

NEW ZEALAND NATURE FARMING SOCIETY

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Report on trial using EM for application to compost at CCC Parks Road Plant.

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Objectives of Trial: To reduce the time involved in the composting process (currently 16 weeks).
To reduce the smell associated with composting.
To improve the quality of the end product.
To develop a method of introducing EM into the compost for special orders of Envy containing EM (eg Chamberlains Farm).

Treatment areas = 25 metre rows @ 160 cubic metres of green waste.

Water application = 8-10,000 litres of water per week.

EM to be applied in the water at weekly applications to the rows.

Treatments :

1. Control- equivalent amount of water, no EM added
2. EM @ 10 litres per week (200 litres expanded EM)

Procedure: adding 1: 1: 20 of EM, molasses and water expanded EM. Then maintained at 25-30 degrees for 5-7 days. This was taken to the plant by Mike Daly and applied within that day by adding the 200 litres of expanded EM to 5000 litres of H₂O and sprayed into the row of green waste during the turning process.

Measurements to compost

- 1) temperature (weekly):
- 1) smell
- 2) composting activity (as measured by screening at 10 weeks)

3) quality of compost (growth trial) (nutrient levels)

Trial commenced 24/8/99

Shredded material was placed in windrows approx. 2.6m³ high and 4.6m³ wide and composted over an 8 week period under standard operating procedures.

RESULTS

EM was applied on a weekly basis by adding the expanded EM to the water and incorporating into the row during the turning process. The control treatment received untreated water at the same volume. On most dates the volume of water was 5000 litres although this was reduced on some occasions due to moist conditions prevailing.

Eight applications of EM were made and then the compost was screened in week 10.

Table 1.

Date of Temperature monitoring	Water volume added	Date compost turned
24-Aug	5000	27-Aug
31-Aug	5000	31-Aug
7-Sept	5000	7-Sept
14-Sept	3000	14-Sept
25-Sept	3000	25-Sept
4-Oct	5000	4-Oct
11-Oct	3000	11-Oct
18-Oct	2000	18-Oct

The temperature ranged between 40 –60 degrees centigrade. The EM appeared to maintain a more consistent temperature around 60 degrees over the trial period.

The compost visually did not appear to be different during the trial or at the end of the trial.

To check on any measurable effects, some objective measurements were taken from samples sub sampled from each treatment and screened (Table 2).

The final application of EM occurred in week 8 and the composting process was concluded in week 10, when samples were screened to measure differences in decomposition by grading standards.

Fig 1 Temperature of Compost during Trial Duration

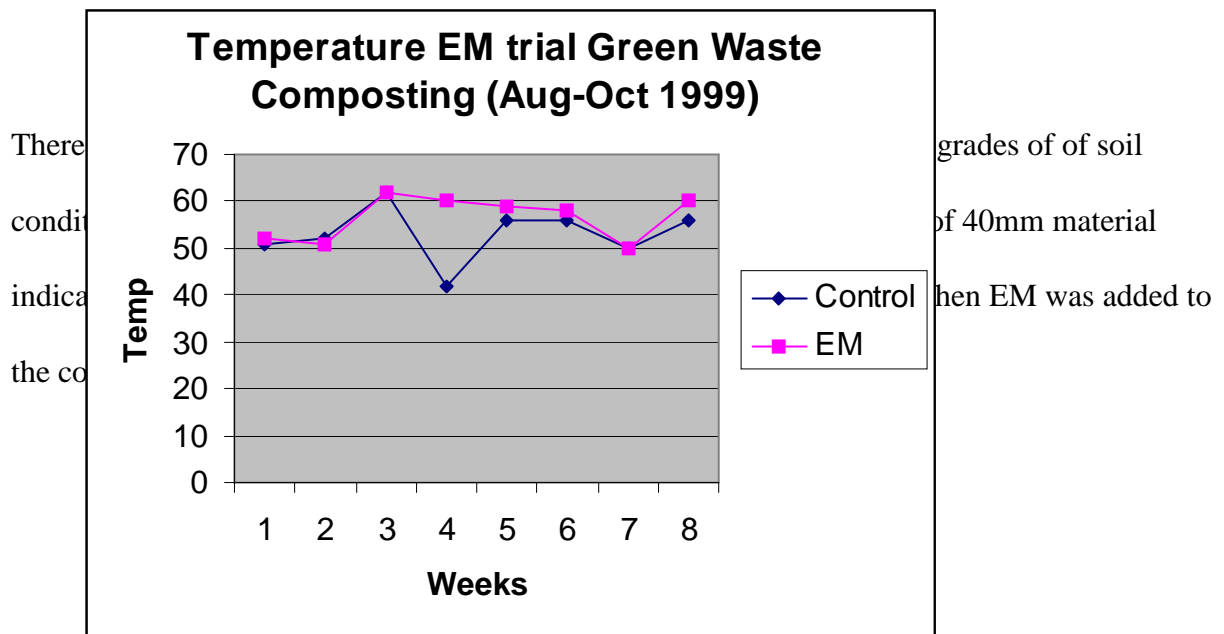
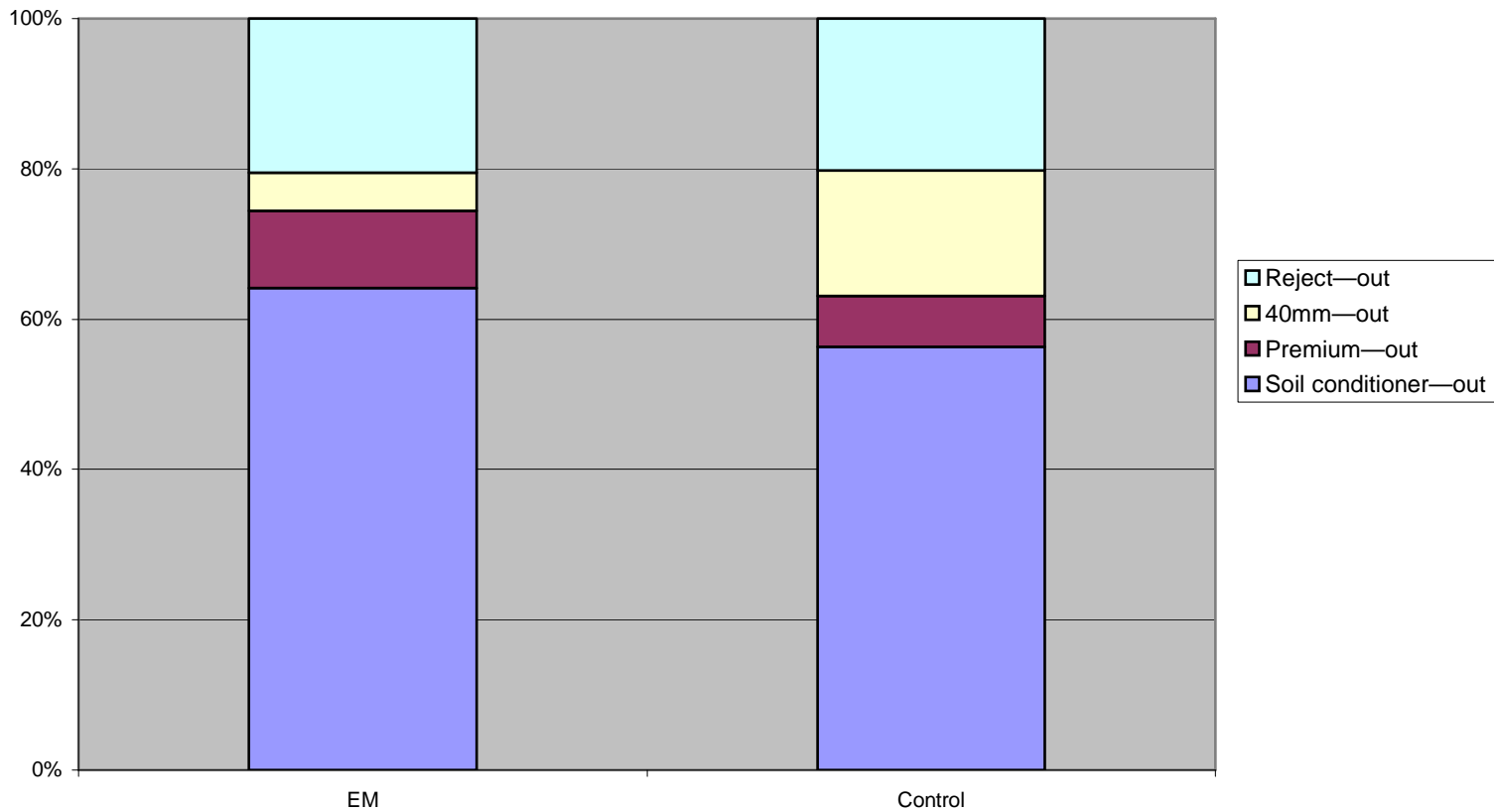


Table 2 Grading out ratios of Compost

Date—11 November 1999	EM yield m ³	%	Control yield m ³	%
Bulk compost –in	117		89	
Soil conditioner—out	75	64.1	50	56.3
Premium—out	12	10.3	6	6.8
40mm—out	6	5.1	15	16.7
Reject—out	24	20.5	18	20.2
Totals	117	100	89	100

Fig 2 Grading out ratios of Compost

Effect of EM on Green Waste Compost



Further samples were submitted George Fietje for growth trials and nutrient levels

Table 3.

Analysis	CONTROL	EM compost	Compliance NGIA standards
pH	8.26	8.12	5.0 – 8.5
Conductivity (mS/cm)	2.23	2.20	<5.0
Nitrate-N (mg/L)	3	1	>5.0
Ammonium-N (mg/L)	16	19	<200
Toxicity	7	7	Non-toxic score (6-7)

Chemical differences were slight, with lower nitrate-N and slightly higher ammonium-N in the EM treatment. Toxicity, pH and conductivity were similar between treatments.(Table 3)

Table 4 Growth Trial

Replicates for growth trial					Control growth compared to growing in sand	
Rep A	Rep B	Rep C	Rep D	Mean	PGI index	Treatment
45	49	44	46.8	46.8	10.9	Control compost
45	51	58	53	52.5	12.2	EM compost

The growth trial, which compared the growth of test plants was replicated 4 times for each treatment. The EM compost gave a higher growth rate in 3 out of 4 reps and overall gave a small but consistent increase growth (this difference statistically significant at 90% confidence).

SUMMARY

The objectives of the trial were to see if EM could:

1)To reduce the time involved in the composting process (currently 16 weeks). *This was not significantly improved although there was evidence of extra activity in the EM compost with a greater ratio of finer grading.*

2)To reduce the smell associated with composting. *This was not measured because of difficulty in separating smells associated with the large volume of existing compost in various stages of decomposition at the plant.*

3)To improve the quality of the end product. *This was achieved by a greater proportion of compost in the soil conditioner and premium grades and less 40mm. In addition there was better growth from EM compost.*

4)To develop a method of introducing EM into the compost for special orders of Envy containing EM (eg Chamberlains Farm). *This was achieved*

Acknowledgements

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Mike Daly
5/4/00