

Professional Growers Mix



Soil, Water, and Plant Testing Lab
A319 NESB
200 W. Lake St.
Fort Collins, CO 80523
970-491-5061

Soil Analysis Report

Billing: CC06673

Submitted By: Read Spear
P O Box 18546
Denver CO 80218
Sample ID: B
Amendment Type: compost

Lab No. H1266b
Date Received: 2/25/13
Date Reported: 3/8/13
Sample Date: 2/25/13

Parameter	As Received Basis		Dry Matter Basis		method*	Level
Total Solids (%)	34.3		100		03.09-A	**
Moisture (%)	65.7		0		03.09-A	***
Organic Matter (%)	18.1		52.9		05.07-A	****
Ash (%)	16.2		47.1		05.07-A	***
Soluble Salts (1:5, mmhos/cm)	2.9				04-10-A	***
Soluble salts (paste, mmhos/cm)	6.5					****
pH 1:5	6.5				04-11-A	.
pH (paste)	6.2					.
	lbs/ton		lbs/ton			
Total Nitrogen (%)	0.6716	13.4	1.958	39.2	04.02-D	**
Organic Nitrogen (%)	0.6045	12.1	1.763	35.3	Calc	**
Ammonium-Nitrogen (%)	0.0669		0.1951		04.02-C	****
Ammonium-Nitrogen (ppm)	669.2		1951.0		04.02-C	****
Nitrate-Nitrogen (%)	0.0001		0.0004		04.02-B	.
Nitrate-Nitrogen (ppm)	1.4		4.1		04.02-B	.
Total Phosphorus as P (%)	0.0818	1.6	0.238	4.8	04.03-A	**
Total Phosphorus as P2O5 (%)	0.1873	3.7	0.546	10.9	04.03-A	**
Total Potassium as K (%)	0.4227	8.5	1.2324	24.6	04.04-A	****
Total Potassium as K2O (%)	0.5072	10.1	1.4788	29.6	04.04-A	****
C/N ratio	26.2		26.2		Calc	****
Ammonium-N/Nitrate-N Ratio	478		478.00		Calc	****
Lime (% calcium carbonate)	1.06		3.09		6E1c**	**
Sodium Adsorption Ratio (SAR)	2.0		2.0		10-3.4***	.
Plant available phosphorus (ppm)	180		525		AB-DTPA	****
Plant available potassium (ppm)	3174		9254		AB-DTPA	****
Plant available zinc (ppm)	12.3		35.9		AB-DTPA	***
Plant available iron (ppm)	4.7		13.7		AB-DTPA	***
Plant available manganese (ppm)	16.3		47.5		AB-DTPA	***
Plant available copper (ppm)	9.3		27.1		AB-DTPA	***
total zinc (ppm)	29.3		85.4		3050/6010	***
total iron (ppm)	481		1402		3050/6010	****
total manganese (ppm)	35.7		104		3050/6010	***
total copper (ppm)	18.4		53.6		3050/6010	***

*Unless otherwise noted, methods are from "Test Methods For The Examination of Composting and Compost.2001, W.H Thompson (ed)

**From Soil Survey Laboratory Methods Manual, Soil Survey Investigations Report, No. 42,Version 3, 1996.

EPA methods 3050(digestion) and 6010 (analysis)from SW-846. ***Methods of Soil Analysis. A.L. Page (ed), ASA, 1982

AB-DTPA is ammonium bicarbonate-DTPA.

The organic matter is high, and the C/N ratio is high indicating that nitrogen may be immobilized by high carbon.

The total nitrogen is at a moderate level, however this product will help supply some nitrogen to the soil.
The salts are high indicating that this material may present problems for salt sensitive plants if over -applied.
Nitrate-N is low and ammonium-N is high indicating that this material has not matured completely.

% Sand=64 % Silt=8 % Clay=28 Texture Sandy Clay Loam

All other nutrients are at sufficient levels for plant growth.

Chromium 0.20 ppm Molybdenum 0.25 ppm Cadmium 0.10 ppm Lead 2.01 ppm. Metals are low.

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The levels of nutrients are as follows:

Low . Medium .. High ... Very High

The report on the previous page is designed primarily for composts, potting soils, manures, or other organic products that are used as soil amendments to improve soil structure or as stand alone products such as organic potting soil where plants are grown in the material directly.

The following is an explanation of the parameters measured:

	Total Solids (%) : The percentage of actual solid material in the product minus the water.
	Moisture (%) : The percentage of water in the material.
	Organic Matter (%) : The percentage of carbon based material such as sticks, leaves, or plant material. Chemically, it includes carbon compounds such as cellulose, hemicelluloses, protein, and carbohydrates.
	Ash (%) : The amount of residue left over after the sample is ashed at 550C. This may be comprised of soil or anything else that is resistant to high temperatures.
	Soluble Salts (1:5, mmhos/cm) : A measure of the total salts in the soil based on a mixture of 1 part soil to 5 parts water . An acceptable range for a class I compost is 0-5 mmhos/cm. This can be used in most situations unless the soil's salts are more than 2 mmhos/cm.
	Soluble salts (paste, mmhos/cm) : A measure of the total salts in the soil based on a mixture of soil to water to create a saturated paste. A value of 2 mmhos/cm or more indicates that the salts are high and may be a problem if plants are grown in a material such as potting soil directly.
	pH 1:5 : A measure of pH based on a mixture of 1 part soil to 5 parts water. An acceptable range is 6.0-8.4 for a class I compost.
	pH (paste) : A measure of pH based on a mixture of soil to water to create a saturated paste. An acceptable range is 6.0 to 8.4. A paste pH value is useful for potting mixes since it simulates what the plant will encounter when the mix is saturated with water or at field capacity.
	Total Nitrogen (%) : A measure of the inorganic nitrogen that includes ammonium-N and nitrate-N plus organic nitrogen.
	Organic Nitrogen (%) : Nitrogen that is in an organic form such as protein, amino acids, or alkaloids. It must be converted to ammonium-N and nitrate-N by microbial activity before plants can use it as a nitrogen source.
	Ammonium-Nitrogen (%) : The percent of inorganic nitrogen that is soluble in water that can be used immediately by plants. It is usually converted to nitrate-N by microbial activity as the soil temperature increases.
	Ammonium-Nitrogen (ppm) : Ammonium-nitrogen expressed as ppm.
	Nitrate-Nitrogen (%) : The percent of inorganic nitrogen that is soluble in water that can be used immediately by plants.
	Nitrate-Nitrogen (ppm) : Nitrate-nitrogen expressed as ppm.
	Total Phosphorus as P (%) : Mineral P, ortho-P and organic P. As the compost decomposes it will convert mineral P and organic P to ortho-P, which is the form of P that plants will use from the soil.
	Total Phosphorus as P2O5 (%) : Total P times 2.29 to express P as P2O5 in percent. Having P expressed as P2O5 will help in comparing this product with other fertilizer/compost products
	Total Potassium as K (%) : Mineral K, organic K, and water soluble or plant available K. As the compost decomposes the mineral K and organic K will convert to plant available K.
	Total Potassium as K2O (%) : Total K times 1.2 to express K as K2O. Having K expressed as K2O will help in comparing this product with other fertilizer/compost products.
	C/N ratio : This is the ratio of total carbon to total nitrogen. Class I composts have C/N ratios of less than 12. As the C/N ratio increases, nitrogen may become immobilized and unavailable for plant growth due to increased microbial activity. Composts with higher C/N ratios can still be used effectively if they are not over-applied.
	Ammonium-N/Nitrate-N Ratio :The ratio of ammonium-N to nitrate-N. A high ratio indicates that ammonium-N is much greater than nitrate-N and that the material has not composted long enough. A small ratio indicates that most of the ammonium-N has been converted to nitrate-N indicating that

Professional Growers Mix

the material has significantly composted and has reached or is reaching the end of the composting process. A class I compost has an ammonium-N/nitrate-N ratio of < 4.

The following is an explanation of the parameters measured (continued):

Lime (% calcium carbonate)	Lime usually consists of either calcium carbonate or magnesium carbonate, but is expressed as percent calcium carbonate or percent calcium carbonate equivalence. Low lime is 0-1%, medium lime is 1-2%, high lime is 2-5%, and very high lime is greater than 5%. Lime can range from <1% to over 40%. Plants can still grow well in high lime composts.
Sodium Adsorption Ratio (SAR)	This is the ratio of sodium to calcium and magnesium. The calculation is: $Na/\sqrt{(Ca+Mg)/2}$, where the values for Na, Ca, and Mg are expressed as meq/L. (Take the square root of the denominator). A compost or soil is sodic (high in sodium) if the SAR is ≥ 13 . Adding a compost high in sodium can cause drainage problems due to a change in soil structure.
Plant available phosphorus (ppm)	Available forms of nutrients are removed from the compost or soil by plants to promote growth. These are rarely deficient in composts, but they may be deficient in soils.
Plant available potassium (ppm)	High phosphorus and potassium are rarely toxic, however high potassium can be associated with high salts. Potassium at levels usually greater than 1000 ppm have usually been amended with manure products than can make the compost high in salts. Composts high in salts need to be managed carefully to avoid over applications to the soil.
Plant available zinc (ppm)	
Plant available iron (ppm)	
Plant available manganese (ppm)	
Plant available copper (ppm)	
total zinc (ppm)	Total nutrients include mineral forms that are associated with rocks, or organic forms that may be part of carbon compounds in plant material or manure, and plant available or soluble forms that plants readily use for growth. This represents the nutrients that are immediately available to plants and the nutrients that may eventually become plant available as the material decomposes.
total iron (ppm)	
total manganese (ppm)	
total copper (ppm)	

Soil Analysis Report

Billing: CC06673

Submitted By: Read Spear

Lab No. H1265a

P O Box 18546

Date Received: 2/25/13

Denver CO 80218

Date Reported: 3/8/13

Sample ID: A

Sample Date: 2/25/13

Amendment Type: compost

Parameter	As Received Basis		Dry Matter Basis		method*	Level
Total Solids (%)	13.2		100		03.09-A	**
Moisture (%)	86.8		0		03.09-A	****
Organic Matter (%)	9.6		72.8		05.07-A	****
Ash (%)	3.6		27.2		05.07-A	**
Soluble Salts (1:5, mmhos/cm)	2.4				04-10-A	***
Soluble salts (paste, mmhos/cm)	6.6					****
pH 1:5	6.5				04-11-A	.
pH (paste)	5.4					.
	lbs/ton		lbs/ton			
Total Nitrogen (%)	0.3116	6.2	2.361	47.2	04.02-D	**
Organic Nitrogen (%)	0.2545	5.1	1.928	38.6	Calc	**
Ammonium-Nitrogen (%)	0.0570		0.4321		04.02-C	****
Ammonium-Nitrogen (ppm)	570.4		4321.2		04.02-C	****
Nitrate-Nitrogen (%)	0.0001		0.0008		04.02-B	.
Nitrate-Nitrogen (ppm)	1.1		8.3		04.02-B	.
Total Phosphorus as P (%)	0.0586	1.2	0.444	8.9	04.03-A	**
Total Phosphorus as P2O5 (%)	0.1342	2.7	1.016	20.3	04.03-A	**
Total Potassium as K (%)	0.2997	6.0	2.2705	45.4	04.04-A	****
Total Potassium as K2O (%)	0.3596	7.2	2.7245	54.5	04.04-A	****
C/N ratio	36.0		36.0		Calc	****
Ammonium-N/Nitrate-N Ratio	519		518.55		Calc	****
Lime (% calcium carbonate)	0.33		2.50		6E1c**	.
Sodium Adsorption Ratio (SAR)	1.7		1.7		10-3.4***	.
Plant available phosphorus (ppm)	216		1636		AB-DTPA	****
Plant available potassium (ppm)	2439		18477		AB-DTPA	****
Plant available zinc (ppm)	13.7		103.8		AB-DTPA	***
Plant available iron (ppm)	6.0		45.5		AB-DTPA	***
Plant available manganese (ppm)	18.2		137.9		AB-DTPA	***
Plant available copper (ppm)	11.2		84.8		AB-DTPA	***
total zinc (ppm)	21.9		165.9		3050/6010	***
total iron (ppm)	597		4523		3050/6010	****
total manganese (ppm)	25.8		195		3050/6010	***
total copper (ppm)	13.0		98.5		3050/6010	***

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EPA methods 3050(digestion) and 6010 (analysis)from SW-846. ***Methods of Soil Analysis. A.L. Page (ed), ASA, 1982

AB-DTPA is ammonium bicarbonate-DTPA.

The organic matter is high, and the C/N ratio is high indicating that nitrogen may be immobilized by high carbon.

The total nitrogen is at a moderate level, however this product will help supply some nitrogen to the soil.

The salts are high indicating that this material may present problems for salt sensitive plants if over -applied.

Nitrate-N is low and ammonium-N is high indicating that this material has not matured completely.

% Sand=72 % Silt=6 % Clay=22 Texture Sandy Clay Loam

All other nutrients are at sufficient levels for plant growth.

Chromium 0.34 ppm Molybdenum 0.06 ppm Cadmium 0.08 ppm Lead 1.06 ppm. Metals are low.

The levels of nutrients are as follows:

Low . Medium .. High ... Very High

The report on the previous page is designed primarily for composts, potting soils, manures, or other organic products that are used as soil amendments to improve soil structure or as stand alone products such as organic potting soil where plants are grown in the material directly.

The following is an explanation of the parameters measured:

	Total Solids (%) : The percentage of actual solid material in the product minus the water.
	Moisture (%) : The percentage of water in the material.
	Organic Matter (%) : The percentage of carbon based material such as sticks, leaves, or plant material. Chemically, it includes carbon compounds such as cellulose, hemicelluloses, protein, and carbohydrates.
	Ash (%) : The amount of residue left over after the sample is ashed at 550C. This may be comprised of soil or anything else that is resistant to high temperatures.
	Soluble Salts (1:5, mmhos/cm) : A measure of the total salts in the soil based on a mixture of 1 part soil to 5 parts water . An acceptable range for a class I compost is 0-5 mmhos/cm. This can be used in most situations unless the soil's salts are more than 2 mmhos/cm.
	Soluble salts (paste, mmhos/cm) : A measure of the total salts in the soil based on a mixture of soil to water to create a saturated paste. A value of 2 mmhos/cm or more indicates that the salts are high and may be a problem if plants are grown in a material such as potting soil directly.
	pH 1:5 : A measure of pH based on a mixture of 1 part soil to 5 parts water. An acceptable range is 6.0-8.4 for a class I compost.
	pH (paste) : A measure of pH based on a mixture of soil to water to create a saturated paste. An acceptable range is 6.0 to 8.4. A paste pH value is useful for potting mixes since it simulates what the plant will encounter when the mix is saturated with water or at field capacity.
	Total Nitrogen (%) : A measure of the inorganic nitrogen that includes ammonium-N and nitrate-N plus organic nitrogen.
	Organic Nitrogen (%) : Nitrogen that is in an organic form such as protein, amino acids, or alkaloids. It must be converted to ammonium-N and nitrate-N by microbial activity before plants can use it as a nitrogen source.
	Ammonium-Nitrogen (%) : The percent of inorganic nitrogen that is soluble in water that can be used immediately by plants. It is usually converted to nitrate-N by microbial activity as the soil temperature increases.
	Ammonium-Nitrogen (ppm) : Ammonium-nitrogen expressed as ppm.
	Nitrate-Nitrogen (%) : The percent of inorganic nitrogen that is soluble in water that can be used immediately by plants.
	Nitrate-Nitrogen (ppm) : Nitrate-nitrogen expressed as ppm.
	Total Phosphorus as P (%) : Mineral P, ortho-P and organic P. As the compost decomposes it will convert mineral P and organic P to ortho-P, which is the form of P that plants will use from the soil.
	Total Phosphorus as P2O5 (%) : Total P times 2.29 to express P as P2O5 in percent. Having P expressed as P2O5 will help in comparing this product with other fertilizer/compost products
	Total Potassium as K (%) : Mineral K, organic K, and water soluble or plant available K. As the compost decomposes the mineral K and organic K will convert to plant available K.
	Total Potassium as K2O (%) : Total K times 1.2 to express K as K2O. Having K expressed as K2O will help in comparing this product with other fertilizer/compost products.
	C/N ratio : This is the ratio of total carbon to total nitrogen. Class I composts have C/N ratios of less than 12. As the C/N ratio increases, nitrogen may become immobilized and unavailable for plant growth due to increased microbial activity. Composts with higher C/N ratios can still be used effectively if they are not over-applied.
	Ammonium-N/Nitrate-N Ratio :The ratio of ammonium-N to nitrate-N. A high ratio indicates that ammonium-N is much greater than nitrate-N and that the material has not composted long enough. A small ratio indicates that most of the ammonium-N has been converted to nitrate-N indicating that

Gardeners Mix

the material has significantly composted and has reached or is reaching the end of the composting process. A class I compost has an ammonium-N/nitrate-N ratio of < 4.

The following is an explanation of the parameters measured (continued):

Lime (% calcium carbonate)	Lime usually consists of either calcium carbonate or magnesium carbonate, but is expressed as percent calcium carbonate or percent calcium carbonate equivalence. Low lime is 0-1%, medium lime is 1-2%, high lime is 2-5%, and very high lime is greater than 5%. Lime can range from <1% to over 40%. Plants can still grow well in high lime composts.
Sodium Adsorption Ratio (SAR)	This is the ratio of sodium to calcium and magnesium. The calculation is: $Na/\sqrt{(Ca+Mg)/2}$, where the values for Na, Ca, and Mg are expressed as meq/L. (Take the square root of the denominator). A compost or soil is sodic (high in sodium) if the SAR is ≥ 13 . Adding a compost high in sodium can cause drainage problems due to a change in soil structure.
Plant available phosphorus (ppm)	Available forms of nutrients are removed from the compost or soil by plants to promote growth. These are rarely deficient in composts, but they may be deficient in soils.
Plant available potassium (ppm)	High phosphorus and potassium are rarely toxic, however high potassium can be associated with high salts. Potassium at levels usually greater than 1000 ppm have usually been amended with manure products than can make the compost high in salts. Composts high in salts need to be managed carefully to avoid over applications to the soil.
Plant available zinc (ppm)	Total nutrients include mineral forms that are associated with rocks, or organic forms that may be part of carbon compounds in plant material or manure, and plant available or soluble forms that plants readily use for growth. This represents the nutrients that are immediately available to plants and the nutrients that may eventually become plant available as the material decomposes.
Plant available iron (ppm)	
Plant available manganese (ppm)	
Plant available copper (ppm)	



Soil, Water, and Plant Testing Lab
 A319 NESB
 200 W. Lake St.
 Fort Collins, CO 80523
 970-491-5061

Soil Analysis Report

Billing: CC06673

Submitted By: Read Spear
 P O Box 18546
 Denver CO 80218
 Sample ID: c
 Amendment Type: compost

Lab No. H1267c
 Date Received: 2/25/13
 Date Reported: 3/8/13
 Sample Date: 2/25/13

Parameter	As Received Basis		Dry Matter Basis		method*	Level
Total Solids (%)	52.8		100		03.09-A	***
Moisture (%)	47.2		0		03.09-A	***
Organic Matter (%)	25.6		48.5		05.07-A	****
Ash (%)	27.2		51.5		05.07-A	****
Soluble Salts (1:5, mmhos/cm)	1.5				04-10-A	**
Soluble salts (paste, mmhos/cm)	4.5					****
pH 1:5	5.9				04-11-A	.
pH (paste)	5.7					.
	lbs/ton		lbs/ton			
Total Nitrogen (%)	0.3408	6.8	0.645	12.9	04.02-D	**
Organic Nitrogen (%)	0.2179	4.4	0.413	8.3	Calc	**
Ammonium-Nitrogen (%)	0.0259		0.0491		04.02-C	***
Ammonium-Nitrogen (ppm)	259.2		490.9		04.02-C	***
Nitrate-Nitrogen (%)	0.0970		0.1837		04.02-B	****
Nitrate-Nitrogen (ppm)	969.8		1836.7		04.02-B	****
Total Phosphorus as P (%)	0.0525	1.1	0.099	2.0	04.03-A	**
Total Phosphorus as P2O5 (%)	0.1203	2.4	0.228	4.6	04.03-A	**
Total Potassium as K (%)	0.0885	1.8	0.1676	3.4	04.04-A	****
Total Potassium as K2O (%)	0.1062	2.1	0.2012	4.0	04.04-A	****
C/N ratio	41.1		41.1		Calc	****
Ammonium-N/Nitrate-N Ratio	0.27		0.27		Calc	.
Lime (% calcium carbonate)	0.89		1.69		6E1c**	.
Sodium Adsorption Ratio (SAR)	0.2		0.2		10-3.4***	.
Plant available phosphorus (ppm)	156		295		AB-DTPA	****
Plant available potassium (ppm)	448.4		849		AB-DTPA	****
Plant available zinc (ppm)	4.5		8.5		AB-DTPA	***
Plant available iron (ppm)	247.5		468.8		AB-DTPA	***
Plant available manganese (ppm)	10.1		19.1		AB-DTPA	***
Plant available copper (ppm)	4.5		8.5		AB-DTPA	***
total zinc (ppm)	22.9		43.4		3050/6010	***
total iron (ppm)	8553		16199		3050/6010	****
total manganese (ppm)	213.6		405		3050/6010	***
total copper (ppm)	13.0		24.6		3050/6010	***

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EPA methods 3050(digestion) and 6010 (analysis)from SW-846. ***Methods of Soil Analysis. A.L. Page (ed), ASA, 1982

AB-DTPA is ammonium bicarbonate-DTPA.

The organic matter is high, and the C/N ratio is high indicating that nitrogen should not be immobilized by high carbon.

The total nitrogen is at a moderate level, however this product will help supply some nitrogen to the soil.

The salts are high in the paste indicating that this material may present problems for salt sensitive plants if over -applied.

Nitrate-N and ammonium-N are high indicating that this material has not matured completely.

% Sand=56 % Silt=22 % Clay=22 Texture Sandy Clay Loam

All other nutrients are at sufficient levels for plant growth.

Chromium 0.39 ppm Molybdenum 0.01 ppm Cadmium 0.13 ppm Lead 1.44 ppm. Metals are low.

Competitor 1

The levels of nutrients are as follows:

Low . Medium .. High ... Very High

The report on the previous page is designed primarily for composts, potting soils, manures, or other organic products that are used as soil amendments to improve soil structure or as stand alone products such as organic potting soil where plants are grown in the material directly.

The following is an explanation of the parameters measured:

	Total Solids (%) : The percentage of actual solid material in the product minus the water.
	Moisture (%) : The percentage of water in the material.
	Organic Matter (%) : The percentage of carbon based material such as sticks, leaves, or plant material. Chemically, it includes carbon compounds such as cellulose, hemicelluloses, protein, and carbohydrates.
	Ash (%) : The amount of residue left over after the sample is ashed at 550C. This may be comprised of soil or anything else that is resistant to high temperatures.
	Soluble Salts (1:5, mmhos/cm) : A measure of the total salts in the soil based on a mixture of 1 part soil to 5 parts water . An acceptable range for a class I compost is 0-5 mmhos/cm. This can be used in most situations unless the soil's salts are more than 2 mmhos/cm.
	Soluble salts (paste, mmhos/cm) : A measure of the total salts in the soil based on a mixture of soil to water to create a saturated paste. A value of 2 mmhos/cm or more indicates that the salts are high and may be a problem if plants are grown in a material such as potting soil directly.
	pH 1:5 : A measure of pH based on a mixture of 1 part soil to 5 parts water. An acceptable range is 6.0-8.4 for a class I compost.
	pH (paste) : A measure of pH based on a mixture of soil to water to create a saturated paste. An acceptable range is 6.0 to 8.4. A paste pH value is useful for potting mixes since it simulates what the plant will encounter when the mix is saturated with water or at field capacity.
	Total Nitrogen (%) : A measure of the inorganic nitrogen that includes ammonium-N and nitrate-N plus organic nitrogen.
	Organic Nitrogen (%) : Nitrogen that is in an organic form such as protein, amino acids, or alkaloids. It must be converted to ammonium-N and nitrate-N by microbial activity before plants can use it as a nitrogen source.
	Ammonium-Nitrogen (%) : The percent of inorganic nitrogen that is soluble in water that can be used immediately by plants. It is usually converted to nitrate-N by microbial activity as the soil temperature increases.
	Ammonium-Nitrogen (ppm) : Ammonium-nitrogen expressed as ppm.
	Nitrate-Nitrogen (%) : The percent of inorganic nitrogen that is soluble in water that can be used immediately by plants.
	Nitrate-Nitrogen (ppm) : Nitrate-nitrogen expressed as ppm.
	Total Phosphorus as P (%) : Mineral P, ortho-P and organic P. As the compost decomposes it will convert mineral P and organic P to ortho-P, which is the form of P that plants will use from the soil.
	Total Phosphorus as P2O5 (%) : Total P times 2.29 to express P as P2O5 in percent. Having P expressed as P2O5 will help in comparing this product with other fertilizer/compost products
	Total Potassium as K (%) : Mineral K, organic K, and water soluble or plant available K. As the compost decomposes the mineral K and organic K will convert to plant available K.
	Total Potassium as K2O (%) : Total K times 1.2 to express K as K2O. Having K expressed as K2O will help in comparing this product with other fertilizer/compost products.
	C/N ratio : This is the ratio of total carbon to total nitrogen. Class I composts have C/N ratios of less than 12. As the C/N ratio increases, nitrogen may become immobilized and unavailable for plant growth due to increased microbial activity. Composts with higher C/N ratios can still be used effectively if they are not over-applied.
	Ammonium-N/Nitrate-N Ratio :The ratio of ammonium-N to nitrate-N. A high ratio indicates that ammonium-N is much greater than nitrate-N and that the material has not composted long enough. A small ratio indicates that most of the ammonium-N has been converted to nitrate-N indicating that

Competitor 1

Competitor 1

the material has significantly composted and has reached or is reaching the end of the composting process. A class I compost has an ammonium-N/nitrate-N ratio of < 4.

The following is an explanation of the parameters measured (continued):

Lime (% calcium carbonate)	: Lime usually consists of either calcium carbonate or magnesium carbonate, but is expressed as percent calcium carbonate or percent calcium carbonate equivalence. Low lime is 0-1%, medium lime is 1-2%, high lime is 2-5%, and very high lime is greater than 5%. Lime can range from <1% to over 40%. Plants can still grow well in high lime composts.
Sodium Adsorption Ratio (SAR)	: This is the ratio of sodium to calcium and magnesium. The calculation is: $Na/\sqrt{(Ca+Mg)/2}$, where the values for Na, Ca, and Mg are expressed as meq/L. (Take the square root of the denominator). A compost or soil is sodic (high in sodium) if the SAR is ≥ 13 . Adding a compost high in sodium can cause drainage problems due to a change in soil structure.
Plant available phosphorus (ppm)	Available forms of nutrients are removed from the compost or soil by plants to promote growth. These are rarely deficient in composts, but they may be deficient in soils .
Plant available potassium (ppm)	High phosphorus and potassium are rarely toxic, however high potassium can be associated with high salts. Potassium at levels usually greater than 1000 ppm have usually been amended with manure products than can make the compost high in salts. Composts high in salts need to be managed carefully to avoid over applications to the soil.
Plant available zinc (ppm)	
Plant available iron (ppm)	
Plant available manganese (ppm)	
Plant available copper (ppm)	
total zinc (ppm)	Total nutrients include mineral forms that are associated with rocks, or organic forms that may be part of carbon compounds in plant material or manure, and plant available or soluble forms that plants readily use for growth. This represents the nutrients that are immediately available to plants and the nutrients that may eventually become plant available as the material decomposes.
total iron (ppm)	
total manganese (ppm)	
total copper (ppm)	

Competitor 2



Soil, Water, and Plant Testing Lab
 A319 NESB
 200 W. Lake St.
 Fort Collins, CO 80523
 970-491-5061

Soil Analysis Report

Billing: CC06673

Submitted By: Read Spear

Lab No. H1268d

P O Box 18546

Date Received: 2/25/13

Denver CO 80218

Date Reported: 3/8/13

Sample ID: D

Sample Date: 2/25/13

Amendment Type: compost

Parameter	As Received Basis		Dry Matter Basis		method*	Level
Total Solids (%)	48.1		100		03.09-A	***
Moisture (%)	51.9		0		03.09-A	***
Organic Matter (%)	21.2		44.0		05.07-A	***
Ash (%)	26.9		56.0		05.07-A	***
Soluble Salts (1:5, mmhos/cm)	0.8				04-10-A	.
Soluble salts (paste, mmhos/cm)	2.0					**
pH 1:5	7.7				04-11-A	***
pH (paste)	7.5					***
	lbs/ton		lbs/ton			
Total Nitrogen (%)	0.7328	14.7	1.523	30.5	04.02-D	**
Organic Nitrogen (%)	0.5840	11.7	1.214	24.3	Calc	**
Ammonium-Nitrogen (%)	0.1464		0.3043		04.02-C	****
Ammonium-Nitrogen (ppm)	1463.7		3043.0		04.02-C	****
Nitrate-Nitrogen (%)	0.0025		0.0051		04.02-B	.
Nitrate-Nitrogen (ppm)	24.5		50.9		04.02-B	.
Total Phosphorus as P (%)	0.0867	1.7	0.180	3.6	04.03-A	**
Total Phosphorus as P2O5 (%)	0.1985	4.0	0.413	8.3	04.03-A	**
Total Potassium as K (%)	0.1718	3.4	0.3572	7.1	04.04-A	****
Total Potassium as K2O (%)	0.2062	4.1	0.4286	8.6	04.04-A	****
C/N ratio	17.3		17.3		Calc	**
Ammonium-N/Nitrate-N Ratio	59.74		59.74		Calc	****
Lime (% calcium carbonate)	0.65		1.35		6E1c**	.
Sodium Adsorption Ratio (SAR)	2.3		2.3		10-3.4***	.
Plant available phosphorus (ppm)	90		187		AB-DTPA	****
Plant available potassium (ppm)	1451		3017		AB-DTPA	****
Plant available zinc (ppm)	8.4		17.5		AB-DTPA	***
Plant available iron (ppm)	29.3		60.9		AB-DTPA	***
Plant available manganese (ppm)	14.7		30.6		AB-DTPA	***
Plant available copper (ppm)	6.4		13.3		AB-DTPA	***
total zinc (ppm)	16.8		34.9		3050/6010	***
total iron (ppm)	1984		4125		3050/6010	****
total manganese (ppm)	71		148		3050/6010	***
total copper (ppm)	8.3		17.3		3050/6010	***

*Unless otherwise noted, methods are from "Test Methods For The Examination of Composting and Compost.2001, W.H Thompson (ed)

**From Soil Survey Laboratory Methods Manual, Soil Survey Investigations Report, No. 42,Version 3, 1996.

EPA methods 3050(digestion) and 6010 (analysis)from SW-846. ***Methods of Soil Analysis. A.L. Page (ed), ASA, 1982

AB-DTPA is ammonium bicarbonate-DTPA.

The organic matter is high, and the C/N ratio is elevated indicating that nitrogen may be immobilized by high carbon.

The total nitrogen is at a moderate level, however this product will help supply some nitrogen to the soil.

The salts are low indicating that this material may not present problems for salt sensitive plants if over -applied.

Nitrate-N is low and ammonium-N is high indicating that this material has not matured completely.

% Sand=62 % Silt=17 % Clay=21 Texture Sandy Clay Loam

All other nutrients are at sufficient levels for plant growth.

Competitor 2

Competitor 2

The levels of nutrients are as follows:

Low . Medium .. High ... Very High

Chromium 0.20 ppm Molybdenum 0.01 ppm Cadmium 0.01 ppm Lead 1.09 ppm. metals are low.

The report on the previous page is designed primarily for composts, potting soils, manures, or other organic products that are used as soil amendments to improve soil structure or as stand alone products such as organic potting soil where plants are grown in the material directly.

The following is an explanation of the parameters measured:

	Total Solids (%) : The percentage of actual solid material in the product minus the water.
	Moisture (%) : The percentage of water in the material.
	Organic Matter (%) : The percentage of carbon based material such as sticks, leaves, or plant material. Chemically, it includes carbon compounds such as cellulose, hemicelluloses, protein, and carbohydrates.
	Ash (%) : The amount of residue left over after the sample is ashed at 550C. This may be comprised of soil or anything else that is resistant to high temperatures.
	Soluble Salts (1:5, mmhos/cm) : A measure of the total salts in the soil based on a mixture of 1 part soil to 5 parts water . An acceptable range for a class I compost is 0-5 mmhos/cm. This can be used in most situations unless the soil's salts are more than 2 mmhos/cm.
	Soluble salts (paste, mmhos/cm) : A measure of the total salts in the soil based on a mixture of soil to water to create a saturated paste. A value of 2 mmhos/cm or more indicates that the salts are high and may be a problem if plants are grown in a material such as potting soil directly.
	pH 1:5 : A measure of pH based on a mixture of 1 part soil to 5 parts water. An acceptable range is 6.0-8.4 for a class I compost.
	pH (paste) : A measure of pH based on a mixture of soil to water to create a saturated paste. An acceptable range is 6.0 to 8.4. A paste pH value is useful for potting mixes since it simulates what the plant will encounter when the mix is saturated with water or at field capacity.
	Total Nitrogen (%) : A measure of the inorganic nitrogen that includes ammonium-N and nitrate-N plus organic nitrogen.
	Organic Nitrogen (%) : Nitrogen that is in an organic form such as protein, amino acids, or alkaloids. It must be converted to ammonium-N and nitrate-N by microbial activity before plants can use it as a nitrogen source.
	Ammonium-Nitrogen (%) : The percent of inorganic nitrogen that is soluble in water that can be used immediately by plants. It is usually converted to nitrate-N by microbial activity as the soil temperature increases.
	Ammonium-Nitrogen (ppm) : Ammonium-nitrogen expressed as ppm.
	Nitrate-Nitrogen (%) : The percent of inorganic nitrogen that is soluble in water that can be used immediately by plants.
	Nitrate-Nitrogen (ppm) : Nitrate-nitrogen expressed as ppm.
	Total Phosphorus as P (%) : Mineral P, ortho-P and organic P. As the compost decomposes it will convert mineral P and organic P to ortho-P, which is the form of P that plants will use from the soil.
	Total Phosphorus as P2O5 (%) : Total P times 2.29 to express P as P2O5 in percent. Having P expressed as P2O5 will help in comparing this product with other fertilizer/compost products
	Total Potassium as K (%) : Mineral K, organic K, and water soluble or plant available K. As the compost decomposes the mineral K and organic K will convert to plant available K.
	Total Potassium as K2O (%) : Total K times 1.2 to express K as K2O. Having K expressed as K2O will help in comparing this product with other fertilizer/compost products.
	C/N ratio : This is the ratio of total carbon to total nitrogen. Class I composts have C/N ratios of less than 12. As the C/N ratio increases, nitrogen may become immobilized and unavailable for plant growth due to increased microbial activity. Composts with higher C/N ratios can still be used effectively if they are not over-applied.
	Ammonium-N/Nitrate-N Ratio :The ratio of ammonium-N to nitrate-N. A high ratio indicates that ammonium-N is much greater than nitrate-N and that the material has not composted long enough. A small ratio indicates that most of the ammonium-N has been converted to nitrate-N indicating that

Competitor 2

Competitor 2

the material has significantly composted and has reached or is reaching the end of the composting process. A class I compost has an ammonium-N/nitrate-N ratio of < 4.

The following is an explanation of the parameters measured (continued):

Lime (% calcium carbonate)	: Lime usually consists of either calcium carbonate or magnesium carbonate, but is expressed as percent calcium carbonate or percent calcium carbonate equivalence. Low lime is 0-1%, medium lime is 1-2%, high lime is 2-5%, and very high lime is greater than 5%. Lime can range from <1% to over 40%. Plants can still grow well in high lime composts.
Sodium Adsorption Ratio (SAR)	: This is the ratio of sodium to calcium and magnesium. The calculation is: $Na/\sqrt{(Ca+Mg)/2}$, where the values for Na, Ca, and Mg are expressed as meq/L. (Take the square root of the denominator). A compost or soil is sodic (high in sodium) if the SAR is ≥ 13 . Adding a compost high in sodium can cause drainage problems due to a change in soil structure.
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total iron (ppm)	
total manganese (ppm)	
total copper (ppm)	