PENNSTATE

(814) 863-0841 Fax (814) 863-4540

Agricultural Analytical Services Laboratory
The Pennsylvania State University
University Park PA 16802

http://www.aasl.psu.edu

SOIL TEST REPORT FOR:	ADDITIONAL COPY TO:
MIKE REED COMMUNITY ENERGY INC 201 KING OF PRUSSIA RD, STE 550 WAYNE PA 19087	

DATE	LAB #	SERIAL #	COUNTY	ACRES	FIELD ID	SOIL
05/07/2010	S09-39913	69416	Delaware		S-4-buckshire	

SOIL NUTRIENT LEVELS			Below Optimum	Optimum	Above Optimum
Soil pH	7.5				
Phosphorus	749	ppm			
Potassium	383	ppm			

RECOMMENDATIONS FOR: ***Cemetery-To Plant*** ***Bentgrass***

Prior to planting, incorporate the following into the top 4 to 6 inches of soil.

Limestone: NONE

Phosphate (P_2O_5): NONE

Potash (K_2O): NONE

Organic Matter NONE

Apply a starter fertilizer just prior to seeding and work lightly into the soil

Apply a starter fertilizer at approximate rate of 1 lb of nitrogen per 1000 square feet, 0.5 to 1.0 lb of P_2O_5 per 1000 square feet, and 0.5 to 1.0 lb of K_2O per 1000 square feet using a fertilizer with approximate 1:1:1 or 2:1:1 ratio of $N:P_2O_5:K_2O$.

MESSAGES

The above recommendations are for a new establishment that will be tilled 4 to 6 inches in depth prior to planting. In some cases, turfgrass seed is planted into soils that have not been tilled. In such cases, incorporating large amounts of lime, fertilizer, and organic matter into soil 4 to 6 inches in depth is not possible. When planting into soils that have not been tilled, do not exceed 100 lb lime/1000 square feet; 5 lb P_2O_5/1000 square feet; or 2.0 lb K_2O/1000 square feet. Do not apply organic matter unless a core aerator is used to incorporate into the soil surface. If attempting to incorporate organic matter with a core aerator, apply 1/4 to 1/2 inch of organic matter to the turf/soil surface and make 8 to 10 passes with the aerator.

LABORATORY RESULTS:

[1]pH	[2]P lb/A	Exchangeable Cations (meq/100g)					% Saturation of the CEC			Optional Tests:		
		[3]Acidity	[2]K	[2]Mg	[2]Ca	[4]CEC	K	Mg	Ca	Organic Matter %	Nitrate-N ppm	Soluble salts mmhos/cm
7.5	1498	0.00	0.98	2.08	20.15	18.1	5.4	11.5	83.0	3.6	18.7	

Test Methods: [1]1:1 soil:water pH, [2]Mehlich 3 (ICP), [3]Mehlich Buffer pH, [4]Summation of Cations

The high calcium level in this sample indicates the probable presence of soluble calcium. Therefore the CEC and the percent saturations were calculated using a maximum exchangeable calcium level of 15 meq/100 g.

Turf-To Plant

1922

Comments

1. Apply full lime recommendation and thoroughly mix into the soil four to six inches deep. Use a high quality agricultural ground limestone product to meet the lime recommendation on this report. Manufacturers of agricultural ground limestone products provide a number called the calcium carbonate equivalent, or CCE, on the label. CCEs with high numerical values (close to 100 or above) indicate a pure lime source (greater ability to neutralize soil acidity). The amount of lime recommended on this report is based on an agricultural ground limestone with a CCE of 100. If your lime source is close to or equal to 100, you don't need to adjust the recommended amount. In the event that you use a lime source with a CCE well below 100, use the following formula to adjust the required amount.

$$\text{Actual liming material required} = \frac{\text{(Soil test recommendation in lbs of lime/1000 square feet)}}{\text{CCE of liming material}} \times 100$$

Example Only:
Soil Test Recommendation: Apply 75 lbs lime/1000 square feet
CCE on label: 80 percent

$$\text{Actual liming material required} = \frac{\text{(75 lbs of lime)} \times 100}{80}$$

$$= 94 \text{ lb liming material/1000 square feet}$$

2. If organic matter test was requested and organic matter recommended, throughly mix organic matter into a four to six inch soil depth. Sphagnum peat and peat humus typically contain high amounts of organic matter (> 80 %) and will usually meet organic matter requirements when incorporated at the rate recommended on the soil test report. A good quality compost can also be used as an organic amendment; however, most composts contain lower amounts of organic matter than peats. Therefore, you may need to add greater amounts of compost to meet soil test organic matter recommendations. For more information on using composts as organic amendments in new turf plantings, refer to the publication, "Using Composts to Improve Turf Performance". This publication is available from Penn State Cooperative Extension offices or the Publication Distribution Center, The Pennsylvania State University, 112 Agricultural Administration Bldg., University Park, PA 16802.

4. Thoroughly mix phosphate and/or potash into a four to six inch soil depth.

5. Grade and finish rake for seeding. Apply starter fertilizer just prior to seeding.

6. Fertilizers that can be used to meet recommendations for phosphate (P_2O_5) include ordinary superphophate (0-20-0) or triple (treble) superphosphate (0-46-0). Fertilizers that can be used t meet recommendations for potash (K_20) include muriate of potash (0-0-60) or sulfate of potash (0-0-50).

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SOIL TEST REPORT FOR:	ADDITIONAL COPY TO:
MIKE REED COMMUNITY ENERGY INC 201 KING OF PRUSSIA RD, STE 550 WAYNE PA 19087	

DATE	LAB #	SERIAL #	COUNTY	ACRES	FIELD ID	SOIL
05/07/2010	S09-39914	69415	Delaware		S-3-buckshire	

SOIL NUTRIENT LEVELS			Below Optimum	Optimum	Above Optimum
Soil pH	7.5				
Phosphorus	1181	ppm			
Potassium	423	ppm			

RECOMMENDATIONS FOR: ***Cemetery-To Plant*** ***Bentgrass***

Prior to planting, incorporate the following into the top 4 to 6 inches of soil.

Limestone: NONE

Phosphate (P_2O_5): NONE

Potash (K_2O): NONE

Organic Matter NONE

Apply a starter fertilizer just prior to seeding and work lightly into the soil

Apply a starter fertilizer at approximate rate of 1 lb of nitrogen per 1000 square feet, 0.5 to 1.0 lb of P_2O_5 per 1000 square feet, and 0.5 to 1.0 lb of K_2O per 1000 square feet using a fertilizer with approximate 1:1:1 or 2:1:1 ratio of $N:P_2O_5:K_2O$.

MESSAGES

The above recommendations are for a new establishment that will be tilled 4 to 6 inches in depth prior to planting. In some cases, turfgrass seed is planted into soils that have not been tilled. In such cases, incorporating large amounts of lime, fertilizer, and organic matter into soil 4 to 6 inches in depth is not possible. When planting into soils that have not been tilled, do not exceed 100 lb lime/1000 square feet; 5 lb P_2O_5/1000 square feet; or 2.0 lb K_2O/1000 square feet. Do not apply organic matter unless a core aerator is used to incorporate into the soil surface. If attempting to incorporate organic matter with a core aerator, apply 1/4 to 1/2 inch of organic matter to the turf/soil surface and make 8 to 10 passes with the aerator.

LABORATORY RESULTS:

[1]pH	[2]P lb/A	Exchangeable Cations (meq/100g)					% Saturation of the CEC			Optional Tests:		
		[3]Acidity	[2]K	[2]Mg	[2]Ca	[4]CEC	K	Mg	Ca	Organic Matter %	Nitrate-N ppm	Soluble salts mmhos/cm
7.5	2362	0.00	1.08	2.24	25.70	18.3	5.9	12.2	81.8	3.6	14.3	

Test Methods: [1]1:1 soil:water pH, [2]Mehlich 3 (ICP), [3]Mehlich Buffer pH, [4]Summation of Cations

The high calcium level in this sample indicates the probable presence of soluble calcium. Therefore the CEC and the percent saturations were calculated using a maximum exchangeable calcium level of 15 meq/100 g.

1923

Turf-To Plant

Comments

1. Apply full lime recommendation and thoroughly mix into the soil four to six inches deep. Use a high quality agricultural ground limestone product to meet the lime recommendation on this report. Manufacturers of agricultural ground limestone products provide a number called the calcium carbonate equivalent, or CCE, on the label. CCEs with high numerical values (close to 100 or above) indicate a pure lime source (greater ability to neutralize soil acidity). The amount of lime recommended on this report is based on an agricultural ground limestone with a CCE of 100. If your lime source is close to or equal to 100, you don't need to adjust the recommended amount. In the event that you use a lime source with a CCE well below 100, use the following formula to adjust the required amount.

$$\text{Actual liming material required} = \frac{\text{(Soil test recommendation in lbs of lime/1000 square feet)}}{\text{CCE of liming material}} \times 100$$

Example Only:
Soil Test Recommendation: Apply 75 lbs lime/1000 square feet
CCE on label: 80 percent

$$\text{Actual liming material required} = \frac{\text{(75 lbs of lime)} \times 100}{80}$$

$$= 94 \text{ lb liming material/1000 square feet}$$

2. If organic matter test was requested and organic matter recommended, throughly mix organic matter into a four to six inch soil depth. Sphagnum peat and peat humus typically contain high amounts of organic matter (> 80 %) and will usually meet organic matter requirements when incorporated at the rate recommended on the soil test report. A good quality compost can also be used as an organic amendment; however, most composts contain lower amounts of organic matter than peats. Therefore, you may need to add greater amounts of compost to meet soil test organic matter recommendations. For more information on using composts as organic amendments in new turf plantings, refer to the publication, "Using Composts to Improve Turf Performance". This publication is available from Penn State Cooperative Extension offices or the Publication Distribution Center, The Pennsylvania State University, 112 Agricultural Administration Bldg., University Park, PA 16802.

4. Thoroughly mix phosphate and/or potash into a four to six inch soil depth.

5. Grade and finish rake for seeding. Apply starter fertilizer just prior to seeding.

6. Fertilizers that can be used to meet recommendations for phosphate (P_2O_5) include ordinary superphophate (0-20-0) or triple (treble) superphosphate (0-46-0). Fertilizers that can be used t meet recommendations for potash (K_20) include muriate of potash (0-0-60) or sulfate of potash (0-0-50).

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SOIL TEST REPORT FOR:	ADDITIONAL COPY TO:
MIKE REED COMMUNITY ENERGY INC 201 KING OF PRUSSIA RD, STE 550 WAYNE PA 19087	

DATE	LAB #	SERIAL #	COUNTY	ACRES	FIELD ID	SOIL
05/07/2010	S09-39915	69414	Delaware		S-2-buckshire	

SOIL NUTRIENT LEVELS			Below Optimum	Optimum	Above Optimum
Soil pH	7.4				
Phosphorus	1481	ppm			
Potassium	576	ppm			

RECOMMENDATIONS FOR: *Cemetery-To Plant* *Bentgrass*

Prior to planting, incorporate the following into the top 4 to 6 inches of soil.

Limestone: NONE

Phosphate (P_2O_5): NONE

Potash (K_2O): NONE

Organic Matter NONE

Apply a starter fertilizer just prior to seeding and work lightly into the soil

Apply a starter fertilizer at approximate rate of 1 lb of nitrogen per 1000 square feet, 0.5 to 1.0 lb of P_2O_5 per 1000 square feet, and 0.5 to 1.0 lb of K_2O per 1000 square feet using a fertilizer with approximate 1:1:1 or 2:1:1 ratio of $N:P_2O_5:K_2O$.

MESSAGES

The above recommendations are for a new establishment that will be tilled 4 to 6 inches in depth prior to planting. In some cases, turfgrass seed is planted into soils that have not been tilled. In such cases, incorporating large amounts of lime, fertilizer, and organic matter into soil 4 to 6 inches in depth is not possible. When planting into soils that have not been tilled, do not exceed 100 lb lime/1000 square feet; 5 lb P_2O_5/1000 square feet; or 2.0 lb K_2O/1000 square feet. Do not apply organic matter unless a core aerator is used to incorporate into the soil surface. If attempting to incorporate organic matter with a core aerator, apply 1/4 to 1/2 inch of organic matter to the turf/soil surface and make 8 to 10 passes with the aerator.

LABORATORY RESULTS:

[1]pH	[2]P lb/A	Exchangeable Cations (meq/100g)					% Saturation of the CEC			Optional Tests:		
		[3]Acidity	[2]K	[2]Mg	[2]Ca	[4]CEC	K	Mg	Ca	Organic Matter %	Nitrate-N ppm	Soluble salts mmhos/cm
7.4	2962	0.00	1.48	2.50	33.62	19.0	7.8	13.2	79.0	4.2	37.9	

Test Methods: [1]1:1 soil:water pH, [2]Mehlich 3 (ICP), [3]Mehlich Buffer pH, [4]Summation of Cations

The high calcium level in this sample indicates the probable presence of soluble calcium. Therefore the CEC and the percent saturations were calculated using a maximum exchangeable calcium level of 15 meq/100 g.

1924

Turf-To Plant

Comments

1. Apply full lime recommendation and thoroughly mix into the soil four to six inches deep. Use a high quality agricultural ground limestone product to meet the lime recommendation on this report. Manufacturers of agricultural ground limestone products provide a number called the calcium carbonate equivalent, or CCE, on the label. CCEs with high numerical values (close to 100 or above) indicate a pure lime source (greater ability to neutralize soil acidity). The amount of lime recommended on this report is based on an agricultural ground limestone with a CCE of 100. If your lime source is close to or equal to 100, you don't need to adjust the recommended amount. In the event that you use a lime source with a CCE well below 100, use the following formula to adjust the required amount.

$$\text{Actual liming material required} = \frac{\text{(Soil test recommendation in lbs of lime/1000 square feet)}}{\text{CCE of liming material}} \times 100$$

Example Only:
Soil Test Recommendation: Apply 75 lbs lime/1000 square feet
CCE on label: 80 percent

$$\text{Actual liming material required} = \frac{\text{(75 lbs of lime)} \times 100}{80}$$

$$= 94 \text{ lb liming material/1000 square feet}$$

2. If organic matter test was requested and organic matter recommended, throughly mix organic matter into a four to six inch soil depth. Sphagnum peat and peat humus typically contain high amounts of organic matter (> 80 %) and will usually meet organic matter requirements when incorporated at the rate recommended on the soil test report. A good quality compost can also be used as an organic amendment; however, most composts contain lower amounts of organic matter than peats. Therefore, you may need to add greater amounts of compost to meet soil test organic matter recommendations. For more information on using composts as organic amendments in new turf plantings, refer to the publication, "Using Composts to Improve Turf Performance". This publication is available from Penn State Cooperative Extension offices or the Publication Distribution Center, The Pennsylvania State University, 112 Agricultural Administration Bldg., University Park, PA 16802.

4. Thoroughly mix phosphate and/or potash into a four to six inch soil depth.

5. Grade and finish rake for seeding. Apply starter fertilizer just prior to seeding.

6. Fertilizers that can be used to meet recommendations for phosphate (P_2O_5) include ordinary superphophate (0-20-0) or triple (treble) superphosphate (0-46-0). Fertilizers that can be used t meet recommendations for potash (K_20) include muriate of potash (0-0-60) or sulfate of potash (0-0-50).

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SOIL TEST REPORT FOR:	ADDITIONAL COPY TO:
MIKE REED COMMUNITY ENERGY INC 201 KING OF PRUSSIA RD, STE 550 WAYNE PA 19087	

DATE	LAB #	SERIAL #	COUNTY	ACRES	FIELD ID	SOIL
05/07/2010	S09-39916	69418	Delaware		S-6-buckshire	

SOIL NUTRIENT LEVELS			Below Optimum	Optimum	Above Optimum
Soil pH	7.5				
Phosphorus	1492	ppm			
Potassium	460	ppm			

RECOMMENDATIONS FOR: *Cemetery-To Plant* *Bentgrass*

Prior to planting, incorporate the following into the top 4 to 6 inches of soil.

Limestone: NONE

Phosphate (P_2O_5): NONE

Potash (K_2O): NONE

Organic Matter NONE

Apply a starter fertilizer just prior to seeding and work lightly into the soil

Apply a starter fertilizer at approximate rate of 1 lb of nitrogen per 1000 square feet, 0.5 to 1.0 lb of P_2O_5 per 1000 square feet, and 0.5 to 1.0 lb of K_2O per 1000 square feet using a fertilizer with approximate 1:1:1 or 2:1:1 ratio of $N:P_2O_5:K_2O$.

MESSAGES

The above recommendations are for a new establishment that will be tilled 4 to 6 inches in depth prior to planting. In some cases, turfgrass seed is planted into soils that have not been tilled. In such cases, incorporating large amounts of lime, fertilizer, and organic matter into soil 4 to 6 inches in depth is not possible. When planting into soils that have not been tilled, do not exceed 100 lb lime/1000 square feet; 5 lb P_2O_5/1000 square feet; or 2.0 lb K_2O/1000 square feet. Do not apply organic matter unless a core aerator is used to incorporate into the soil surface. If attempting to incorporate organic matter with a core aerator, apply 1/4 to 1/2 inch of organic matter to the turf/soil surface and make 8 to 10 passes with the aerator.

LABORATORY RESULTS:

[1]pH	[2]P lb/A	Exchangeable Cations (meq/100g)					% Saturation of the CEC			Optional Tests:		
		[3]Acidity	[2]K	[2]Mg	[2]Ca	[4]CEC	K	Mg	Ca	Organic Matter %	Nitrate-N ppm	Soluble salts mmhos/cm
7.5	2984	0.00	1.18	2.52	36.42	18.7	6.3	13.5	80.2	4.1	26.9	

Test Methods: [1]1:1 soil:water pH, [2]Mehlich 3 (ICP), [3]Mehlich Buffer pH, [4]Summation of Cations

The high calcium level in this sample indicates the probable presence of soluble calcium. Therefore the CEC and the percent saturations were calculated using a maximum exchangeable calcium level of 15 meq/100 g.

Turf-To Plant

Comments

1. Apply full lime recommendation and thoroughly mix into the soil four to six inches deep. Use a high quality agricultural ground limestone product to meet the lime recommendation on this report. Manufacturers of agricultural ground limestone products provide a number called the calcium carbonate equivalent, or CCE, on the label. CCEs with high numerical values (close to 100 or above) indicate a pure lime source (greater ability to neutralize soil acidity). The amount of lime recommended on this report is based on an agricultural ground limestone with a CCE of 100. If your lime source is close to or equal to 100, you don't need to adjust the recommended amount. In the event that you use a lime source with a CCE well below 100, use the following formula to adjust the required amount.

$$\text{Actual liming material required} = \frac{\text{(Soil test recommendation in lbs of lime/1000 square feet)}}{\text{CCE of liming material}} \times 100$$

Example Only:
Soil Test Recommendation: Apply 75 lbs lime/1000 square feet
CCE on label: 80 percent

$$\text{Actual liming material required} = \frac{\text{(75 lbs of lime)} \times 100}{80}$$

$$= 94 \text{ lb liming material/1000 square feet}$$

2. If organic matter test was requested and organic matter recommended, throughly mix organic matter into a four to six inch soil depth. Sphagnum peat and peat humus typically contain high amounts of organic matter (> 80 %) and will usually meet organic matter requirements when incorporated at the rate recommended on the soil test report. A good quality compost can also be used as an organic amendment; however, most composts contain lower amounts of organic matter than peats. Therefore, you may need to add greater amounts of compost to meet soil test organic matter recommendations. For more information on using composts as organic amendments in new turf plantings, refer to the publication, "Using Composts to Improve Turf Performance". This publication is available from Penn State Cooperative Extension offices or the Publication Distribution Center, The Pennsylvania State University, 112 Agricultural Administration Bldg., University Park, PA 16802.

4. Thoroughly mix phosphate and/or potash into a four to six inch soil depth.

5. Grade and finish rake for seeding. Apply starter fertilizer just prior to seeding.

6. Fertilizers that can be used to meet recommendations for phosphate (P_2O_5) include ordinary superphophate (0-20-0) or triple (treble) superphosphate (0-46-0). Fertilizers that can be used t meet recommendations for potash (K_20) include muriate of potash (0-0-60) or sulfate of potash (0-0-50).

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SOIL TEST REPORT FOR:	ADDITIONAL COPY TO:
MIKE REED COMMUNITY ENERGY INC 201 KING OF PRUSSIA RD, STE 550 WAYNE PA 19087	

DATE	LAB #	SERIAL #	COUNTY	ACRES	FIELD ID	SOIL
05/07/2010	S09-39917	69419	Delaware		S-7-buckshire	

SOIL NUTRIENT LEVELS			Below Optimum	Optimum	Above Optimum
Soil pH	7.4				
Phosphorus	907	ppm			
Potassium	321	ppm			

RECOMMENDATIONS FOR: *Cemetery-To Plant* *Bentgrass*

Prior to planting, incorporate the following into the top 4 to 6 inches of soil.

Limestone: NONE

Phosphate (P_2O_5): NONE

Potash (K_2O): NONE

Organic Matter NONE

Apply a starter fertilizer just prior to seeding and work lightly into the soil

Apply a starter fertilizer at approximate rate of 1 lb of nitrogen per 1000 square feet, 0.5 to 1.0 lb of P_2O_5 per 1000 square feet, and 0.5 to 1.0 lb of K_2O per 1000 square feet using a fertilizer with approximate 1:1:1 or 2:1:1 ratio of $N:P_2O_5:K_2O$.

MESSAGES

The above recommendations are for a new establishment that will be tilled 4 to 6 inches in depth prior to planting. In some cases, turfgrass seed is planted into soils that have not been tilled. In such cases, incorporating large amounts of lime, fertilizer, and organic matter into soil 4 to 6 inches in depth is not possible. When planting into soils that have not been tilled, do not exceed 100 lb lime/1000 square feet; 5 lb P_2O_5/1000 square feet; or 2.0 lb K_2O/1000 square feet. Do not apply organic matter unless a core aerator is used to incorporate into the soil surface. If attempting to incorporate organic matter with a core aerator, apply 1/4 to 1/2 inch of organic matter to the turf/soil surface and make 8 to 10 passes with the aerator.

LABORATORY RESULTS:

[1]pH	[2]P lb/A	Exchangeable Cations (meq/100g)					% Saturation of the CEC			Optional Tests:		
		[3]Acidity	[2]K	[2]Mg	[2]Ca	[4]CEC	K	Mg	Ca	Organic Matter %	Nitrate-N ppm	Soluble salts mmhos/cm
7.4	1814	0.00	0.82	1.70	25.47	17.5	4.7	9.7	85.6	3.2	44.2	

Test Methods: [1]1:1 soil:water pH, [2]Mehlich 3 (ICP), [3]Mehlich Buffer pH, [4]Summation of Cations

The high calcium level in this sample indicates the probable presence of soluble calcium. Therefore the CEC and the percent saturations were calculated using a maximum exchangeable calcium level of 15 meq/100 g.

Turf-To Plant

Comments

1. Apply full lime recommendation and thoroughly mix into the soil four to six inches deep. Use a high quality agricultural ground limestone product to meet the lime recommendation on this report. Manufacturers of agricultural ground limestone products provide a number called the calcium carbonate equivalent, or CCE, on the label. CCEs with high numerical values (close to 100 or above) indicate a pure lime source (greater ability to neutralize soil acidity). The amount of lime recommended on this report is based on an agricultural ground limestone with a CCE of 100. If your lime source is close to or equal to 100, you don't need to adjust the recommended amount. In the event that you use a lime source with a CCE well below 100, use the following formula to adjust the required amount.

$$\text{Actual liming material required} = \frac{\text{(Soil test recommendation in lbs of lime/1000 square feet)}}{\text{CCE of liming material}} \times 100$$

Example Only:
Soil Test Recommendation: Apply 75 lbs lime/1000 square feet
CCE on label: 80 percent

$$\text{Actual liming material required} = \frac{\text{(75 lbs of lime)} \times 100}{80}$$

$$= 94 \text{ lb liming material/1000 square feet}$$

2. If organic matter test was requested and organic matter recommended, throughly mix organic matter into a four to six inch soil depth. Sphagnum peat and peat humus typically contain high amounts of organic matter (> 80 %) and will usually meet organic matter requirements when incorporated at the rate recommended on the soil test report. A good quality compost can also be used as an organic amendment; however, most composts contain lower amounts of organic matter than peats. Therefore, you may need to add greater amounts of compost to meet soil test organic matter recommendations. For more information on using composts as organic amendments in new turf plantings, refer to the publication, "Using Composts to Improve Turf Performance". This publication is available from Penn State Cooperative Extension offices or the Publication Distribution Center, The Pennsylvania State University, 112 Agricultural Administration Bldg., University Park, PA 16802.

4. Thoroughly mix phosphate and/or potash into a four to six inch soil depth.

5. Grade and finish rake for seeding. Apply starter fertilizer just prior to seeding.

6. Fertilizers that can be used to meet recommendations for phosphate (P_2O_5) include ordinary superphophate (0-20-0) or triple (treble) superphosphate (0-46-0). Fertilizers that can be used t meet recommendations for potash (K_20) include muriate of potash (0-0-60) or sulfate of potash (0-0-50).

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DATE	LAB #	SERIAL #	COUNTY	ACRES	FIELD ID	SOIL
05/07/2010	S09-39918	69417	Delaware		S-5-buckshire	

SOIL NUTRIENT LEVELS			Below Optimum	Optimum	Above Optimum
Soil pH	7.4				
Phosphorus	886	ppm			
Potassium	130	ppm			

RECOMMENDATIONS FOR: *Cemetery-To Plant* *Bentgrass*

Prior to planting, incorporate the following into the top 4 to 6 inches of soil.

Limestone: NONE

Phosphate (P_2O_5): NONE

Potash (K_2O): 0 lb/1000 square feet

Organic Matter NONE

Apply a starter fertilizer just prior to seeding and work lightly into the soil

Apply a starter fertilizer at approximate rate of 1 lb of nitrogen per 1000 square feet, 0.5 to 1.0 lb of P_2O_5 per 1000 square feet, and 0.5 to 1.0 lb of K_2O per 1000 square feet using a fertilizer with approximate 1:1:1 or 2:1:1 ratio of $N:P_2O_5:K_2O$.

MESSAGES

The above recommendations are for a new establishment that will be tilled 4 to 6 inches in depth prior to planting. In some cases, turfgrass seed is planted into soils that have not been tilled. In such cases, incorporating large amounts of lime, fertilizer, and organic matter into soil 4 to 6 inches in depth is not possible. When planting into soils that have not been tilled, do not exceed 100 lb lime/1000 square feet; 5 lb P_2O_5/1000 square feet; or 2.0 lb K_2O/1000 square feet. Do not apply organic matter unless a core aerator is used to incorporate into the soil surface. If attempting to incorporate organic matter with a core aerator, apply 1/4 to 1/2 inch of organic matter to the turf/soil surface and make 8 to 10 passes with the aerator.

LABORATORY RESULTS:

[1]pH	[2]P lb/A	Exchangeable Cations (meq/100g)					% Saturation of the CEC			Optional Tests:		
		[3]Acidity	[2]K	[2]Mg	[2]Ca	[4]CEC	K	Mg	Ca	Organic Matter %	Nitrate-N ppm	Soluble salts mmhos/cm
7.4	1772	0.00	0.33	1.60	25.22	16.9	2.0	9.4	88.6	3.3	54.2	

Test Methods: [1]1:1 soil:water pH, [2]Mehlich 3 (ICP), [3]Mehlich Buffer pH, [4]Summation of Cations

The high calcium level in this sample indicates the probable presence of soluble calcium. Therefore the CEC and the percent saturations were calculated using a maximum exchangeable calcium level of 15 meq/100 g.

Turf-To Plant

Comments

1. Apply full lime recommendation and thoroughly mix into the soil four to six inches deep. Use a high quality agricultural ground limestone product to meet the lime recommendation on this report. Manufacturers of agricultural ground limestone products provide a number called the calcium carbonate equivalent, or CCE, on the label. CCEs with high numerical values (close to 100 or above) indicate a pure lime source (greater ability to neutralize soil acidity). The amount of lime recommended on this report is based on an agricultural ground limestone with a CCE of 100. If your lime source is close to or equal to 100, you don't need to adjust the recommended amount. In the event that you use a lime source with a CCE well below 100, use the following formula to adjust the required amount.

$$\text{Actual liming material required} = \frac{\text{(Soil test recommendation in lbs of lime/1000 square feet)}}{\text{CCE of liming material}} \times 100$$

Example Only:
Soil Test Recommendation: Apply 75 lbs lime/1000 square feet
CCE on label: 80 percent

$$\text{Actual liming material required} = \frac{\text{(75 lbs of lime)} \times 100}{80}$$

$$= 94 \text{ lb liming material/1000 square feet}$$

2. If organic matter test was requested and organic matter recommended, throughly mix organic matter into a four to six inch soil depth. Sphagnum peat and peat humus typically contain high amounts of organic matter (> 80 %) and will usually meet organic matter requirements when incorporated at the rate recommended on the soil test report. A good quality compost can also be used as an organic amendment; however, most composts contain lower amounts of organic matter than peats. Therefore, you may need to add greater amounts of compost to meet soil test organic matter recommendations. For more information on using composts as organic amendments in new turf plantings, refer to the publication, "Using Composts to Improve Turf Performance". This publication is available from Penn State Cooperative Extension offices or the Publication Distribution Center, The Pennsylvania State University, 112 Agricultural Administration Bldg., University Park, PA 16802.

4. Thoroughly mix phosphate and/or potash into a four to six inch soil depth.

5. Grade and finish rake for seeding. Apply starter fertilizer just prior to seeding.

6. Fertilizers that can be used to meet recommendations for phosphate (P_2O_5) include ordinary superphophate (0-20-0) or triple (treble) superphosphate (0-46-0). Fertilizers that can be used t meet recommendations for potash (K_2O) include muriate of potash (0-0-60) or sulfate of potash (0-0-50).

PENNSTATE

(814) 863-0841 Fax (814) 863-4540

Agricultural Analytical Services Laboratory
The Pennsylvania State University
University Park PA 16802

http://www.aasl.psu.edu

SOIL TEST REPORT FOR:	ADDITIONAL COPY TO:
MIKE REED COMMUNITY ENERGY INC 201 KING OF PRUSSIA RD, STE 550 WAYNE PA 19087	

DATE	LAB #	SERIAL #	COUNTY	ACRES	FIELD ID	SOIL
05/07/2010	S09-39919	69413	Delaware		S-1-buckshire	

SOIL NUTRIENT LEVELS			Below Optimum	Optimum	Above Optimum
Soil pH	7.4				
Phosphorus	764	ppm			
Potassium	390	ppm			

RECOMMENDATIONS FOR: *Cemetery-To Plant* *Bentgrass*

Prior to planting, incorporate the following into the top 4 to 6 inches of soil.

Limestone: NONE

Phosphate (P_2O_5): NONE

Potash (K_2O): NONE

Organic Matter NONE

Apply a starter fertilizer just prior to seeding and work lightly into the soil

Apply a starter fertilizer at approximate rate of 1 lb of nitrogen per 1000 square feet, 0.5 to 1.0 lb of P_2O_5 per 1000 square feet, and 0.5 to 1.0 lb of K_2O per 1000 square feet using a fertilizer with approximate 1:1:1 or 2:1:1 ratio of $N:P_2O_5:K_2O$.

MESSAGES

The above recommendations are for a new establishment that will be tilled 4 to 6 inches in depth prior to planting. In some cases, turfgrass seed is planted into soils that have not been tilled. In such cases, incorporating large amounts of lime, fertilizer, and organic matter into soil 4 to 6 inches in depth is not possible. When planting into soils that have not been tilled, do not exceed 100 lb lime/1000 square feet; 5 lb P_2O_5/1000 square feet; or 2.0 lb K_2O/1000 square feet. Do not apply organic matter unless a core aerator is used to incorporate into the soil surface. If attempting to incorporate organic matter with a core aerator, apply 1/4 to 1/2 inch of organic matter to the turf/soil surface and make 8 to 10 passes with the aerator.

LABORATORY RESULTS:

[1]pH	[2]P lb/A	Exchangeable Cations (meq/100g)					% Saturation of the CEC			Optional Tests:		
		[3]Acidity	[2]K	[2]Mg	[2]Ca	[4]CEC	K	Mg	Ca	Organic Matter %	Nitrate-N ppm	Soluble salts mmhos/cm
7.4	1528	0.00	1.00	1.52	20.77	17.5	5.7	8.7	85.6	3.2	29.6	

Test Methods: [1]1:1 soil:water pH, [2]Mehlich 3 (ICP), [3]Mehlich Buffer pH, [4]Summation of Cations

The high calcium level in this sample indicates the probable presence of soluble calcium. Therefore the CEC and the percent saturations were calculated using a maximum exchangeable calcium level of 15 meq/100 g.

1928

Turf-To Plant

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Turfgrass Seed and Seed Mixtures

One of the most important steps in turfgrass establishment is the selection of high quality seed or a seed mixture that is adapted to the site conditions and intended use of the site. Poor quality seed may be low in viability and contain weed seeds and undesirable grass species. Use of poor quality seed may result in unsatisfactory turf establishment, and thus, wasted time, effort, and money. Also, if the species in the seed mixture are not adapted to the conditions at the site, the resulting stand may become thin and subject to soil erosion and weed encroachment.

Included in this publication are descriptions of the components of the turf seed label and suggestions for turf seed and seed mixtures for a variety of site conditions and uses in Pennsylvania. Information concerning specific varieties can be obtained from your county office of Penn State Cooperative Extension.

THE SEED LABEL

When purchasing turfgrass seed it is important to read the label to determine the kind, amount, and quality of seed in the container. All seed sold in Pennsylvania and other states is required by law to bear a tag or label indicating basic information about the quality of the seed. The basic information that should appear on the label is as follows:

1. Name and address of labeler.
2. Lot number.
3. Kind and variety of turfgrass seed listed in order of predominance.
4. Percentage by weight of pure seed of each species and variety (percentage purity).
5. Germination percentage (percentage viable seed).
6. Percentage by weight of other-crop seed.
7. Percentage by weight of weed seed.
8. Percentage undesirable grass seed.
9. Percentage by weight of inert matter.
10. Date on which the germination test was conducted.

The name and address of the labeler represents the party responsible for the contents of the container. The lot number is listed so that the contents of the container can be traced back to the original source of production.

Each label lists the species (kind) or species and varieties of turfgrasses in the seed container. By law, the label must state the commonly accepted name of the turfgrass species or species and variety, listed in order of predominance when present in excess of 5.0 percent by weight of the contents of the container. In addition to listing the individual turfgrasses, the label must also provide the percentage by weight of pure seed of each species.

The percentage germination that is listed on the label for each turfgrass indicates the viability of the seed. Germination percentages are based on seed that germinated in a test sample. According to Pennsylvania law, germination tests must have been within the nine-month period prior to sale of the seed.

The percentage of other-crop seed in the container must be listed on the label. Other-crop seed includes all agricultural seed present in amounts of less than 5.0 percent by weight each. Since some crop seed is not compatible with the desirable turfgrasses in the mixture, it is usually best to purchase seed that is low in other-crop seed.

The percentage of weed seeds should not exceed 1.0 percent by weight in the container. Good quality grass seed usually contains no more than 0.5 percent weed seeds.

The label lists the percentage of undesirable grass seed in the container. By law, turfgrass seed cannot have more than 0.5 percent undesirable grass seed in the container. However, high quality turfgrass seed contains no undesirable grass species.

Seeds of, or seed mixtures containing, timothy, meadow fescue, orchardgrass, tall oatgrass, annual ryegrass, or clover are generally not suggested for turfgrass use. Annual ryegrass should be used for temporary turf stands only. Bentgrass may be used for specialized turfgrass areas (golf courses, bowling greens, croquet courts, tennis courts, etc.), but is not suggested for other turfgrass uses.

The percentage of inert material, such as chaff or foreign material, must be listed on the label and should not exceed 15.0 percent by weight except when fertilizer coating or pelleting is used to enhance establishment.

SUGGESTED SEED AND SEED MIXTURES

Listed below are some suggested turfgrass seed and seed mixtures for different site conditions and uses in Pennsylvania. Unless otherwise indicated, all suggestions are designed to produce a permanent turf. Procedures used to establish turfgrasses are outlined in Penn State Cooperation Extension publication "Turfgrass Establishment."

All seeding rates in this publication are in pounds per 1,000 square feet. If converting to an acre basis, multiply by 43. Three to five varieties of Kentucky bluegrass are suggested in a blend or mixture. The resulting increase in diversity will often provide greater overall resistance to turfgrass diseases and other environmental stresses.

In some cases, suggestions call for turf-type tall fescues or ryegrasses. This designation is required to distinguish the finer-textured, persistent grasses designed for high-quality turf use from the coarser-textured, pasture-type grasses such as 'Kentucky-31' tall fescue or nonpersistent grasses such as 'Linn' perennial ryegrass.

Fine fescues include creeping red, Chewings, and hard fescue. Sheep fescue is also a fine fescue, but is generally used for low maintenance situations and not in highly maintained turfs.

SITE CONDITIONS AND TURF USES

Seed mixtures for general conditions (home lawns, parks, cemeteries, institutional grounds, and commercial properties)

■ OPEN, SUNNY LOCATIONS AND WELL-DRAINED SOILS

Southeastern Pennsylvania (south and east of South mountains)

Kentucky bluegrass	100%	at 2–3 lb per 1,000 sq ft
Kentucky bluegrass	80-90%	at 3–4 lb per 1,000 sq ft
Perennial ryegrass	10-20%	
Kentucky bluegrass	40-60%	at 3–4 lb per 1,000 sq ft
Fine fescues	30-40%	
Perennial ryegrass	10-20%	
Turf-type tall fescue	100%	at 6–8 lb per 1,000 sq ft
Turf-type perennial ryegrass	100%	at 4–5 lb per 1,000 sq ft

Other areas of Pennsylvania—all seed mixtures and rates listed above or

Fine fescues	100%	at 4–5 lb per 1,000 sq ft

■ MODERATE-TO-PARTIAL SHADE

Fine fescues	40-50%	at 4 lb per 1,000 sq ft
Kentucky bluegrass	40-50%	
Perennial ryegrass	10-20%	
Fine fescues	100%	at 4–5 lb per 1,000 sq ft
Turf-type tall fescue	100%	at 6–8 lb per 1,000 sq ft

■ HEAVY SHADE, WELL-DRAINED SOILS

Fine fescues	100%	at 4–5 lb per 1,000 sq ft

■ HEAVY SHADE, POORLY-DRAINED SOILS

Rough bluegrass *(Poa trivialis)*	100%	at 2–3 lb per 1,000 sq ft

Turf seed mixtures for heavy-use areas (parks, playgrounds, athletic fields for football, soccer, lacrosse, field hockey, baseball, softball)

Kentucky bluegrass	100%	at 2–3 lb per 1,000 sq ft
Turf-type perennial ryegrass	100%	at 4–5 lb per 1,000 sq ft
Kentucky bluegrass	80-90%	at 3–4 lb per 1,000 sq ft
Perennial ryegrass	10-20%	
Turf-type tall fescue	100%	at 6–8 lb per 1,000 sq ft

Note: Tall fescue requires time to establish strong root systems. It may not withstand heavy use on athletic fields, unless practice and play are withheld for two growing seasons following seeding.

Seed and seed mixtures for low maintenance turf areas (service areas, utility areas, highway rest areas, parks)

Turf-type tall fescue	100%	at 6–8 lb per 1,000 sq ft
Use if appearance is important.		
Nonturf-type tall fescue	100%	at 8–10 lb per 1,000 sq ft
Use if coarse, light green, and high-cut turf is not objectionable.		
Fine fescues	100%	at 4–5 lb per 1,000 sq ft

Seed for golf courses

■ GREENS

Creeping bentgrass	100%	at 1 lb per 1,000 sq ft

■ TEES AND FAIRWAYS

Creeping bentgrass	100%	at 1 lb per 1,000 sq ft
Perennial ryegrass	100%	at 4–5 lb per 1,000 sq ft

Seed for renovation of recreational turf (athletic fields, playgrounds, lawns, parks, and golf course fairways, tees, and roughs)

Turf-type perennial ryegrass	100%	at 2–5 lb per 1,000 sq ft

Seed mixtures for temporary purposes (areas needing temporary cover for quick erosion and dust control)

Annual or Italian ryegrass	100%	at 4–5 lb per 1,000 sq ft

PURE LIVE SEED

Occasionally, turfgrass seed is sold that is low in purity and germination. To compensate for the reduced quality, the seeding rate should be increased. The amount of seed required to compensate for poor purity and germination can be determined by calculating percentage pure live seed (PLS). To calculate PLS, the percentage of pure seed is multiplied by the percentage of germination, and the product is divided by 100. For example, 85 percent pure seed x 72 percent germination / 100 = 61 percent PLS. To determine how much seed to plant, divide the percentage PLS into 100. Thus, in this example, 100/61 = 1.6. Hence, 1.6 pounds of seed with a purity of 85 percent and a germination of 72 percent would need to be planted for each pound specified in the desired seed mixture.

Seed that is low in purity and germination is often sold at a reduced price. One way of determining if the reduced price is really a bargain is to divide the PLS into 100 and then multiply by the cost of the seed. A comparison of two seed lots is provided as an example.

Seedlot A

(sold at 'reduced' price of $0.95 per lb)

PLS = (85) x (60)/100 = 51%

100/51 = 2 lb of seed needed per lb of seed specified

Cost = $0.95 x 2 = $1.90

Seedlot B

(sold at regular price of $1.65 per lb)

PLS = (99) x (90)/100 = 89%

100/89 = 1.1 lb of seed needed per lb of seed specified

Cost = $1.65 x 1.1 = $1.82

A comparison of actual cost per pound of pure, viable seed reveals that the seed that appeared to be a bargain was actually more expensive.

Revised by Peter Landschoot,
professor of turfgrass science, from Special Circular 168 "Turfgrass Seed Mixtures," by John C. Harper II, professor emeritus of agronomy.

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LIMING MATERIAL CONVERSION TABLE

The limestone recommendation on your soil test report is based on the use of a liming material equivalent in neutralizing power to 100% calcium carbonate limestone. The recommendations are in pounds of calcium carbonate equivalent (CCE) per acre. The use of any liming material that is not equivalent in neutralizing power to pure calcium carbonate limestone (100% CCE) must be adjusted so that you actually apply enough liming material to neutralize the acidity in your soil. All agricultural liming materials sold in Pennsylvania are required by law to be labeled with their calcium carbonate equivalent (CCE). Using the CCE of your liming material, the amount required to supply the recommended amount of neutralizing power (CCE) for your soil may be calculated as shown below or read directly from the table.

It is also very important that a liming material be ground fine enough to be effective. Pennsylvania aglime regulations classify agricultural liming materials into the following three groups based on fineness:

1. Fine-sized
95% through a 20-mesh screen
60% through a 60-mesh screen
50% through a 100-mesh screen

2. Medium-sized
90% through a 20-mesh screen
50% through a 60-mesh screen
30% through a 100-mesh screen

3. Coarse-sized
All liming materials that fail to meet one of the above minimums for fineness.

A material meeting the standard for a fine-sized liming material is considered adequate for meeting soil test recommendations in most situations. It is assumed that fine-sized liming materials will react rapidly enough to effect a change in soil pH in the year of application and will typically remain effective for about three years. The medium- and coarse-sized materials will be slower to react and thus less effective in changing soil pH in the year of application and will take longer to completely react. The actual fineness must be printed on the liming material label.

Calculation of Actual Lime Requirement:

$$\text{Actual Liming Material Required} = \frac{\text{Soil Test Limestone Recommendation}}{\text{CCE of liming material to be used}} \times 100$$

Example:

Soil Test Recommendation:
Limestone – Apply 4,000 lbs. of calcium carbonate equivalent per acre.

Liming Material Label:
Calcium Carbonate Equivalent (CCE) = 80%

Actual Liming Material Required:

$$\frac{4000}{80} \times 100 = 5{,}000 \text{ lbs. liming material per acre.}$$

The calculations and table for adjusting your recommendations for the CCE of your liming material assume that the material meets the minimum fineness standards for fine-sized limestone. In selecting a liming material, there is generally little advantage in using material much finer than the minimum standards for fine-sized material. In emergency situations where a very rapid change in soil pH is required, paying extra for a finer material may be warranted. However, planning ahead by using a less expensive material and allowing it time to react will generally give better and more economical results.

Directions for using the conversion table:
Find your test limestone recommendation in the left hand column and then read across the table on that line until you come to the column headed by the % CCE nearest to that of your liming material. The number at that point is the pounds of liming material required to meet the limestone recommendation on your soil test.

Because there is generally little advantage to applying more than 8,000 pounds of CCE per acre in any one application to agricultural land, this table is divided into three sections suggesting how the total liming material required can be split for most efficient use. Separate the applications by 6 months time or at least by tillage operations. (See the right hand column).

Pounds per acre of Calcium Carbonate Equivalent Recommendation on your soil test	Percent Calcium Carbonate Equivalent (%CCE) of Your Liming Material								Divide Total into the Following Number Applications
	70	75	80	85	90	95	100	105	
1000	1400	1300	1200	1200	1100	1100	1000	1000	
2000	2900	2700	2500	2400	2200	2100	2000	1900	
3000	4300	4000	3700	3500	3300	3200	3000	2900	
4000	5700	5300	5000	4700	4400	4200	4000	3800	
5000	7100	6700	6200	5900	5600	5300	5000	4800	1
6000	8600	8000	7500	7100	6700	6300	6000	5700	
7000	10000	9300	8700	8200	7800	7400	7000	6700	
8000	11400	10700	10000	9400	8900	8400	8000	7600	
9000	12900	12000	11200	10600	10000	9500	9000	8600	
10000	14300	13300	12500	11800	11100	10500	10000	9500	
11000	15700	14700	13700	12900	12200	11600	11000	10500	
12000	17100	16000	15000	14100	13300	12600	12000	11400	
13000	18600	17300	16200	15300	14400	13200	13000	12400	2
14000	20000	18700	17500	16500	15600	14700	14000	13300	
15000	21400	20000	18700	17600	16700	15800	15000	14300	
16000	22900	21300	20000	18800	17800	16800	16000	15200	
17000	24300	22700	21200	20000	18900	17900	17000	16200	
18000	25700	24000	22500	21200	20000	18900	18000	17100	3
19000	27100	25300	23700	22400	21100	20000	19000	18100	
20000	28600	26700	25000	23500	22200	21100	20000	19000	

To convert to 1000 sq. ft. rate, divide the recommended value in the table by 43.5.

Prepared By: Douglas Beegle, Extension Agronomist.

MAGNESIUM CONVERSION TABLE

If the magnesium level was found to be too low or out of balance with the other nutrients an application of magnesium is recommended. There are a number of materials that can be used. If both limestone and magnesium are required it will be most economical, generally, to use a limestone containing magnesium. The amount of the various materials needed to supply the magnesium recommendation can be determined from the following table.

Row application of special fertilizer containing 2 to 4 percent magnesium may be used if soil levels of magnesium are low. This may reduce magnesium problems for the current year. However, this will not correct low magnesium levels in the soil as too little is applied. For example, an application of 500 lbs. of fertilizer containing 2% Mg will supply only 10 lbs. of magnesium. To benefit from an application of such small amounts, it must be applied in the row.

Annual application of magnesium material should not be necessary for most crops if soil test recommendations are followed.

APPROXIMATE POUNDS OF MATERIALS (nearest 5 lbs.) REQUIRED

For Magnesium recommendation of	Emjeo (17% Mg)	Epson Salt (11% Mg)	K-Mag (11% Mg)	Limestone (10% MgO) (6% Mg)	Limestone (15% MgO) (9% Mg)	Limestone (20% MgO) (12% Mg)	Magox (50% Mg)	Magnesium Sulfate (10% Mg)	Sul-Po-Mag (11% Mg)
40 lbs. of Mg, use	230	360	360	650	450	350	80	360	360
50 lbs of Mg, use	295	450	450	850	550	400	100	450	450
60 lbs of Mg, use	350	540	540	1000	650	500	120	540	540
70 lbs of Mg, use	410	640	640	1200	800	600	140	640	640
80 lbs of Mg, use	470	730	730	1300	900	650	160	730	730
90 lbs of Mg, use	530	820	820	1500	1000	750	180	820	820
100 lbs of Mg, use	590	910	910	1700	1100	850	200	910	910
125 lbs of Mg, use	735	1140	1140	2000	1400	1000	250	1140	1140
150 lbs of Mg, use	880	1360	1360	2500	1600	1250	300	1360	1360
175 lbs of Mg, use	1030	1590	1590	3000	2000	1500	350	1590	1590
200 lbs of Mg, use	1180	1820	1820	3300	2200	1650	400	1820	1820
240 lbs of Mg, use	1410	2180	2180	4000	2700	2000	480	2180	2180

$Mg \times 1.6 = MgO$ $MgO \times 0.6 = Mg$