**S1-Figure 1:** Soil microbial community analyses of the compost used to mix soil treatments 1-5, analyzed by Soil Foodweb Oregon LLC, 635 SW Western Blvd, Corvallis, OR 97333 to enumerate fungal, bacterial, protozoan and nematode populations.

# Biological Analysis Soil

David C. Johnson			9.000 BOOK COM				For interpretation of this report please contact.	i una report picase	COLITACI.
		San	nple#: 01-11711	Sample#: 01-117115   Submission:01-023294	1-023294		Earthfort Labs		
PO Box 30001 MSC WERC	VERC	Uniq	Unique ID: 130805-6	_			info@earthfort.com	1	
Las Cruces, NM 88003 USA	3 USA		Plant: Not Indicated	ated			(541) 257-2612		
(575) 646-5474		Invoice Number: 0	mber: 0						
davidcjohnson@nmsu.edu	edu	Sample Rec	Sample Received: 8/7/2013				Consult	Consulting fees may apply	
Organism Dry Biomass Data	Weight	Dry Weight Active Bacteria Total Bacteria (µg/g) (µg/g)	Total Bacteria (µg/g)	Active Fungi (µg/g)	Total Fungi (µg/g)	Hyphal Diameter (µm)		Nematode detail (# per gram or # per mL) Classified by type and identified to genus. (If section is blank, no nematodes identified.)	r mL) ius. tified.)
Results 0.	0.480	89.5	621	82.7	2682	2.85	Bacterial Feeders	18.62	
Comments In Goo	In Good Range	Above range	Above range	Above range	Above range		Butlerius		<del>-</del> 2
Expected Low 0	0.45	30	300	33	300		Cuticularia		0.55
_	0.85	09	009	89	009		Diplogasteritus		7.12
	Ā	Protozoa (Numbers/g)	(b/s	Total	Mycorrhizal Colonization (%)	lonization (%)	Prodesmodora		2.19
Flag	Flagellates	Amoebae	Ciliates	Nematodes #/g	ENDO	ECTO	Rhabditidae	200	0.55
1							Purigai/Root Peeuers	Ctom 9 Bulk nometodo	3 20
Results 28	28858	577176	2816	23.0	Not Ordered	Not Ordered	Filenchus	Sterii & Duib Heillatoue	1.10
Comments	Good	High	High	High					2
Low	10000	10000	0	10	10%	10%			
Range Hgh 10	100000	100000	200	20	%09	20%			
Organism Total	Total Fungi to	Active to Total	Active to Total Active Fungi to	Active Fungi to	Nitrogen				
ios	Tot.Bacteria	Fungi	Bacteria	Act. Bacteria	Cycling Potential (lbs/ac)	•			
Results 4	4.32	0.03	0.14	0.92	300+				
Comments	High	Low	Good	Low					
Expected Low	-	0.1	0.1	-					
-Fi	2	0.15	0.15	2					

01-117115: Page 1 of 2

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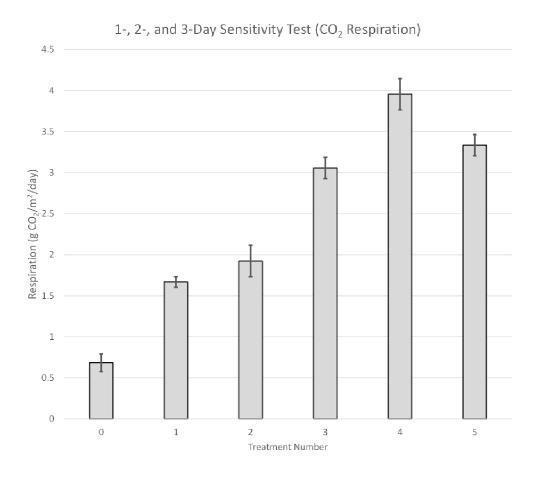
**S1-Figure 2:** Soil microbial community analyses of the alluvial sand used to mix soil treatments 0-5, analyzed by Soil Foodweb Oregon LLC, 635 SW Western Blvd, Corvallis, OR 97333 to enumerate fungal, bacterial, protozoan and nematode populations.

# Biological Analysis Soil

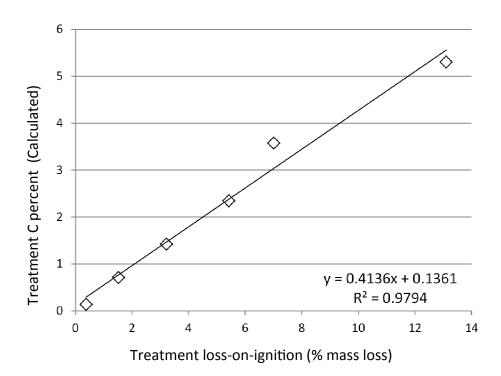
WERC / NMSU	ed Tor:	Repor	Report Sent: 8/15/2013	-			For interpretation of	For interpretation of this report please contact:	contact
David C Johnson	_	Sai	Sample#: 01-117114   Submission:01-023294	4   Submission:	11-023294		Earthfort Labs		
PO Box 30001 MSC WERC	<b>MSC WERC</b>	Unic	Unique ID: 130805-0				info@earthfort.com	E	
Las Cruces, NM 88003 USA	88003 USA		Plant: Not Indicated	ated			(541) 257-2612		
(575) 646-5474		Invoice Number: 0	umber: 0				80 87		
davidcjohnson@nmsu.edu	Jumsu.edu	Sample Rec	Sample Received: 8/7/2013				Consult	Consulting fees may apply	
Organism Biomass Data	Dry Weight	Dry Weight Active Bacteria Total Bacteria (µg/g) (µg/g)	Total Bacteria (µg/g)	Active Fungi (µg/g)	Total Fungi (µg/g)	Hyphal Diameter (µm)	Nematode detail (Classified by type (If section is blank,	Nematode detail (# per gram or # per mL) Classified by type and identified to genus. (If section is blank, no nematodes identified.)	r mL) nus. ntified.)
Results	0.970	0.53	214	0	7.93	3	Bacterial Feeders	0.05	
Comments	Above Range	Below range	Below range	Below range	Below range		Acrobeles		0.0
Expected Low	0.45	30	300	8	300		Chiloplacus		0.0
Range Hgh	0.85	09	009	89	900		Panagrolaimus		0.02
	Ā	Protozoa (Numbers/g)	(b/s	Total	Mycorrhizal Colonization (%)	lonization (%)	Ditylenchus	0.04 Stem & Bulb nematode	0.04
	Flagellates	Amoebae	Ciliates	Nematodes #/g	ENDO	ECTO			
Results	37	4743	14	0.09	Not Ordered	Not Ordered			
Comments	Low	Low	Good	Low					
Expected Low	10000	10000	0	10	10%	10%			
Range Hgh	100000	100000	200	20	%09	20%			
Organism	Total Fungi to	Active to Total Active to Total Active Fungi to	Active to Total	Active Fungi to	Nitrogen				
Biomass Ratios	Tot.Bacteria	Fungi	Bacteria	Act. Bacteria	Cycling Potential (lbs/ac)	6			
Results	0.04	0	0.002	0	50-75				
Comments	Low	Low	Low	Low					
Expected Low	-	0.1	0.1	-					
Range Hgh	2	0.15	0.15	2					

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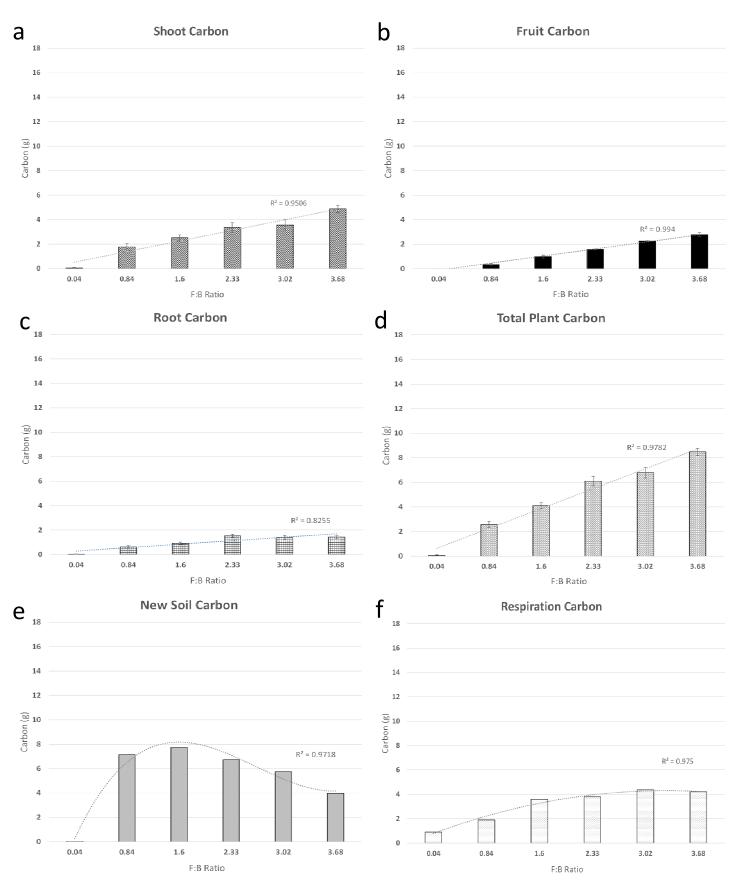
**S1-Figure 3**: Results of pre-experiment static alkali reactor sensitivity analyses, using data from 1–day, 2-day, and 3-day reactor operating times, conducted to confirm LOI reliability, CO<sub>2</sub> absorption characteristics, variance, and reproducibility with different reactor sampling intervals.



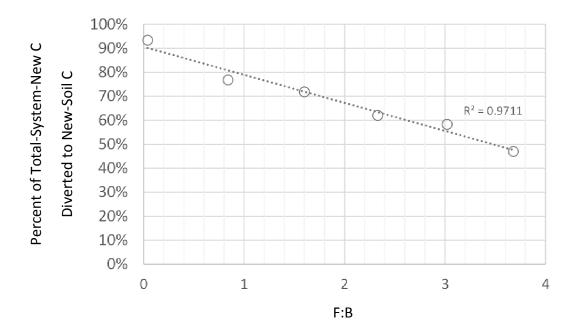
**S1-Figure 4:** Results from a GLM regression analysis, comparing initial calculated treatment soil mix (C%) with loss-on-ignition analyses (percent mass loss) to confirm experimental setup.



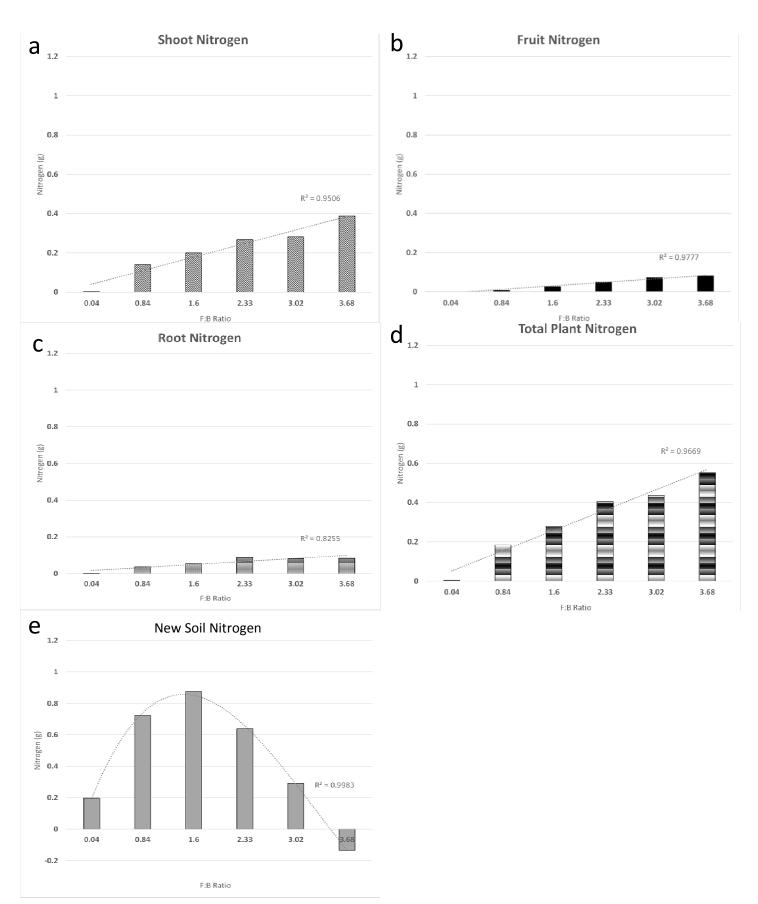
**S1-Figure 5:** Carbon partitioning (g) present in: a) shoot C, b) fruit C, c) root C, d) total plant C, e) new soil C, and f) respiration C as related to fungal:bacterial ratio.



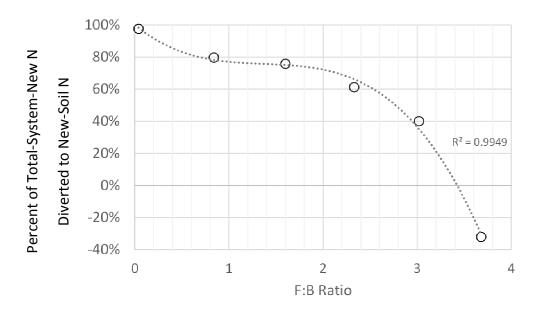
**S1-Figure 6:** Percent of total system new carbon diverted to the soil as related to fungal:bacterial ratio.



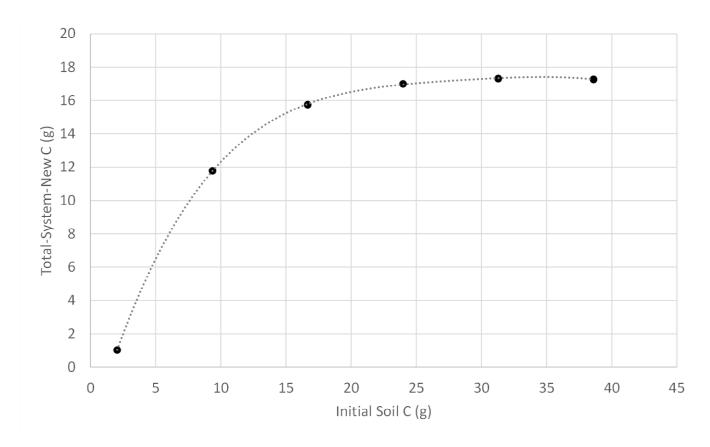
**S1-Figure 7:** Nitrogen partitioning (g) present in: a) plant shoot N, b) fruit N, c) root N, d) total plant N, and e) total new soil N as related to fungal:bacterial ratio.



**S1-Figure 8:** Percent of Total-System-New N diverted to New-Soil N as related to fungal:bacterial ratio.



**S1-Figure 9:** Comparison of Initial C vs. Total-System-New C.



# a Shoot Mass (g)

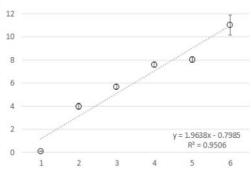
# Treatment

0	1	2	3	4	5	
0.1167	3.3469	5.4748	8.0426	8.7749	13.3571	
0.1644	4.5046	6.0747	7.9015	7.7082	9.3811	
0.0225	3.8626	5.52	7.0299	7.8018	11.196	
0.0856	4.2284		7.469	7.8575	10.1853	

### Anova: Single Factor

SUMMARY

Groups	Cou	int	Sum	Average	Variance	Std. Err.
-	0	4	0.3892	0.0973	0.0035369	0.029735921
	1	4	15.9425	3.985625	0.250459843	0.250229816
	2	3	17.0695	5.689833333	0.111602523	0.192875196
	3	4	30.443	7.61075	0.209503257	0.228857629
	4	4	32.1424	8.0356	0.246712433	0.248350777
	5	4	44.1195	11.029875	2.958446549	0.860006766



Shoot Mass (g)

14

Total 295.0745349 22

# b Fruit Mass (g)

## Treatment

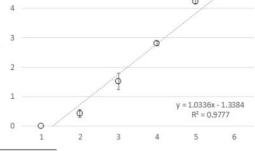
0	1	2	3	4	5
0	0.5414	1.4372	2.6034	4.1799	4.5572
0	0.1946	2.0294	2.9892	4.3162	4.2033
0	0.7423	1.0921	2.8713	4.3683	5.3315
0	0.2171		2 784	4.0273	



### Anova: Single Factor

SUMMARY

Count	Sum	Average	Variance	Std Error
4	0	0	0	0
4	1.6954	0.42385	0.07017651	0.132454247
3	4.5587	1.519566667	0.224721023	0.273691446
4	11.2479	2.811975	0.026404763	0.081247712
4	16.8917	4.222925	0.023318136	0.076351385
3	14.092	4.697333333	0.332936823	0.333135019
	4 4 3 4 4 3	4 0 4 1.6954 3 4.5587 4 11.2479 4 16.8917	4 0 0 0 4 1.6954 0.42385 3 4.5587 1.519566667 4 11.2479 2.811975 4 16.8917 4.222925	4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0



Total 71.41946109 21

# C Root Mass (g)

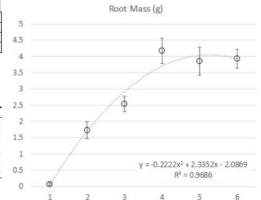
## Treatment

0		1	2	3	4	5
0.05	79	1.1458	2.1713	5.2195	3.6632	4.5716
0.14	166	2.3974	2.4668	3.8361	3.0441	3.1789
0.00	88	1.6721	2.9855	3,4119	5.0861	4.0429
		1 7012		4 2270	2 6122	2.0100

# Anova: Single Factor

SUMMARY

Groups	Count		Sum	Average	Variance	Std. Err.
5	0	3	0.2133	0.0711	0.00487789	0.040323236
	1	4	6.9166	1.72915	0.263628537	0.256723848
	2	3	7.6236	2.5412	0.16988193	0.237964934
	3	4	16.6954	4.17385	0.59698273	0.386323288
	4	4	15.4066	3.85165	0.756125203	0.4347773
	5	4	15.7122	3.92805	0.329552803	0.287033449



ANOVA Source of Variation SS df MS F P-value F-crit

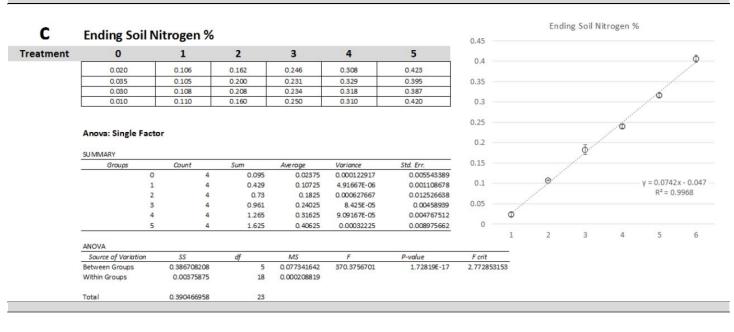
Between Groups 44.14964463 5 8.829928925 22.82967311 9.27416E-07 2.852409165
Within Groups 6.18838746 16 0.386774216

Total 50.33803209 21

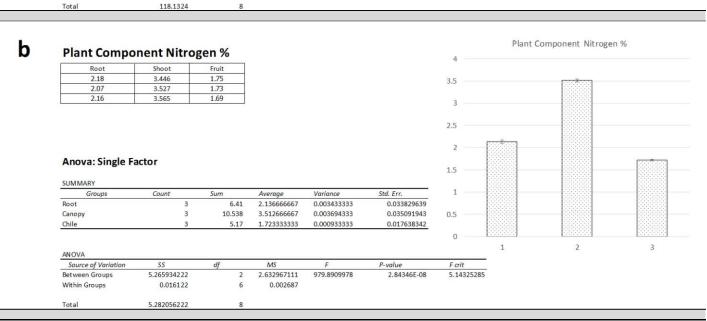
# **S1-Table 2**: Ending soil dry mass, soil carbon percent and soil nitrogen percent.

#### Ending Soil Dry Mass (g) a Ending Soil Dry Mass (g) 1600 Treatment 2 3 5 1400 1295.75 1141.48 1458.81 1030.39 832.76 686.96 0 671.41 1453.28 1337.15 1164.51 1000.79 851.68 1200 1430.73 1338.20 1201.31 1012.16 853.71 694.34 1451.23 1345.67 1041.61 829.68 696.78 ·-- 🗇 1000 Anova: Single Factor 800 SUMMARY 0 Groups Average 1448.5085 Count Variance Std. Err. 600 6.140207902 5794.034 150.8086123 5316.763 1329.19075 511.4831522 11.30799664 400 3507.300529 1169.100176 910.7564496 17.42370463 4084.951 1021.23775 333.0498629 9.124826888 y = -154.72x + 1624.4200 3367.8304 841.9576 155.9628786 6.244254932 $R^2 = 0.9973$ 2749.4836 687.3709 130.6733385 5.71562198 0 5 Source of Variation SS MS P-value F crit 1672477.121 334495.4242 1003.348206 2.2402E-20 2.809996175 Between Groups Within Groups 5667.446433 17 333.3792019

#### 1678144.568 Ending Soil Carbon % b **Ending Soil Carbon %** Treatment 0 2 3 4 5 0.186 1.158 1.994 3.220 4.674 5.646 0.100 1.024 1.722 2.785 4.510 6.836 0.147 1.541 2.550 3.018 4.012 6.093 0.190 1.160 1.990 3.220 4.670 5.650 Φ. Anova: Single Factor 0 SUMMARY Average 0.15575 Groups Count Sum Variance Std. Error 0.001757583 0.020961771 0.623 1.22075 0.049632917 0.111392231 4.883 v = 1.1496x - 1.1863 0.121178667 8.256 2.064 0.174053632 $R^2 = 0.9855$ 0.04286225 12.243 3.06075 0.103516001 0 0 17.866 4.4665 0.097643667 0.156239933 2 5 6 24 225 6.05625 0.314234917 0.280283302 ANOVA Source of Variation MS P-value F crit 18.77423907 93.87119533 179.569008 1.05089E-14 2.772853153 Between Groups Within Groups 18 0.104551667 1.88193 95.75312533



#### Plant Component Carbon % a Plant Component Carbon % 50 Root 34.73 Shoot 44.1 45 43.4 38.47 44.36 43,44 40 36.05 44.22 43.47 35 30 25 Anova: Single Factor 20 SUMMARY 15 Std. Err. 10 109.25 36.41666667 3.597733333 1.095100198 Canopy 132.68 44.22666667 0.016933333 0.075129518 Chile 130.31 43.43666667 0.001233333 0.020275875 2 3 ANOVA MS Source of Variation SS P-value F crit 110.9006 55.4503 46.00539285 0.00022942 5.14325285 Between Groups 1.2053 Within Groups 7.2318



C

	Re	spiraton	Rate (g (	CO <sub>2</sub> m <sup>2</sup> /d	lay)	Respirati	ation (g	CO <sub>2</sub> /m <sup>2</sup> /	period)			
Date	130803	130913	130921	131005	131102	130913 1	130921	131005	131102			l
Total Days	0	38	46	58	86	Reactor Area	ea=	0.002826	m <sup>2</sup>			l
Days Between Periods		38	8	12	28	Pot Area=		0.015386	m <sup>2</sup>		Cumulative	J
						Respiration ( (m²)]* [Pot A	n (g CO <sub>2</sub> /n : Area (m2		actor Area rea (m²)] *		Respiration (gCO2)	
	Treatment		1					1	1	1		
	0	2.31	2.31	1.54	4.62	1.35	0.28	0.28	1.99		3.91	┖
	1	6.16	7.70	1.54	6.16	3.60	0.95	0.28	2.65		7.48	L
	2	13.09	10.78	3.08	9.62	7.65	1.33	0.57	4.14		13.69	
	3	15.40	11.55	3.85	4.62	9.00	1.42	0.71	1.99		13.12	
	4	16.16	13.86	6.16	6.93	9.45	1.71	1.14	2.98		15.28	Ι