Helen's Acres Farm Testing Part 1: Preliminary Results

Open Mind Developments

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pela

lomi.

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1.0 Introduction

1.1 Objective

The objective of conducting this farm trial was to assess the impact of the application of Lomi Earth on crop size, crop yield, nutrient density, and soil health and to compare the results to the application of an organic fertilizer and mature compost.

1.2 Scope of Work

To achieve the objective detailed above, various test plots were set up in partnership with Helen's Acres, a local farm in Kelowna. Six crop species were grown from seed, transplanted in the field, and examined for size, yield, and nutrient density. These crops included: broccoli, cabbage, cauliflower, kale, romaine lettuce, and green leaf lettuce. Laboratory testing for crop nutrient density was conducted by SGS Canada Inc.

Additionally, soil health was assessed by taking field composite samples prior to the start of the experiment for analysis by A&L Canada Laboratories Inc. The results were then compared to soil samples taken after the completion of the project. Lomi Earth performance for crop and soil health was compared to an organic fertilizer called Sustane and municipal compost with food scraps and yard waste feedstocks (Sustane Natural Fertilizer, Inc, 2016).

2.0 Methods

2.1 Experimental Design

On June 28, the six crop species (broccoli, cabbage, cauliflower, kale, romaine lettuce, and green leaf lettuce) were grown from seed in regular potting soil in a greenhouse. The seedlings were then transplanted into the field five weeks later. Broccoli, cabbage, and cauliflower were chosen as these are cold hearty plants that could be harvested in mid-October.

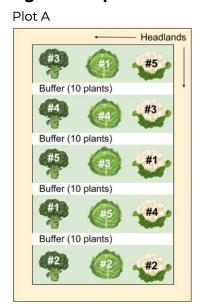
Three test plots (plot A, plot B, plot C) were set up with three beds 100 feet long and 5 feet wide each. Plot A and plot B were replicates of each other and contained the same three crops (broccoli, cabbage, and cauliflower). Plot C was stand-alone and contained kale, romaine lettuce, and green leaf lettuce. The test plots were set up with one crop species per bed. Each bed in the test plots corresponded to one of three crop species in that plot and had five treatment zones separated by buffer zones (see Figure 1). This was done to avoid cross-contamination between treatment sections in the bed.

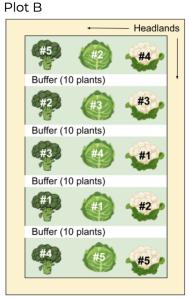
The treatment sections each had 16 plants in a double row for a total of 32 plants (80ft²) while the buffer zones had 5 plants in a double row (or a total of 10 plants (25ft²). Therefore, each bed had 200 plants, with 600 plants per plot and 1,800 plants for the entire experiment. The order of the treatment sections in each bed was randomized to avoid positioning of treatments within the bed and plot to affect performance. The various treatment zones were as follows:

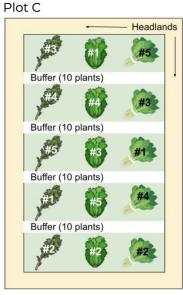
- 1. No treatment (control)
- 2. Compost (OgoGrow)
- 3. Lomi Earth Grow
- 4. Lomi Earth Grow + Lomi Blends Lawn & Garden
- 5. Organic Fertilizer (Sustane)

Lomi Earth Grow was made using a mixture of recipe 8, recipe 9, recipe 10, and recipe 12 processed on Grow mode. Broadcast application of material was completed for each treatment zone followed by irrigation. Plots were regularly maintained throughout the experiment (weeding and irrigation) and qualitative observations were recorded. Qualitative parameters such as colour richness, phytotoxic signs, and disease were assessed for all plants and visual side-by-side comparisons were made. Weather effects and conditions, field characteristics, and insect and disease occurrences were recorded during weekly visits. The previous history of the test site, including herbicide and fertilizer use, previous cropping patterns, old yard sites and manure applications were recorded as all can have an effect on crop growth. The experimental plot setup is presented in Figure 1 below.

Figure 1. Experimental Plot Setup







^{*}Each plant icon represents a 32 plants treatment zone with the treatment type of the corresponding number.

2.2 Crop Sampling

Once crops reached full maturity and were ready for harvesting, crop size and yield were measured and crop quality was assessed by testing for nutrient density. Two plants were randomly selected from each treatment zone in each bed of the three plots (2 plants x 5 treatment zones x 3 beds x



3 plots = 90 plants samples) and sent to SGS Canada laboratory to test for nutrient density. The following nutrients were analyzed for the six crops:

- Nitrogen
- Phosphorus
- Potassium
- Magnesium
- Calcium
- Sulphur
- Zinc
- Manganese
- Copper
- Iron
- Boron

2.3 Soil Sampling

The soil samples were obtained using a soil sampler push probe to ensure uniform amounts were collected within the upper 15 cm of the soil.

Three composite soil samples were obtained prior to the start of the experiment (prior to planting of seedlings in the field) in each plot to determine the baseline health of the soil.

Nutrient content, microbial biomass, and structural aspects of the soil were examined. To account for soil variability, five samples were obtained at various sections in each bed to create one composite sample for each bed in each plot for a total of 3 composite samples per plot. At the end of the experiment (post-harvesting), composite samples were obtained again but this time for each treatment zone for each bed in each plot. A&L Lab analyzed the soil samples for the following parameters:

- Total organic carbon and organic matter
- Respiration rate
- pH

- Electrical conductivity
- Cation exchange capacity
- Percent base saturation
- Phosphorus
- Potassium
- Magnesium
- Calcium
- Sodium
- Aluminum
- Total nitrogen
- Bulk density
- Capillary and non-capillary pore space
- Water holding capacity
- Infiltration rate
- Bacterial count
- Mold and yeast count

2.4 Laboratory Methods and Standards

A&L Lab is accredited by the Standards Council of Canada for specific tests as listed on www.scc.ca and by the Canadian Association for Laboratory Accreditation as listed on www.cala.ca. SGS Canada Inc. operates under the internationally recognized quality standard ISO/IEC 17025 (CALA. 2022). The laboratory analytical reports and analytical methods are presented in Appendix A.



3.0 Results

At the end of June 2022, six crop species were grown from seed and five weeks later the plants were transplanted into the field at Helen's Acres Farm. These crops were treated with Lomi Earth, an organic fertilizer, and compost and tested for various performance metrics (crop size, crop yield, crop nutrient density) by SGS Canada laboratory. Due to cold weather conditions, the cauliflower plants did not survive. Therefore, only five of the six crops will be discussed in this report as these were the ones harvested and tested.

The impact of Lomi Earth, organic fertilizer, and compost application on soil health was also analyzed by A&L Canada Laboratories through a comparison of nutrients, microbial biomass, and structural properties before the start of the experiment and after the end of the experiment. The laboratory analytical results, and averages of the results, are presented in Appendix A. The results are summarized in the tables and figures in the sections below.

3.1 Crop Yield and Size

The results show that Lomi Earth produced a higher yield by weight for 4 out of 5 of the crops (kale, romaine lettuce, cabbage, and broccoli) than if these crops were grown on their own, grown in the presence of an organic fertilizer, or grown with compost.

Lomi Earth increased the overall crop size by 17% and increased overall crop yield by weight by 26%. When looking at the overall performance for all six crops, Lomi Earth produced the greatest crop size (see Figure 2) and the second greatest crop yield by weight (see Figure 3).

Figure 2. Overall Increase in Crop Size

Overall Increase in Size

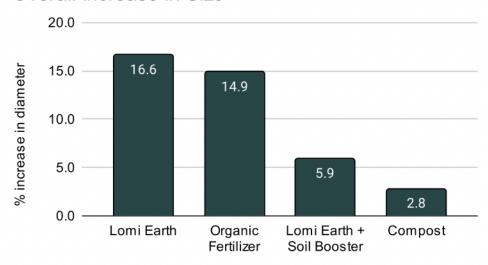


Figure 3. Overall Increase in Crop Weight Yield

Overall Increase in Weight Yield

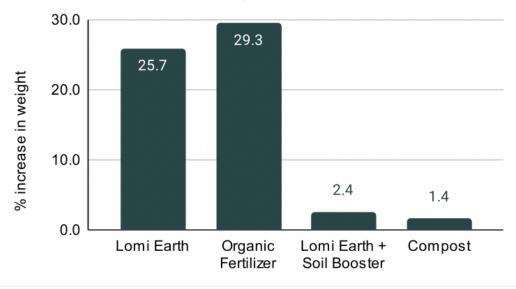


Table 3.1.1: Average Crop Yield by Weight (g)

	Broccoli	Cabbage	Kale	Romaine Lettuce	Green Leaf Lettuce
No treatment	6,781	39,950	11,386	27,567	11,346
Lomi Earth Grow	<u>13,835</u>	43,318	<u>15,173</u>	27,729	9,341
Organic Fertilizer	13,268	41,344	14,181	27,567	<u>13,953</u>
Compost	10,977	41,163	7,819	17,380	12,546

<u>Underline</u> indicates best performance.

Table 3.1.2: Average Crop Diameter (cm)

	Broccoli	Cabbage	Kale	Romaine Lettuce	Green Leaf Lettuce
No treatment	9.1	13.7	23.6	36.8	35.8
Lomi Earth Grow	<u>13.6</u>	14.6	<u>28.9</u>	37.3	36.8
Organic Fertilizer	12.1	<u>15.0</u>	28.3	<u>37.7</u>	<u>39.2</u>
Compost	11.3	14.8	18.8	36.2	36.7

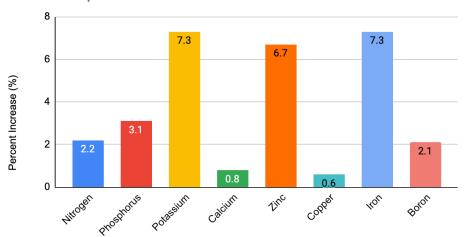
<u>Underline</u> indicates best performance.

3.2 Crop Nutrient Density

Nutrient density was analyzed as nutrient uptake is often related to better-tasting plants and healthier crops. The results show that Lomi Earth + Lomi Blends Lawn & Garden increases the overall nutrient density of eight key nutrients in leafy greens (including micronutrients and macronutrients) as seen in Figure 4. Lomi Earth + Lomi Blends Lawn & Garden increases the overall nutrient content of leafy greens by 22%.

Figure 4. Nutrient Density Increase in Leafy Green Crops

Average Nutrient Density Increase Across Three Leafy Green Crops



Lomi Earth + Lomi Blends Lawn & Garden also increases the iron content in green leaf lettuce by 26% and the zinc content in kale by 14% (see Figures 5 and 6). Iron is important for oxygen transport in the body via your red blood cells, proper enzyme function, and immune system strength. Zinc is necessary for almost 100 enzymes to carry out vital chemical reactions. It is a major player in the creation of DNA, growth of cells, building of proteins, healing of damaged tissue, and support of a healthy immune system.

Figure 5. Green Leaf Lettuce Iron Content

Green Leaf Lettuce - Iron

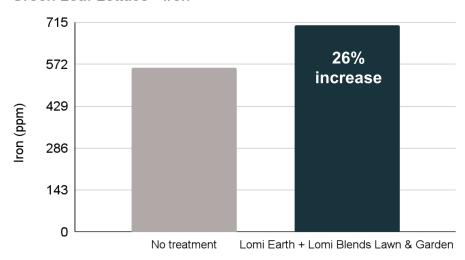
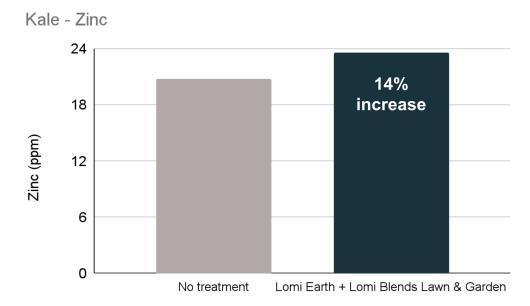


Figure 6. Kale Zinc Content



Lomi Earth + Lomi Blends Lawn & Garden increased the overall nutrient density of four key nutrients when looking at the average of all five test crops (including micronutrients and macronutrients) as seen in Figure 7 and Table 3.2.1.

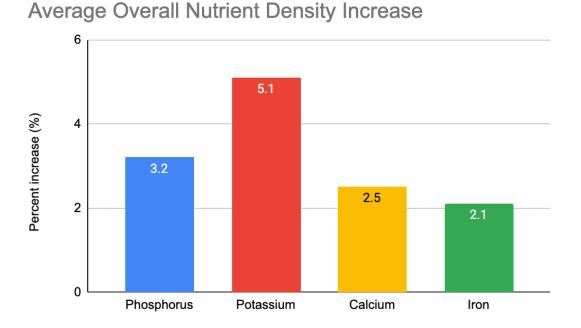


Figure 7. Overall Nutrient Density Increase in All Five Test Crops

The nutrient density of green leaf lettuce compared to the other crops performed the best with Lomi Earth and with Lomi Earth + Lomi Blends Lawn & Garden.

- Lomi Earth
 - o 3/11 nutrients showed an increase in nutrient density.
 - Overall nutrient density of the plant showed a 21% decrease.
- Lomi Earth + Lomi Blends Lawn & Garden
 - 5/11 nutrients showed an increase in nutrient density.
 - Overall nutrient density of the plant showed a 50% increase.

Romaine lettuce performed the best in terms of the crop with the most nutrients that showed a percent increase, with Lomi Earth 5/11 and Lomi Earth + Lomi Blends Lawn & Garden 7/11.

The nutrient density of cabbage compared to the other crops performed the worst with Lomi Earth and with Lomi Earth + Lomi Blends Lawn & Garden.

- Lomi Earth
 - 3/11 nutrients showed an increase in nutrient density.
 - Overall nutrient density of the plant showed a 44% decrease.
- Lomi Earth + Lomi Blends Lawn & Garden
 - o 1/11 nutrients showed an increase in nutrient density.
 - Overall nutrient density of the plant showed a 99% decrease.

When looking at the average of all five crops, the results show an overall decrease in nutrient density for most nutrients (see Table 3.2.1). The organic fertilizer performed the best, with 7 out of 11 nutrients showing a percent increase.

Table 3.2.1: Average Overall Nutrient Density Change in All Five Crops

		P	ercent	Increas	se or D	ecreas	e in Nu	ıtrient	Densit	ty	
	N	P	K	Mg	Ca	S	Zn	Mn	Cu	Fe	В
Compost	-17.90	-17.13	-20.47	-11.42	-8.19	-10.11	-0.50	-15.46	-4.29	0.19	-6.11
Lomi Earth	2.07	4.07	1.39	-10.69	-9.19	-6.85	-1.87	-10.63	-5.81	-14.71	-8.34
Lomi Earth + Lomi Blends Lawn & Garden	-0.79	3.24	5.07	-2.92	2.54	-1.63	-0.02	-7.52	-5.30	2.04	-0.57
Organic Fertilizer	3.00	6.66	9.26	-0.92	9.42	-4.62	7.43	-2.08	14.12	-4.54	5.94

Protein contents of the plant samples were determined via the Kjeldahl method using the conventional nitrogen to protein (N:P) conversion factor of 6.25 (i.e. total nitrogen × 6.25). Compared to municipal compost and the organic fertilizer, Lomi Earth increased the protein content in green leaf lettuce and in kale the most (see Figures 8 and 9).

Figure 8. Protein Content in Green Leaf Lettuce

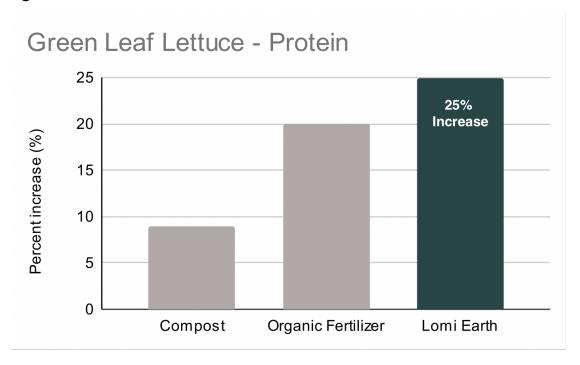
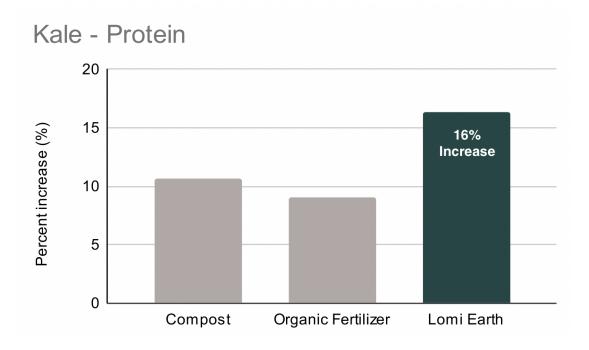


Figure 9. Protein Content in Kale



It should be noted that the numbers reported in this section should be treated as very tentative as there were no replicate samples obtained. The decreased nutrient density for some nutrients when plants are exposed to any of the fertilizers (Lomi Earth, compost, or the organic fertilizer) seems counterintuitive, as nutrient density shouldn't typically decrease when a plant is presented with more nutrients, could simply be a result of capturing variability. Future sampling programs will be conducted in triplicates for each crop in each treatment zone to help to dampen this inherent variability and give more reliable results.

3.3 Soil Health

The soil health data was obtained and analyzed from test plots A and B. Plot C was an observational test plot with no replicate samples and too much variability to draw conclusions.

The results from plot A and plot B indicated Lomi Earth increased the soils' organic matter content by 13% and the TOC by 31% (see Figures 10 and 11).

Areas where Lomi Earth was applied had 44% higher organic matter

compared to the organic fertilizer and 29% higher organic matter compared to compost.

Figure 10. Organic Matter Content Before & After the Experiment

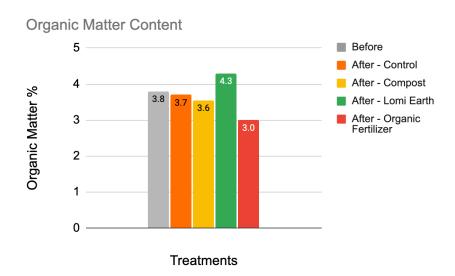
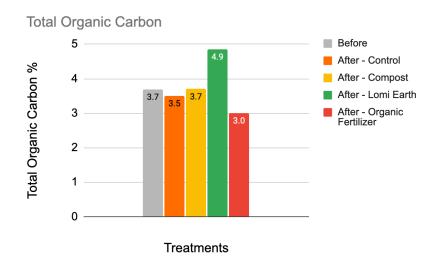


Figure 11. Total Organic Carbon Before & After the Experiment



Lomi Earth did not significantly impact soil pH. The soils' pH after Lomi Earth application remained in the neutral range. This shows that although Lomi Earth has an acidic pH, it does not cause the pH of the soil to drop, ensuring it remains hospitable to most plants.

In areas where Lomi Earth was applied, CEC was 30% higher than the compost application area and 45% higher than the organic fertilizer



application area as shown in Figure 13. The CEC concentration post-harvest was 2% less than compared to pre-Lomi Earth application.

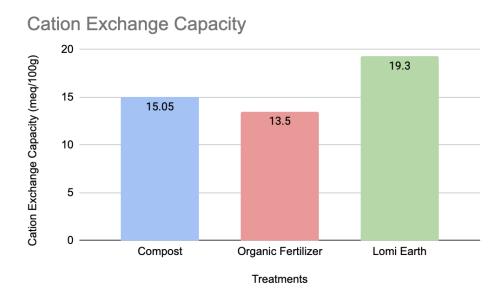


Figure 12. Cation Exchange Capacity Post Experiment

Lomi Earth increased the soil's bacterial count by 75%. Areas where Lomi Earth was applied had 295% more bacteria than the areas treated with compost and 175% more bacteria than areas treated with the organic fertilizer. Lomi Earth increased the soil's mold/fungi/yeast count by 118%. Areas where Lomi Earth was applied had 137% more mold/fungi/yeast than the areas treated with compost and 188% more mold/fungi/yeast than areas treated with the organic fertilizer.

Lomi Earth improved the water-holding capacity of the soil by 10%. Areas where Lomi Earth was applied had 9% higher water-holding capacity compared to the organic fertilizer and 7% higher water-holding capacity compared to compost. Increased water-holding capacity is important to provide plant roots with the water they need to grow, but it is also critical to resist periods of drought and reduce soil erosion and runoff during floods.



Lomi Earth decreased the bulk density of the soil by 15%, therefore allowing easier water and solute movement and increasing soil aeration. Lomi Earth could be used to fight against soil compaction, this is confirmed through the improved soil porosity observed where Lomi Earth was applied.

Capillary pore space (micropores that are water-filled) increased by 15% and non-capillary pore space (macropores that are air-filled) increased by 589%. Macropores and micropores are critical to the movement of air, water, and roots through the soil and provide a habitat for important soil microorganisms.

Potassium, magnesium, calcium, sodium and aluminum concentrations had decreased levels compared to how the soil was pre-Lomi Earth application. This is likely due to the fact that the plants took up a lot of these nutrients to fuel their growth, leaving the soil more depleted than how it started. In addition, nutrient levels remained higher in areas where Lomi Earth was applied than in the organic fertilizer application areas. This indicates that Lomi Earth is able to help provide more nutrients and ensure soils are less depleted after crop harvests.

- a) Lomi Earth increased potassium in the soil by 71% compared to compost and 125% compared to the organic fertilizer. Another way to say this is "Areas where Lomi Earth was applied had 71% more potassium than the areas treated with compost and 125% more potassium than areas treated with the organic fertilizer."
- b) Lomi Earth increased magnesium in the soil by 15% compared to compost and 37% compared to the organic fertilizer.
- c) Lomi Earth increased calcium in the soil by 20% compared to compost and 35% compared to the organic fertilizer.
- d) Lomi Earth decreased sodium in the soil by 10% compared to compost and increased sodium by 6% compared to the organic fertilizer.

- e) Lomi Earth decreased aluminum in the soil by 3% compared to compost and increased sodium by 5% compared to the organic fertilizer.
- f) Lomi Earth increased phosphorus in the soil by 36% compared to compost and 52% compared to the organic fertilizer.
- g) Lomi Earth increased the total nitrogen content of the soil by 10%.

The percent base saturation of potassium, magnesium, calcium, sodium, and hydrogen were within the ideal levels for most soils in all treatment areas (control, compost, organic fertilizer, and Lomi Earth application areas).

The soil respiration rate was below the detectable limit for before-treatment applications and after-treatment applications for all samples.

4.0 Conclusion

The preliminary results from the Helen's Acres Farm Testing indicate applying Lomi Earth to the soil has positive benefits for crop yield and size, crop nutrient density and soil health. The initial testing results indicate adding Lomi Earth to soil increased crop yield by 26%, increased crop size by 17%, and boosted levels of 8 essential nutrients, as compared to the control. The visual results of the same number of plants obtained from each treatment zone are presented in the photograph below.



Figure 13. Harvested Broccoli (Plot A) for Each Treatment Zone

Lomi Earth is a nutrient-rich and microbially-rich organic fertilizer that you can craft at home at the push of a button. Lomi takes your food waste and transforms it into something you can mix back into your garden soil. Not only does it improve *soil* quality, but Lomi Earth has the potential to be the answer to global food security through its impact on *crop* quality.

The high organic matter and nutrient content Lomi Earth adds to the soil feeds the microbial life below ground and is taken up by the plants you grow in your garden. One application of Lomi Earth can help boost levels of eight essential nutrients, meaning the lettuce you grow in your backyard will be able to provide you with the nutrition you really need.

Lomi Earth can be used at your local farms to ensure that the produce you pick up at your farmers market is also healthy, nutritious, and of high quality. Lomi Earth can help food regain its nutrients, give you agency over your health, and provide a sense of power when it comes to choosing the food you put in your body and those of your children.

Soil health is deeply connected to environmental health, animal health, plant health, and human health. In the last 100 years, the quality of our soil has been declining at an alarming rate, and therefore, so has the quality of our food. So much so, that we would need twenty-one oranges today to get the same amount of nutrients as one orange grown 80 years ago.

This nutrient decline is contributing to a phenomenon called 'hidden hunger', where people feel sated but may not be healthy, as their food is calorie-rich but nutrient-poor. This means that even if we have access to and are consuming 'healthy foods', like fruits and vegetables, we may not actually be getting the nutrition we need anymore. This is further exacerbated in regions where access to fresh and healthy food is limited (food deserts).

The issue of global food security is rapidly expanding, especially in the face of this discovery. Nutrient deficiencies represent a major threat to the health and development of populations worldwide, particularly children and pregnant women in low-income countries. "An estimated two billion people – 30% of the global population – lack one or more crucial micronutrients. Many people suffer serious and life-long health problems as a result" (World Health Organization, World Food Programme, & United Nations Children's Fund, 2006). It is undeniable, our food quality is declining and with it so is our health.

5.0 Next Steps

Part 2 of Lomi Earth testing at Helen's Acres Community Farm involves conducting more testing to further validate the value of Lomi Earth as an organic fertilizer for farm use. The project will involve the following:

- 1. Test 4 different application rates of Lomi Earth in the soil;
- 2. Test Lomi Earth on 3 new crops (potatoes, carrots, and onions); and
- 3. Observe the long-term effects of Lomi Earth on the soil.

The Helen's Acres Farm Testing Part 2 report will be completed after harvest 2023.

6.0 References

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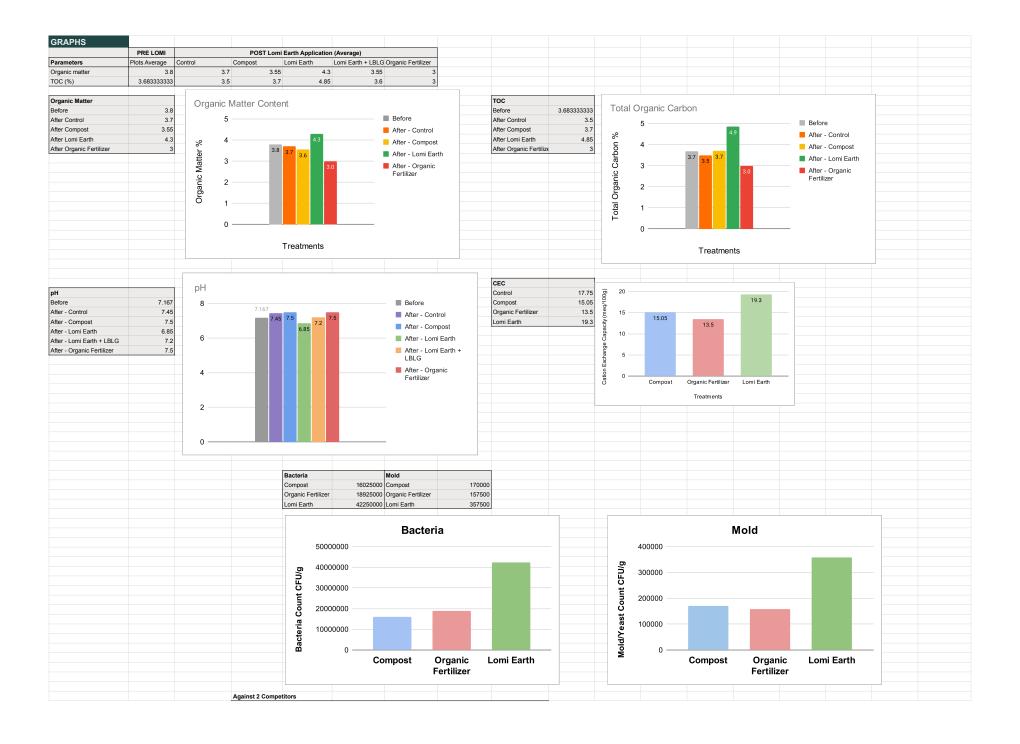
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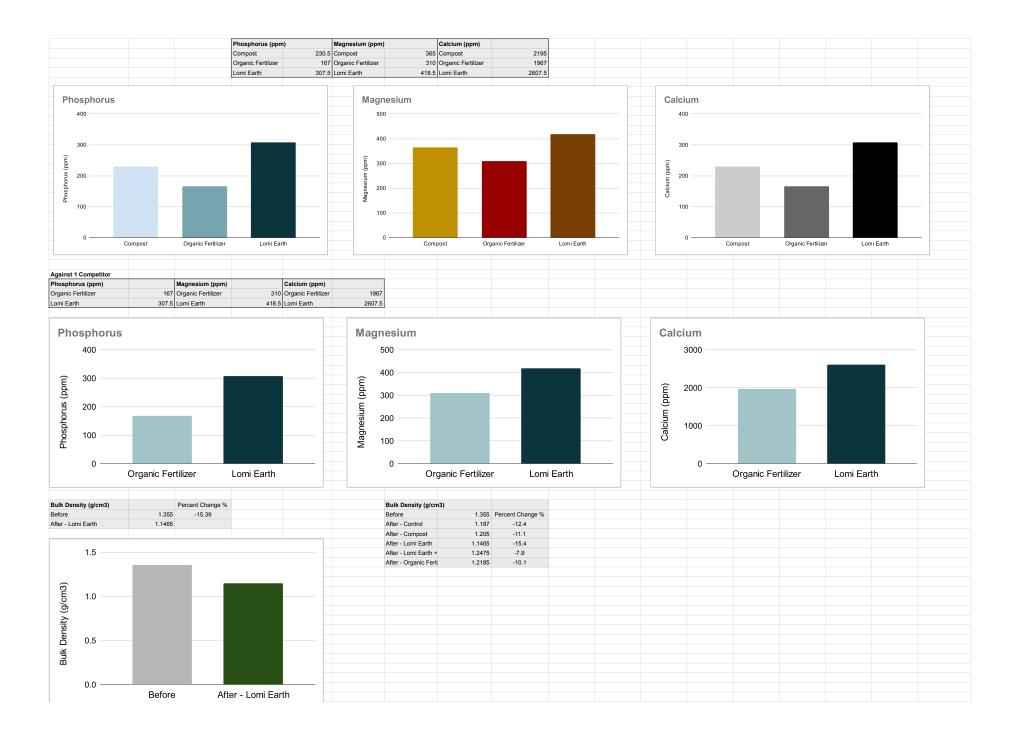
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7.0 Appendix

Appendix A:
Farm Soil Samples

		PRE Lomi Eartl	h Application			POST Lomi Ea	rth Application	(Average)		Percent In	ncrease/Decre	ease Compare	ed to Before (Ave	rage)	Percent C	nange Com	npared to Contr	ol After (Average	e)		nge Compared t After (Average)	o Compost	Percent Change C Fertilizer A	Compared to	Organic e)
Parameters	Bed 1 Avg. I	Bed 2 Avg.	Bed 3 Avg. I	Plots Average	Control	Compost L	omi Earth L	omi Earth + L (Organic Fertili	Control Co	mpost L	omi Earth	Lomi Earth + L C	Organic Fertili Con	trol Com	oost L	omi Earth Le	omi Earth + L Org	ganic Fertil	i Compost	Lomi Earth	Lomi Earth + L	Organic Fertili Lomi	Earth Lo	mi Earth + L
Organic matter	3.6	3.8	4	3.8	3.7	3.55	4.30	3.55	3.00	-3.0	-7.5	13.1	-6.6	-21.1	0	-5.8	17.6	-2.8	-18.2	0.0	28.8	6.5	0.0	43.5	18.5
TOC (%)	3.75	3.65	3.65	3.7	3.5	3.7	4.85	3.6	3	-4.4	-0.4	31.3	-2.4	-18.0	0	6.4	39.1	3.2	-14.3	0.0	33.0	-0.7	0.0	62.5	20.5
Phosphorus P (ppm)										-24.1	-22.5	-5.8	-29.6	-32.4	0	2.1	38.7	-6.3	-9.5	0.0	36.0	-8.2	0.0	51.7	3.6
Potassium K (ppm)	300.5	305	385.5	330	190.5	230.5	307.5	202.5	167	-42.7	-31.2	-7.1	-39.1	-50.1	0	12.4	68.2	6.3	-17.5	0.0	71.2	3.5	0.0	125.0	37.1
Magnesium Mg (ppm)	411.5	408	456.5	425	414	365	418.5	327	310	-2.5	-13.7	-1.4	-22.3	-26.4	0	-11.7	1.1	-20.8	-24.9	0.0	15.0	-10.8	0.0	37.1	5.3
Calcium Ca (ppm)	2793.5	2792.5	2976.5	2854	2618	2195	2607.5	2124	1967	-8.2	-23.0	-8.6	-25.5	-31.0	0	-16.4	-0.2	-19.5	-25.3	0.0	20.1	-4.0	0.0	35.4	7.4
Sodium Na (ppm)	57	48.5	54.5	53.3	39.5	39.5	35.5	39	33.5	-25.6	-25.4	-33.0	-26.2	-36.8	0	-0.2	-10.2	-1.6	-15.3	0.0	-10.0	-1.6	0.0	6.0	15.9
Aluminium Al (ppm)	422	403.5	383.5	403	344.5	321	309	277.5	293.5	-15.7	-21.1	-23.5	-30.1	-26.0	0	-6.2	-8.6	-15.5	-10.6	0.0	-2.8	-10.4	0.0	4.8	-5.5
Nitrogen total (%)	0.25	0.25	0.3	0.3	0.25	0.3	0.3	0.3	0.3	-7.1	9.5	9.5	14.3	14.3	0	16.7	16.7	25.0	25.0	0.0	0.0	12.5	0.0	0.0	0.0
Estimated nitrogen release ENR	48	50	52	50	49	47.5	55	47.5	42	-2.2	-5.5	10.0	-5.0	-16.0	0	-4.0	13.0	-2.4	-13.8	0.0	19.7	3.5	0.0	31.0	13.2
pH	7.2	7.05	7.3	7.2	7.45	7.5	6.85	7.2	7.5	3.8	4.7	-4.1	0.4	4.6	0	0.9	-7.4	-3.3	0.8	0.0	-8.4	-4.1	0.0	-8.3	-4.1
CEC (meg/100g)	18.95	18.9	21.5	19.8	17.75	15.05	19.3	14.6	13.5	-9.9	-23.2	-2.2	-25.3	-31.0	0	-15.3	8.8	-17.8	-24.0	0.0	29.6	-3.3	0.0	45.2	7.9
Electrical conductivity, salts (ms/cm)	0.45	0.5	0.45	0.5	0.3	0.3	0.35	0.4	0.3	-26.3	-26.3	-18.4	-10.5	-26.3	0	0.0	16.7	33.3	0.0	0.0	16.7	33.3	0.0	16.7	33.3
Bacteria (CFU/g)	18250000	27500000	28000000	24583333	9550000	16025000	42250000	24250000	18925000	-62.8	-42.2	74.7	-5.1	-28.9	0	47.7	385.4	155.4	86.4	0.0	294.5	94.8	0.0	175.2	40.5
Mold & Yeast (CFU/g)	582500	660000	750000	664167	107500	170000	357500	252500	157500	-47.5	-37.1	117.7	-19.8	-48.6	0	67.1	213.2	154.1	57.9	0.0	136.6	44.5	0.0	188.1	59.0
Respiration (mgCO2-C/g OM/day)	1.0	BDL	BDL E	BDL	BDL	BDL B	DL B	IDL E	BDL	BDL BD	L E	BDL	BDL B	BDL	0 BDL	E	BDL B	BDL BD	L	0	BDL	BDL	0 BDL	BD	
Respiration (mgCO2-C/g TS/day)	0.10	BDL	BDL I	BDL	BDL	BDL B	DL E	IDL E	BDL	BDL BD	DL E	BDL	BDL E	BDL	0 BDL	Е	BDL B	BDL BD	L	0	BDL	BDL	0 BDL	BD	L
Bulk density (kg/m3)	1280	1405	1380	1355	1187	1205	1146.5	1247.5	1218.5	-12.38477506	-11.1	-15.4	-7.9	-10.1	0.0	2.9	-3.0	6.0	4.3	0.0	-5.0	3.4	0.0	-5.9	24
Capillary pore space (%)	39.30	40.70	42.90	40.97	51.3	41.2	47.5	45.3	41	25.17073235	0.5	15.8	10.5	0.0	0.0	-19.7	-9.1	-12.1	-20.2	0.0	13.3	9.4	0.0	13.6	10.1
Infiltration rate (in/hr)	BDL	0.73	3.495		BDL	1.24	2.04 E	IDL E	BDL	BDL	-29.1	16.6		BDL	0.0 BDL	E	BDL B	BDL BD	L	0.0	BDL	BDL	0.0 BDL	BD)L
Non capillary pore space (%)	1.40	3.30	1.60	2.10	2.15	2.2	11.55	6.9	9.85	18.27458256	19.1	589.3	261.2	494.2	0.0	6.7	313.4	263.0	238.2	0.0	315.5	234.8	0.0	56.9	265.7
Water holding capacity (%)	31.80	29.95	32.10	31.28	35.15	31.95	34.45	31.3	31.35	12.28915457	2.0	10.0	0.1	0.2	0.0	-9.5	-3.1	-9.9	-10.6	0.0	6.7	0.2	0.0	8.7	0.6
BS - %K	4.05	4.15	4.6	4.3	2.75	3.75	4.05	3.5		-36.43848289	-15.2	-5.4		-30.5	0.0	29.4	51.0	30.3	7.0	0.0	25.9	8.5	0.0	46.9	26.6
BS - %Mg	18.05	17.95	17.75		19.45	20.3 72.7	18.05	18.65	19.15		13.3	0.7		6.9	0.0	4.3	-7.1	-4.0	-1.4		-10.9	-7.9	0.0	-5.7	-2.6
BS - %Ca	73.6	73.9	70.25	72.6	73.7		67.6	72.25	72.45		0.3	-6.8		-0.1	0.0	-1.3	-8.3	-2.0	-1.7	0.0	-7.0	-0.7	0.0	-6.7	-0.3
BS - %H	6.1	6	12.8	8.3	6.6	4.5	9.45	9.2	8.8		-45.8	54.2		6.0	0.0	-31.8	93.9	39.4	33.3			V/A	0.0 N/A	N/A	
BS - %Na	1.35	1.1	1.15	1.2	0.95	1.1	0.8	1.2	1.05	-20.83333333	-8.3	-33.3	0.0	-12.5	0.0	16.1	-16.1	26.7	11.1	0.0	-27.3	9.1	0.0	-23.2	14.5





Appendix B: Farm Soil Samples Top 10 Conclusions

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Farm Soil Samples Top 10 Conclusions (Plot A and B only)

Lomi Earth

- 1) Lomi Earth increased the soils' organic matter content by 13% and the TOC by 31%. Areas where Lomi Earth was applied had 44% higher organic matter compared to the organic fertiliser and 29% higher organic matter compared to compost. There are lots of benefits to having increased soil organic matter. If you want to list some, a quick google will give you some good bullets.
- 2) Lomi Earth did not significantly impact soil pH. The soils' pH after Lomi Earth application remained in the neutral range. This is good to know because Lomi Earth has an acidic pH and we were worried that it might cause the pH of the soil to drop, making it less hospitable to most plants.
- 3) In areas where Lomi Earth was applied, CEC was 30% higher than the compost application area and 45% higher than the organic fertiliser application area. However, Lomi Earth decreased CEC by 2% compared to pre Lomi Earth application. More testing required.
- 4) Lomi Earth increased the soils' bacterial count by 75%. Areas where Lomi Earth was applied had 295% more bacteria than the areas treated with compost and 175% more bacteria than areas treated with the organic fertiliser.
- 5) Lomi Earth increased the soils' mold/fungi/yeast count by 118%. Areas where Lomi Earth was applied had 137% more mold/fungi/yeast than the areas treated with compost and 188% more mold/fungi/yeast than areas treated with the organic fertiliser.
- 6) Lomi Earth improved water holding capacity of the soil by 10%. Areas where Lomi Earth was applied had 9% higher water holding capacity compared to the organic fertiliser and 7% higher water holding capacity compared to compost. Increased water holding capacity is important to provide plant roots with the water they need to grow, but it is also critical to resist periods of drought and reduce soil erosion and runoff during floods.
- 7) Lomi Earth decreased the bulk density of the soil by 15%, therefore allowing easier water and solute movement and increasing soil aeration. Lomi Earth could be used to fight against soil compaction, this is confirmed through the improved soil porosity observed where Lomi Earth was applied. Capillary pore space (micropores that are water-filled) increased by 15% and non-capillary pore space (macropores that are air-filled) increased by 589%. Macropores and micropores are critical to the movement of air, water, and roots through the soil and provide habitat for important soil microorganisms.
- 8) Nutrients:

- a) The nutrients (potassium, magnesium, calcium, sodium, aluminium) had decreased levels compared to how the soil was pre Lomi Earth application. This is likely due to the fact that the plants took up a lot of these nutrients to fuel their growth, leaving the soil more depleted than how it started. However, all nutrient levels remained higher in areas where Lomi Earth was applied than in the organic fertiliser application areas. This means that Lomi Earth is able to provide more nutrients and ensure soils are less depleted after crop harvests. More testing is required.
- b) Lomi Earth increased potassium in the soil by 71% compared to compost and 125% compared to the organic fertiliser. Another way to say this is "Areas where Lomi Earth was applied had 71% more potassium than the areas treated with compost and 125% more potassium than areas treated with the organic fertiliser."
- c) Lomi Earth increased magnesium in the soil by 15% compared to compost and 37% compared to the organic fertiliser.
- d) Lomi Earth increased calcium in the soil by 20% compared to compost and 35% compared to the organic fertiliser.
- e) Lomi Earth decreased sodium in the soil by 10% compared to compost and increased sodium by 6% compared to the organic fertiliser..
- f) Lomi Earth decreased aluminium in the soil by 3% compared to compost and increased sodium by 5% compared to the organic fertiliser.
- g) Lomi Earth increased phosphorus in the soil by 36% compared to compost and 52% compared to the organic fertiliser.
- h) Lomi Earth increased the total nitrogen content of the soil by 10%.
- 9) The percent base saturation of potassium, magnesium, calcium, sodium, and hydrogen were within the ideal levels for most soils in all treatment areas (control, compost, organic fertiliser, and Lomi Earth application areas).
- 10) Soil respiration rate was below the detectable limit before treatment applications and after treatment application for all samples.

Appendix C:

Data Analysis of Harvested Plants - Crop Size and Yield

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	of Harvested Plants - Crop Size										
Plant Type:	Green Leafy Lettuce	Kale	Romaine Lettuce	Plot A - Cauliflower	Plot A - Cabbage	Plot A - Broccoli	Plot B - Cauliflower	Plot B - Cabbage	Plot B - Broccoli	Plot A & B Averaged - Cabbage	Plot A & B Averaged - Broccoli
	Highest We	eight Yield					Н	ighest Weight Yield		Highest We	ight Yield
#1	Organic Fertilizer	Lomi Earth	Lomi Earth		Lomi Earth + LBLG	Organic Fertilizer		Compost	Lomi Earth	Lomi Earth + LBLG	Lomi Earth
#2	Compost	Organic Fertilizer	Organic Fertilizer		Lomi Earth	Lomi Earth		Organic Fertilizer	Compost	Lomi Earth	Organic Fertilizer
#3	No Treatment	No Treatment	No Treatment		Organic Fertilizer	Lomi Earth + LBLG		No Treatment	Organic Fertilizer	Organic Fertilizer	Compost
#4	Lomi Earth	Compost	Lomi Earth + LBLG		No Treatment	Compost		Lomi Earth + LBLG	No Treatment	Compost	Lomi Earth + LBLG
#5	Lomi Earth + LBLG	Lomi Earth + LBLG	Compost		Compost	No Treatment		Lomi Earth	Lomi Earth + LBLG	No Treatment	No Treatment
	Greatest Av						Gr	eatest Average Size		Greatest Ave	
#1	Organic Fertilizer	Lomi Earth	Organic Fertilizer		Organic Fertilizer	Organic Fertilizer		Compost	Lomi Earth	Organic Fertilizer	Lomi Earth
#2	Lomi Earth + LBLG	Organic Fertilizer	Lomi Earth		Lomi Earth	Lomi Earth + LBLG		Organic Fertilizer	Compost	Compost	Organic Fertilizer
#3	Lomi Earth	Lomi Earth + LBLG	No Treatment		Lomi Earth + LBLG	Lomi Earth		No Treatment	Organic Fertilizer	Lomi Earth	Compost
#4	Compost	No Treatment	Compost		Compost	Compost		Lomi Earth + LBLG	No Treatment	Lomi Earth + LBLG	Lomi Earth + LBLG
#5	No Treatment	Compost	Lomi Earth + LBLG		No Treatment	No Treatment		Lomi Earth	Lomi Earth + LBLG	No Treatment	No Treatment
	Greatest Average	Weight of 1 Plant					Greatest	Average Weight of 1	Plant	Greatest Average V	Veight of 1 Plant
#1	Organic Fertilizer	Lomi Earth	Lomi Earth		Lomi Earth + LBLG	N/A		Compost	N/A	Lomi Earth + LBLG	N/A
#2	Compost	Organic Fertilizer	Organic Fertilizer		Lomi Earth	N/A		Organic Fertilizer	N/A	Lomi Earth	N/A
#3	No Treatment	No Treatment	No Treatment		Organic Fertilizer	N/A		No Treatment	N/A	Organic Fertilizer	N/A
#4	Lomi Earth	Lomi Earth + LBLG	Lomi Earth + LBLG		No Treatment	N/A		Lomi Earth + LBLG	N/A	Compost	N/A
#5	Lomi Earth + LBLG	Compost	Compost		Compost	N/A		Lomi Earth	N/A	No Treatment	N/A
				Overall Increase i	n Weight Yield	Overall Ir	crease in Size				
	W IS COMPARED TO NO TREATMENT (BASELIN			30.0	29.3	20.0					
Overall Performanc		% increase in weight yield	% increase in size	25.7	25.5	<u></u> 15.0 −	16.6				
#1	Lomi Earth	25.7	16.6	튬 20.0		g	14.9				
#2	Organic Fertilizer	29.3	14.9	Ne i		<u>.</u> 10.0 —					
#3	Lomi Earth + Lomi Blends Lawn & Garden	2.4	5.9	.⊑ ⊕ 10.0							
#4	Compost	1.4	2.8	eas	2.4	1.4 8 5.0 -		5.9			
#5	No Treatment	U	0			5		1			
									8		
				- 0.0 Caff	narit catt	.= 0.0 -	esti astre		\$ >		
				lanitath	Organic Lord Later Confi	. <u></u> 0.0 –	Loni Easts Organic	Lord Early Compo	>		
	% increase in weight yield	% increase in size		Lantender	% increase in weight yield	% increase in size	John Leiter Organie		8		
Lomi Earth	-17.7	3.0		Cabbage Lomi Earth	% increase in weight yield 8.4	% increase in size	Loritatin Oderste		\$		
Lomi Earth Lomi Earth + LBLG	-17.7 -12.4	3.0 5.9		Cabbage Lomi Earth Lomi Earth + LBLG	% increase in weight yield 8.4 16.1	% increase in size 6.6 4.3	Lori Edit Opposit		\$		
Lomi Earth Lomi Earth + LBLG Organic Fertilizer	-17.7 -12.4 23.0	3.0 5.9 9.6		Cabbage Lomi Earth Lomi Earth + LBLG Organic Fertilizer	% increase in weight yield 8.4 16.1 3.5	% increase in size 6.6 4.3 9.3	Lentelith Olygine		\$		
Lomi Earth Lomi Earth + LBLG Organic Fertilizer Compost	-17.7 -12.4 23.0 10.6	3.0 5.9 9.6 2.6		Cabbage Lomi Earth + LBLG Organic Fertilizer Compost	% increase in weight yield 8.4 16.1 3.5 3.0	% increase in size 6.6 4.3 9.3 8.2	Levi Levi Regente		\$		
Lomi Earth Lomi Earth + LBLG Organic Fertilizer	-17.7 -12.4 23.0	3.0 5.9 9.6		Cabbage Lomi Earth Lomi Earth + LBLG Organic Fertilizer	% increase in weight yield 8.4 16.1 3.5	% increase in size 6.6 4.3 9.3	Lord Left Cryptile		>>		
Lomi Earth Lomi Earth + LBLG Organic Fertilizer Compost No Treatment Kale	-17.7 -12.4 23.0 10.6 0.0	3.0 5.9 9.6 2.6 0.0		Cabbage Lomi Earth + LBLG Organic Fertilizer Compost No Treatment Broccoli	% increase in weight yield 8.4 16.1 3.5 3.0 0.0	% increase in size 6.6 4.3 9.3 8.2 0.0	control of the second		>		
Lomi Earth Lomi Earth + LBLG Organic Fertilizer Compost No Treatment Kale Lomi Earth	-17.7 -12.4 23.0 10.6 0.0 % increase in weight yield	3.0 5.9 9.6 2.6 0.0 % increase in size		Cabbage Lomi Earth + LBLG Organic Fertilizer Compost No Treatment Broccoll Lomi Earth	% Increase in weight yield 8.4 16.1 3.5 3.0 0.0 % Increase in weight yield 104.0	% increase in size 6.6 4.3 9.3 8.2 0.0 % increase in size 49.7	odens of the state		>		
Lomi Earth Lomi Earth + LBLG Organic Fertilizer Compost No Treatment Kale Lomi Earth Lomi Earth + LBLG	-17.7 -12.4 23.0 10.6 0.0 % increase in weight yield 33.3	3.0 5.9 9.6 2.6 0.0 % increase in size 22.5 5.7		Cabbage Lomi Earth Lomi Earth + LBLG Organic Fertilizer Compost No Treatment Broccoll Lomi Earth + LBLG Lomi Earth Lomi Earth	% increase in weight yield 8.4 16.1 3.5 3.0 0.0 % increase in weight yield 104.0 22.4	% increase in size 6.6 4.3 9.3 8.2 0.0 % increase in size 49.7 15.1	ogatic page				
Lomi Earth Lomi Earth + LBLG Organic Fertilizer Compost No Treatment Kale Lomi Earth Lomi Earth + LBLG Organic Fertilizer	-17.7 -12.4 23.0 10.6 0.0 % Increase in weight yield 33.3 -9.4 24.5	3.0 5.9 9.6 2.6 0.0 % increase in size 22.5 5.7 19.8		Cabbage Lomi Earth Lomi Earth + LBLG Organic Fertilizer Compost No Treatment Broccoll Lomi Earth + LBLG Organic Fertilizer	% increase in weight yield 8.4 16.1 3.5 3.0 0.0 % increase in weight yield 104.0 22.4 95.7	% increase in size 6.6 4.3 9.3 8.2 0.0 % increase in size 49.7 15.1 3.3.1	order of the state		\$		
Lomi Earth Lomi Earth + LBLG Organic Fertilizer Compost No Treatment Kale Lomi Earth + LBLG Organic Fertilizer Compost	-17.7 -12.4 23.0 10.6 0.0 % increase in weight yield 33.3 -9.4 24.5 -31.3	3.0 5.9 9.6 2.6 0.0 % Increase in size 22.5 5.7 19.8 -20.4		Cabbage Lomi Earth + LBLG Organic Fertilizer Compost No Treatment Broccoli Lomi Earth + LBLG Organic Fertilizer Compost Compost Compost Compost Compost Compost Compost Compost	% Increase in weight yield 8.4 16.1 3.5 3.0 0.0 % Increase in weight yield 104.0 22.4 95.7 61.9	% increase in size 6.6 4.3 9.3 8.2 0.0 % increase in size 49.7 15.1 33.1 2.4.8	ogens of the state		\$		
Lomi Earth Lomi Earth + LBLG Organic Fertilizer Compost No Treatment Kale Lomi Earth Lomi Earth + LBLG Organic Fertilizer	-17.7 -12.4 23.0 10.6 0.0 % Increase in weight yield 33.3 -9.4 24.5	3.0 5.9 9.6 2.6 0.0 % increase in size 22.5 5.7 19.8		Cabbage Lomi Earth Lomi Earth + LBLG Organic Fertilizer Compost No Treatment Broccoll Lomi Earth + LBLG Organic Fertilizer	% increase in weight yield 8.4 16.1 3.5 3.0 0.0 % increase in weight yield 104.0 22.4 95.7	% increase in size 6.6 4.3 9.3 8.2 0.0 % increase in size 49.7 15.1 3.3.1	ogens of the state				
Lomi Earth Lomi Earth + LBLG Organic Fertilizer Compost No Treatment Kale Lomi Earth + LBLG Organic Fertilizer Compost	-17.7 -12.4 23.0 10.6 0.0 % increase in weight yield 33.3 -9.4 24.5 -31.3	3.0 5.9 9.6 2.6 0.0 % Increase in size 22.5 5.7 19.8 -20.4		Cabbage Lomi Earth + LBLG Organic Fertilizer Compost No Treatment Broccoli Lomi Earth + LBLG Organic Fertilizer Compost Compost Compost Compost Compost Compost Compost Compost	% Increase in weight yield 8.4 16.1 3.5 3.0 0.0 % Increase in weight yield 104.0 22.4 95.7 61.9	% increase in size 6.6 4.3 9.3 8.2 0.0 % increase in size 49.7 15.1 33.1 2.4.8	oggas oggas				
Lomi Earth Lomi Earth + LBLG Organic Fertilizer Compost No Treatment Kale Lomi Earth Lomi Earth Lomi Earth + LBLG Organic Fertilizer Compost No Treatment	-17.7 -12.4 23.0 10.6 0.0 % Increase in weight yield 33.3 -9.4 24.5 -31.3 0.0	3.0 5.9 9.6 2.6 0.0 % increase in size 22.5 5.7 19.8 -20.4 0.0		Cabbage Lomi Earth + LBLG Organic Fertilizer Compost No Treatment Broccoli Lomi Earth + LBLG Organic Fertilizer Compost Compost Compost Compost Compost Compost Compost Compost	% Increase in weight yield 8.4 16.1 3.5 3.0 0.0 % Increase in weight yield 104.0 22.4 95.7 61.9	% increase in size 6.6 4.3 9.3 8.2 0.0 % increase in size 49.7 15.1 33.1 2.4.8	og profession of the state of t		\$\frac{1}{2}		
Lomi Earth Lomi Earth + LBLG Organic Fertilizer Compost No Treatment Kale Lomi Earth Lomi Earth + LBLG Organic Fertilizer Compost No Treatment	-17.7 -12.4 -23.0 -10.6 -0.0 % increase in weight yield -33.3 -9.4 -24.5 -31.3 -0.0 % increase in weight yield	3.0 5.9 9.6 2.6 0.0 % increase in size 22.5 5.7 19.8 -20.4 0.0		Cabbage Lomi Earth + LBLG Organic Fertilizer Compost No Treatment Broccoli Lomi Earth + LBLG Organic Fertilizer Compost Compost Compost Compost Compost Compost Compost Compost	% Increase in weight yield 8.4 16.1 3.5 3.0 0.0 % Increase in weight yield 104.0 22.4 95.7 61.9	% increase in size 6.6 4.3 9.3 8.2 0.0 % increase in size 49.7 15.1 33.1 2.4.8	oggas oggas				
Lomi Earth Lomi Earth + LBLG Organic Fertilizer Compost No Treatment Kale Lomi Earth Lomi Earth + LBLG Organic Fertilizer Compost No Treatment	-17.7 -12.4 -23.0 -10.6 -0.0 % increase in weight yield -33.3 -9.4 -24.5 -31.3 -0.0 % increase in weight yield	3.0 5.9 9.6 2.6 0.0 % increase in size 22.5 5.7 19.8 -20.4 0.0		Cabbage Lomi Earth + LBLG Organic Fertilizer Compost No Treatment Broccoli Lomi Earth + LBLG Organic Fertilizer Compost Compost Compost Compost Compost Compost Compost Compost	% Increase in weight yield 8.4 16.1 3.5 3.0 0.0 % Increase in weight yield 104.0 22.4 95.7 61.9	% increase in size 6.6 4.3 9.3 8.2 0.0 % increase in size 49.7 15.1 33.1 2.4.8	carlier or				
Lomi Earth + LBLG Organic Fertilizer Compost No Treatment Kale Lomi Earth + LBLG Organic Fertilizer Compost No Treatment Kane Lomi Earth + LBLG Romane Lomi Earth + LBLG Lomi Earth + LBLG Lomi Earth + LBLG	-17.7 -12.4 -23.0 -10.6 -0.0 % increase in weight yield -33.3 -9.4 -24.5 -31.3 -0.0 % increase in weight yield -4.6	3.0 5.9 9.6 2.6 0.0 % increase in size 22.5 5.7 19.8 -20.4 0.0 % increase in size		Cabbage Lomi Earth + LBLG Organic Fertilizer Compost No Treatment Broccoli Lomi Earth + LBLG Organic Fertilizer Compost Compost Compost Compost Compost Compost Compost Compost	% Increase in weight yield 8.4 16.1 3.5 3.0 0.0 % Increase in weight yield 104.0 22.4 95.7 61.9	% increase in size 6.6 4.3 9.3 8.2 0.0 % increase in size 49.7 15.1 33.1 2.4.8	og grant				

CABBAGE PLOTA				AVERAGE CABBAGE			
Treatment	Overall Weight of R & L Rows (g)	Average Diameter of Plant (cm)	Average Weight of 1 Plant (cm)	Treatment	Overall Weight of R & L Rows (g)	Average Diameter of Plant (cm)	Average Weight of 1 Plant (cm)
#1 No Treatment	41889.2	13.8	1309.0	#1 No Treatment	39950.1	13.7	1248.4
#4 Lomi Earth + LBLG	56993.8	15.1	1781.1	#4 Lomi Earth + LBLG	46368.4	14.3	1449.0
#3 Lomi Earth	51165.2	15.9	1598.9	#3 Lomi Earth	43318.0	14.6	1353.7
#5 Organic Fertilizer	44270.6	16.2	1383.5	#5 Organic Fertilizer	41344.9	15.0	1292.0
#2 Compost	41730.5	15.0	1304.1	#2 Compost	41163.5	14.8	1286.4
#2 Compost	41700.0	10.0	1004.1	#2 Compost	41100.5	14.0	1200.4
	To a to a set of the little and Table	T					
	Treatment with Highest Total Weight Yield	Treatment with Largest Average Size of Plant	Treatment with Largest Average Weight of 1 Plant				
#1	Lomi Earth + LBLG	Organic Fertilizer	Lomi Earth + LBLG				
#2	Lomi Earth	Lomi Earth	Lomi Earth				
#3	Organic Fertilizer	Lomi Earth + LBLG	Organic Fertilizer				
#4	No Treatment	Compost	No Treatment				
#5	Compost	No Treatment	Compost				
PLOT B							
Treatment	Overall Weight of R & L Rows (g)	Average Diameter of Plant (cm)	Average Weight of 1 Plant (cm)				
#2 Compost	40596.5	14.7	1268.6				
#3 Lomi Earth	35470.9	13.3	1108.5				
#4 Lomi Earth + LBLG	35743.0	13.6	1117.0				
#1 No Treatment	38011.0	13.7	1187.8				
#5 Organic Fertilizer	38419.2	13.8	1200.6				
	Treatment with Highest Total	Treatment with Largest Average					
	Weight Yield	Size of Plant	Treatment with Largest Average Weight of 1 Plant				
#1	Compost	Compost	Compost				
#2	Organic Fertilizer	Organic Fertilizer	Organic Fertilizer				
#3	No Treatment	No Treatment	No Treatment				
#4	Lomi Earth + LBLG	Lomi Earth + LBLG	Lomi Earth + LBLG				
#5	Lomi Earth	Lomi Earth	Lomi Earth				
DD000011							
BROCCOLI				AVEDACE PROCESSI			
PLOTA	Overall Weight of P. 8.1. Power (n)	Average Diameter of Blant (cm)		AVERAGE BROCCOLI	Overall Weight of P. 8.1. Power (n)	Average Diameter of Plant (cm)	
PLOT A Treatment	Overall Weight of R & L Rows (g)	Average Diameter of Plant (cm)		Treatment	Overall Weight of R & L Rows (g)	Average Diameter of Plant (cm)	
PLOT A Treatment #3 Lomi Earth	13562.4	12.6		Treatment #3 Lomi Earth	13834.6	13.6	
PLOT A Treatment #3 Lomi Earth #4 Lomi Earth + LBLG	13562.4 13199.5	12.6 13.0		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG	13834.6 8300.7	13.6 10.4	
PLOT A Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer	13562.4 13199.5 15785.0	12.6 13.0 13.1		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer	13834.6 8300.7 13267.6	13.6 10.4 12.1	
PLOT A Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13562.4 13199.5 15785.0 6078.1	12.6 13.0 13.1 9.3		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13834.6 8300.7 13267.6 6781.2	13.6 10.4 12.1 9.1	
PLOT A Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer	13562.4 13199.5 15785.0	12.6 13.0 13.1		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer	13834.6 8300.7 13267.6	13.6 10.4 12.1	
PLOT A Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13562.4 13199.5 15785.0 6078.1 9525.4	12.6 13.0 13.1 9.3 10.2		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13834.6 8300.7 13267.6 6781.2	13.6 10.4 12.1 9.1	
PLOT A Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13562.4 13199.5 15785.0 6078.1 9525.4 Treatment with Highest Total	12.6 13.0 13.1 9.3 10.2		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13834.6 8300.7 13267.6 6781.2	13.6 10.4 12.1 9.1	
PLOT A Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13562.4 13199.5 15785.0 6078.1 9525.4 Treatment with Highest Total Weight Yield	12.6 13.0 13.1 9.3 10.2		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13834.6 8300.7 13267.6 6781.2	13.6 10.4 12.1 9.1	
PLOTA Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment #2 Compost	13562.4 13199.5 15785.0 6078.1 9525.4 Treatment with Highest Total	12.6 13.0 13.1 9.3 10.2 Treatment with Largest Average Size of Plant		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13834.6 8300.7 13267.6 6781.2	13.6 10.4 12.1 9.1	
PLOTA Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment #2 Compost	13562.4 13199.5 15785.0 6078.1 9525.4 Treatment with Highest Total Weight Yield Organic Fertilizer	12.6 13.0 13.1 9.3 10.2 Treatment with Largest Average Size of Plant Organic Fertilizer		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13834.6 8300.7 13267.6 6781.2	13.6 10.4 12.1 9.1	
PLOTA Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment #2 Compost	13562.4 13199.5 15785.0 6078.1 9525.4 Treatment with Highest Total Weight Yield Organic Fertilizer Lomi Earth	12.6 13.0 13.1 9.3 10.2 Treatment with Largest Average Size of Plant Organic Fertilizer Lomi Earth + LBLG		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13834.6 8300.7 13267.6 6781.2	13.6 10.4 12.1 9.1	
PLOTA Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment #2 Compost	13562.4 13199.5 15785.0 6078.1 9525.4 Treatment with Highest Total Weight Yield Organic Fertilizer Lomi Earth Lomi Earth + LBLG	12.6 13.0 13.1 9.3 10.2 Treatment with Largest Average Size of Plant Organic Fertilizer Lomi Earth + LBLG Lomi Earth		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13834.6 8300.7 13267.6 6781.2	13.6 10.4 12.1 9.1	
PLOTA Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment #2 Compost #1 #2 #3 #4	13562.4 13199.5 15785.0 6078.1 9525.4 Treatment with Highest Total Weight Yield Organic Fertilizer Lomi Earth Lomi Earth + LBLG Compost	12.6 13.0 13.1 9.3 10.2 Treatment with Largest Average Size of Plant Organic Fertilizer Lomi Earth + LBLG Lomi Earth Compost		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13834.6 8300.7 13267.6 6781.2	13.6 10.4 12.1 9.1	
PLOTA Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment #2 Compost #1 #2 #3 #4	13562.4 13199.5 15785.0 6078.1 9525.4 Treatment with Highest Total Weight Yield Organic Fertilizer Lomi Earth Lomi Earth + LBLG Compost	12.6 13.0 13.1 9.3 10.2 Treatment with Largest Average Size of Plant Organic Fertilizer Lomi Earth + LBLG Lomi Earth Compost		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13834.6 8300.7 13267.6 6781.2	13.6 10.4 12.1 9.1	
PLOTA Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment #2 Compost #1 #2 #3 #4 #5	13562.4 13199.5 15785.0 6078.1 9525.4 Treatment with Highest Total Weight Yield Organic Fertilizer Lomi Earth Lomi Earth + LBLG Compost	12.6 13.0 13.1 9.3 10.2 Treatment with Largest Average Size of Plant Organic Fertilizer Lomi Earth + LBLG Lomi Earth Compost		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13834.6 8300.7 13267.6 6781.2	13.6 10.4 12.1 9.1	
PLOTA Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment #2 Compost #1 #2 #3 #4 #5	13562.4 13199.5 15785.0 6078.1 9525.4 Treatment with Highest Total Weight Yield Organic Fertilizer Lomi Earth Lomi Earth + LBLG Compost No Treatment	12.6 13.0 13.1 9.3 10.2 Treatment with Largest Average Size of Plant Organic Fertilizer Lomi Earth + LBLG Lomi Earth Compost No Treatment		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13834.6 8300.7 13267.6 6781.2	13.6 10.4 12.1 9.1	
PLOTA Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment #2 Compost #1 #2 #3 #4 #5 PLOT B Treatment	13562.4 13199.5 15785.0 6078.1 9525.4 Treatment with Highest Total Weight Vield Organic Fertilizer Lomi Earth Lomi Earth + LBLG Compost No Treatment	12.6 13.0 13.1 9.3 10.2 Treatment with Largest Average Size of Plant Organic Fertilizer Lomi Earth + LBLG Lomi Earth Compost No Treatment Average Diameter of Plant (cm)		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13834.6 8300.7 13267.6 6781.2	13.6 10.4 12.1 9.1	
PLOTA Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment #2 Compost #1 #2 #3 #4 #5 PLOT B Treatment #5 Organic Fertilizer	13562.4 13199.5 15785.0 6078.1 9525.4 Treatment with Highest Total Weight Yield Organic Fertilizer Lomi Earth Lomi Earth + LBLG Compost No Treatment Overall Weight of R & L Rows (g) 10750.1	12.6 13.0 13.1 9.3 10.2 Treatment with Largest Average Size of Plant Organic Fertilizer Lomi Earth + LBLG Lomi Earth + Compost No Treatment Average Diameter of Plant (cm) 11.0		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13834.6 8300.7 13267.6 6781.2	13.6 10.4 12.1 9.1	
PLOTA Treatment #3 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment #2 Compost #1 #2 #3 #4 #5 PLOT B Treatment #5 Organic Fertilizer #10 Treatment #5 Organic Fertilizer #10 Treatment #10 Treatment #11 Treatment #11 No Treatment	13562.4 13199.5 15785.0 6078.1 9825.4 Treatment with Highest Total Weight Yield Organic Fertilizer Lomi Earth Lomi Earth + LBLG Compost No Treatment Overall Weight of R & L Rows (g) 10750.1 12428.4 141106.7 7484.3	12.6 13.0 13.1 9.3 10.2 Treatment with Largest Average Size of Plant Organic Fertilizer Lomi Earth + LBLG Lomi Earth Compost No Treatment Average Diameter of Plant (cm) 11.0 12.4 14.5 8.8		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13834.6 8300.7 13267.6 6781.2	13.6 10.4 12.1 9.1	
PLOTA Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment #2 Compost #1 #2 #3 #4 #5 PLOT B Treatment #5 Organic Fertilizer #5 Organic Fertilizer #3 Treatment #5 Organic Fertilizer #3 Lomi Earth	13562.4 13199.5 15785.0 6078.1 9525.4 Treatment with Highest Total Weight Yield Organic Fertilizer Lomi Earth + LBLG Compost No Treatment Overall Weight of R & L Rows (g) 10750.1 12428.4 14106.7	12.6 13.0 13.1 9.3 10.2 Treatment with Largest Average Size of Plant Organic Fertilizer Lomi Earth + LBLG Lomi Earth Compost No Treatment Average Diameter of Plant (cm) 11.0 12.4 14.5		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13834.6 8300.7 13267.6 6781.2	13.6 10.4 12.1 9.1	
PLOTA Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment #2 Compost #1 #2 #3 #4 #5 PLOT B Treatment #5 Organic Fertilizer #2 Compost	13562.4 13199.5 15785.0 6078.1 9825.4 Treatment with Highest Total Weight Yield Organic Fertilizer Lomi Earth Lomi Earth + LBLG Compost No Treatment Overall Weight of R & L Rows (g) 10750.1 12428.4 141106.7 7484.3	12.6 13.0 13.1 9.3 10.2 Treatment with Largest Average Size of Plant Organic Fertilizer Lomi Earth + LBLG Lomi Earth Compost No Treatment Average Diameter of Plant (cm) 11.0 12.4 14.5 8.8		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13834.6 8300.7 13267.6 6781.2	13.6 10.4 12.1 9.1	
PLOTA Treatment #3 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment #2 Compost #1 #2 #3 #4 #5 PLOT B Treatment #5 Organic Fertilizer #10 Treatment #5 Organic Fertilizer #10 Treatment #10 Treatment #11 Treatment #11 No Treatment	13562.4 13199.5 15785.0 6078.1 9525.4 Treatment with Highest Total Weight Yield Organic Fertilizer Lomi Earth Lomi Earth + LBLG Compost No Treatment Overall Weight of R & L Rows (g) 10750.1 12428.4 141106.7 77484.3 3401.9	12.6 13.0 13.1 9.3 10.2 Treatment with Largest Average Size of Plant Organic Fertilizer Lomi Earth + LBLG Lomi Earth + LBLG Lomi Earth Compost No Treatment Average Diameter of Plant (cm) 11.0 12.4 14.5 8.8 7.9		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13834.6 8300.7 13267.6 6781.2	13.6 10.4 12.1 9.1	
PLOTA Treatment #3 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment #2 Compost #1 #2 #3 #4 #5 PLOT B Treatment #5 Organic Fertilizer #10 Treatment #5 Organic Fertilizer #10 Treatment #10 Treatment #11 Treatment #11 No Treatment	13562.4 13199.5 15785.0 6078.1 9825.4 Treatment with Highest Total Weight Yield Organic Fertilizer Lomi Earth Lomi Earth + LBLG Compost No Treatment Overall Weight of R & L Rows (g) 10750.1 12428.4 141106.7 7484.3	12.6 13.0 13.1 9.3 10.2 Treatment with Largest Average Size of Plant Organic Fertilizer Lomi Earth + LBLG Lomi Earth Compost No Treatment Average Diameter of Plant (cm) 11.0 12.4 14.5 8.8		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13834.6 8300.7 13267.6 6781.2	13.6 10.4 12.1 9.1	
PLOTA Treatment #3 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment #2 Compost #1 #2 #3 #4 #5 PLOT B Treatment #5 Organic Fertilizer #2 Compost #1 #1 #2 #3 #4 #5 #4 #5 #5 #6 Organic Fertilizer #7 #7 #7 #7 #7 #7 #7 #7 #7 #7 #7 #7 #7	13562.4 13199.5 15785.0 6078.1 9525.4 Treatment with Highest Total Weight Yield Organic Fertilizer Lomi Earth Lomi Earth + LBLG Compost No Treatment Overall Weight of R & L Rows (g) 10750.1 12428.4 14106.7 7484.3 3401.9 Treatment with Highest Total	12.6 13.0 13.1 9.3 10.2 Treatment with Largest Average Size of Plant Organic Fertilizer Lomi Earth + LBLG Lomi Earth + LBLG Lomi Earth Compost No Treatment Average Diameter of Plant (cm) 11.0 12.4 14.5 8.8 7.9		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13834.6 8300.7 13267.6 6781.2	13.6 10.4 12.1 9.1	
PLOTA Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment #2 Compost #1 #2 #3 #4 #5 PLOT B Treatment #5 Organic Fertilizer #2 Compost #3 Lomi Earth #1 No Treatment #4 Lomi Earth + LBLG	13562.4 13199.5 15785.0 6078.1 9525.4 Treatment with Highest Total Weight Vield Organic Fertilizer Lomi Earth Lomi Earth + LBLG Compost No Treatment Overall Weight of R & L Rows (g) 10750.1 12428.4 14106.7 7484.3 3401.9 Treatment with Highest Total Weight Vield Lomi Earth Compost	12.6 13.0 13.1 9.3 10.2 Treatment with Largest Average Size of Plant Organic Fertilizer Lomi Earth + LBLG Lomi Earth + LBLG Lomi Earth Compost No Treatment Average Diameter of Plant (cm) 11.0 12.4 14.5 8.8 7.9 Treatment with Largest Average Size of Plant Lomi Earth Compost		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13834.6 8300.7 13267.6 6781.2	13.6 10.4 12.1 9.1	
PLOTA Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment #2 Compost #1 #2 #3 #4 #5 PLOT B Treatment #5 Organic Fertilizer #5 Organic Fertilizer #1 No Treatment #5 Organic Fertilizer #4 Lomi Earth #1 No Treatment #4 Lomi Earth + LBLG	13562.4 13199.5 15785.0 6078.1 9525.4 Treatment with Highest Total Weight Yield Organic Fertilizer Lomi Earth + LBLG Compost No Treatment Overall Weight of R & L Rows (g) 10750.1 12428.4 14106.7 7484.3 3401.9 Treatment with Highest Total Weight Yield Lomi Earth Compost Organic Fertilizer	12.6 13.0 13.1 9.3 10.2 Treatment with Largest Average Size of Plant Organic Fertilizer Lomi Earth + LBLG Lomi Earth Compost No Treatment Average Diameter of Plant (cm) 11.0 12.4 14.5 8.8 7.9 Treatment with Largest Average Size of Plant Lomi Earth Compost Organic Fertilizer		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13834.6 8300.7 13267.6 6781.2	13.6 10.4 12.1 9.1	
PLOTA Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment #2 Compost #1 #2 #3 #4 #5 PLOT B Treatment #5 Organic Fertilizer #2 Compost #3 Lomi Earth #1 No Treatment #4 Lomi Earth + LBLG	13562.4 13199.5 15785.0 6078.1 9525.4 Treatment with Highest Total Weight Vield Organic Fertilizer Lomi Earth Lomi Earth + LBLG Compost No Treatment Overall Weight of R & L Rows (g) 10750.1 12428.4 14106.7 7484.3 3401.9 Treatment with Highest Total Weight Vield Lomi Earth Compost	12.6 13.0 13.1 9.3 10.2 Treatment with Largest Average Size of Plant Organic Fertilizer Lomi Earth + LBLG Lomi Earth + LBLG Lomi Earth Compost No Treatment Average Diameter of Plant (cm) 11.0 12.4 14.5 8.8 7.9 Treatment with Largest Average Size of Plant Lomi Earth Compost		Treatment #3 Lomi Earth #4 Lomi Earth + LBLG #5 Organic Fertilizer #1 No Treatment	13834.6 8300.7 13267.6 6781.2	13.6 10.4 12.1 9.1	

Appendix D: Crop Nutrient Density Results

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