Compost Trial 2016 - 2017

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AIM

To evaluate the effects of three different rates of a commercial compost on processing tomato production and soil health.







Site 1

- 10 km north of Rochester, Victoria
 - Geltch Investment Cimones 2 block

Site 2

- 10 km north of Mathoura, NSW
 - Kagome Hibma W. 12 block











COMPOST

Biomix Compost

- Green organic waste
- Composted approximately 12 weeks
- Fine screened to < 20 mm
- pasteurised











Treatments

- Treatment 1 Control
- Treatment 2 10 t/ha Biomix compost
- Treatment 3 20 t/ha Biomix compost
- Treatment 4 30 t/ha Biomix compost







Trial design

- Four replicates
- Each treatment plot three adjacent rows
- Middle row sampled and harvested

										Davellanta 4					
	кери	cate 1			керис	cate 2		Replicate 3			Replicate 4				
Control	20 t/ha Biomix	10 t/ha Biomix	30 t/ha Biomix	30 t/ha Biomix	10 t/ha Biomix	Control	20 t/ha Biomix	30 t/ha Biomix	Control	10 t/ha Biomix	20 t/ha Biomix	10 t/ha Biomix	Control	30 t/ha Biomix	20 t/ha Biomix

Compost trial layout for both trial sites







Compost Analysis

	% w/w (dry	% w/w (wet basis or	
Nutrient	basis)	as applied)	kg per tonne
Ν	1.57	1.24	12.36
Ρ	0.266	0.21	2.09
Κ	1.34	1.05	10.55
S	0.245	0.19	1.93
Са	3.27	2.57	25.73
Mg	0.528	0.42	4.16
Na	0.378	0.30	2.97
Fe	1.12	0.88	8.81
Total Organic C	19.4	15.27	152.68
Moisture Content	21.3%		
C/N ratio	12.36		







Nutrients Applied in Compost

	10 t/ha t	reatment	20 t/ha t	reatment	30 t/ha treatment			
		banded area		banded area		banded area		
	entire area	(kg/banded	entire area	(kg/banded	entire area	(kg/banded		
Nutrient	(kg/ha)	ha)	(kg/ha)	ha)	(kg/ha)	ha)		
Ν	6.2	12.4	12.4	24.7	18.5	37.1		
Р	4.2	8.4	8.4	16.7	12.6	25.1		
Κ	42.2	84.4	84.4	168.7	126.5	253.1		
S	4.8	9.6	9.6	19.3	14.5	28.9		
Са	64.3	128.7	128.7	257.3	193.0	386.0		
Mg	10.4 20.8		20.8	41.6	31.2	62.3		
Total Organic C	763.4	1526.8	1526.8	3053.6	2290.2	4580.3		







Site Details

Site	Date Compost Applied	Tomato Variety Transplanted	Planting Date	Harvest Date	Growing Days	
Rochester	3/05/2016	H3402 Mix	22/10/2016	9/03/2017	137	
Mathoura	6/05/2016	H1015	11/10/2016	27/02/2017	136	

Summary of trial sites







Results - Yield and °Brix



This project is supported by the Goulburn Broken Catchment Management Authority's Beyond SoilCare program through funding from the Australian Government's National Landcare Program.







1

Soil Organic Carbon



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Bulk Density



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Soil Strength



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1

Site 1

Site 2

	Treatment	Pre compost	Control	30 t/ha compost
н	pH (H ₂ O)	6.28	6.05	6.28
þ	pH (CaCl ₂)	6.06	5.28	5.53
dS/m	EC	0.6	0.15	0.15
%	Organic Carbon	1.12	1.32	1.21
	Potassium (NH₄Cl)	0.93	0.77	0.78
g	Calcium (NH₄Cl)	12.07	Control30 t/ha compost6.056.285.285.530.150.151.321.210.770.7810.1510.339.2710.200.770.970.110.1120.9722.269.4312.8514.6813.8362.1365.58104.20102.20302.0304.055.9367.382.352.564.754.0597.9892.360.540.5932.0532.5048.3846.3844.2545.783.693.493.493.7711.9913.141.101.02	
100	Magnesium (NH₄Cl)	11.56	9.27	30 t/ha compost 6.28 5.53 0.15 1.21 0.78 10.33 10.20 0.97 0.11 22.26 12.85 13.83 65.58 102.20 304.0 67.38 2.56 4.05 92.36 0.59 32.50 46.38 45.78 3.49 4.36
ed/	Sodium (NH₄Cl)	1.75	0.77	0.97
Е	Aluminium (KCl)	0.17	0.11	Control30 t/ha compost6.056.285.285.530.150.151.321.210.770.7810.1510.339.2710.200.770.970.110.1120.9722.269.4312.8514.6813.8362.1365.5804.20102.20302.0304.055.9367.382.352.564.754.0597.9892.360.540.5932.0532.5048.3846.3844.2545.783.693.493.493.7711.9913.141101.02
	CECe	26.3	20.97	22.26
	Chloride	68.5	9.43	12.85
CECe 26.3 20.9 Chloride 68.5 9.43 Nitrate-N (H2O) 42.5 14.66 Olsen P 39.2 62.11 PBI 91 104.2 Potassium 363.6 302.0 Sulphur (MCP) 430.5 55.9 Boron (hot water) 2.85 2.35 Copper (DTPA) 1.6 4.75 Iron (DTPA) 27.71 97.93	Nitrate-N (H2O)	42.5	14.68	13.83
	Olsen P	39.2	62.13	65.58
	PBI	91	104.20	102.20
	Potassium	363.6	302.0	304.0
	55.93	67.38		
	Boron (hot water)	2.85	2.35	2.56
	Chloride 20.3 20.37 Chloride 68.5 9.43 Nitrate-N (H2O) 42.5 14.68 Olsen P 39.2 62.13 PBI 91 104.20 Potassium 363.6 302.0 Sulphur (MCP) 430.5 55.93 Boron (hot water) 2.85 2.35 Copper (DTPA) 1.6 4.75 Iron (DTPA) 27.71 97.98 Zinc (DTPA) 0.21 0.54	4.05		
	Iron (DTPA)	CECe 26.3 20.97 22 Chloride 68.5 9.43 12 Nitrate-N (H2O) 42.5 14.68 13 Olsen P 39.2 62.13 65 PBI 91 104.20 100 Potassium 363.6 302.0 30 Sulphur (MCP) 430.5 55.93 67 Boron (hot water) 2.85 2.35 2 Copper (DTPA) 1.6 4.75 4 Iron (DTPA) 27.71 97.98 92 Zinc (DTPA) 0.21 0.54 0 Manganese (DTPA) 14.33 32.05 32	92.36	
	Zinc (DTPA)	0.21	0.54	0.59
	Manganese (DTPA)	14.33	32.05	32.50
	Calcium	45.9	48.38	46.38
CEC	Magnesium	43.94	44.25	45.78
) %	Potassium	3.53	3.69	6.28 5.53 0.15 1.21 0.78 10.33 10.20 0.97 0.11 22.26 12.85 13.83 65.58 102.20 304.0 67.38 2.56 4.05 92.36 0.59 32.50 46.38 45.78 3.49 4.36 3.77 13.14 1.02
	Sodium	6.63	3.69	4.36
	Ca:NO₃	1.42	3.49	3.77
io	Mg:K	12.45	11.99	13.14
Rat	Ca:Mg		1.10	1.02

	Treatment	Pre compost	Control	30 t/ha compost		
т	pH (H ₂ O)	5.49	6.12	5.86		
đ	pH (CaCl ₂)	Pre compost Control 3 5.49 6.12 5.27 5.29 0.48 0.15 1 1.8 1.15 1 0.43 0.35 1 0.43 0.35 1 0.43 0.35 1 0.43 0.35 1 0.43 0.35 1 0.43 0.35 1 0.43 0.35 1 0.43 0.35 1 0.43 0.35 1 0.43 0.35 1 0.43 0.35 1 0.43 0.35 1 0.43 0.35 1 11.94 13.63 1 11.94 13.63 1 11.94 13.63 1 11.94 13.63 1 145.5 70.00 1 145.5 70.00 1 145.5 59.90 1 0.69 <td>5.08</td>	5.08			
dS/m	EC	0.48	0.15	0.14		
%	Organic Carbon	1.8	1.15	1.38		
	Potassium (NH₄Cl)	0.43	0.35	0.35		
മ	Calcium (NH₄Cl)	Pre compost Control 30 tyna compost 5.49 6.12 5.86 5.27 5.29 5.08 0.48 0.15 0.14 1.8 1.15 1.38 0.43 0.35 0.35 8.96 7.41 7.10 1.85 5.04 4.25 0.7 0.83 0.65 0.5 0.11 0.15 11.94 13.63 12.34 37.6 9.85 10.53 60 22.55 25.10 50.7 41.00 39.45 45.5 70.00 67.75 168.1 138.0 134.9 185.5 59.90 52.23 0.98 1.69 1.47 0.63 1.71 1.82 64.64 70.51 89.14 0.69 0.56 0.95 17.32 25.72 29.72 75.1 54.48 57.75 15.5 36.79<				
100	Magnesium (NH₄Cl)	1.85	5.04	4.25		
/bə	Sodium (NH₄Cl)	0.7	0.83	0.65		
E	Aluminium (KCl)	0.5	0.11	5.86 5.86 5.08 0.14 1.38 0.35 7.10 4.25 0.65 0.15 12.34 10.53 25.10 39.45 67.75 134.9 52.23 1.47 1.82 89.14 0.95 29.72 57.75 34.19 2.82 5.26 1.47 12.12		
	CECe	11.94	13.63	12.34		
	Chloride	37.6	9.85	10.53		
	Nitrate-N (H2O)	60	22.55	25.10		
	Olsen P	50.7	41.00	39.45		
	PBI	45.5	70.00	67.75		
_	Potassium	168.1	138.0	134.9		
E Nitrate-N (H2O) Olsen P PBI Potassium Sulphur (MCP) Boron (hot water) Copper (DTPA)	Sulphur (MCP)	185.5	59.90	52.23		
-	Boron (hot water)	CECe11.9413.63Chloride37.69.85Nitrate-N (H2O)6022.55Olsen P50.741.00PBI45.570.00Potassium168.1138.0Sulphur (MCP)185.559.90oron (hot water)0.981.69Copper (DTPA)0.631.71Iron (DTPA)64.6470.51Zinc (DTPA)0.690.56	1.47			
	Copper (DTPA)	0.63	0.5 0.11 0.15 11.94 13.63 12.34 37.6 9.85 10.53 60 22.55 25.10 50.7 41.00 39.45 45.5 70.00 67.75 168.1 138.0 134.9 185.5 59.90 52.23 0.98 1.69 1.47 0.63 1.71 1.82 64.64 70.51 89.14 0.69 0.56 0.95 17.32 25.72 29.72	1.82		
	Iron (DTPA)	N (H2O) 60 n P 50.7 sl 45.5 sium 168.1 (MCP) 185.5 st water) 0.98 (DTPA) 0.63 DTPA) 64.64 DTPA) 0.69	70.51	89.14		
	Zinc (DTPA)	0.69	0.56	0.95		
	Manganese (DTPA)	17.32	25.72	29.72		
	Calcium	75.1	54.48	57.75		
CEC	Magnesium	15.5	36.79	34.19		
) %	Potassium	3.57	2.61	2.82		
	Sodium	5.88	6.10	5.26		
	Ca:NO₃	0.75	1.74	1.47		
.e	Mg:K	4.34	14.08	12.12		
Rat	Ca:Mg		1.49	1.72		







																	Yie	ld Range
	Geltch	t/ha						NŤ										
	115.8	117.5	131.6	85.1	108.8	98.2	106.1	113.2	120.2	117.5	76.3	110.5	110.5	103.5	116.7	123.7	120)-140
	124.6	98.2	121.9	79.8	114.0	76.3	95.6	107.9	93.9	119.3	64.9	93.9	107.9	111.4	120.2	127.2	110)-120
	112.3	107.0	111.4	98.2	107.9	85.1	88.6	97.4	86.0	108.8	80.7	91.2	112.3	90.4	113.2	118.4	100)-110
	79.8	55.3	96.5	72.8	94.7	65.8	77.2	93.0	78.9	107.9	62.3	81.6	106.1	56.1	111.4	86.8	90-	100
Treatment	1	3	2	4	4	2	1	3	4	1	2	3	2	1	4	3	80-	90
Row Average	108	95	115	84	106	81	92	103	95	113	71	94	109	90	115	114	70-	80
																	<70	J
	Hibma	t/ha						N←									>14	40
	119.3	127.7	94.6	119.3	147.0	116.2	107.0	86.9	119.3	54.6	86.9	107.7	61.6	124.7	83.9	100.8	120)-140
	113.9	126.2	95.4	113.9	94.6	127.0	125.4	97.0	133.9	117.0	118.5	140.8	100.0	132.3	115.4	118.5	110)-120
	93.9	108.5	89.3	104.6	107.7	111.6	116.2	90.0	122.3	108.5	121.6	127.7	122.3	145.4	123.1	141.6	100)-110
	114.7	128.5	102.3	121.6	113.1	111.6	112.3	100.0	133.9	115.4	117.7	123.9	109.3	120.0	130.0	141.6	90-	100
			spray row					spray row					spray row				80-	90
Treatment	1	3	2	4	4	2	1	3	4	1	2	3	2	1	4	3	70-	80
Row average	110	125	95	115	116	116	115	93	127	99	111	125	98	131	113	126	<70	ງ







Summary

No statistical variation between the treatments

Higher compost rates (20 t/ha or more) = slight benefit compared

Slightly more organic carbon post harvest in the 30 t/ha treatment

Regular soil chemistry tests, from constant points in the paddock (recorded using a GPS)





