
25 (one-off)	2-year rotation	100	12	\$3.10
100 (one-off)	2-year rotation	100	45	\$1.30
50 (one-off)	1-year rotation	100	48	Not measured

Arable cropping

Application rate t/ha	Time frame	N fertiliser (% of recommended rate)	Yield increase above standard practice* (%)	Break-even freight rate (\$/t)
8 (yearly)	3-year rotation	66	10	\$33.80
50 (one-off)	3-year rotation	100	14	\$18.50
17 (yearly)	3-year rotation	66	11	\$7.50
25 (one-off)	3-year rotation	100	7	\$6.40
50 (one-off)	3-year rotation	66	10	\$5.80
8 (yearly)	3-year rotation	33	0	-\$1.90**
17 (yearly)	3-year rotation	33	0	-\$6.90**
25 (one-off)	3-year rotation	66	2	-\$17.90**

* Standard practice = 100% of recommended fertiliser N (recommended as though no compost was to be applied).

** Yield benefits beyond the time frame reported would improve the profitability.

Further information and statistical analyses regarding these case studies can be found in the following report: <http://www.mpi.govt.nz/environment-natural-resources/funding-programmes/sustainable-farming-fund/sustainable-farming-fund-search.aspx> (Grant number 09/152).

FERTILITY BENEFITS

- Elevated soil nutrients (N, P, K) can be expected for more than 2 years after compost is applied.
- A complete substitution of fertiliser with compost is not recommended. To get the best out of compost it needs to be applied with fertiliser N.
- A crop's ability to respond to available N (from soil, fertiliser and compost reserves) increases where compost has been applied.
- Compost also provides other key nutrients such as Mg and Ca.
- See Forage brassica and Arable case study boxes for information on profitable rates.



SOIL AND ENVIRONMENTAL BENEFITS

- Soil organic matter and carbon content have been shown to increase significantly where compost was applied.
- Soil structure and water holding capacity tend to improve with higher application rates of compost. Lower rates of compost may require long-term application before soil structure and water holding capacity benefits can be confirmed.
- Due to much of the N content in compost being in a slow release organic form, the amount of nitrate leached tends to be lower than with standard fertiliser. This suggests there may be potential to reduce total N leached where compost applications offset fertiliser applications.



DISCLAIMER

Information used in this factsheet comes from field trials on limited soil types and environments and should be used as a guide only. Plant & Food Research does not accept any responsibility or liability for any consequences of any decisions based on this information.

NUTRIENT CONTENT OF COMPOST

Nutrient	Typical nutrient content	kg nutrient applied per tonne of compost *
Total Nitrogen (N) %	2	13
Total Phosphorus (P) %	0.3-0.4	2.3
Total Potassium (K) %	1	6.5
Total Sulphur (S) %	0.4	2.6
Total Calcium (Ca) %	2.5	16.3
Total Magnesium (Mg) %	0.42	2.7
Total Sodium (Na) %	0.14	0.9
pH	6.8	-
Organic matter %	38	-
Total Carbon %	22	143
C:N	9.5	-

*Fresh weight basis at 35% moisture

FURTHER INFORMATION

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