

According to (G.S. 130A-309.09D(b)) completed forms must be returned by August 1, 2013 and a copy of this report must be sent to the County Manager of each county from which waste was received. If you have questions or require assistance in completing this report, contact your Regional Environmental Senior Specialist.

Facility Name: Novozymes, North America, Inc.

Permit: 3504-COMPOST

Facility Website (URL): www.naturesgreenreleaf.com

Physical Address	Mailing Address
Street 1: <u>445 Old Smith Farm Rd</u>	Street 1: <u>PO Box 576</u>
Street 2: _____	Street 2: _____
City: <u>Franklinton</u> County: <u>Franklin</u>	City: <u>Franklinton</u>
State: <u>North Carolina</u> Zip: <u>27525</u>	State: <u>North Carolina</u> Zip: <u>27525</u>
Primary Facility Contact Person	Billing Contact Person
Name: <u>Frank Franciosi</u>	Name: <u>Frank Franciosi</u>
Phone: <u>(919) 494-3489</u> Fax: <u>(919) 494-1472</u>	Phone: <u>(919) 494-3489</u> Fax: <u>(919) 494-1472</u>
Email: <u>frfr@novozymes.com</u>	Email: <u>frfr@novozymes.com</u>

1. Tipping Fee: \$30.00 per Ton (Attach a schedule of tipping fees if appropriate.)

2. Please attach results of monthly temperature monitoring for the period of July 1, 2012 thru June 30, 2013.

3. For Type II, III, and IV facilities, attach results of tests (Waste Analysis with metals, foreign matter and pathogens) as required in Table 3 of Rule 15A NCAC 13B .1408 for the period of July 1, 2012 thru June 30, 2013. **Current Rules state that "Compost shall be analyzed at intervals of every 20,000 tons of compost produced or every six months, whichever comes first."**

4. What type and quantity of waste was composted by your facility?

Materials COMPOSTED	Check X if Received	Tons RECEIVED	Tons COMPOSTED	Unusable Tons DISPOSED
Yard Waste	<input checked="" type="checkbox"/>	13,403	13,403	0
Clean Wood	<input type="checkbox"/>			
Sawdust	<input checked="" type="checkbox"/>	1,030	1,030	0
Wooden Pallets	<input type="checkbox"/>			
Food Waste	<input checked="" type="checkbox"/>	41	41	0
Animal Waste	<input type="checkbox"/>			
Sludge and Biosolids	<input type="checkbox"/>			
Grease Trap Waste	<input type="checkbox"/>			
Animal Mortalities	<input type="checkbox"/>			
Sheetrock	<input type="checkbox"/>			
Commingled (Describe)	<input type="checkbox"/>			
Other (Describe) Enzyme Residuals	<input checked="" type="checkbox"/>	6,625	6,625	0
Other (Describe)	<input type="checkbox"/>			
Other (Describe)	<input type="checkbox"/>			
TOTAL		21,099	21,099	0



US COMPOSTING COUNCIL

Seal of Testing Assurance

Novozymes NA, Inc.

Frank Franciosi

P.O. Box 576

Franklinton

NC 27525-0576 (919) 494-3489

Date Sampled/Received: 02 Jul. 12 / 03 Jul. 12

Product Identification Compost
Nature's GREEN-RELEAF Compost

COMPOST TECHNICAL DATA SHEET

LABORATORY: Soil Control Lab; 42 Hangar Way; Watsonville, CA 95076 tel: 831.724.5422 fax: 831.724.3188

<i>Compost Parameters</i>	<i>Reported as (units of measure)</i>	<i>Test Results</i>	<i>Test Results</i>
Plant Nutrients:	%, weight basis	Not reported	Not reported
Moisture Content	%, wet weight basis	36.3	
Organic Matter Content	%, dry weight basis	55.2	
pH	units	6.90	
Soluble Salts <i>(electrical conductivity EC₅)</i>	dS/m (mmhos/cm)	3.3	
Particle Size or Sieve Size	maximum aggregate size, inches	0.64	
Stability Indicator (<i>respirometry</i>)		Stability Rating:	
CO ₂ Evolution	mg CO ₂ -C/g OM/day	1.1	Very Stable
	mg CO ₂ -C/g TS/day	0.58	
Maturity Indicator (bioassay)			
Percent Emergence	average % of control	100.0	
Relative Seedling Vigor	average % of control	100.0	
Select Pathogens	PASS/FAIL: per US EPA Class A standard, 40 CFR § 503.32(a)	Pass	<i>Fecal coliform</i>
		Pass	<i>Salmonella</i>
Trace Metals	PASS/FAIL: per US EPA Class A standard, 40 CFR § 503.13, Tables 1 and 3.	Pass	<i>As,Cd,Cr,Cu,Pb,Hg</i>
			<i>Mo,Ni,Se,Zn</i>

Participants in the US Composting Council's Seal of Testing Assurance Program have shown the commitment to test their compost products on a prescribed basis and provide this data, along with compost end use instructions, as a means to better serve the needs of their compost customers.

Laboratory Group: Jul12A Laboratory Number: 2070086-1/1

Analyst: Assaf Sadeh

www.compostlab.com



US COMPOSTING COUNCIL

Seal of Testing Assurance

Novozymes NA, Inc.

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<i>Compost Parameters</i>	<i>Reported as (units of measure)</i>	<i>Test Results</i>	<i>Test Results</i>
Plant Nutrients:	% , weight basis	% , wet weight basis	% , dry weight basis
Nitrogen	Total N	1.4	2.2
Phosphorus	P ₂ O ₅	0.80	1.2
Potassium	K ₂ O	0.49	0.77
Calcium	Ca	1.3	2.0
Magnesium	Mg	0.23	0.36
Moisture Content	% , wet weight basis	36.3	
Organic Matter Content	% , dry weight basis	55.2	
pH	units	6.90	
Soluble Salts <i>(electrical conductivity EC₅)</i>	dS/m (mmhos/cm)	3.3	
Particle Size or Sieve Size	% under 9.5 mm, dw basis	93.4	
<i>Stability Indicator (respirometry)</i>		<i>Stability Rating:</i>	
CO ₂ Evolution	mg CO ₂ -C/g OM/day	1.1	Very Stable
	mg CO ₂ -C/g TS/day	0.58	
<i>Maturity Indicator (bioassay)</i>			
Percent Emergence	average % of control	100.0	
Relative Seedling Vigor	average % of control	100.0	
Select Pathogens	PASS/FAIL: per US EPA Class A standard, 40 CFR § 503.32(a)	Pass	<i>Fecal coliform</i>
		Pass	<i>Salmonella</i>
Trace Metals	PASS/FAIL: per US EPA Class A standard, 40 CFR § 503.13, Tables 1 and 3.	Pass	<i>As,Cd,Cr,Cu,Pb,Hg</i>
			<i>Mo,Ni,Se,Zn</i>

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Laboratory Group: Jul12A Laboratory Number: 2070086-1/1

Analyst: Assaf Sadeh

www.compostlab.com

SOIL CONTROL LAB

42 HANGAR WAY
WATSONVILLE
CALIFORNIA
95076
USA

Account #: 2070086-1/1-2197
Group: Jul12A #12
Reporting Date: July 24, 2012

Novozymes NA, Inc.
P.O. Box 576
Franklinton, NC 27525-0576
Attn: Frank Franciosi

Date Received: 03 Jul. 12
Sample Identification: Nature's GREEN-RELEAF Compost
Sample ID #: 2070086 - 1/1

Nutrients	Dry wt.	As Rcvd.	units	Stability Indicator:	Biologically	
Total Nitrogen:	2.2	1.4	%	CO2 Evolution	Available C	
Ammonia (NH ₄ -N):	1000	650	mg/kg	mg CO ₂ -C/g OM/day	Respirometry 1.1	
Nitrate (NO ₃ -N):	620	400	mg/kg	mg CO ₂ -C/g TS/day	0.58	
Org. Nitrogen (Org.-N):	2.0	1.3	%	<i>Stability Rating</i>	<i>very stable</i>	
Phosphorus (as P ₂ O ₅):	1.3	0.80	%		<i>very stable</i>	
Phosphorus (P):	5500	3500	mg/kg	Maturity Indicator: Cucumber Bioassay		
Potassium (as K ₂ O):	0.77	0.49	%	Compost:Vermiculite(v:v)	1:1 1:3	
Potassium (K):	6400	4100	mg/kg	Emergence (%)	100 100	
Calcium (Ca):	2.0	1.3	%	Seedling Vigor (%)	100 100	
Magnesium (Mg):	0.36	0.23	%	<i>Description of Plants</i>	<i>healthy healthy</i>	
Sulfate (SO ₄ -S):	130	80	mg/kg	Pathogens	Results Units Rating	
Boron (Total B):	32	20	mg/kg	Fecal Coliform	< 2.0 MPN/g <i>pass</i>	
Moisture:	0	36.3	%	Salmonella	< 3 MPN/4g <i>pass</i>	
Sodium (Na):	0.070	0.045	%	Date Tested: 03 Jul. 12		
Chloride (Cl):	0.089	0.057	%	Inerts	% by weight	
pH Value:	NA	6.90	unit	Plastic	< 0.5	
Bulk Density :	19	30	lb/cu ft	Glass	< 0.5	
Carbonates (CaCO ₃):	3.8	2.4	lb/ton	Metal	< 0.5	
Conductivity (EC5):	3.3	NA	mmhos/cm	Sharps	ND	
Organic Matter:	55.2	35.2	%	Size & Volume Distribution		
Organic Carbon:	32.0	21.0	%	MM	% by weight % by volume BD g/cc	
Ash:	44.8	28.5	%	> 50	0.0 0.0 0.00	
C/N Ratio	15	15	ratio	25 to 50	0.0 0.0 0.00	
AgIndex	> 10	> 10	ratio	16 to 25	0.0 0.0 0.00	
				9.5 to 16	6.6 3.4 0.83	
				6.3 to 9.5	5.2 5.3 0.42	
				4.0 to 6.3	7.8 9.3 0.37	
				2.0 to 4.0	14.0 15.9 0.38	
				< 2.0	66.4 66.1 0.43	
				Bulk Density Description:<.35 Light Materials, .35-.60 medium weight materials, >.60 Heavy Materials		
				Analyst: Assaf Sadeh		

*Sample was received and handled in accordance with TMECC procedures.

Account No.:
2070086 - 1/1 - 2197
Group: Jul12A No. 12

Date Received
Sample i.d.
Sample I.d. No.

03 Jul. 12
Nature's GREEN-RELEAF Compost
1/1 2070086

INTERPRETATION:

Is Your Compost Stable?

Respiration Rate 1.1 mg CO ₂ -C/ g OM/day	Biodegradation Rate of Your Pile	++++ < Stable > < Moderately Stable > < Unstable > < High For Mulch
Biologically Available Carbon (BAC) 1.1 mg CO ₂ -C/ g OM/day	Optimum Degradation Rate	++++ < Stable > < Moderately Stable > < Unstable > < High For Mulch

Is Your Compost Mature?

Ammonia/NitrateN ratio 1.6 Ratio	+++++	VeryMature> < Mature > < Immature
Ammonia N ppm 1000 mg/kg dry wt.	+++++	VeryMature> < Mature > < Immature
Nitrate N ppm 620 mg/kg dry wt.	+++++	< Immature > < Mature > < Immature
pH value 6.90 units	+++++	< Immature > < Mature > < Immature
Cucumber Emergence 100.0 percent	+++++	< Immature > < Mature > < Immature

Is Your Compost Safe Regarding Health?

Fecal Coliform < 1000 MPN/g dry wt.	+++++	< Safe > < High Fecal Coliform
Salmonella Less than 3 /4g dry wt.	+++++	<Safe (none detected) > < High Salmonella Count(> 3 per 4 grams)
Metals US EPA 503 Pass dry wt.	+++++	<All Metals Pass > < One or more Metals Fail

Does Your Compost Provide Nutrients or Organic Matter?

Nutrients (N+P2O5+K2O) 4.2 Percent dry wt.	+++++	<Low > < Average > < High Nutrient Content
AgIndex (Nutrients / Sodium and Chloride Salts) 15 Ratio	+++++	Na & Cl > < Nutrient and Sodium and Chloride Provider > < Nutrient Provider
Plant Available Nitrogen (PAN) 6 lbs/ton wet wt.	+++++	Low Nitrogen Provider> < Average Nitrogen Provider > <High Nitrogen Provider
C/N Ratio 15 Ratio	+++++	< Nitrogen Release > < N-Neutral > < N-Demand> < High Nitrogen Demand
Soluble Available Nutrients & Salts (EC5 w/w dw) 3.3 mmhos/cm dry wt.	+++++	SloRelease> < Average Nutrient Release Rate > <High Available Nutrients
Lime Content (CaCO3) 3.8 Lbs/ton dry wt.	+++++	< Low > < Average > < High Lime Content (as CaCO3)

What are the physical properties of your compost?

Percent Ash 44.8 Percent dry wt.	+++++	< High Organic Matter > < Average > < High Ash Content
Sieve Size % > 6.3 MM (0.25") 11.8 Percent dry wt.	+++++	All Uses > < Size May Restrict Uses for Potting mix and Golf Courses

Account No.:
2070086 - 1/1 - 2197
Group: Jul12A No. 12

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Sample i.d.
Sample I.d. No.

03 Jul. 12
Nature's GREEN-RELEAF Compost
1/1 2070086

INTERPRETATION:

Is Your Compost Stable?

Page two of three

Respiration Rate

1.1 Low: Good for all uses mg CO₂-C/g OM/day

The respiration rate is a measurement of the biodegradation rate of the organic matter in the sample (as received). The respiration rate is determined by measuring the rate at which CO₂ is released under optimized moisture and temperature conditions.

Biologically Available Carbon

1 Low: Good for all uses mg CO₂-C/g OM/day

Biologically Available Carbon (BAC) is a measurement of the rate at which CO₂ is released under optimized moisture, temperature, porosity, nutrients, pH and microbial conditions. If both the RR and the BAC test values are close to the same value, the pile is optimized for composting. If both values are high the compost pile just needs more time. If both values are low the compost has stabilized and should be moved to curing. BAC test values that are higher than RR indicate that the compost pile has stalled. This could be due to anaerobic conditions, lack of available nitrogen due to excessive air converting ammonia to the unavailable nitrate form, lack of nitrogen or other nutrients due to poor choice of feedstock, pH value out of range, or microbes rendered non-active.

Is Your Compost Mature?

Ammonia:NitrateN ratio

1.6 mature

Ammonia N ppm

1000 immature

Nitrate N ppm

620 mature

pH value

6.90 mature

Composting to stabilize carbon can occur at such a rapid rate that sometimes phytotoxins remain in the compost and must be neutralized before using in high concentrations or in high-end uses. This step is called curing. Typically ammonia is in excess with the break-down of organic materials resulting in an increase in pH. This combination results in a loss of volatile ammonia (it smells). Once this toxic ammonia has been reduced and the pH drops, the microbes convert the ammonia to nitrates. A low ammonia + high nitrate score is indicative of a mature compost, however there are many exceptions. For example, a compost with a low pH (<7) will retain ammonia, while a compost with high lime content can lose ammonia before the organic fraction becomes stable. Composts must first be stable before curing indicators apply.

Cucumber Bioassay

100.0 Percent

Cucumbers are chosen for this test because they are salt tolerant and very sensitive to ammonia and organic acid toxicity. Therefore, we can germinate seeds in high concentrations of compost to measure phytotoxic effects without soluble salts being the limiting factor. Values above 80% for both percent emergence and vigor are indicative of a well-cured compost. Exceptions include very high salts that affect the cucumbers, excessive concentrations of nitrates and other nutrients that will be in range when formulated to make a growing media. In addition to testing a 1:1 compost: vermiculite blend, we also test a diluted 1:4 blend to indicate a more sensitive toxicity level.

Is Your Compost Safe Regarding Health?

Fecal Coliform

< 1000 / g dry wt.

Fecal coliforms can survive in both aerobic and anaerobic conditions and is common in all initial compost piles. Most human pathogens occur from fecal matter and all fecal matter is loaded in fecal coliforms. Therefore fecal coliforms are used as an indicator to determine if the chosen method for pathogen reduction (heat for compost) has met the requirements of sufficient temperature, time and mixing. If the fecal coliforms are reduced to below 1000 per gram dry wt. it is assumed all other pathogens are eliminated. Potential problems are that fecal coliform can regrow during the curing phase or during shipping. This is because the conditions are now more favorable for growth than during the composting process.

Salmonella Bacteria

Less than 3 3 / 4g dry wt. Salmonella is not only another indicator organism but also a toxic microbe. It has been used in the case of biosolids industry to determine adequate pathogen reduction.

Metals

Pass

The ten heavy metals listed in the EPA 503 regulations are chosen to determine if compost can be applied to ag land and handled without toxic effects. Most high concentrations of heavy metals are derived from woodwaste feedstock such as chrome-arsenic treated or lead painted demolition wood. Biosolids are rarely a problem.

Does Your Compost Provide Nutrients or Organic Matter?

Nutrients (N+P₂O₅+K₂O)

4.2 Average nutrient content

This value is the sum of the primary nutrients Nitrogen, Phosphorus and Potassium. Reported units are consistent with those found on fertilizer formulations. A sum greater than 5 is indicative of a compost with high nutrient content, and best used to supply nutrients to a receiving soil. A sum below 2 indicates low nutrient content, and is best-used to improve soil structure via the addition of organic matter. Most compost falls between 2 and 5.

Account No.:	Date Received	03 Jul. 12
2070086 - 1/1 - 2197	Sample i.d.	Nature's GREEN-RELEAF Compost
Group: Jul12A No. 12	Sample I.d. No.	1/1 2070086

INTERPRETATION:

Page three of three

AgIndex (Nutrients/Na+Cl)

15 High nutrient ratio Composts with low AgIndex values have high concentrations of sodium and/or chloride compared to nutrients. Repeated use of a compost with a low AgIndex (< 2) may result in sodium and/or chloride acting as the limiting factor compared to nutrients, governing application rates. These composts may be used on well-draining soils and/or with salt-tolerant plants. Additional nutrients from another source may be needed if the application rate is limited by sodium or chloride. If the AgIndex is above 10, nutrients optimal for plant growth will be available without concern of sodium and/or chloride toxicity. Composts with an AgIndex of above 10 are good for increasing nutrient levels for all soils. Most composts score between 2 and 10. Concentrations of nutrients, sodium, and chloride in the receiving soil should be considered when determining compost application rates. The AgIndex is a product of feedstock quality. Feedstock from dairy manure, marine waste, industrial wastes, and halophytic plants are likely to produce a finished compost with a low AgIndex.

Plant Available Nitrogen (lbs/ton)

6 Average N Provider Plant Available Nitrogen (PAN) is calculated by estimating the release rate of Nitrogen from the organic fraction of the compost. This estimate is based on information gathered from the BAC test and measured ammonia and nitrate values. Despite the PAN value of the compost, additional sources of Nitrogen may be needed during the growing season to offset the Nitrogen demand of the microbes present in the compost. With ample nutrients these microbes can further breakdown organic matter in the compost and release bound Nitrogen. Nitrogen demand based on a high C/N ratio is not considered in the PAN calculation because additional Nitrogen should always be supplemented to the receiving soil when composts with a high C/N ratio are applied.

C/N Ratio

15 Indicates immaturity As a guiding principal, a C/N ratio below 14 indicates maturity and above 14 indicates immaturity, however, there are many exceptions. Large woodchips (>6.3mm), bark, and redwood are slow to breakdown and therefore can result in a relatively stable product while the C/N ratio value is high. Additionally, some composts with chicken manure and/or green grass feedstocks can start with a C/N ratio below 15 and are very unstable. A C/N ratio below 10 supplies Nitrogen, while a ratio above 20 can deplete Nitrogen from the soil. The rate at which Nitrogen will be released or used by the microbes is indicated by the respiration rate (BAC). If the respiration rate is too high the transfer of Nitrogen will not be controllable.

Soluble Nutrients & Salts (EC5 w/w dw - mmhos/cm)

3.3 Average salts This value refers to all soluble ions including nutrients, sodium, chloride and some soluble organic compounds. The concentration of salts will change due to the release of salts from the organic matter as it degrades, volatilization of ammonia, decomposition of soluble organics, and conversion of molecular structure. High salts + high AgIndex is indicative of a compost high in readily available nutrients. The application rate of these composts should be limited by the optimum nutrient value based on soil analysis of the receiving soil. High Salts + low AgIndex is indicative of a compost low in nutrients with high concentrations of sodium and/or chloride. Limit the application rate according to the toxicity level of the sodium and/or chloride. Low salts indicates that the compost can be applied without risking salt toxicity, is likely a good source of organic matter, and that nutrients will release slowly over time.

Lime Content (lbs. per ton)

3.8 Low lime content Compost high in lime or carbonates are often those produced from chicken manure (layers) ash materials, and lime products. These are excellent products to use on a receiving soil where lime has been recommended by soil analysis to raise the pH. Composts with a high lime content should be closely considered for pH requirements when formulating potting mixes.

Physical Properties

Percent Ash

44.8 Average ash content Ash is the non-organic fraction of a compost. Most composts contain approximately 50% ash (dry weight basis). Compost can be high in ash content for many reasons including: excess mineralization (old compost), contamination with soil base material during turning, poor quality feedstock, and soil or mineral products added. Finding the source and reducing high ash content is often the fastest means to increasing nutrient quality of a compost.

Particle Size % > 6.3 MM (0.25")

11.8 May restrict use Large particles may restrict use for potting soils, golf course topdressings, seed-starter mixes, and where a fine size distribution is required. Composts with large particles can still be used as excellent additions to field soils, shrub mixes and mulches.

Particle Size Distribution

Each size fraction is measured by weight, volume and bulk density. These results are particularly relevant with decisions to screen or not, and if screening, which size screen to use. The bulk density indicates if the fraction screened is made of light weight organic material or heavy mineral material. Removing large mineral material can greatly improve compost quality by increasing nutrient and organic concentrations.

Appendix:	Estimated available nutrients for use when calculating application rates
Plant Available Nitrogen (PAN) calculations:	lbs/ton
PAN = (X * (organic N)) + ((NH4-N) + (NO3-N))	
X value = If BAC < 2 then X = 0.1	Plant Available Nitrogen (PAN) 6.4
If BAC =2.1 to 5 then X = 0.2	Ammonia (NH4-N) 1.30
If BAC =5.1 to 10 then X = 0.3	Nitrate (NO3-N) 0.80
If BAC > 10 then X = 0.4	Available Phosphorus (P2O5*0.64) 10.2
Note: If C/N ratio > 15 additional N should be applied.	Available Potassium (K2O) 9.9



US COMPOSTING COUNCIL

Seal of Testing Assurance

Novozymes NA, Inc.

Frank Franciosi

P.O. Box 576

Franklinton

NC 27525-0576 0

Date Sampled/Received: 12 Sep. 12 / 13 Sep. 12

Product Identification Compost
Nature's Green-Releaf Compost

COMPOST TECHNICAL DATA SHEET

LABORATORY: Soil Control Lab; 42 Hangar Way; Watsonville, CA 95076 tel: 831.724.5422 fax: 831.724.3188

<i>Compost Parameters</i>	<i>Reported as (units of measure)</i>	<i>Test Results</i>	<i>Test Results</i>
Plant Nutrients:	%, weight basis	Not reported	Not reported
Moisture Content	%, wet weight basis	35.8	
Organic Matter Content	%, dry weight basis	57.6	
pH	units	7.12	
Soluble Salts <i>(electrical conductivity EC₅)</i>	dS/m (mmhos/cm)	2.8	
Particle Size or Sieve Size	maxium aggregate size, inches	0.64	
Stability Indicator (respirometry)		Stability Rating:	
CO ₂ Evolution	mg CO ₂ -C/g OM/day	1.3	Very Stable
	mg CO ₂ -C/g TS/day	0.76	
Maturity Indicator (bioassay)			
Percent Emergence	average % of control	100.0	
Relative Seedling Vigor	average % of control	100.0	
Select Pathogens	PASS/FAIL: per US EPA Class A standard, 40 CFR § 503.32(a)	Pass	<i>Salmonella</i>
Trace Metals	PASS/FAIL: per US EPA Class A standard, 40 CFR § 503.13, Tables 1 and 3.	Pass	<i>As,Cd,Cr,Cu,Pb,Hg</i> <i>Mo,Ni,Se,Zn</i>

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Laboratory Group: Sep.12 B Laboratory Number: 2090347-1/1

Analyst: Assaf Sadeh

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LABORATORY: Soil Control Lab; 42 Hangar Way; Watsonville, CA 95076 tel: 831.724.5422 fax: 831.724.3188

<i>Compost Parameters</i>	<i>Reported as (units of measure)</i>	<i>Test Results</i>	<i>Test Results</i>
Plant Nutrients:	%, weight basis	%, wet weight basis	%, dry weight basis
Nitrogen	Total N	1.3	2.0
Phosphorus	P ₂ O ₅	0.59	0.91
Potassium	K ₂ O	0.39	0.61
Calcium	Ca	1.0	1.6
Magnesium	Mg	0.18	0.29
Moisture Content	%, wet weight basis	35.8	
Organic Matter Content	%, dry weight basis	57.6	
pH	units	7.12	
Soluble Salts <i>(electrical conductivity EC₅)</i>	dS/m (mmhos/cm)	2.8	
Particle Size or Sieve Size	% under 9.5 mm, dw basis	96.5	
<i>Stability Indicator (respirometry)</i>		<i>Stability Rating:</i>	
CO ₂ Evolution	mg CO ₂ -C/g OM/day	1.3	Very Stable
	mg CO ₂ -C/g TS/day	0.76	
<i>Maturity Indicator (bioassay)</i>			
Percent Emergence	average % of control	100.0	
Relative Seedling Vigor	average % of control	100.0	
Select Pathogens	PASS/FAIL: per US EPA Class A standard, 40 CFR § 503.32(a)	Pass	<i>Salmonella</i>
Trace Metals	PASS/FAIL: per US EPA Class A standard, 40 CFR § 503.13, Tables 1 and 3.		Pass

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Laboratory Group: Sep.12 B Laboratory Number: 2090347-1/1

Analyst: Assaf Sadeh		www.compostlab.com
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US COMPOSTING COUNCIL

Seal of Testing Assurance



Novozymes NA, Inc.

Frank Franciosi

P.O. Box 576

Franklinton

NC 27525-0576

0

Product Identification:	Compost
Nature's Green-Releaf Compost	

Date Sampled/Received: 12 Sep. 12 / 13 Sep. 12

COMPOST TECHNICAL DATA SHEET for NORTH CAROLINA DOT

LABORATORY: Soil Control Lab; 42 Hangar Way; Watsonville, CA 95076 tel: 831.724.5422 fax: 831.724.3188			
<i>Compost Parameters</i>	<i>Test Results</i>	<i>Reported as (units of measure)</i>	<i>Project Specification (Allowable Limit)</i>
Organic Matter Content	57.6	%, dry weight basis	25 - 65
pH	7.12	Unitless	5.0 - 8.5
Moisture Content	35.8	%, wet weight basis	30 - 60
Soluble Salts (electrical conductivity)	2.8	dS/m (mmhos/cm)	5.0 dS/m, maximum
Particle Size	100.0	%, dry weight passing through 3 inch screen and	100%
	100.0	1 inch screen and	90% minimum
	100.0	3/4 inch screen and	65% minimum
	92.9	1/4 inch screen	50% maximum
Stability Indicator (respirometry) CO2 Evolution	1.3	mg CO2-C/g OM/day	≤ 8
Maturity Indicator (bioassay) Percent Emergence	100.0	average % of control	80%, minimum
Relative Seedling Vigor	100.0	average % of control	80%, minimum
Select Pathogens (Salmonella)	Pass	PASS/FAIL: Per US EPA Class A standard, 40 CFR 503.32(a)	Pass
Trace Metals	Pass	PASS/FAIL: Per US EPA Class A 40 CFR 503.13, tables 1 and 3.	Pass
Inert Contamination (man-made)	None Detected	%, dry weight	<1.0 %

Participants in the US Composting Council's Seal of Testing Assurance Program have shown the commitment to test their compost products on a prescribed basis and provide this data, along with compost end use instructions, as a means to better serve the needs of their compost customers.

For additional information pertaining to compost use, the specific compost parameters tested for within the Seal of Testing assurance Program, or the program in general, log on to the US Composting Council's TMECC web-site at <http://www.tmecc.org>.

This compost product has been sampled and tested as required by the Seal of Testing assurance Program on the United States Composting Council (USCC), using certain methods from the "Test Methods for the Examination of Compost and Composting" manual. Test results are available upon request by contacting the compost producer (address at top of page). The USCC makes no warranties regarding this product or its content, quality, or suitability for any particular use.

Laboratory Group:	Sep.12 B	Laboratory Number:	2090347-1/1
Analyst: Assaf Sadeh		www.compostlab.com	

SOIL CONTROL LAB

42 HANGAR WAY
WATSONVILLE
CALIFORNIA
95076
USA

Account #: 2090347-1/1-2197
Group: Sep.12 B #17
Reporting Date: September 26, 2012

Novozymes NA, Inc.
P.O. Box 576
Franklinton, NC 27525-0576
Attn: Frank Franciosi

Date Received: 13 Sep. 12
Sample Identification: Nature's Green-Relief Compost
Sample ID #: 2090347 - 1/1

Nutrients				Stability Indicator:			
	Dry wt.	As Rcvd.	units	CO2 Evolution	Respirometry	Biologically Available C	
Total Nitrogen:	2.0	1.3	%	mg CO ₂ -C/g OM/day	1.3	1.9	
Ammonia (NH ₄ -N):	1100	700	mg/kg	mg CO ₂ -C/g TS/day	0.76	1.1	
Nitrate (NO ₃ -N):	470	300	mg/kg	<i>Stability Rating</i>	<i>very stable</i>	<i>very stable</i>	
Org. Nitrogen (Org.-N):	1.8	1.2	%	Maturity Indicator: Cucumber Bioassay			
Phosphorus (as P ₂ O ₅):	0.92	0.59	%	Compost:Vermiculite(v:v)	1:1	1:3	
Phosphorus (P):	4000	2600	mg/kg	Emergence (%)	100	100	
Potassium (as K ₂ O):	0.61	0.39	%	Seedling Vigor (%)	100	100	
Potassium (K):	5100	3200	mg/kg	<i>Description of Plants</i>	<i>healthy</i>	<i>healthy</i>	
Calcium (Ca):	1.6	1.0	%	Pathogens			
Magnesium (Mg):	0.29	0.18	%	Results	Units	Rating	
Sulfate (SO ₄ -S):	58	37	mg/kg	Fecal Coliform	> 1300	MPN/g	
Boron (Total B):	25	16	mg/kg	Salmonella	< 3	MPN/4g	
Moisture:	0	35.8	%	Date Tested: 13 Sep. 12			
Sodium (Na):	0.079	0.051	%	Inerts			
Chloride (Cl):	0.11	0.07	%	% by weight			
pH Value:	NA	7.12	unit	Plastic	< 0.5		
Bulk Density :	19	30	lb/cu ft	Glass	< 0.5		
Carbonates (CaCO ₃):	3.0	1.9	lb/ton	Metal	< 0.5		
Conductivity (EC5):	2.8	NA	mmhos/cm	Sharps	ND		
Organic Matter:	57.6	37.0	%	Size & Volume Distribution			
Organic Carbon:	29.0	19.0	%	MM	% by weight	% by volume	
Ash:	42.4	27.2	%	> 50	0.0	0.0	
C/N Ratio	15	15	ratio	25 to 50	0.0	0.0	
AgIndex	> 10	> 10	ratio	16 to 25	0.0	0.0	
Metals							
Aluminum (Al)	5000	-	mg/kg	9.5 to 16	3.5	1.3	
Arsenic (As):	3.4	41	mg/kg	6.3 to 9.5	3.6	3.3	
Cadmium (Cd):	< 1.0	39	mg/kg	4.0 to 6.3	7.1	8.8	
Chromium (Cr):	13	1200	mg/kg	2.0 to 4.0	13.9	16.4	
Cobalt (Co)	4.8	-	mg/kg	< 2.0	71.9	70.2	
Copper (Cu):	36	1500	mg/kg	Bulk Density Description: <.35 Light Materials, .35-.60 medium weight materials, >.60 Heavy Materials			
Iron (Fe):	6900	-	mg/kg	Analyst: Assaf Sadeh			
Lead (Pb):	19	300	mg/kg				
Manganese (Mn):	520	-	mg/kg				
Mercury (Hg):	< 1.0	17	mg/kg				
Molybdenum (Mo):	1.9	75	mg/kg				
Nickel (Ni):	9.2	420	mg/kg				
Selenium (Se):	0.92	36	mg/kg				
Zinc (Zn):	120	2800	mg/kg				

*Sample was received and handled in accordance with TMECC procedures.

Account No.:
 2090347 - 1/1 - 2197
 Group: Sep.12 B No. 17

Date Received
 Sample i.d.
 Sample I.d. No.

13 Sep. 12
 Nature's Green-Relief Compost
 1/1 2090347

INTERPRETATION:

Is Your Compost Stable?

Respiration Rate 1.3 mg CO ₂ -C/ g OM/day	Biodegradation Rate of Your Pile	+++++	< Stable	> < Moderately Unstable	< Unstable	> < High For Mulch
Biologically Available Carbon (BAC) 1.9 mg CO ₂ -C/ g OM/day	Optimum Degradation Rate	+++++++	< Stable	> < Moderately Unstable	< Unstable	> < High For Mulch

Is Your Compost Mature?

Ammonia/Nitrate N ratio 2.3 Ratio	+++++	VeryMature> <	Mature	> <	Immature
Ammonia N ppm 1100 mg/kg dry wt.	+++++	VeryMature> <	Mature	> <	Immature
Nitrate N ppm 470 mg/kg dry wt.	+++++	<	Immature	> <	Mature
pH value 7.12 units	+++++	<	Immature	> <	Mature > < Immature
Cucumber Emergence 100.0 percent	+++++	<	Immature	> <	Mature

Is Your Compost Safe Regarding Health?

Fecal Coliform > 1000 MPN/g dry wt.	+++++	<	Safe	> <	High Fecal Coliform
Salmonella Less than 3 /4g dry wt.	+++++	<	Safe (none detected)	> <	High Salmonella Count(> 3 per 4 grams)
Metals US EPA 503 Pass dry wt.	+++++	<	All Metals Pass	> <	One or more Metals Fail

Does Your Compost Provide Nutrients or Organic Matter?

Nutrients (N+P2O5+K2O) 3.5 Percent dry wt.	+++++	<	Low	> <	Average	> <	High Nutrient Content
AgIndex (Nutrients / Sodium and Chloride Salts) 15 Ratio	+++++	Na & Cl	> <	Nutrient and Sodium and Chloride Provider	> <	Nutrient Provider	
Plant Available Nitrogen (PAN) 6 lbs/ton wet wt.	+++++	Low Nitrogen Provider	> <	Average Nitrogen Provider	> <	High Nitrogen Provider	
C/N Ratio 15 Ratio	+++++	<	Nitrogen Release	> <	N-Neutral > < N-Demand	> <	High Nitrogen Demand
Soluble Available Nutrients & Salts (EC5 w/w dw) 2.8 mmhos/cm dry wt.	+++++	SlowRelease	> <	Average Nutrient Release Rate	> <	High Available Nutrients	
Lime Content (CaCO3) 3.0 Lbs/ton dry wt.	++++	<	Low	> <	Average	> <	High Lime Content (as CaCO3)

What are the physical properties of your compost?

Percent Ash 42.4 Percent dry wt.	+++++	<	High Organic Matter	> <	Average	> <	High Ash Content
Sieve Size % > 6.3 MM (0.25") 7.1 Percent dry wt.	+++++	All Uses	> <	Size May Restrict Uses for Potting mix and Golf Courses			

Account No.:
2090347 - 1/1 - 2197
Group: Sep.12 B No. 17

Date Received
Sample i.d.
Sample I.d. No.

13 Sep. 12
Nature's Green-Relief Compost
1/1 2090347

INTERPRETATION:

Is Your Compost Stable?

Page two of three

Respiration Rate

1.3 Low: Good for all uses mg CO₂-C/g OM/day

The respiration rate is a measurement of the biodegradation rate of the organic matter in the sample (as received). The respiration rate is determined by measuring the rate at which CO₂ is released under optimized moisture and temperature conditions.

Biologically Available Carbon

2 Low: Good for all uses mg CO₂-C/g OM/day

Biologically Available Carbon (BAC) is a measurement of the rate at which CO₂ is released under optimized moisture, temperature, porosity, nutrients, pH and microbial conditions. If both the RR and the BAC test values are close to the same value, the pile is optimized for composting. If both values are high the compost pile just needs more time. If both values are low the compost has stabilized and should be moved to curing. BAC test values that are higher than RR indicate that the compost pile has stalled. This could be due to anaerobic conditions, lack of available nitrogen due to excessive air converting ammonia to the unavailable nitrate form, lack of nitrogen or other nutrients due to poor choice of feedstock, pH value out of range, or microbes rendered non-active.

Is Your Compost Mature?

Ammonia:NitrateN ratio

2.3 mature

Ammonia N ppm

1100 immature

Nitrate N ppm

470 mature

pH value

7.12 mature

Composting to stabilize carbon can occur at such a rapid rate that sometimes phytotoxins remain in the compost and must be neutralized before using in high concentrations or in high-end uses. This step is called curing. Typically ammonia is in excess with the break-down of organic materials resulting in an increase in pH. This combination results in a loss of volatile ammonia (it smells). Once this toxic ammonia has been reduced and the pH drops, the microbes convert the ammonia to nitrates. A low ammonia + high nitrate score is indicative of a mature compost, however there are many exceptions. For example, a compost with a low pH (<7) will retain ammonia, while a compost with high lime content can lose ammonia before the organic fraction becomes stable. Composts must first be stable before curing indicators apply.

Cucumber Bioassay

100.0 Percent

Cucumbers are chosen for this test because they are salt tolerant and very sensitive to ammonia and organic acid toxicity. Therefore, we can germinate seeds in high concentrations of compost to measure phytotoxic effects without soluble salts being the limiting factor. Values above 80% for both percent emergence and vigor are indicative of a well-cured compost. Exceptions include very high salts that affect the cucumbers, excessive concentrations of nitrates and other nutrients that will be in range when formulated to make a growing media. In addition to testing a 1:1 compost: vermiculite blend, we also test a diluted 1:4 blend to indicate a more sensitive toxicity level.

Is Your Compost Safe Regarding Health?

Fecal Coliform

> 1000 / g dry wt.

Fecal coliforms can survive in both aerobic and anaerobic conditions and is common in all initial compost piles. Most human pathogens occur from fecal matter and all fecal matter is loaded in fecal coliforms. Therefore fecal coliforms are used as an indicator to determine if the chosen method for pathogen reduction (heat for compost) has met the requirements of sufficient temperature, time and mixing. If the fecal coliforms are reduced to below 1000 per gram dry wt. it is assumed all other pathogens are eliminated. Potential problems are that fecal coliform can regrow during the curing phase or during shipping. This is because the conditions are now more favorable for growth than during the composting process.

Salmonella Bacteria

Less than 3 3 / 4g dry wt. Salmonella is not only another indicator organism but also a toxic microbe. It has been used in the case of biosolids industry to determine adequate pathogen reduction.

Metals

Pass

The ten heavy metals listed in the EPA 503 regulations are chosen to determine if compost can be applied to ag land and handled without toxic effects. Most high concentrations of heavy metals are derived from woodwaste feedstock such as chrome-arsenic treated or lead painted demolition wood. Biosolids are rarely a problem.

Does Your Compost Provide Nutrients or Organic Matter?

Nutrients (N+P₂O₅+K₂O)

3.5 Average nutrient content

This value is the sum of the primary nutrients Nitrogen, Phosphorus and Potassium. Reported units are consistent with those found on fertilizer formulations. A sum greater than 5 is indicative of a compost with high nutrient content, and best used to supply nutrients to a receiving soil. A sum below 2 indicates low nutrient content, and is best-used to improve soil structure via the addition of organic matter. Most compost falls between 2 and 5.

Account No.:
2090347 - 1/1 - 2197
Group: Sep.12 B No. 17

Date Received: 13 Sep. 12
Sample i.d.: Nature's Green-Relief Compost
Sample I.d. No.: 1/1 2090347

INTERPRETATION:

AgIndex (Nutrients/Na+Cl)

15 High nutrient ratio Composts with low AgIndex values have high concentrations of sodium and/or chloride compared to nutrients. Repeated use of a compost with a low AgIndex (< 2) may result in sodium and/or chloride acting as the limiting factor compared to nutrients, governing application rates. These composts may be used on well-draining soils and/or with salt-tolerant plants. Additional nutrients from another source may be needed if the application rate is limited by sodium or chloride. If the AgIndex is above 10, nutrients optimal for plant growth will be available without concern of sodium and/or chloride toxicity. Composts with an AgIndex of above 10 are good for increasing nutrient levels for all soils. Most composts score between 2 and 10. Concentrations of nutrients, sodium, and chloride in the receiving soil should be considered when determining compost application rates. The AgIndex is a product of feedstock quality. Feedstock from dairy manure, marine waste, industrial wastes, and halophytic plants are likely to produce a finished compost with a low AgIndex.

Plant Available Nitrogen (lbs/ton)

6 Average N Provider Plant Available Nitrogen (PAN) is calculated by estimating the release rate of Nitrogen from the organic fraction of the compost. This estimate is based on information gathered from the BAC test and measured ammonia and nitrate values. Despite the PAN value of the compost, additional sources of Nitrogen may be needed during the growing season to offset the Nitrogen demand of the microbes present in the compost. With ample nutrients these microbes can further breakdown organic matter in the compost and release bound Nitrogen. Nitrogen demand based on a high C/N ratio is not considered in the PAN calculation because additional Nitrogen should always be supplemented to the receiving soil when composts with a high C/N ratio are applied.

C/N Ratio

15 Indicates immaturity As a guiding principal, a C/N ratio below 14 indicates maturity and above 14 indicates immaturity, however, there are many exceptions. Large woodchips (>6.3mm), bark, and redwood are slow to breakdown and therefore can result in a relatively stable product while the C/N ratio value is high. Additionally, some composts with chicken manure and/or green grass feedstocks can start with a C/N ratio below 15 and are very unstable. A C/N ratio below 10 supplies Nitrogen, while a ratio above 20 can deplete Nitrogen from the soil. The rate at which Nitrogen will be released or used by the microbes is indicated by the respiration rate (BAC). If the respiration rate is too high the transfer of Nitrogen will not be controllable.

Soluble Nutrients & Salts (EC5 w/w dw - mmhos/cm)

2.8 Average salts This value refers to all soluble ions including nutrients, sodium, chloride and some soluble organic compounds. The concentration of salts will change due to the release of salts from the organic matter as it degrades, volatilization of ammonia, decomposition of soluble organics, and conversion of molecular structure. High salts + high AgIndex is indicative of a compost high in readily available nutrients. The application rate of these composts should be limited by the optimum nutrient value based on soil analysis of the receiving soil. High Salts + low AgIndex is indicative of a compost low in nutrients with high concentrations of sodium and/or chloride. Limit the application rate according to the toxicity level of the sodium and/or chloride. Low salts indicates that the compost can be applied without risking salt toxicity, is likely a good source of organic matter, and that nutrients will release slowly over time.

Lime Content (lbs. per ton)

3.0 Low lime content Compost high in lime or carbonates are often those produced from chicken manure (layers) ash materials, and lime products. These are excellent products to use on a receiving soil where lime has been recommended by soil analysis to raise the pH. Composts with a high lime content should be closely considered for pH requirements when formulating potting mixes.

Physical Properties

Percent Ash

42.4 Average ash content Ash is the non-organic fraction of a compost. Most composts contain approximately 50% ash (dry weight basis). Compost can be high in ash content for many reasons including: excess mineralization (old compost), contamination with soil base material during turning, poor quality feedstock, and soil or mineral products added. Finding the source and reducing high ash content is often the fastest means to increasing nutrient quality of a compost.

Particle Size % > 6.3 MM (0.25")

7.1 May restrict use Large particles may restrict use for potting soils, golf course topdressings, seed-starter mixes, and where a fine size distribution is required. Composts with large particles can still be used as excellent additions to field soils, shrub mixes and mulches.

Particle Size Distribution

Each size fraction is measured by weight, volume and bulk density. These results are particularly relevant with decisions to screen or not, and if screening, which size screen to use. The bulk density indicates if the fraction screened is made of light weight organic material or heavy mineral material. Removing large mineral material can greatly improve compost quality by increasing nutrient and organic concentrations.

Appendix:	Estimated available nutrients for use when calculating application rates
Plant Available Nitrogen (PAN) calculations:	lbs/ton
PAN = (X * (organic N)) + ((NH4-N) + (NO3-N))	
X value = If BAC < 2 then X = 0.1	Plant Available Nitrogen (PAN) 5.8
If BAC =2.1 to 5 then X = 0.2	Ammonia (NH4-N) 1.40
If BAC =5.1 to 10 then X = 0.3	Nitrate (NO3-N) 0.60
If BAC > 10 then X = 0.4	Available Phosphorus (P2O5*0.64) 7.6
Note: If C/N ratio > 15 additional N should be applied.	Available Potassium (K2O) 7.7



US COMPOSTING COUNCIL

Seal of Testing Assurance

Novozymes NA, Inc.

Frank Franciosi

P.O. Box 576

Franklinton

NC 27525-0576 0

Date Sampled/Received: 29 Oct. 12 / 30 Oct. 12

Product Identification Compost
Nature's GREEN-RELEAF Compost

COMPOST TECHNICAL DATA SHEET

LABORATORY: Soil Control Lab; 42 Hangar Way; Watsonville, CA 95076 tel: 831.724.5422 fax: 831.724.3188

<i>Compost Parameters</i>	<i>Reported as (units of measure)</i>	<i>Test Results</i>	<i>Test Results</i>
Plant Nutrients:	% , weight basis	Not reported	Not reported
Moisture Content	% , wet weight basis	52.8	
Organic Matter Content	% , dry weight basis	56.4	
pH	units	6.10	
Soluble Salts <i>(electrical conductivity EC₅)</i>	dS/m (mmhos/cm)	2.6	
Particle Size or Sieve Size	maxium aggregate size, inches	0.64	
<i>Stability Indicator (respirometry)</i>		<i>Stability Rating:</i>	
CO ₂ Evolution	mg CO ₂ -C/g OM/day	1.1	Very Stable
	mg CO ₂ -C/g TS/day	0.61	
<i>Maturity Indicator (bioassay)</i>			
Percent Emergence	average % of control	100.0	
Relative Seedling Vigor	average % of control	100.0	
Select Pathogens	PASS/FAIL: per US EPA Class A standard, 40 CFR § 503.32(a)	Pass	<i>Salmonella</i>
Trace Metals	PASS/FAIL: per US EPA Class A standard, 40 CFR § 503.13, Tables 1 and 3.	Pass	<i>As,Cd,Cr,Cu,Pb,Hg</i> <i>Mo,Ni,Se,Zn</i>

Participants in the US Composting Council's Seal of Testing Assurance Program have shown the commitment to test their compost products on a prescribed basis and provide this data, along with compost end use instructions, as a means to better serve the needs of their compost customers.

Laboratory Group: Nov.12 A_1 Laboratory Number: 2100804-1/1

Analyst: Assaf Sadeh

www.compostlab.com



US COMPOSTING COUNCIL

Seal of Testing Assurance

Novozymes NA, Inc.

Frank Franciosi

P.O. Box 576

Franklinton

NC 27525-0576 0

Date Sampled/Received: 29 Oct. 12 / 30 Oct. 12

Product Identification Compost
Nature's GREEN-RELEAF Compost

COMPOST TECHNICAL DATA SHEET

LABORATORY: Soil Control Lab; 42 Hangar Way; Watsonville, CA 95076 tel: 831.724.5422 fax: 831.724.3188

<i>Compost Parameters</i>	<i>Reported as (units of measure)</i>	<i>Test Results</i>	<i>Test Results</i>
Plant Nutrients:	% , weight basis	% , wet weight basis	% , dry weight basis
Nitrogen	Total N	0.78	1.7
Phosphorus	P ₂ O ₅	0.36	0.77
Potassium	K ₂ O	0.29	0.60
Calcium	Ca	0.71	1.5
Magnesium	Mg	0.13	0.27
Moisture Content	% , wet weight basis	52.8	
Organic Matter Content	% , dry weight basis	56.4	
pH	units	6.10	
Soluble Salts <i>(electrical conductivity EC₅)</i>	dS/m (mmhos/cm)	2.6	
Particle Size or Sieve Size	% under 9.5 mm, dw basis	97.9	
<i>Stability Indicator (respirometry)</i>		<i>Stability Rating:</i>	
CO ₂ Evolution	mg CO ₂ -C/g OM/day	1.1	Very Stable
	mg CO ₂ -C/g TS/day	0.61	
<i>Maturity Indicator (bioassay)</i>			
Percent Emergence	average % of control	100.0	
Relative Seedling Vigor	average % of control	100.0	
Select Pathogens	PASS/FAIL: per US EPA Class A standard, 40 CFR § 503.32(a)	Pass	Salmonella
Trace Metals	PASS/FAIL: per US EPA Class A standard, 40 CFR § 503.13, Tables 1 and 3.		Pass

Participants in the US Composting Council's Seal of Testing Assurance Program have shown the commitment to test their compost products on a prescribed basis and provide this data, along with compost end use instructions, as a means to better serve the needs of their compost customers.

Laboratory Group: Nov.12 A_1 Laboratory Number: 2100804-1/1

Analyst: Assaf Sadeh		www.compostlab.com
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US COMPOSTING COUNCIL

Seal of Testing Assurance



Novozymes NA, Inc.

Frank Franciosi

P.O. Box 576

Franklinton

NC 27525-0576

0

Product Identification:	Compost
Nature's GREEN-RELEAF Compost	

Date Sampled/Received: 29 Oct. 12 / 30 Oct. 12

COMPOST TECHNICAL DATA SHEET for NORTH CAROLINA DOT

LABORATORY: Soil Control Lab; 42 Hangar Way; Watsonville, CA 95076 tel: 831.724.5422 fax: 831.724.3188			
<i>Compost Parameters</i>	<i>Test Results</i>	<i>Reported as (units of measure)</i>	<i>Project Specification (Allowable Limit)</i>
Organic Matter Content	56.4	%, dry weight basis	25 - 65
pH	6.10	Unitless	5.0 - 8.5
Moisture Content	52.8	%, wet weight basis	30 - 60
Soluble Salts (electrical conductivity)	2.6	dS/m (mmhos/cm)	5.0 dS/m, maximum
Particle Size	100.0	%, dry weight passing through 3 inch screen and	100%
	100.0	1 inch screen and	90% minimum
	100.0	3/4 inch screen and	65% minimum
	92.8	1/4 inch screen	50% maximum
Stability Indicator (respirometry) CO2 Evolution	1.1	mg CO2-C/g OM/day	≤ 8
Maturity Indicator (bioassay) Percent Emergence	100.0	average % of control	80%, minimum
Relative Seedling Vigor	100.0	average % of control	80%, minimum
Select Pathogens (Salmonella)	Pass	PASS/FAIL: Per US EPA Class A standard, 40 CFR 503.32(a)	Pass
Trace Metals	Pass	PASS/FAIL: Per US EPA Class A 40 CFR 503.13, tables 1 and 3.	Pass
Inert Contamination (man-made)	None Detected	%, dry weight	<1.0 %

Participants in the US Composting Council's Seal of Testing Assurance Program have shown the commitment to test their compost products on a prescribed basis and provide this data, along with compost end use instructions, as a means to better serve the needs of their compost customers.

For additional information pertaining to compost use, the specific compost parameters tested for within the Seal of Testing assurance Program, or the program in general, log on to the US Composting Council's TMECC web-site at <http://www.tmecc.org>.

This compost product has been sampled and tested as required by the Seal of Testing assurance Program on the United States Composting Council (USCC), using certain methods from the "Test Methods for the Examination of Compost and Composting" manual. Test results are available upon request by contacting the compost producer (address at top of page). The USCC makes no warranties regarding this product or its content, quality, or suitability for any particular use.

Laboratory Group:	Nov.12 A_1	Laboratory Number:	2100804-1/1
Analyst: Assaf Sadeh		www.compostlab.com	

SOIL CONTROL LAB

42 HANGAR WAY
WATSONVILLE
CALIFORNIA
95076
USA

Account #: 2100804-1/1-2197
Group: Nov.12 A_1 #1
Reporting Date: November 14, 2012

Novozymes NA, Inc.
P.O. Box 576
Franklinton, NC 27525-0576
Attn: Frank Franciosi

Date Received: 30 Oct. 12
Sample Identification: Nature's GREEN-RELEAF Compost
Sample ID #: 2100804 - 1/1

Nutrients				Stability Indicator:			Biologically Available C	
	Dry wt.	As Rcvd.	units	CO2 Evolution	Respirometry			
Total Nitrogen:	1.7	0.78	%	mg CO ₂ -C/g OM/day	1.1	2.2		
Ammonia (NH ₄ -N):	280	130	mg/kg	mg CO ₂ -C/g TS/day	0.61	1.2		
Nitrate (NO ₃ -N):	750	360	mg/kg	<i>Stability Rating</i>	<i>very stable</i>	<i>stable</i>		
Org. Nitrogen (Org.-N):	1.6	0.76	%					
Phosphorus (as P ₂ O ₅):	0.78	0.37	%					
Phosphorus (P):	3400	1600	mg/kg					
Potassium (as K ₂ O):	0.60	0.29	%					
Potassium (K):	5000	2400	mg/kg					
Calcium (Ca):	1.5	0.71	%					
Magnesium (Mg):	0.27	0.13	%					
Sulfate (SO ₄ -S):	56	26	mg/kg					
Boron (Total B):	17	7.8	mg/kg					
Moisture:	0	52.8	%					
Sodium (Na):	0.041	0.019	%					
Chloride (Cl):	0.062	0.029	%					
pH Value:	NA	6.10	unit					
Bulk Density :	17	36	lb/cu ft					
Carbonates (CaCO ₃):	9.8	4.6	lb/ton					
Conductivity (EC5):	2.6	NA	mmhos/cm					
Organic Matter:	56.4	26.6	%					
Organic Carbon:	24.0	11.0	%					
Ash:	43.6	20.6	%					
C/N Ratio	15	15	ratio					
AgIndex	> 10	> 10	ratio					
				Maturity Indicator: Cucumber Bioassay				
				Compost:Vermiculite(v:v)	1:1	1:3		
				Emergence (%)	100	100		
				Seedling Vigor (%)	100	100		
				<i>Description of Plants</i>	<i>healthy</i>	<i>healthy</i>		
				Pathogens	Results	Units	Rating	
				Fecal Coliform	> 1800	MPN/g	<i>fail</i>	
				Salmonella	< 3	MPN/4g	<i>pass</i>	
				Date Tested: 30 Oct. 12				
				Inerts	% by weight			
				Plastic	< 0.5			
				Glass	< 0.5			
				Metal	< 0.5			
				Sharps	ND			
				Size & Volume Distribution				
				MM	% by weight	% by volume	BD g/cc	
				> 50	0.0	0.0	0.00	
				25 to 50	0.0	0.0	0.00	
				16 to 25	0.0	0.0	0.00	
				9.5 to 16	2.1	1.4	0.65	
				6.3 to 9.5	5.1	4.2	0.51	
				4.0 to 6.3	7.5	8.4	0.38	
				2.0 to 4.0	16.6	20.9	0.34	
				< 2.0	68.7	65.1	0.45	
				Bulk Density Description:<.35 Light Materials, .35-.60 medium weight materials, >.60 Heavy Materials				
				Analyst: Assaf Sadeh				
Metals								
	Dry wt.	EPA Limit	units					
Aluminum (Al)	5500	-	mg/kg					
Arsenic (As):	3.2	41	mg/kg					
Cadmium (Cd):	< 1.0	39	mg/kg					
Chromium (Cr):	32	1200	mg/kg					
Cobalt (Co)	3.7	-	mg/kg					
Copper (Cu):	44	1500	mg/kg					
Iron (Fe):	6700	-	mg/kg					
Lead (Pb):	21	300	mg/kg					
Manganese (Mn):	410	-	mg/kg					
Mercury (Hg):	< 1.0	17	mg/kg					
Molybdenum (Mo):	1.5	75	mg/kg					
Nickel (Ni):	9.8	420	mg/kg					
Selenium (Se):	< 1.0	36	mg/kg					
Zinc (Zn):	110	2800	mg/kg					

*Sample was received and handled in accordance with TMECC procedures.

Assaf Sadeh

Account No.:
 2100804 - 1/1 - 2197
 Group: Nov.12 A_1 No. 1

Date Received
 Sample i.d.
 Sample I.d. No.

30 Oct. 12
 Nature's GREEN-RELEAF Compost
 1/1 2100804

INTERPRETATION:

Is Your Compost Stable?

Respiration Rate	Biodegradation Rate of Your Pile
1.1 mg CO ₂ -C/ g OM/day	++++ < Stable > < Moderately Unstable> < Unstable > < High For Mulch
Biologically Available Carbon (BAC)	Optimum Degradation Rate
2.2 mg CO ₂ -C/ g OM/day	+++++++ < Stable > < Moderately Unstable> < Unstable > < High For Mulch

Is Your Compost Mature?

Ammonia/NitrateN ratio	
0.37 Ratio	+++++++ VeryMature> < Mature > < Immature
Ammonia N ppm	
280 mg/kg dry wt.	+++++++ VeryMature> < Mature > < Immature
Nitrate N ppm	
750 mg/kg dry wt.	+++++++ < Immature > < Mature
pH value	
6.10 units	+++++++ < Immature > < Mature > < Immature
Cucumber Emergence	
100.0 percent	+++++++ < Immature > < Mature

Is Your Compost Safe Regarding Health?

Fecal Coliform	
> 1000 MPN/g dry wt.	+++++++ < Safe > < High Fecal Coliform
Salmonella	
Less than 3 /4g dry wt.	+++++++ <Safe (none detected) > < High Salmonella Count(> 3 per 4 grams)
Metals	US EPA 503
Pass dry wt.	+++++++ <All Metals Pass > < One or more Metals Fail

Does Your Compost Provide Nutrients or Organic Matter?

Nutrients (N+P2O5+K2O)	
3.1 Percent dry wt.	+++++++ <Low > < Average > < High Nutrient Content
AgIndex (Nutrients / Sodium and Chloride Salts)	((N+P2O5+K2O) / (Na + Cl))
15 Ratio	+++++++ Na & Cl > < Nutrient and Sodium and Chloride Provider > < Nutrient Provider
Plant Available Nitrogen (PAN)	Estimated release for first season
8 lbs/ton wet wt.	+++++++ Low Nitrogen Provider> < Average Nitrogen Provider > <High Nitrogen Provider
C/N Ratio	
15 Ratio	+++++++ < Nitrogen Release > < N-Neutral > < N-Demand> < High Nitrogen Demand
Soluble Available Nutrients & Salts (EC5 w/w dw)	
2.6 mmhos/cm dry wt.	+++++++ SlowRelease> < Average Nutrient Release Rate > <High Available Nutrients
Lime Content (CaCO3)	
9.8 Lbs/ton dry wt.	+++++++ < Low > < Average > < High Lime Content (as CaCO3)

What are the physical properties of your compost?

Percent Ash	
43.6 Percent dry wt.	+++++++ < High Organic Matter > < Average > < High Ash Content
Sieve Size % > 6.3 MM (0.25")	
7.2 Percent dry wt.	+++++++ All Uses > < Size May Restrict Uses for Potting mix and Golf Courses

Account No.:
2100804 - 1/1 - 2197
Group: Nov.12 A_1 No. 1

Date Received 30 Oct. 12
Sample i.d. Nature's GREEN-RELEAF Compost
Sample I.d. No. 1/1 2100804

INTERPRETATION:

Is Your Compost Stable?

Page two of three

Respiration Rate

1.1 Low: Good for all uses mg CO₂-C/g OM/day

The respiration rate is a measurement of the biodegradation rate of the organic matter in the sample (as received). The respiration rate is determined by measuring the rate at which CO₂ is released under optimized moisture and temperature conditions.

Biologically Available Carbon

2 Low: Good for all uses mg CO₂-C/g OM/day

Biologically Available Carbon (BAC) is a measurement of the rate at which CO₂ is released under optimized moisture, temperature, porosity, nutrients, pH and microbial conditions. If both the RR and the BAC test values are close to the same value, the pile is optimized for composting. If both values are high the compost pile just needs more time. If both values are low the compost has stabilized and should be moved to curing. BAC test values that are higher than RR indicate that the compost pile has stalled. This could be due to anaerobic conditions, lack of available nitrogen due to excessive air converting ammonia to the unavailable nitrate form, lack of nitrogen or other nutrients due to poor choice of feedstock, pH value out of range, or microbes rendered non-active.

Is Your Compost Mature?

Ammonia:N:NitrateN ratio

0.37 very mature

Ammonia N ppm

280 mature

Nitrate N ppm

750 mature

pH value

6.10 immature

Composting to stabilize carbon can occur at such a rapid rate that sometimes phytotoxins remain in the compost and must be neutralized before using in high concentrations or in high-end uses. This step is called curing. Typically ammonia is in excess with the break-down of organic materials resulting in an increase in pH. This combination results in a loss of volatile ammonia (it smells). Once this toxic ammonia has been reduced and the pH drops, the microbes convert the ammonia to nitrates. A low ammonia + high nitrate score is indicative of a mature compost, however there are many exceptions. For example, a compost with a low pH (<7) will retain ammonia, while a compost with high lime content can lose ammonia before the organic fraction becomes stable. Composts must first be stable before curing indicators apply.

Cucumber Bioassay

100.0 Percent

Cucumbers are chosen for this test because they are salt tolerant and very sensitive to ammonia and organic acid toxicity. Therefore, we can germinate seeds in high concentrations of compost to measure phytotoxic effects without soluble salts being the limiting factor. Values above 80% for both percent emergence and vigor are indicative of a well-cured compost. Exceptions include very high salts that affect the cucumbers, excessive concentrations of nitrates and other nutrients that will be in range when formulated to make a growing media. In addition to testing a 1:1 compost: vermiculite blend, we also test a diluted 1:4 blend to indicate a more sensitive toxicity level.

Is Your Compost Safe Regarding Health?

Fecal Coliform

> 1000 / g dry wt.

Fecal coliforms can survive in both aerobic and anaerobic conditions and is common in all initial compost piles. Most human pathogens occur from fecal matter and all fecal matter is loaded in fecal coliforms. Therefore fecal coliforms are used as an indicator to determine if the chosen method for pathogen reduction (heat for compost) has met the requirements of sufficient temperature, time and mixing. If the fecal coliforms are reduced to below 1000 per gram dry wt. it is assumed all other pathogens are eliminated. Potential problems are that fecal coliform can regrow during the curing phase or during shipping. This is because the conditions are now more favorable for growth than during the composting process.

Salmonella Bacteria

Less than 3 3 / 4g dry wt. Salmonella is not only another indicator organism but also a toxic microbe. It has been used in the case of biosolids industry to determine adequate pathogen reduction.

Metals

Pass

The ten heavy metals listed in the EPA 503 regulations are chosen to determine if compost can be applied to ag land and handled without toxic effects. Most high concentrations of heavy metals are derived from woodwaste feedstock such as chrome-arsenic treated or lead painted demolition wood. Biosolids are rarely a problem.

Does Your Compost Provide Nutrients or Organic Matter?

Nutrients (N+P₂O₅+K₂O)

3.1 Average nutrient content

This value is the sum of the primary nutrients Nitrogen, Phosphorus and Potassium. Reported units are consistent with those found on fertilizer formulations. A sum greater than 5 is indicative of a compost with high nutrient content, and best used to supply nutrients to a receiving soil. A sum below 2 indicates low nutrient content, and is best-used to improve soil structure via the addition of organic matter. Most compost falls between 2 and 5.

Account No.:	Date Received	30 Oct. 12
2100804 - 1/1 - 2197	Sample i.d.	Nature's GREEN-RELEAF Compost
Group: Nov.12 A_1 No. 1	Sample I.d. No.	1/1 2100804

INTERPRETATION:

AgIndex (Nutrients/Na+Cl)

15 High nutrient ratio Composts with low AgIndex values have high concentrations of sodium and/or chloride compared to nutrients. Repeated use of a compost with a low AgIndex (< 2) may result in sodium and/or chloride acting as the limiting factor compared to nutrients, governing application rates. These composts may be used on well-draining soils and/or with salt-tolerant plants. Additional nutrients from another source may be needed if the application rate is limited by sodium or chloride. If the AgIndex is above 10, nutrients optimal for plant growth will be available without concern of sodium and/or chloride toxicity. Composts with an AgIndex of above 10 are good for increasing nutrient levels for all soils. Most composts score between 2 and 10. Concentrations of nutrients, sodium, and chloride in the receiving soil should be considered when determining compost application rates. The AgIndex is a product of feedstock quality. Feedstock from dairy manure, marine waste, industrial wastes, and halophytic plants are likely to produce a finished compost with a low AgIndex.

Plant Available Nitrogen (lbs/ton)

8 Average N Provider Plant Available Nitrogen (PAN) is calculated by estimating the release rate of Nitrogen from the organic fraction of the compost. This estimate is based on information gathered from the BAC test and measured ammonia and nitrate values. Despite the PAN value of the compost, additional sources of Nitrogen may be needed during the growing season to offset the Nitrogen demand of the microbes present in the compost. With ample nutrients these microbes can further breakdown organic matter in the compost and release bound Nitrogen. Nitrogen demand based on a high C/N ratio is not considered in the PAN calculation because additional Nitrogen should always be supplemented to the receiving soil when composts with a high C/N ratio are applied.

C/N Ratio

15 Indicates immaturity As a guiding principal, a C/N ratio below 14 indicates maturity and above 14 indicates immaturity, however, there are many exceptions. Large woodchips (>6.3mm), bark, and redwood are slow to breakdown and therefore can result in a relatively stable product while the C/N ratio value is high. Additionally, some composts with chicken manure and/or green grass feedstocks can start with a C/N ratio below 15 and are very unstable. A C/N ratio below 10 supplies Nitrogen, while a ratio above 20 can deplete Nitrogen from the soil. The rate at which Nitrogen will be released or used by the microbes is indicated by the respiration rate (BAC). If the respiration rate is too high the transfer of Nitrogen will not be controllable.

Soluble Nutrients & Salts (EC5 w/w dw - mmhos/cm)

2.6 Average salts This value refers to all soluble ions including nutrients, sodium, chloride and some soluble organic compounds. The concentration of salts will change due to the release of salts from the organic matter as it degrades, volatilization of ammonia, decomposition of soluble organics, and conversion of molecular structure. High salts + high AgIndex is indicative of a compost high in readily available nutrients. The application rate of these composts should be limited by the optimum nutrient value based on soil analysis of the receiving soil. High Salts + low AgIndex is indicative of a compost low in nutrients with high concentrations of sodium and/or chloride. Limit the application rate according to the toxicity level of the sodium and/or chloride. Low salts indicates that the compost can be applied without risking salt toxicity, is likely a good source of organic matter, and that nutrients will release slowly over time.

Lime Content (lbs. per ton)

9.8 Average lime content Compost high in lime or carbonates are often those produced from chicken manure (layers) ash materials, and lime products. These are excellent products to use on a receiving soil where lime has been recommended by soil analysis to raise the pH. Composts with a high lime content should be closely considered for pH requirements when formulating potting mixes.

Physical Properties

Percent Ash

43.6 Average ash content Ash is the non-organic fraction of a compost. Most composts contain approximately 50% ash (dry weight basis). Compost can be high in ash content for many reasons including: excess mineralization (old compost), contamination with soil base material during turning, poor quality feedstock, and soil or mineral products added. Finding the source and reducing high ash content is often the fastest means to increasing nutrient quality of a compost.

Particle Size % > 6.3 MM (0.25")

7.2 May restrict use Large particles may restrict use for potting soils, golf course topdressings, seed-starter mixes, and where a fine size distribution is required. Composts with large particles can still be used as excellent additions to field soils, shrub mixes and mulches.

Particle Size Distribution

Each size fraction is measured by weight, volume and bulk density. These results are particularly relevant with decisions to screen or not, and if screening, which size screen to use. The bulk density indicates if the fraction screened is made of light weight organic material or heavy mineral material. Removing large mineral material can greatly improve compost quality by increasing nutrient and organic concentrations.

Appendix:	Estimated available nutrients for use when calculating application rates
Plant Available Nitrogen (PAN) calculations:	lbs/ton
PAN = (X * (organic N)) + ((NH4-N) + (NO3-N))	
X value = If BAC < 2 then X = 0.1	Plant Available Nitrogen (PAN) 8.5
If BAC =2.1 to 5 then X = 0.2	Ammonia (NH4-N) 0.26
If BAC =5.1 to 10 then X = 0.3	Nitrate (NO3-N) 0.72
If BAC > 10 then X = 0.4	Available Phosphorus (P2O5*0.64) 4.7
Note: If C/N ratio > 15 additional N should be applied.	Available Potassium (K2O) 5.8



US COMPOSTING COUNCIL

Seal of Testing Assurance

Novozymes NA, Inc.
Frank Franciosi
P.O. Box 576
Franklinton
NC 27525-0576

Date Sampled/Received: 07 Jan. 13 / 08 Jan. 13

Product Identification Compost
Nature's GREEN-RELEAF Compost

COMPOST TECHNICAL DATA SHEET

LABORATORY: Soil Control Lab; 42 Hangar Way; Watsonville, CA 95076 tel: 831.724.5422 fax: 831.724.3188

<i>Compost Parameters</i>	<i>Reported as (units of measure)</i>	<i>Test Results</i>	<i>Test Results</i>
Plant Nutrients:	%, weight basis	Not reported	Not reported
Moisture Content	%, wet weight basis	45.6	
Organic Matter Content	%, dry weight basis	50.1	
pH	units	7.90	
Soluble Salts <i>(electrical conductivity EC₅)</i>	dS/m (mmhos/cm)	3.5	
Particle Size or Sieve Size	maximum aggregate size, inches	0.64	
Stability Indicator (respirometry)		Stability Rating:	
CO ₂ Evolution	mg CO ₂ -C/g OM/day	1.5	Very Stable
	mg CO ₂ -C/g TS/day	0.76	
Maturity Indicator (bioassay)			
Percent Emergence	average % of control	100.0	
Relative Seedling Vigor	average % of control	100.0	
Select Pathogens	PASS/FAIL: per US EPA Class A standard, 40 CFR § 503.32(a)	Pass	Salmonella
Trace Metals	PASS/FAIL: per US EPA Class A standard, 40 CFR § 503.13, Tables 1 and 3.	Pass	As,Cd,Cr,Cu,Pb,Hg Mo,Ni,Se,Zn

Participants in the US Composting Council's Seal of Testing Assurance Program have shown the commitment to test their compost products on a prescribed basis and provide this data, along with compost end use instructions, as a means to better serve the needs of their compost customers.

Laboratory Group: Jan.13 B Laboratory Number: 3010148-1/1

Analyst: Assaf Sadeh

www.compostlab.com



US COMPOSTING COUNCIL

Seal of Testing Assurance

Novozymes NA, Inc.

Frank Franciosi

P.O. Box 576

Franklinton

NC 27525-0576

Date Sampled/Received: 07 Jan. 13 / 08 Jan. 13

Product Identification Compost
Nature's GREEN-RELEAF Compost

COMPOST TECHNICAL DATA SHEET

LABORATORY: Soil Control Lab; 42 Hangar Way; Watsonville, CA 95076 tel: 831.724.5422 fax: 831.724.3188

<i>Compost Parameters</i>	<i>Reported as (units of measure)</i>	<i>Test Results</i>	<i>Test Results</i>
Plant Nutrients:	% , weight basis	% , wet weight basis	% , dry weight basis
Nitrogen	Total N	1.4	2.6
Phosphorus	P ₂ O ₅	0.66	1.2
Potassium	K ₂ O	0.53	0.99
Calcium	Ca	0.93	1.7
Magnesium	Mg	0.19	0.36
Moisture Content	% , wet weight basis	45.6	
Organic Matter Content	% , dry weight basis	50.1	
pH	units	7.90	
Soluble Salts <i>(electrical conductivity EC₅)</i>	dS/m (mmhos/cm)	3.5	
Particle Size or Sieve Size	% under 9.5 mm, dw basis	93.4	
<i>Stability Indicator (respirometry)</i>		<i>Stability Rating:</i>	
CO ₂ Evolution	mg CO ₂ -C/g OM/day	1.5	Very Stable
	mg CO ₂ -C/g TS/day	0.76	
<i>Maturity Indicator (bioassay)</i>			
Percent Emergence	average % of control	100.0	
Relative Seedling Vigor	average % of control	100.0	
Select Pathogens	PASS/FAIL: per US EPA Class A standard, 40 CFR § 503.32(a)	Pass	Salmonella
Trace Metals	PASS/FAIL: per US EPA Class A standard, 40 CFR § 503.13, Tables 1 and 3.		Pass

Participants in the US Composting Council's Seal of Testing Assurance Program have shown the commitment to test their compost products on a prescribed basis and provide this data, along with compost end use instructions, as a means to better serve the needs of their compost customers.

Laboratory Group: Jan.13 B Laboratory Number: 3010148-1/1

Analyst: Assaf Sadeh		www.compostlab.com
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SOIL CONTROL LAB

42 HANGAR WAY
WATSONVILLE
CALIFORNIA
95076
USA

Account #: 3010148-1/1-2197
Group: Jan.13 B #12
Reporting Date: January 23, 2013

Novozymes NA, Inc.
P.O. Box 576
Franklinton, NC 27525-0576
Attn: Frank Franciosi

Date Received: 08 Jan. 13
Sample Identification: Nature's GREEN-RELEAF Compost
Sample ID #: 3010148 - 1/1

Nutrients				Stability Indicator:			
	Dry wt.	As Rcvd.	units	CO2 Evolution		Respirometry	Biologically Available C
Total Nitrogen:	2.6	1.4	%	mg CO ₂ -C/g OM/day	1.5	1.5	
Ammonia (NH ₄ -N):	6000	3300	mg/kg	mg CO ₂ -C/g TS/day	0.76	0.78	
Nitrate (NO ₃ -N):	490	270	mg/kg	<i>Stability Rating</i>	<i>very stable</i>	<i>very stable</i>	
Org. Nitrogen (Org.-N):	2.0	1.1	%	Maturity Indicator: Cucumber Bioassay			
Phosphorus (as P ₂ O ₅):	1.2	0.66	%	Compost:Vermiculite(v:v)	1:1	1:3	
Phosphorus (P):	5300	2900	mg/kg	Emergence (%)	100	100	
Potassium (as K ₂ O):	0.98	0.53	%	Seedling Vigor (%)	100	100	
Potassium (K):	8200	4400	mg/kg	<i>Description of Plants</i>	<i>healthy</i>	<i>healthy</i>	
Calcium (Ca):	1.7	0.93	%	Pathogens			
Magnesium (Mg):	0.36	0.19	%	Results	Units	Rating	
Sulfate (SO ₄ -S):	120	65	mg/kg	Fecal Coliform	> 1400	MPN/g	<i>fail</i>
Boron (Total B):	27	15	mg/kg	Salmonella	< 3	MPN/4g	<i>pass</i>
Moisture:	0	45.6	%	Date Tested: 08 Jan. 13			
Sodium (Na):	0.072	0.039	%	Inerts			
Chloride (Cl):	0.13	0.072	%	% by weight			
pH Value:	NA	7.90	unit	Plastic	< 0.5		
Bulk Density :	23	42	lb/cu ft	Glass	< 0.5		
Carbonates (CaCO ₃):	<0.1	<0.1	lb/ton	Metal	< 0.5		
Conductivity (EC5):	3.5	NA	mmhos/cm	Sharps	ND		
Organic Matter:	50.1	27.3	%	Size & Volume Distribution			
Organic Carbon:	29.0	16.0	%	MM	% by weight	% by volume	BD g/cc
Ash:	49.9	27.2	%	> 50	0.0	0.0	0.00
C/N Ratio	11	11	ratio	25 to 50	0.0	0.0	0.00
AgIndex	> 10	> 10	ratio	16 to 25	0.0	0.0	0.00
Metals				9.5 to 16	6.6	2.2	1.41
Aluminum (Al)	6500	-	mg/kg	6.3 to 9.5	5.9	7.6	0.37
Arsenic (As):	3.2	41	mg/kg	4.0 to 6.3	6.8	7.2	0.45
Cadmium (Cd):	< 1.0	39	mg/kg	2.0 to 4.0	15.0	17.9	0.40
Chromium (Cr):	17	1200	mg/kg	< 2.0	65.6	65.0	0.48
Cobalt (Co)	4.2	-	mg/kg	Bulk Density Description: <.35 Light Materials, .35-.60 medium weight materials, >.60 Heavy Materials			
Copper (Cu):	43	1500	mg/kg	Analyst: Assaf Sadeh			
Iron (Fe):	7900	-	mg/kg				
Lead (Pb):	18	300	mg/kg				
Manganese (Mn):	430	-	mg/kg				
Mercury (Hg):	< 1.0	17	mg/kg				
Molybdenum (Mo):	1.2	75	mg/kg				
Nickel (Ni):	11	420	mg/kg				
Selenium (Se):	< 1.0	36	mg/kg				
Zinc (Zn):	110	2800	mg/kg				

*Sample was received and handled in accordance with TMECC procedures.

Account No.:
3010148 - 1/1 - 2197
Group: Jan.13 B No. 12

Date Received
Sample i.d.
Sample I.d. No.

08 Jan. 13
Nature's GREEN-RELEAF Compost
1/1 3010148

INTERPRETATION:

Is Your Compost Stable?

Respiration Rate 1.5 mg CO ₂ -C/ g OM/day	Biodegradation Rate of Your Pile	+++++	< Stable	> < Moderately Unstable	< Unstable	> < High For Mulch
Biologically Available Carbon (BAC) 1.5 mg CO ₂ -C/ g OM/day	Optimum Degradation Rate	+++++	< Stable	> < Moderately Unstable	< Unstable	> < High For Mulch

Is Your Compost Mature?

Ammonia/Nitrate N ratio 12 Ratio	+++++	VeryMature> < Mature	> < Immature
Ammonia N ppm 6000 mg/kg dry wt.	+++++	VeryMature> < Mature	> < Immature
Nitrate N ppm 490 mg/kg dry wt.	+++++	< Immature	> < Mature
pH value 7.90 units	+++++	< Immature	> < Mature > < Immature
Cucumber Emergence 100.0 percent	+++++	< Immature	> < Mature

Is Your Compost Safe Regarding Health?

Fecal Coliform > 1000 MPN/g dry wt.	+++++	< Safe	> < High Fecal Coliform
Salmonella Less than 3 /4g dry wt.	+++++	<Safe (none detected)	> < High Salmonella Count(> 3 per 4 grams)
Metals US EPA 503 Pass dry wt.	+++++	<All Metals Pass	> < One or more Metals Fail

Does Your Compost Provide Nutrients or Organic Matter?

Nutrients (N+P2O5+K2O) 4.8 Percent dry wt.	+++++	<Low > < Average > < High Nutrient Content
AgIndex (Nutrients / Sodium and Chloride Salts) 15 Ratio	+++++	Na & Cl > < Nutrient and Sodium and Chloride Provider > < Nutrient Provider
Plant Available Nitrogen (PAN) 14 lbs/ton wet wt.	+++++	Low Nitrogen Provider> < Average Nitrogen Provider > <High Nitrogen Provider
C/N Ratio 11 Ratio	+++++	< Nitrogen Release > < N-Neutral > < N-Demand> < High Nitrogen Demand
Soluble Available Nutrients & Salts (EC5 w/w dw) 3.5 mmhos/cm dry wt.	+++++	SloRelease> < Average Nutrient Release Rate > <High Available Nutrients
Lime Content (CaCO3) 0 Lbs/ton dry wt.	+	< Low > < Average > < High Lime Content (as CaCO3)

What are the physical properties of your compost?

Percent Ash 49.9 Percent dry wt.	+++++	< High Organic Matter > < Average > < High Ash Content
Sieve Size % > 6.3 MM (0.25") 12.5 Percent dry wt.	+++++	All Uses > < Size May Restrict Uses for Potting mix and Golf Courses

Account No.:
3010148 - 1/1 - 2197
Group: Jan.13 B No. 12

Date Received
Sample i.d.
Sample I.d. No.

08 Jan. 13
Nature's GREEN-RELEAF Compost
1/1 3010148

INTERPRETATION:

Is Your Compost Stable?

Page two of three

Respiration Rate

1.5 Low: Good for all uses mg CO₂-C/g OM/day

The respiration rate is a measurement of the biodegradation rate of the organic matter in the sample (as received). The respiration rate is determined by measuring the rate at which CO₂ is released under optimized moisture and temperature conditions.

Biologically Available Carbon

1.5 Low: Good for all uses mg CO₂-C/g OM/day

Biologically Available Carbon (BAC) is a measurement of the rate at which CO₂ is released under optimized moisture, temperature, porosity, nutrients, pH and microbial conditions. If both the RR and the BAC test values are close to the same value, the pile is optimized for composting. If both values are high the compost pile just needs more time. If both values are low the compost has stabilized and should be moved to curing. BAC test values that are higher than RR indicate that the compost pile has stalled. This could be due to anaerobic conditions, lack of available nitrogen due to excessive air converting ammonia to the unavailable nitrate form, lack of nitrogen or other nutrients due to poor choice of feedstock, pH value out of range, or microbes rendered non-active.

Is Your Compost Mature?

Ammonia:NitrateN ratio

12 immature

Composting to stabilize carbon can occur at such a rapid rate that sometimes phytotoxins remain in the compost and must be neutralized before using in high concentrations or in high-end uses. This step is called curing. Typically ammonia is in excess with the break-down of organic materials resulting in an increase in pH. This combination results in a loss of volatile ammonia (it smells). Once this toxic ammonia has been reduced and the pH drops, the microbes convert the ammonia to nitrates. A low ammonia + high nitrate score is indicative of a mature compost, however there are many exceptions. For example, a compost with a low pH (<7) will retain ammonia, while a compost with high lime content can lose ammonia before the organic fraction becomes stable. Composts must first be stable before curing indicators apply.

Ammonia N ppm

6000 immature

Nitrate N ppm

490 mature

pH value

7.90 mature

Cucumber Bioassay

100.0 Percent

Cucumbers are chosen for this test because they are salt tolerant and very sensitive to ammonia and organic acid toxicity. Therefore, we can germinate seeds in high concentrations of compost to measure phytotoxic effects without soluble salts being the limiting factor. Values above 80% for both percent emergence and vigor are indicative of a well-cured compost. Exceptions include very high salts that affect the cucumbers, excessive concentrations of nitrates and other nutrients that will be in range when formulated to make a growing media. In addition to testing a 1:1 compost: vermiculite blend, we also test a diluted 1:3 blend to indicate a more sensitive toxicity level.

Is Your Compost Safe Regarding Health?

Fecal Coliform

> 1000 / g dry wt.

Fecal coliforms can survive in both aerobic and anaerobic conditions and is common in all initial compost piles. Most human pathogens occur from fecal matter and all fecal matter is loaded in fecal coliforms. Therefore fecal coliforms are used as an indicator to determine if the chosen method for pathogen reduction (heat for compost) has met the requirements of sufficient temperature, time and mixing. If the fecal coliforms are reduced to below 1000 per gram dry wt. it is assumed all other pathogens are eliminated. Potential problems are that fecal coliform can regrow during the curing phase or during shipping. This is because the conditions are now more favorable for growth than during the composting process.

Salmonella Bacteria

Less than 3 3 / 4g dry wt. Salmonella is not only another indicator organism but also a toxic microbe. It has been used in the case of biosolids industry to determine adequate pathogen reduction.

Metals

Pass

The ten heavy metals listed in the EPA 503 regulations are chosen to determine if compost can be applied to ag land and handled without toxic effects. Most high concentrations of heavy metals are derived from woodwaste feedstock such as chrome-arsenic treated or lead painted demolition wood. Biosolids are rarely a problem.

Does Your Compost Provide Nutrients or Organic Matter?

Nutrients (N+P₂O₅+K₂O)

4.8 Average nutrient content

This value is the sum of the primary nutrients Nitrogen, Phosphorus and Potassium. Reported units are consistent with those found on fertilizer formulations. A sum greater than 5 is indicative of a compost with high nutrient content, and best used to supply nutrients to a receiving soil. A sum below 2 indicates low nutrient content, and is best-used to improve soil structure via the addition of organic matter. Most compost falls between 2 and 5.

Account No.:	Date Received	08 Jan. 13
3010148 - 1/1 - 2197	Sample i.d.	Nature's GREEN-RELEAF Compost
Group: Jan.13 B No. 12	Sample I.d. No.	1/1 3010148

INTERPRETATION:

AgIndex (Nutrients/Na+Cl)

15 High nutrient ratio Composts with low AgIndex values have high concentrations of sodium and/or chloride compared to nutrients. Repeated use of a compost with a low AgIndex (< 2) may result in sodium and/or chloride acting as the limiting factor compared to nutrients, governing application rates. These composts may be used on well-draining soils and/or with salt-tolerant plants. Additional nutrients from another source may be needed if the application rate is limited by sodium or chloride. If the AgIndex is above 10, nutrients optimal for plant growth will be available without concern of sodium and/or chloride toxicity. Composts with an AgIndex of above 10 are good for increasing nutrient levels for all soils. Most composts score between 2 and 10. Concentrations of nutrients, sodium, and chloride in the receiving soil should be considered when determining compost application rates. The AgIndex is a product of feedstock quality. Feedstock from dairy manure, marine waste, industrial wastes, and halophytic plants are likely to produce a finished compost with a low AgIndex.

Plant Available Nitrogen (lbs/ton)

14 Average N Provider Plant Available Nitrogen (PAN) is calculated by estimating the release rate of Nitrogen from the organic fraction of the compost. This estimate is based on information gathered from the BAC test and measured ammonia and nitrate values. Despite the PAN value of the compost, additional sources of Nitrogen may be needed during the growing season to offset the Nitrogen demand of the microbes present in the compost. With ample nutrients these microbes can further breakdown organic matter in the compost and release bound Nitrogen. Nitrogen demand based on a high C/N ratio is not considered in the PAN calculation because additional Nitrogen should always be supplemented to the receiving soil when composts with a high C/N ratio are applied.

C/N Ratio

11 Indicates maturity As a guiding principal, a C/N ratio below 14 indicates maturity and above 14 indicates immaturity, however, there are many exceptions. Large woodchips (>6.3mm), bark, and redwood are slow to breakdown and therefore can result in a relatively stable product while the C/N ratio value is high. Additionally, some composts with chicken manure and/or green grass feedstocks can start with a C/N ratio below 15 and are very unstable. A C/N ratio below 10 supplies Nitrogen, while a ratio above 20 can deplete Nitrogen from the soil. The rate at which Nitrogen will be released or used by the microbes is indicated by the respiration rate (BAC). If the respiration rate is too high the transfer of Nitrogen will not be controllable.

Soluble Nutrients & Salts (EC5 w/w dw - mmhos/cm)

3.5 Average salts This value refers to all soluble ions including nutrients, sodium, chloride and some soluble organic compounds. The concentration of salts will change due to the release of salts from the organic matter as it degrades, volatilization of ammonia, decomposition of soluble organics, and conversion of molecular structure. High salts + high AgIndex is indicative of a compost high in readily available nutrients. The application rate of these composts should be limited by the optimum nutrient value based on soil analysis of the receiving soil. High Salts + low AgIndex is indicative of a compost low in nutrients with high concentrations of sodium and/or chloride. Limit the application rate according to the toxicity level of the sodium and/or chloride. Low salts indicates that the compost can be applied without risking salt toxicity, is likely a good source of organic matter, and that nutrients will release slowly over time.

Lime Content (lbs. per ton)

0 Low lime content Compost high in lime or carbonates are often those produced from chicken manure (layers) ash materials, and lime products. These are excellent products to use on a receiving soil where lime has been recommended by soil analysis to raise the pH. Composts with a high lime content should be closely considered for pH requirements when formulating potting mixes.

Physical Properties

Percent Ash

49.9 Average ash content Ash is the non-organic fraction of a compost. Most composts contain approximately 50% ash (dry weight basis). Compost can be high in ash content for many reasons including: excess mineralization (old compost), contamination with soil base material during turning, poor quality feedstock, and soil or mineral products added. Finding the source and reducing high ash content is often the fastest means to increasing nutrient quality of a compost.

Particle Size % > 6.3 MM (0.25")

12.5 May restrict use Large particles may restrict use for potting soils, golf course topdressings, seed-starter mixes, and where a fine size distribution is required. Composts with large particles can still be used as excellent additions to field soils, shrub mixes and mulches.

Particle Size Distribution

Each size fraction is measured by weight, volume and bulk density. These results are particularly relevant with decisions to screen or not, and if screening, which size screen to use. The bulk density indicates if the fraction screened is made of light weight organic material or heavy mineral material. Removing large mineral material can greatly improve compost quality by increasing nutrient and organic concentrations.

Appendix:	Estimated available nutrients for use when calculating application rates
Plant Available Nitrogen (PAN) calculations:	lbs/ton (As Rcvd.)
PAN = (X * (organic N)) + ((NH4-N) + (NO3-N))	
X value = If BAC < 2 then X = 0.1	Plant Available Nitrogen (PAN) 14.5
If BAC =2.1 to 5 then X = 0.2	Ammonia (NH4-N) 6.60
If BAC =5.1 to 10 then X = 0.3	Nitrate (NO3-N) 0.54
If BAC > 10 then X = 0.4	Available Phosphorus (P2O5*0.64) 8.4
Note: If C/N ratio > 15 additional N should be applied.	Available Potassium (K2O) 10.6



US COMPOSTING COUNCIL

Seal of Testing Assurance

Novozymes NA, Inc.

Frank Franciosi

P.O. Box 576

Franklinton

NC 27525-0576 0

Date Sampled/Received: 06 May. 13 / 07 May. 13

Product Identification Compost
Nature's Green-Releaf Compost

COMPOST TECHNICAL DATA SHEET

LABORATORY: Soil Control Lab; 42 Hangar Way; Watsonville, CA 95076 tel: 831.724.5422 fax: 831.724.3188

<i>Compost Parameters</i>	<i>Reported as (units of measure)</i>	<i>Test Results</i>	<i>Test Results</i>
Plant Nutrients:	%, weight basis	Not reported	Not reported
Moisture Content	%, wet weight basis	45.0	
Organic Matter Content	%, dry weight basis	48.7	
pH	units	8.31	
Soluble Salts <i>(electrical conductivity EC₅)</i>	dS/m (mmhos/cm)	3.3	
Particle Size or Sieve Size	maxium aggregate size, inches	0.64	
<i>Stability Indicator (respirometry)</i>		<i>Stability Rating:</i>	
CO ₂ Evolution	mg CO ₂ -C/g OM/day	1.3	Very Stable
	mg CO ₂ -C/g TS/day	0.64	
<i>Maturity Indicator (bioassay)</i>			
Percent Emergence	average % of control	100.0	
Relative Seedling Vigor	average % of control	100.0	
Select Pathogens	PASS/FAIL: per US EPA Class A standard, 40 CFR § 503.32(a)	Pass	<i>Fecal coliform</i>
		Pass	<i>Salmonella</i>
Trace Metals	PASS/FAIL: per US EPA Class A standard, 40 CFR § 503.13, Tables 1 and 3.	Pass	<i>As,Cd,Cr,Cu,Pb,Hg</i> <i>Mo,Ni,Se,Zn</i>

Participants in the US Composting Council's Seal of Testing Assurance Program have shown the commitment to test their compost products on a prescribed basis and provide this data, along with compost end use instructions, as a means to better serve the needs of their compost customers.

Laboratory Group: May.13 B Laboratory Number: 3050177-1/1

Analyst: Assaf Sadeh

www.compostlab.com



US COMPOSTING COUNCIL

Seal of Testing Assurance

Novozymes NA, Inc.

Frank Franciosi

P.O. Box 576

Franklinton

NC 27525-0576 0

Date Sampled/Received: 06 May. 13 / 07 May. 13

Product Identification Compost
Nature's Green-Releaf Compost

COMPOST TECHNICAL DATA SHEET

LABORATORY: Soil Control Lab; 42 Hangar Way; Watsonville, CA 95076 tel: 831.724.5422 fax: 831.724.3188

<i>Compost Parameters</i>	<i>Reported as (units of measure)</i>	<i>Test Results</i>	<i>Test Results</i>
Plant Nutrients:	%, weight basis	%, wet weight basis	%, dry weight basis
Nitrogen	Total N	0.93	1.7
Phosphorus	P ₂ O ₅	0.61	1.1
Potassium	K ₂ O	0.42	0.76
Calcium	Ca	1.0	1.8
Magnesium	Mg	0.17	0.30
Moisture Content	%, wet weight basis	45.0	
Organic Matter Content	%, dry weight basis	48.7	
pH	units	8.31	
Soluble Salts <i>(electrical conductivity EC₅)</i>	dS/m (mmhos/cm)	3.3	
Particle Size or Sieve Size	% under 9.5 mm, dw basis	98.6	
<i>Stability Indicator (respirometry)</i>		<i>Stability Rating:</i>	
CO ₂ Evolution	mg CO ₂ -C/g OM/day	1.3	Very Stable
	mg CO ₂ -C/g TS/day	0.64	
<i>Maturity Indicator (bioassay)</i>			
Percent Emergence	average % of control	100.0	
Relative Seedling Vigor	average % of control	100.0	
Select Pathogens	PASS/FAIL: per US EPA Class A standard, 40 CFR § 503.32(a)	Pass	<i>Fecal coliform</i>
		Pass	<i>Salmonella</i>
Trace Metals	PASS/FAIL: per US EPA Class A standard, 40 CFR § 503.13, Tables 1 and 3.	Pass	<i>As, Cd, Cr, Cu, Pb, Hg</i>
			<i>Mo, Ni, Se, Zn</i>

Participants in the US Composting Council's Seal of Testing Assurance Program have shown the commitment to test their compost products on a prescribed basis and provide this data, along with compost end use instructions, as a means to better serve the needs of their compost customers.

Laboratory Group: May.13 B Laboratory Number: 3050177-1/1

Analyst: Assaf Sadeh		www.compostlab.com
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US COMPOSTING COUNCIL

Seal of Testing Assurance



Novozymes NA, Inc.

Frank Franciosi

P.O. Box 576

Franklinton

NC 27525-0576

0

Date Sampled/Received: 06 May. 13 / 07 May. 13

Product Identification:	Compost
Nature's Green-Releaf Compost	

COMPOST TECHNICAL DATA SHEET for NORTH CAROLINA DOT

LABORATORY: Soil Control Lab; 42 Hangar Way; Watsonville, CA 95076 tel: 831.724.5422 fax: 831.724.3188			
<i>Compost Parameters</i>	<i>Test Results</i>	<i>Reported as (units of measure)</i>	<i>Project Specification (Allowable Limit)</i>
Organic Matter Content	48.7	%, dry weight basis	25 - 65
pH	8.31	Unitless	5.0 - 8.5
Moisture Content	45.0	%, wet weight basis	30 - 60
Soluble Salts (electrical conductivity)	3.3	dS/m (mmhos/cm)	5.0 dS/m, maximum
Particle Size	100.0	%, dry weight passing through 3 inch screen and	100%
	100.0	1 inch screen and	90% minimum
	100.0	3/4 inch screen and	65% minimum
	93.1	1/4 inch screen	50% maximum
Stability Indicator (respirometry) CO2 Evolution	1.3	mg CO2-C/g OM/day	≤ 8
Maturity Indicator (bioassay) Percent Emergence	100.0	average % of control	80%, minimum
Relative Seedling Vigor	100.0	average % of control	80%, minimum
Select Pathogens (Fecal Coliform)	Pass	PASS/FAIL: Per US EPA Class A standard, 40 CFR 503.32(a)	Pass
Trace Metals	Pass	PASS/FAIL: Per US EPA Class A 40 CFR 503.13, tables 1 and 3.	Pass
Inert Contamination (man-made)	None Detected	%, dry weight	<1.0 %

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For additional information pertaining to compost use, the specific compost parameters tested for within the Seal of Testing assurance Program, or the program in general, log on to the US Composting Council's TMECC web-site at <http://www.tmecc.org>.

This compost product has been sampled and tested as required by the Seal of Testing assurance Program on the United States Composting Council (USCC), using certain methods from the "Test Methods for the Examination of Compost and Composting" manual. Test results are available upon request by contacting the compost producer (address at top of page). The USCC makes no warranties regarding this product or its content, quality, or suitability for any particular use.

Laboratory Group:	May.13 B	Laboratory Number:	3050177-1/1
Analyst: Assaf Sadeh		www.compostlab.com	

SOIL CONTROL LAB

42 HANGAR WAY
WATSONVILLE
CALIFORNIA
95076
USA

Account #: 3050177-1/1-2197
Group: May.13 B #12
Reporting Date: May 22, 2013

Novozymes NA, Inc.
P.O. Box 576
Franklinton, NC 27525-0576
Attn: Frank Franciosi

Date Received: 07 May. 13
Sample Identification: Nature's Green-Relief Compost
Sample ID #: 3050177 - 1/1

Nutrients	Dry wt.	As Rcvd.	units	Stability Indicator:	Biologically Available C
Total Nitrogen:	1.7	0.93	%	CO2 Evolution	Respirometry
Ammonia (NH ₄ -N):	1300	710	mg/kg	mg CO ₂ -C/g OM/day	1.3
Nitrate (NO ₃ -N):	200	110	mg/kg	mg CO ₂ -C/g TS/day	0.64
Org. Nitrogen (Org.-N):	1.6	0.88	%	<i>Stability Rating</i>	<i>very stable</i>
Phosphorus (as P ₂ O ₅):	1.1	0.62	%		<i>very stable</i>
Phosphorus (P):	4900	2700	mg/kg		
Potassium (as K ₂ O):	0.76	0.42	%		
Potassium (K):	6300	3500	mg/kg	Maturity Indicator: Cucumber Bioassay	
Calcium (Ca):	1.8	1.0	%	Compost:Vermiculite(v:v)	1:1
Magnesium (Mg):	0.30	0.17	%	Emergence (%)	100
Sulfate (SO ₄ -S):	100	57	mg/kg	Seedling Vigor (%)	100
Boron (Total B):	16	8.7	mg/kg	<i>Description of Plants</i>	<i>healthy</i>
Moisture:	0	45.0	%		<i>healthy</i>
Sodium (Na):	0.064	0.035	%	Pathogens	
Chloride (Cl):	0.13	0.071	%	Fecal Coliform	270
pH Value:	NA	8.31	unit	Salmonella	< 3
Bulk Density :	19	34	lb/cu ft		MPN/g
Carbonates (CaCO ₃):	11	5.9	lb/ton		MPN/4g
Conductivity (EC5):	3.3	NA	mmhos/cm		
Organic Matter:	48.7	26.8	%		
Organic Carbon:	24.0	13.0	%		
Ash:	51.3	28.2	%		
C/N Ratio	14	14	ratio		
AgIndex	> 10	> 10	ratio		
				<i>Date Tested: 07 May. 13</i>	
				Inerts	% by weight
				Plastic	< 0.5
				Glass	< 0.5
				Metal	< 0.5
				Sharps	ND
				Size & Volume Distribution	
				MM	% by weight % by volume
				> 50	0.0 0.0
				25 to 50	0.0 0.0
				16 to 25	0.0 0.0
				9.5 to 16	1.4 0.8
				6.3 to 9.5	5.4 4.5
				4.0 to 6.3	9.8 13.3
				2.0 to 4.0	18.8 22.7
				< 2.0	64.6 58.7
				Bulk Density Description:<.35 Light Materials, .35-.60 medium weight materials, >.60 Heavy Materials	
				Analyst: Assaf Sadeh	
					

*Sample was received and handled in accordance with TMECC procedures.

Account No.:
3050177 - 1/1 - 2197
Group: May.13 B No. 12

Date Received
Sample i.d.
Sample I.d. No.

07 May. 13
Nature's Green-Relief Compost
1/1 3050177

INTERPRETATION:

Is Your Compost Stable?

Respiration Rate 1.3 mg CO ₂ -C/ g OM/day	Biodegradation Rate of Your Pile	+++++	< Stable	> < Moderately Unstable	< Unstable	> < High For Mulch
Biologically Available Carbon (BAC) 1.9 mg CO ₂ -C/ g OM/day	Optimum Degradation Rate	+++++++	< Stable	> < Moderately Unstable	< Unstable	> < High For Mulch

Is Your Compost Mature?

Ammonia/NitrateN ratio 6.5 Ratio	+++++	VeryMature> <	Mature	> <	Immature
Ammonia N ppm 1300 mg/kg dry wt.	+++++	VeryMature> <	Mature	> <	Immature
Nitrate N ppm 200 mg/kg dry wt.	+++++	<	Immature	> <	Mature
pH value 8.31 units	+++++	<	Immature	> <	Mature > < Immature
Cucumber Emergence 100.0 percent	+++++	<	Immature	> <	Mature

Is Your Compost Safe Regarding Health?

Fecal Coliform < 1000 MPN/g dry wt.	+++++	< Safe	> <	High Fecal Coliform
Salmonella Less than 3 /4g dry wt.	+++++	<Safe (none detected)	> <	High Salmonella Count(> 3 per 4 grams)
Metals US EPA 503 Pass dry wt.	+++++	<All Metals Pass	> <	One or more Metals Fail

Does Your Compost Provide Nutrients or Organic Matter?

Nutrients (N+P2O5+K2O) 3.6 Percent dry wt.	+++++	<Low	> <	Average	> <	High Nutrient Content
AgIndex (Nutrients / Sodium and Chloride Salts) 15 Ratio	+++++	Na & Cl	> <	Nutrient and Sodium and Chloride Provider	> <	Nutrient Provider
Plant Available Nitrogen (PAN) 3 lbs/ton wet wt.	+++++	Low Nitrogen Provider> <	Average Nitrogen Provider	> <	High Nitrogen Provider	
C/N Ratio 14 Ratio	+++++	<	Nitrogen Release	> <	N-Neutral > < N-Demand > <	High Nitrogen Demand
Soluble Available Nutrients & Salts (EC5 w/w dw) 3.3 mmhos/cm dry wt.	+++++	SlowRelease> <	Average Nutrient Release Rate	> <	High Available Nutrients	
Lime Content (CaCO3) 11 Lbs/ton dry wt.	+++++	< Low > <	Average	> <	High Lime Content (as CaCO3)	

What are the physical properties of your compost?

Percent Ash 51.3 Percent dry wt.	+++++	<	High Organic Matter	> <	Average	> <	High Ash Content
Sieve Size % > 6.3 MM (0.25") 6.9 Percent dry wt.	+++++	All Uses	> <	Size May Restrict Uses for Potting mix and Golf Courses			

Account No.:
3050177 - 1/1 - 2197
Group: May.13 B No. 12

Date Received
Sample i.d.
Sample I.d. No.

07 May. 13
Nature's Green-Relief Compost
1/1 3050177

INTERPRETATION:

Is Your Compost Stable?

Page two of three

Respiration Rate

1.3 Low: Good for all uses mg CO₂-C/g OM/day

The respiration rate is a measurement of the biodegradation rate of the organic matter in the sample (as received). The respiration rate is determined by measuring the rate at which CO₂ is released under optimized moisture and temperature conditions.

Biologically Available Carbon

2 Low: Good for all uses mg CO₂-C/g OM/day

Biologically Available Carbon (BAC) is a measurement of the rate at which CO₂ is released under optimized moisture, temperature, porosity, nutrients, pH and microbial conditions. If both the RR and the BAC test values are close to the same value, the pile is optimized for composting. If both values are high the compost pile just needs more time. If both values are low the compost has stabilized and should be moved to curing. BAC test values that are higher than RR indicate that the compost pile has stalled. This could be due to anaerobic conditions, lack of available nitrogen due to excessive air converting ammonia to the unavailable nitrate form, lack of nitrogen or other nutrients due to poor choice of feedstock, pH value out of range, or microbes rendered non-active.

Is Your Compost Mature?

Ammonia:NitrateN ratio

6.5 immature

Composting to stabilize carbon can occur at such a rapid rate that sometimes phytotoxins remain in the compost and must be neutralized before using in high concentrations or in high-end uses. This step is called curing. Typically ammonia is in excess with the break-down of organic materials resulting in an increase in pH. This combination results in a loss of volatile ammonia (it smells). Once this toxic ammonia has been reduced and the pH drops, the microbes convert the ammonia to nitrates. A low ammonia + high nitrate score is indicative of a mature compost, however there are many exceptions. For example, a compost with a low pH (<7) will retain ammonia, while a compost with high lime content can lose ammonia before the organic fraction becomes stable. Composts must first be stable before curing indicators apply.

Ammonia N ppm

1300 immature

Nitrate N ppm

200 mature

pH value

8.31 immature

Cucumber Bioassay

100.0 Percent

Cucumbers are chosen for this test because they are salt tolerant and very sensitive to ammonia and organic acid toxicity. Therefore, we can germinate seeds in high concentrations of compost to measure phytotoxic effects without soluble salts being the limiting factor. Values above 80% for both percent emergence and vigor are indicative of a well-cured compost. Exceptions include very high salts that affect the cucumbers, excessive concentrations of nitrates and other nutrients that will be in range when formulated to make a growing media. In addition to testing a 1:1 compost: vermiculite blend, we also test a diluted 1:4 blend to indicate a more sensitive toxicity level.

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< 1000 / g dry wt.

Fecal coliforms can survive in both aerobic and anaerobic conditions and is common in all initial compost piles. Most human pathogens occur from fecal matter and all fecal matter is loaded in fecal coliforms. Therefore fecal coliforms are used as an indicator to determine if the chosen method for pathogen reduction (heat for compost) has met the requirements of sufficient temperature, time and mixing. If the fecal coliforms are reduced to below 1000 per gram dry wt. it is assumed all other pathogens are eliminated. Potential problems are that fecal coliform can regrow during the curing phase or during shipping. This is because the conditions are now more favorable for growth than during the composting process.

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Less than 3 3 / 4g dry wt. Salmonella is not only another indicator organism but also a toxic microbe. It has been used in the case of biosolids industry to determine adequate pathogen reduction.

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Pass

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This value is the sum of the primary nutrients Nitrogen, Phosphorus and Potassium. Reported units are consistent with those found on fertilizer formulations. A sum greater than 5 is indicative of a compost with high nutrient content, and best used to supply nutrients to a receiving soil. A sum below 2 indicates low nutrient content, and is best-used to improve soil structure via the addition of organic matter. Most compost falls between 2 and 5.

Account No.:
3050177 - 1/1 - 2197
Group: May.13 B No. 12

Date Received: 07 May. 13
Sample i.d.: Nature's Green-Relief Compost
Sample I.d. No.: 1/1 3050177

INTERPRETATION:

AgIndex (Nutrients/Na+Cl)

15 High nutrient ratio Composts with low AgIndex values have high concentrations of sodium and/or chloride compared to nutrients. Repeated use of a compost with a low AgIndex (< 2) may result in sodium and/or chloride acting as the limiting factor compared to nutrients, governing application rates. These composts may be used on well-draining soils and/or with salt-tolerant plants. Additional nutrients from another source may be needed if the application rate is limited by sodium or chloride. If the AgIndex is above 10, nutrients optimal for plant growth will be available without concern of sodium and/or chloride toxicity. Composts with an AgIndex of above 10 are good for increasing nutrient levels for all soils. Most composts score between 2 and 10. Concentrations of nutrients, sodium, and chloride in the receiving soil should be considered when determining compost application rates. The AgIndex is a product of feedstock quality. Feedstock from dairy manure, marine waste, industrial wastes, and halophytic plants are likely to produce a finished compost with a low AgIndex.

Plant Available Nitrogen (lbs/ton)

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Soluble Nutrients & Salts (EC5 w/w dw - mmhos/cm)

3.3 Average salts This value refers to all soluble ions including nutrients, sodium, chloride and some soluble organic compounds. The concentration of salts will change due to the release of salts from the organic matter as it degrades, volatilization of ammonia, decomposition of soluble organics, and conversion of molecular structure. High salts + high AgIndex is indicative of a compost high in readily available nutrients. The application rate of these composts should be limited by the optimum nutrient value based on soil analysis of the receiving soil. High Salts + low AgIndex is indicative of a compost low in nutrients with high concentrations of sodium and/or chloride. Limit the application rate according to the toxicity level of the sodium and/or chloride. Low salts indicates that the compost can be applied without risking salt toxicity, is likely a good source of organic matter, and that nutrients will release slowly over time.

Lime Content (lbs. per ton)

11 Average lime content Compost high in lime or carbonates are often those produced from chicken manure (layers) ash materials, and lime products. These are excellent products to use on a receiving soil where lime has been recommended by soil analysis to raise the pH. Composts with a high lime content should be closely considered for pH requirements when formulating potting mixes.

Physical Properties

Percent Ash

51.3 Average ash content Ash is the non-organic fraction of a compost. Most composts contain approximately 50% ash (dry weight basis). Compost can be high in ash content for many reasons including: excess mineralization (old compost), contamination with soil base material during turning, poor quality feedstock, and soil or mineral products added. Finding the source and reducing high ash content is often the fastest means to increasing nutrient quality of a compost.

Particle Size % > 6.3 MM (0.25")

6.9 May restrict use Large particles may restrict use for potting soils, golf course topdressings, seed-starter mixes, and where a fine size distribution is required. Composts with large particles can still be used as excellent additions to field soils, shrub mixes and mulches.

Particle Size Distribution

Each size fraction is measured by weight, volume and bulk density. These results are particularly relevant with decisions to screen or not, and if screening, which size screen to use. The bulk density indicates if the fraction screened is made of light weight organic material or heavy mineral material. Removing large mineral material can greatly improve compost quality by increasing nutrient and organic concentrations.

Appendix:	Estimated available nutrients for use when calculating application rates	
Plant Available Nitrogen (PAN) calculations:	lbs/ton (As Rec'd)	
PAN = (X * (organic N)) + ((NH4-N) + (NO3-N))	Plant Available Nitrogen (PAN)	3.3
X value = If BAC < 2 then X = 0.1	Ammonia (NH4-N)	1.42
If BAC =2.1 to 5 then X = 0.2	Nitrate (NO3-N)	0.22
If BAC =5.1 to 10 then X = 0.3	Available Phosphorus (P2O5*0.64)	7.9
If BAC > 10 then X = 0.4	Available Potassium (K2O)	8.4
Note: If C/N ratio > 15 additional N should be applied.		