

Turf and Soil Testing Update



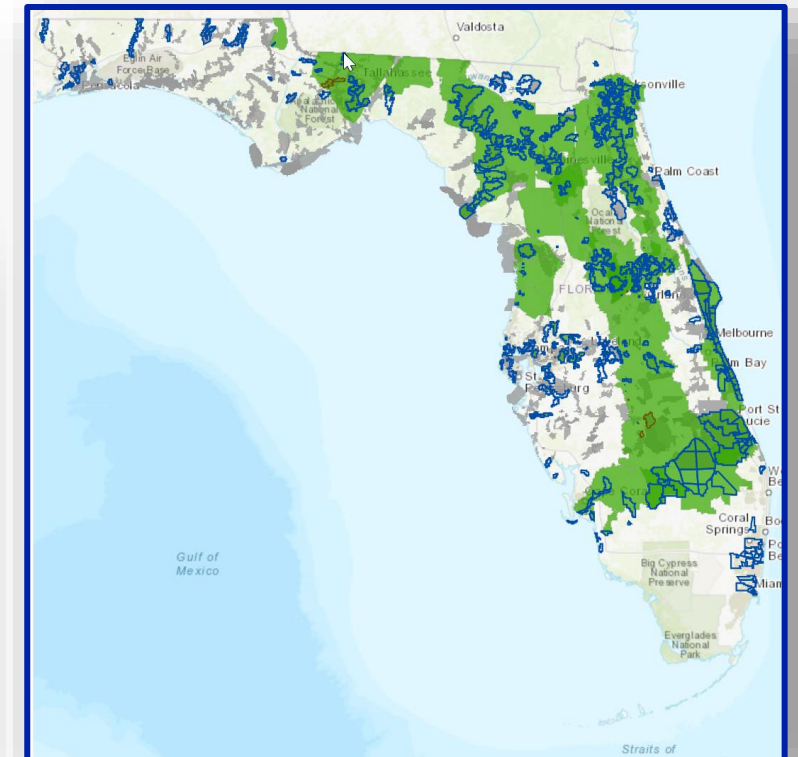
J. Bryan Unruh, Ph.D.

Extension Turfgrass Specialist

University of Florida/IFAS

The Great Debate

- Florida's urban landscapes have been the center of much debate regarding their contribution to Florida's water quality challenges.
 1. Water quality concerns are valid
 2. People desire to have a beautiful landscape





**When You're Fertilizing the Lawn,
Remember, You're Not Just
Fertilizing the Lawn.**



“... please follow directions and use sparingly.”

You fertilize the lawn. Then it rains. The rain washes the fertilizer along the curb, into the storm drain, and directly into our waterways. The nutrients encourage algae to grow, using up oxygen that fish need to survive, resulting in fish kills. So, if you fertilize, please follow directions, and use sparingly.

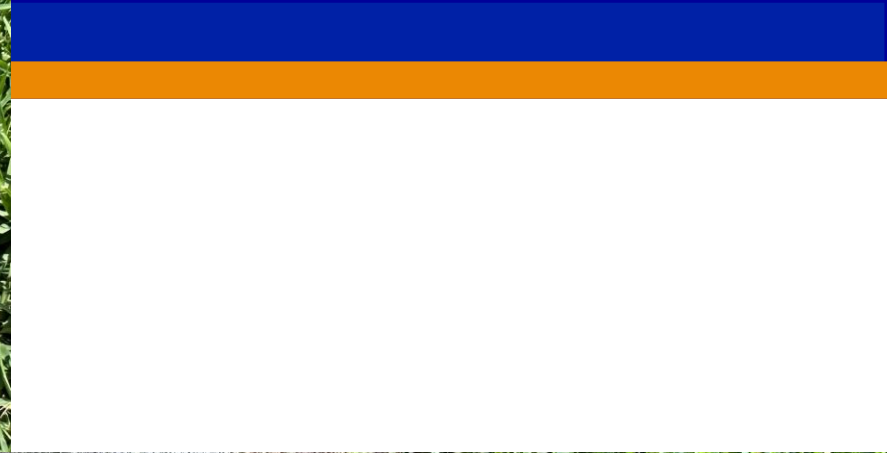


This non-point source pollution information is brought to you by the Bayou Texar Foundation and the West Florida Regional Planning Council.



Printing funded in part by Conoco, The Natural Resources Committee of the Pensacola Bay League of Women Voters, and the Florida Department of Community Affairs, Florida Coastal Management Program, pursuant to the National Oceanographic and Atmospheric Administration Award No. NA170Z1118. The views expressed herein are those of the authors, and do not necessarily reflect the views of the State of Florida, NOAA, or any of its subagencies.





Fertilization of Field-Grown and Landscape Palms in Florida¹

Timothy K. Broschat²

Palms growing in Florida landscapes or field nurseries are subject to a number of potentially serious nutrient deficiencies. These deficiencies are described and illustrated in document ENH1018. Prevention and treatment of these deficiencies is the subject of this document. Chemical symbols used in this document are as follows: N=nitrogen, P=phosphorus, K=potassium, Mg=magnesium, Ca=calcium, Mn=manganese, Fe=iron, B=boron, Cu=copper, Zn=zinc.

Fertilizer Formulation

Nutrient deficiencies are more easily prevented than corrected once they occur. Correction of nutrient deficiencies can take as long as 2 or 3 years for some elements. Research at the UF/IFAS has shown that regular use of a fertilizer having an analysis (the three numbers on all fertilizer labels which refer to their N-P₂O₅-K₂O content) of 8N-2P₂O₅-12K₂O +4Mg with micronutrients can correct mild to moderate deficiencies and prevent their recurrence in most soil types in south and central Florida (Broschat 2015b; Broschat et al. 2008). However, not all fertilizers that have an analysis of 8N-2P₂O₅-12K₂O+4Mg with micronutrients are effective and, if improperly formulated, may be worse for palm health than no fertilizer at all.

It is essential that 100% of the N, K, and Mg in such a fertilizer be in slow release form. Since Florida's soils have very low capacities to retain these elements in the root zone during periods of heavy rainfall or irrigation, the only

effective way to keep these elements readily available to plants during the 2 to 3 month interval between fertilizer applications is to use slow release sources (Broschat 1996; Broschat 1997). A water-soluble source applied one day could be completely leached out of the root zone the next day by a heavy rainfall, and the palm would receive no benefit from the application. Controlled-release fertilizers are not greatly affected by rainfall or irrigation intensity. Since they release more slowly than water-soluble fertilizers, they are also less likely to burn plant roots during periods of drought.

Unlike the macronutrients N, K, and Mg that should be in slow release form, most micronutrients need to be in a water soluble form. However, granular slow release forms of boron are safer and more effective for Florida landscape soils.

Effective sources for N include sulfur-coated urea, urea-formaldehyde, resin-coated urea, and resin-coated ammonium salts. Of all the slow-release K sources tested, sulfur-coated potassium sulfate was found to be the most effective and economical (Broschat 1996). Prilled kieserite (a more slowly soluble form of magnesium sulfate than Epsom salts) is an effective and low-cost slow release form of Mg. Coated Mg products tend to release too slowly to be effective (Broschat 1997; Broschat and Moore 2006). Slow release B sources, such as Granubor, are less affected by leaching than the water soluble B sources often used in landscape fertilizer blends (Broschat 2008). The only

The 8N-2P₂O₅-12K₂O+4Mg with micronutrients maintenance fertilizer blend described above should release nutrients for up to three months, and thus a three-month application interval is recommended. The suggested application rate for south Florida landscapes is 1.5 lbs of the 8N-2P₂O₅-12K₂O+4Mg with micronutrients fertilizer (not N) per 100 sq. ft. of palm canopy area, bed area, or landscape area. Field nurseries typically apply twice that amount to maximize growth (Broschat 2015b). For landscapes in central and north Florida, winter applications can be omitted and lower application rates may also be adequate, although field nurseries in those regions will probably benefit from the higher south Florida application rates.

$$\frac{1.5 \text{ lbs}}{100 \text{ ft}^2} = \frac{X \text{ lbs}}{1,000 \text{ ft}^2}; X = 15 \text{ lbs } 8-2-12-4$$

$$\frac{15 \text{ lbs fertilizer}}{1,000 \text{ ft}^2} \times \frac{0.08 \text{ lbs N}}{1.0 \text{ lb fertilizer}} = \frac{1.2 \text{ lbs N}}{1,000 \text{ ft}^2}$$

$$\frac{1.2 \text{ lbs fertilizer}}{1,000 \text{ ft}^2} \times \frac{4 \text{ applications}}{\text{year}} = \frac{4.8 \text{ lbs N}}{1,000 \text{ ft}^2}$$

1. This document is ENH1009, one of a series of the Environmental Horticulture Department, UF/IFAS Extension. Original publication date September 2005. Revised October 2011, September 2014, and November 2016. Reviewed September 2021. Visit the EDIS website at <http://edis.ifas.ufl.edu>.

2. Timothy K. Broschat, professor emeritus, Environmental Horticulture Department; UF/IFAS Fort Lauderdale Research and Education Center, Davie, FL 33314.

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Nitrogen (N), Phosphorus (P)
and Potassium (K)

15-30-15
NPK RATIO

Nitrogen: Promotes vigorous leaf growth and supports amino acid production, making the plant greener

Phosphorus: Promotes root development which strengthens plant to increase bloom and fruit production

Potassium: Helps plants fight off diseases and withstand extreme temperatures

No coverage information found on label.


BIGGER, BOLDER, BETTER GARDENS**

426 026



TREE, SHRUB & EVERGREEN FERTILIZER

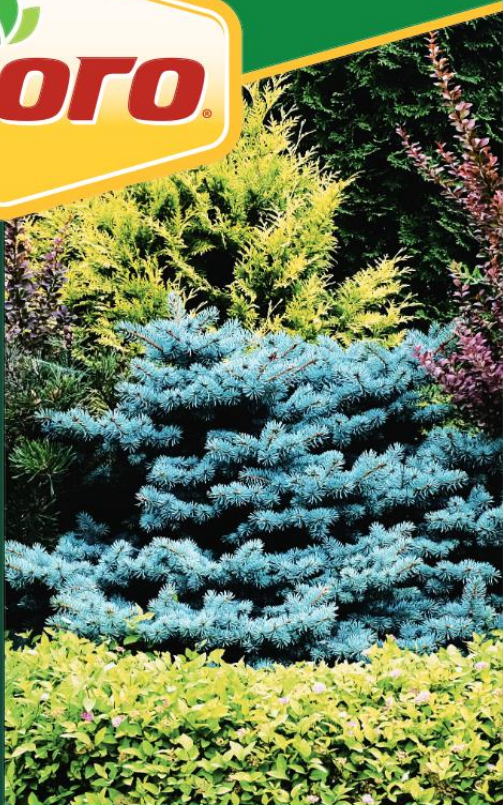
PROMOTES LUSH FOLIAGE & BEAUTIFUL COLOR

 improves stress tolerance & helps develop a deep & dense root system

 contains time-released nitrogen for extended feeding

16-4-8

**vs unfed



WORKS THE FIRST TIME OR YOUR MONEY BACK

NET WT 3.5 lb / 1.58 kg

PROJECT GUIDE - HOW TO USE

TYPES OF PLANTS	HOW MUCH TO APPLY	HOW TO APPLY	WHEN TO APPLY
New trees & shrubs	Based on size of drip line: 2 ft – 1 tbsp 4 ft – 3 tbsp 6 ft – 7 tbsp 8 ft – 1/2 cup 16 ft – 1 cup 25 ft – 2 cups 30 ft – 2 1/2 cups	Mix evenly with the soil used to refill the planting hole or after hole is filled, sprinkle around the base of the plant, careful to avoid contact with the trunk and foliage. Water thoroughly to start feeding.	For best results, feed in early spring as new leaves emerge and again in late summer.
Established trees & shrubs	Based on size of drip line: 8 ft – 2/3 cup 16 ft – 1 1/2 cups 25 ft – 2 1/2 cups 30 ft – 3 cups	Shake evenly onto the soil surface, within the spread of the branches (drip line), careful to avoid contact with the trunk and foliage. Water thoroughly to start feeding.	For best results, feed in early spring as new leaves emerge and again in late summer.
Container trees & shrubs	Based on size of pot: 12 in – 1 tbsp 14 in – 2 tbsp 20 in – 4 tbsp	Mix into soil at time of planting. For established plants shake evenly onto soil surface and lightly work in. Water to begin feeding.	For best results, feed in early spring as new leaves emerge and again in late summer.



Apply Within the Drip Line
Shake evenly into the soil within the spread of the branches (drip line), avoid contact with the trunk and foliage

In regions where soil temperature exceeds 72 °F, product may be reapplied every 6 to 8 weeks. Do not pile fertilizer next to trunk or at the base of the plant. Water thoroughly after applying. **ALWAYS BRUSH OR WASH FERTILIZER GRANULES OFF THE LEAVES TO PREVENT LEAF INJURY.**
NOTE: 1 cup = approximately 1/2 lb •
4 tbsp = approximately 1/4 cup

Label Directions = 2.4 lbs N/1,000 ft²/year

UF IFAS Extension
UNIVERSITY OF FLORIDA

Florida-Friendly Landscaping™
Handbook for Home Landscapes

Florida-Friendly Landscaping™ PROGRAM

UF IFAS Extension
UNIVERSITY OF FLORIDA

**Best Management Practices for
Protection of Water Resources
by the Green Industries**

Florida-Friendly Landscaping™ PROGRAM

BEST MANAGEMENT PRACTICES
FOR THE ENHANCEMENT OF
ENVIRONMENTAL QUALITY
ON FLORIDA GOLF COURSES

GCSAA Florida Chapter
GCSAA

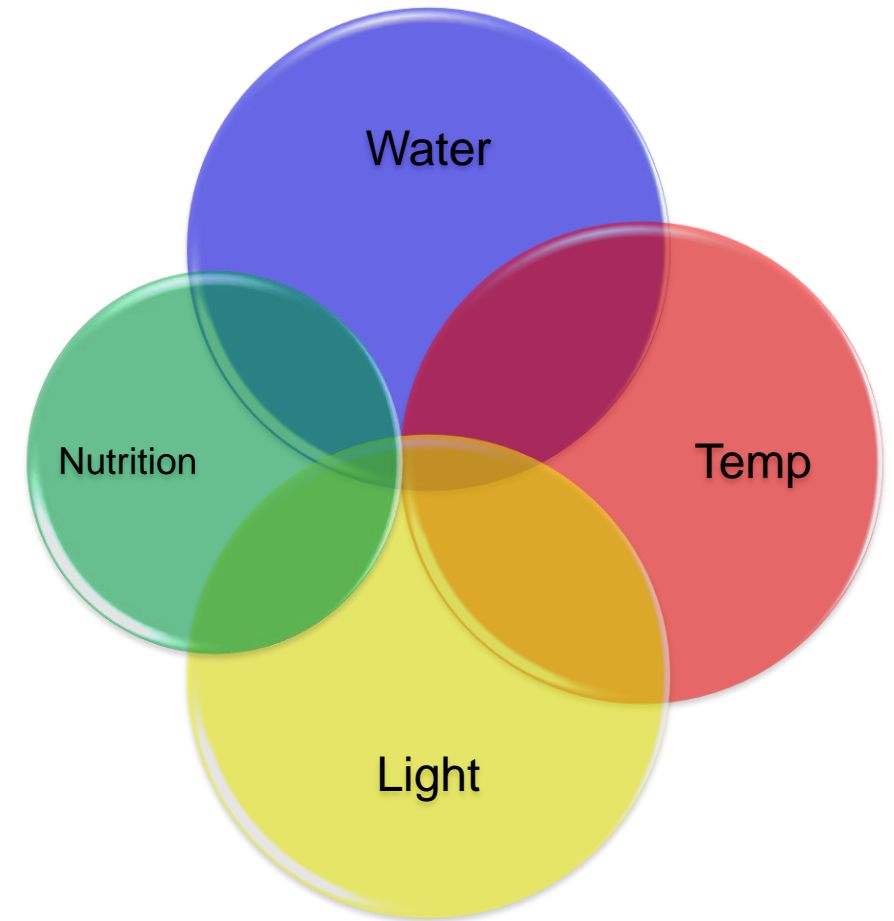
**Water Quality/Quantity
Best Management Practices
for
Florida Sod**

2008 Edition

DACS-P 01330

Water, Light, Temperature, and **Nutrition**

- The environment of a plant is dynamic and very complex.
 - Involves the interrelationships of soil, climate, topography, and other organisms.
- Water, light, and temperature are the drivers.



Nutrition and Fertilization Best Management Practices

- The goal of a proper nutrient management plan should be to apply the minimum necessary nutrients to achieve acceptable quality and apply these nutrients in a manner that maximizes their plant uptake.

Inputs:

Minerals from Soil →

Fertilization & Reclaimed Water →

Atmospheric Deposition →

Deposition of Organic Residues →

*Plant-Available
Nutrient Pool*

Outputs:

→ Clipping Removal

→ Gaseous Loss

→ Conversion to Unavailable Forms

→ Leaching/Runoff Loss

PERIODIC TABLE OF THE ELEMENTS

1A																		8A	
1 H 1.008	2A												3A	4A	5A	6A	7A	2 He 4.003	
3 Li 6.939	4 Be 9.0122											5 B 10.811	6 C 12.011	7 N 14.007	8 O 15.999	9 F 18.998	10 Ne 20.183		
11 Na 22.99	12 Mg 24.312	3B	4B	5B	6B	7B	-----8B-----				1B	2B	13 Al 26.982	14 Si 28.086	15 P 30.974	16 S 32.064	17 Cl 35.453	18 Ar 39.948	
19 K 39.102	20 Ca 40.08	21 Sc 44.956	22 Ti 47.9	23 V 50.942	24 Cr 51.996	25 Mn 54.938	26 Fe 55.847	27 Co 58.933	28 Ni 58.71	29 Cu 63.546	30 Zn 65.37	31 Ga 69.72	32 Ge 72.59	33 As 74.922	34 Se 78.96	35 Br 79.904	36 Kr 83.8		
37 Rb 85.47	38 Sr 87.62	39 Y 88.905	40 Zr 91.22	41 Nb 92.906	42 Mo 95.94	43 Tc [97]	44 Ru 101.07	45 Rh 102.91	46 Pd 106.4	47 Ag 107.87	48 Cd 112.4	49 In 114.82	50 Sn 118.69	51 Sb 121.75	52 Te 127.6	53 I 126.9	54 Xe 131.3		
55 Cs 132.91	56 Ba 137.34	57* La 138.91	72 Hf 178.49	73 Ta 180.95	74 W 183.85	75 Re 186.2	76 Os 190.2	77 Ir 192.2	78 Pt 195.09	79 Au 196.97	80 Hg 200.59	81 Tl 204.37	82 Pb 207.19	83 Bi 208.98	84 Po 210	85 At 210	86 Rn 222		
87 Fr 215	88 Ra 226.03	89** Ac 227.03	104 Rf [261]	105 Db [262]	106 Sg [266]	107 Bh [264]	108 Hs [269]	109 Mt [268]	110 [271]	111 [272]	112 [277]		114 [289]		116 [289]				

*Lanthanides	58 Ce 140.12	59 Pr 140.91	60 Nd 144.24	61 Pm 145	62 Sm 150.35	63 Eu 151.96	64 Gd 157.25	65 Tb 158.92	66 Dy 162.5	67 Ho 164.93	68 Er 167.26	69 Tm 168.93	70 Yb 173.04	71 Lu 174.97
**Actinides	90 Th 232.04	91 Pa 231	92 U 238.03	93 Np 237.05	94 Pu 239.05	95 Am 241.06	96 Cm 244.06	97 Bk 249.08	98 Cf 252.08	99 Es 252.08	100 Fm 257.1	101 Md 258.1	102 No 259.1	103 Lr 262.11

Gaseous at room temperature

Soil Analysis and Interpretation

- The tenets of proper soil testing include:
 - Sampling
 - Testing
 - Interpretation
 - Recommendations

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Soil Sampling Depth

- Probably the greatest source of error.
- Proper sampling procedures involve ensuring that the soil sample accurately represents the area where the turf or landscape will be grown.
 - Soil samples should be taken from the depth in which most of the roots exist – typically the upper 4” for turf and landscape soils.



Soil Sampling Depth

- Using a soil probe or garden spade, take 10 – 15 random samples from the areas in questions.
- Avoid mixing soil from healthy areas with soil from unhealthy areas as this will reduce the ability to diagnose the problem.
- Thoroughly mix the soil and place a one-pint portion in a soil sample bag.





4894

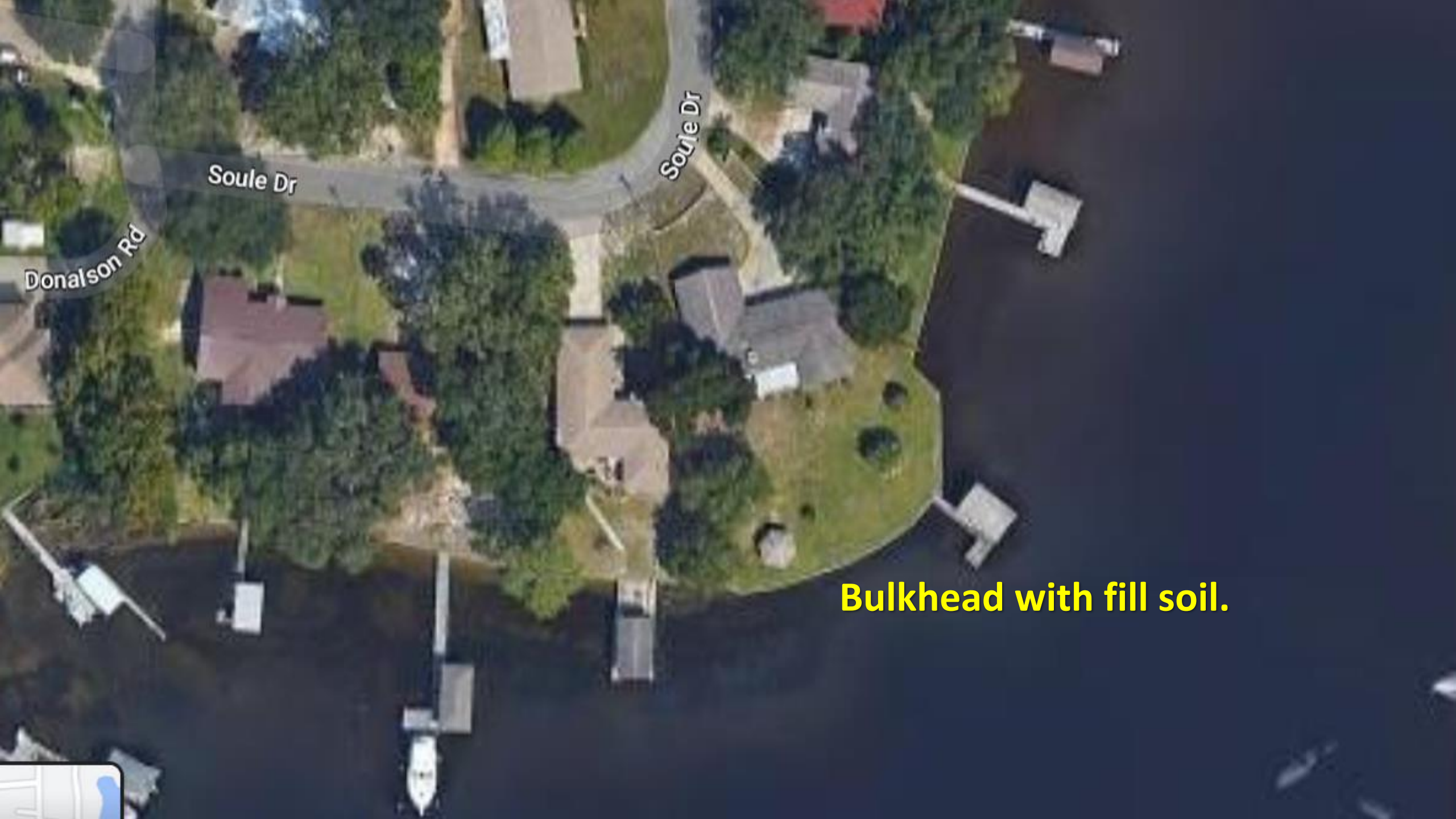
4900

4906

Laurel Oak Dr

Laurel Oak Dr

Laurel Oak Dr



Soule Dr

Soule Dr

Donalson Rd

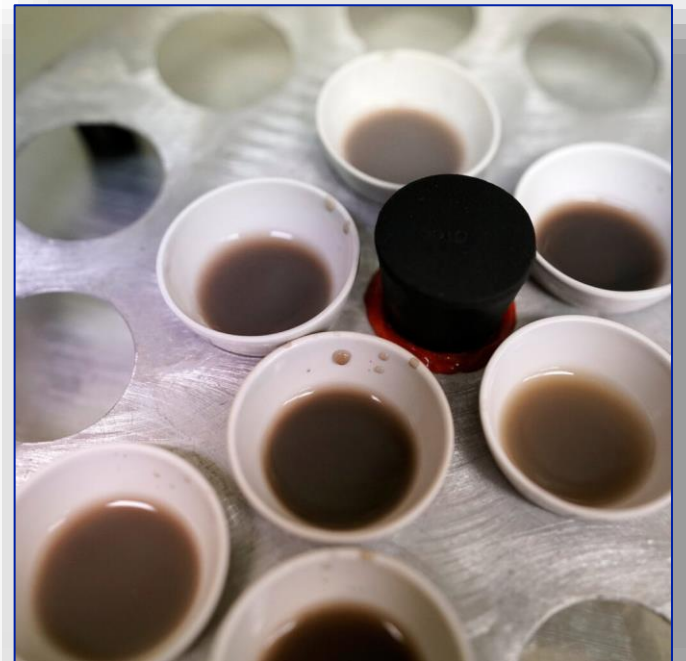
Bulkhead with fill soil.

Soil Analysis and Interpretation

- The tenets of proper soil testing include:
 - Sampling
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Soil Testing Procedures

- Soil testing procedures focus on extraction or digestion of the sample.
 - The purpose of the extractant is to determine the quantity of an element that would be representative of, or correlates to, what will be available for plant uptake during that growing season.
 - The method employed is specific to the nutrients, the geographic region, and the physiographic and mineralogical nature of the sampling site.



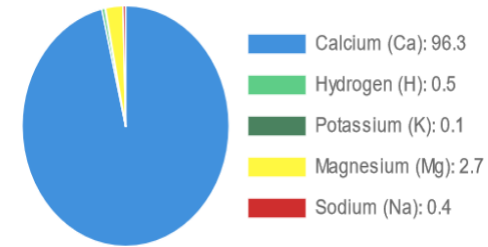
Soil Testing Procedures

- The extractant is a chemical solution including water, acids, and certain organic chemicals that is mixed with the soil sample that was collected and sent to the testing laboratory.
 - Upon mixing, this chemical solution “extracts” nutrients that are bound to the soil.
 - After mixing, the sample’s liquid portion is filtered and analyzed using laboratory analytical equipment.



Soil Testing Procedures

- The results of the liquid analysis are then converted to the dried-soil basis and is referred to as the soil-test index.
 - These are the values typically reported on the soil test report and they are an indication of the soil's ability to supply nutrients to the plant.



Element	ABR	Result (lbs/1000sqft)	Rating	Normal range
Boron [?]	B	0.04	Adequate	0.03 - 0.05
Calcium [?]	Ca	694.12	Very high	22.96 - 32.14
Copper [?]	Cu	0.03	Very high	0.07 - 0.14
Iron [?]	Fe	2.57	Adequate	2.3 - 4.59
Potassium [?]	K	1.84	Adequate	5.17 - 7.46
Magnesium [?]	Mg	11.57	Very high	3.44 - 5.74
Manganese [?]	Mn	0.85	Very high	1.38 - 4.59
Phosphorus [?]	P	0.53	Low	2.3 - 3.44
Zinc [?]	Zn	0.19	High	0.14 - 0.23

Soil Extractants Differ

Region	Soil P Extractant	
Arid and semiarid Midwest, West, and Northwest	Olsen Am. Bicarbonate + DTPA	NaHCO_3 NH_4HCO_3 + DTPA
Humid Midwest, mid-Atlantic, Southeast, and eastern Canada	Mehlich 3 Bray 1	Acetic Acid + NH_4NO_3 + NH_4F + Nitric Acid + EDTA HCl and NH_4F
North central and Midwest	Bray 1	HCl and NH_4F
Washington and Oregon	Bray 1 for acidic soils Olsen for alkaline soils	HCl and NH_4F NaHCO_3
Southeast and mid-Atlantic	Mehlich 1 Mehlich 3	HCl + H_2SO_4 Acetic Acid + NH_4NO_3 + NH_4F + Nitric Acid + EDTA
Northeast (New York and parts of New England), some labs in Idaho and Washington	Morgan or modified Morgan Mehlich 3	Acetic Acid Acetic Acid + NH_4NO_3 + NH_4F + Nitric Acid + EDTA

Soil Analysis and Interpretation

- The tenets of proper soil testing include:
 - Sampling
 - Testing
 - Interpretation
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These two create considerable confusion and frustration!

Interpretation Philosophies

- Build up and Maintain – soil nutrients should be increased to the high soil test level and then maintained based upon plant removal.
 - ‘Feed the Soil’
- Base Cation Saturation – CEC should be occupied by a specific ratio of Ca, Mg, K, and H.
 - ‘Soil Balancing’
- Sufficiency Level – add enough nutrients to meet plant response goals. No nutrients are added when a plant response is not expected at the given soil nutrient level.
 - ‘Feed the Plant’

Landscape And Vegetable Garden Test Report

To:
 Josh Scott
 PO Box 36541
 Panama City FL, 32412
 Tel: (850)215-0474

For more information contact:
 McConnell, Julie
 Bay County Coop Extn Service
 2728 E. 14 St
 Panama City FL, 32401
 Tel: 850-784-6105

Client Identification: pier 1270 Set Number: E73616 Lab Number: E188259
 Crop: **Bermudagrass Lawn**

Report Date: 16-Dec-22

Soil Test Results and Their Interpretations

Target pH: 6.5 This is the pH at which the above crop will grow at its optimum
pH (1:2 Sample:Water): 7.2 This is the pH of your sample in water medium
A-E Buffer Value: N/A Buffer pH is the pH of your soil in Adams-Evans Buffer(A-E Buffer). This is done to determine the lime requirement, which will help increase the soil pH to the target pH level desired by the crop. If the pH is higher than Target pH, Buffer pH will not be determined

Soil Nutrients Mehlich-3 Extractable

Nutrients	Level mg/kg or ppm	Interpretation	Nutrients	Level mg/kg or ppm
Phosphorus (P)	62	HIGH	Sulfur (S)	6.9
Potassium (K)	41	MEDIUM	Copper (Cu)	0.4
Magnesium (Mg)	69	HIGH	Manganese (Mn)	3.4
			Zinc (Zn)	2.2
Calcium (Ca)	399	Ca is typically adequate in Florida soils		

*For these nutrients see directions on the following pages

Lime and Fertilizer Recommendations

Crop: **Bermudagrass Lawn**

Lime: **0.00 lbs per 1000 sq. ft. per year**
 Nitrogen(N): **4.00 lbs per 1000 sq. ft. per year**
 Phosphorus(P₂O₅): **0.00 lbs per 1000 sq. ft. per year**
 Potassium(K₂O): **1.00 lbs per 1000 sq. ft. per year**
 Magnesium(Mg): **0.00 lbs per 1000 sq. ft. per year**

We do not test soil for N as there is no meaningful soil test for predicting N availability. Thus, the N recommendation was developed from research that measured response of the indicated crop to applied N fertilizer. If you expect significant nutrient release from organic sources such as crop residues or organic amendments, estimate the amount mineralized and subtract that amount from the fertilizer recommendations given below to arrive at crop needs.

Caution: Your local county regulations and ordinances, if any, will supersede the recommendations made in this report. Please contact your local county extension office for further clarifications.

IMPORTANT: Please read the directions on the following page(s) carefully, if any nutrient applications are made. If you have any questions, please call the county extension agent listed above.

These interpretations and recommendations are based upon soil test results and scientific research/experience with the specified crop under Florida's growing conditions.

UF/IFAS fertilizer and lime recommendations are advisory in nature, emphasize efficient fertilizer use, and environmentally sound nutrient management without losses of yield or crop quality. It is generally assumed that the nutrients will be supplied from purchased, commercial fertilizer and that expected crop yields and quality will be typical of economically viable production. Growers should consider UF/IFAS recommendations in the context of their entire management strategy, such as return on investment in fertilizer and the benefits of applying manure or biosolids

Prior to making any of the above recommended applications, it is important to read carefully the following footnotes and follow the directions provided on fertilizer applications, timing, doses, sources, sulfur and micronutrients, irrigation, etc.

Directions

Sample Number: 188259

Crop: **Bermudagrass Lawn**

General

- For details on fertilization, obtain UF/IFAS publication SL21, "General recommendations for Fertilization of Turfgrasses on Florida Soils." The publication is available on the web at <http://edis.ifas.ufl.edu/pdf/LH/LH01400.pdf> or from county Extension offices. These rates are for normal, healthy lawns. These rates may be doubled in certain regions of the state for high maintenance turf. Divide annual rates into 2 to 8 applications depending on location and management levels. Apply no more than 1.0 lb N/1000 sq. ft. per application. Available Phosphate: A maximum rate of 0.25 lb per 1000 sq. ft per application, not to exceed 0.5 lb per 1000 sq. ft. annually.

Sulfur

- Application of sulfur is not required if test value is greater than 6.0 mg/kg or ppm. If the soil test value is less than 6.0 mg/kg or ppm apply sulfur as shown below:

Fertilizer should contain 15 to 20 lb sulfur/A. Apply as a sulfate (eg. gypsum, ammonium sulfate, magnesium sulfate, potassium sulfate, potassium magnesium sulfate), since elemental sulfur will react too slowly to supply the sulfur needs of the current crop.



Waters Agricultural Laboratories, Inc.
P.O. Box 382 257 Newton Hwy Camilla, GA 31730
(229) 336-7216 FAX (229) 336-7967

"Improving Growth...
With Science"

Soil Analysis

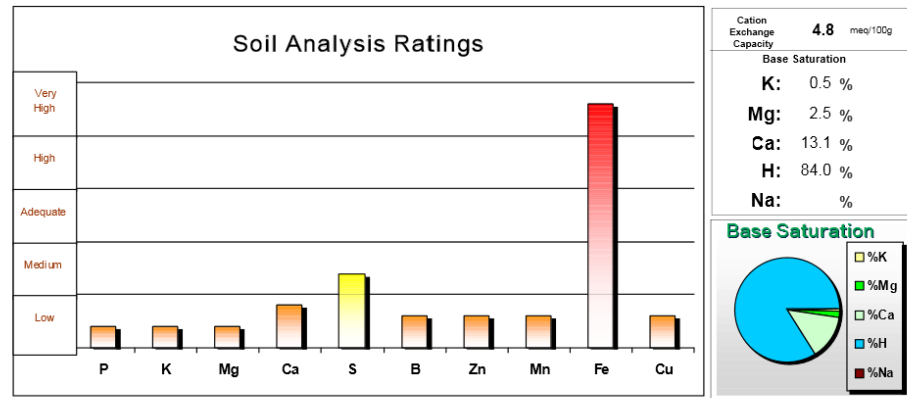
Front Yard

Lab Number: 7596671C

Lab Results
lbs. per Acre

Target pH: 6.5
Test Method: Mehlich I

P	K	Mg	Ca	Soil pH	Buffer pH	S	B	Zn	Mn	Fe	Cu
Phosphorus	Potassium	Magnesium	Calcium			Sulfur	Boron	Zinc	Manganese	Iron	Copper
13 L	17 L	28 L	249 L	4.5	7.50	31 M	0.30 L	1.6 L	9 L	38 VH	0.5 L
Aluminum	Sodium	Nitrate N	Soluble Salts	Organic Matter		Molybdenum	NH4	Nickel	BiCarbs		
mmhos/cm			mmhos/cm	%		ppm		ppm	meq/l		



Fertility Recommendations lbs./1000 Sq. Ft.

Crop: ST. AUGUSTINE GRASS

Yield: TURF

Lime	Gypsum	N	P2O5	K2O	Mg	S	B	Zn	Mn	Fe	Cu
lbs/1000SqFt	lbs/1000SqFt	Nitrogen	Phosphate	Potash	Magnesium	Sulfur	Boron	Zinc	Manganese	Iron	Copper
92.0		2.07	1.84	2.18	1.26	0.11	0.016	0.02	0.23		0.01

Comments:

SPLIT APPLICATIONS OF NITROGEN AND POTASSIUM RECOMMENDED. PLANT SAMPLES SHOULD BE TAKEN DURING THE GROWING SEASON. ADDITIONAL OR SUPPLEMENTAL NUTRIENTS MAY BE NEEDED. * = Maintenance Recommendation - Magnesium recommendation can be cut in half.



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P.O. Box 382 257 Newton Hwy Camilla, GA 31730
(229) 336-7216 FAX (229) 336-7967

"Improving Growth...
With Science"

Soil Analysis

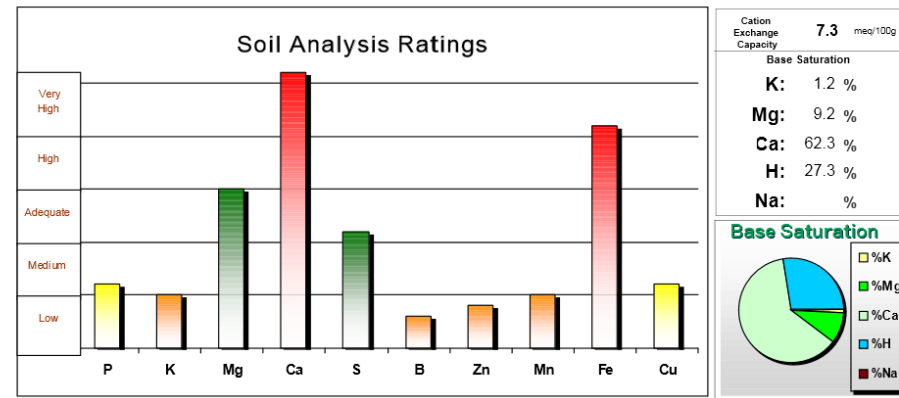
Back Yard

Lab Number: 7596691C

Lab Results
lbs. per Acre

Target pH: 6.5
Test Method: Mehlich I

P	K	Mg	Ca	Soil pH	Buffer pH	S	B	Zn	Mn	Fe	Cu
Phosphorus	Potassium	Magnesium	Calcium			Sulfur	Boron	Zinc	Manganese	Iron	Copper
48 M	70 L	161 A	1824 VH	6.8	7.75	54 A	0.27 L	2.4 L	17 L	33 VH	0.9 M
Aluminum	Sodium	Nitrate N	Soluble Salts	Organic Matter		Molybdenum	NH4	Nickel	BiCarbs		
mmhos/cm			mmhos/cm	%		ppm		ppm	meq/l		



Fertility Recommendations lbs./1000 Sq. Ft.

Crop: ST. AUGUSTINE GRASS

Yield: TURF

Lime	Gypsum	N	P2O5	K2O	Mg	S	B	Zn	Mn	Fe	Cu
lbs/1000SqFt	lbs/1000SqFt	Nitrogen	Phosphate	Potash	Magnesium	Sulfur	Boron	Zinc	Manganese	Iron	Copper
		2.07	1.03	1.84		0.11	0.017	0.02	0.07		0.00

Comments:

SPLIT APPLICATIONS OF NITROGEN AND POTASSIUM RECOMMENDED. PLANT SAMPLES SHOULD BE TAKEN DURING THE GROWING SEASON. ADDITIONAL OR SUPPLEMENTAL NUTRIENTS MAY BE NEEDED. * = Maintenance Recommendation

UF/IFAS Recommendations

We do NOT test for soil nitrogen!!!

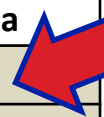
Table 1. Fertilization Guidelines for Established Turfgrass Lawns

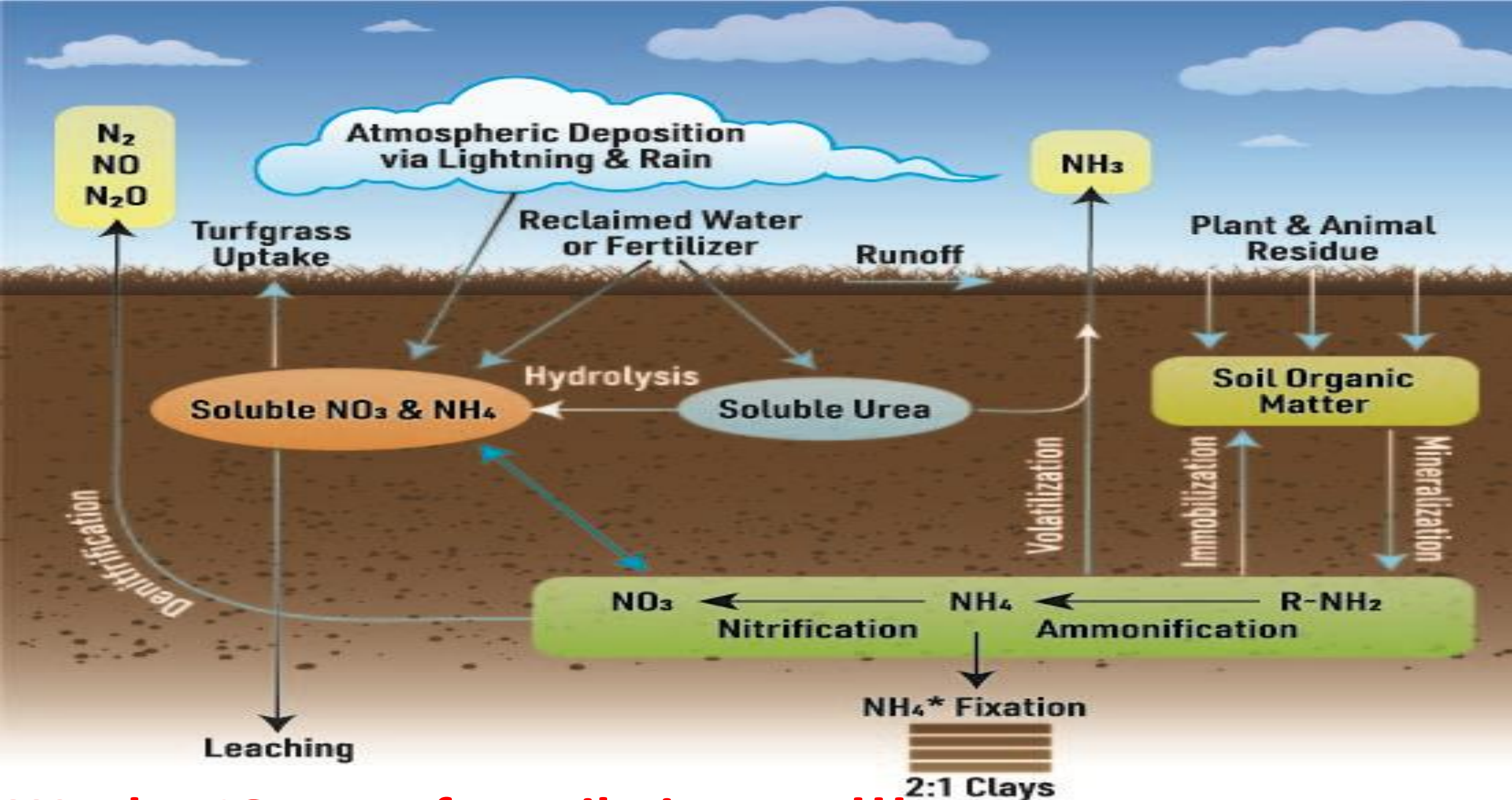
	Nitrogen Recommendations (lbs 1,000 ft ⁻² year ⁻¹) ^{1, 2}		
	North Florida	Central Florida	South Florida
Bahiagrass	1.0 – 2.0	1.0 – 2.0	1.0 – 2.0
Bermudagrass	3.0 – 5.0	4.0 – 6.0	5.0 – 7.0
Centipedegrass	0.4 – 2.0	0.4 – 3.0	0.4 – 3.0
St. Augustinegrass	2.0 – 4.0	2.0 – 5.0	4.0 – 6.0
Zoysiagrass	2.0 – 3.0	2.0 – 4.0	2.5 – 4.5

¹Because homeowner preferences for lawn quality and maintenance level will vary; we recommend a range of fertility rates for each grass and location. Additionally, effects within a localized region (i.e., micro-environmental influences -- such as shade, drought, soil conditions, and irrigation) will necessitate that a range of fertility rates be used.

²These recommendations assume that grass clippings are left on the lawn.

CHANGED!





We do NOT test for soil nitrogen!!!



Waters Agricultural Laboratories, Inc

Soil Health & Fertility Report

“Improving Growth...
With Science”

257 Newton Hwy | Camilla, GA 31730- | Phone (229) 336-7216

Customer: 9556	Sample Information	
UNIVERSITY OF FLORIDA 4253 EXPERIMENT DR HWY 18 JAY, FL 32565	Grower: PABLO AGUSTIN BOERI FieldID: SOIL HEALTH SampleID: 1011	Received: 02/04/2022 Processed: 02/08/2022 Lab Number: 850409YC

Test Method: M3(Adams-Evans)	Soil Analysis Results (lbs/a)	Target pH 6.5
------------------------------	-------------------------------	---------------

Element	P	K	Mg	Ca	S	B	Zn	Mn	Fe	Cu	Soil pH	Buffer pH	Aluminum	Sodium
Very High	High										6.3	7.65	1313	49
High											264	0.6		
Adequate											113	13		
Medium											259	91		
Low											1298	279		
											21	2.1		

Base Saturation						
CEC (meq/100g)	K (%)	Mg (%)	Ca (%)	H (%)	Na (%)	Soluble Salts (mmhos/cm)
7.40	2.00	14.60	44.00	38.00	1.40	0.09

Soil Health & Fertility Analysis

19 Soil Health Score <small>-----Improving Soil Health----->>>>>>>>></small>	Solvita - CO2 Burst (ppm)	92.6	High	
	Solvita - SLAN (ppm)	97.5	Moderate	
70 Fertility Score <small>-----Improving Fertility----->>>>>>>>></small>	Active Carbon (ppm)	869.0	Adequate	
	Aggregate Stability (%)	3.0	Very Low	
P : [Al+Fe] (%)	17			
P : [Ca+Mg] (%)	17			
Ca : [Al+Fe] (%)	82			
ESP - Sodium (%)	1			
	NH4 (ppm)	3.51	Nitrate (ppm)	1.83
	Est. Biological N-Mineralization (lbs/a)	51		
	Est. Nitrogen for Crop (lbs/a)	60		
	Response to Additional Nitrogen (lbs/a)	Likely		

Crop: COVER CROP	Fertility Recommendations (lbs/a)	Yield: MAX									
Lime	Gypsum	N	P205	K20	Mg	S	B	Zn	Mn	Fe	Cu
Tons/Acre	Tons/Acre	Nitrogen	Phosphate	Potash	Magnesium	Sulfur	Boron	Zinc	Manganese	Iron	Copper
0.4		40		85		14	0.6				

Comments

Cover Crop Suggestion: 40% Legume | 60% Grass/Non-Legume
 PLANT SAMPLES SHOULD BE TAKEN DURING THE GROWING SEASON. ADDITIONAL OR SUPPLEMENTAL NUTRIENTS MAY BE NEEDED.

* = Maintenance Recommendation

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SCIENTIFIC RESULTS YOU CAN UNDERSTAND	FERTILIZER & NUTRIENT RECOMMENDATIONS

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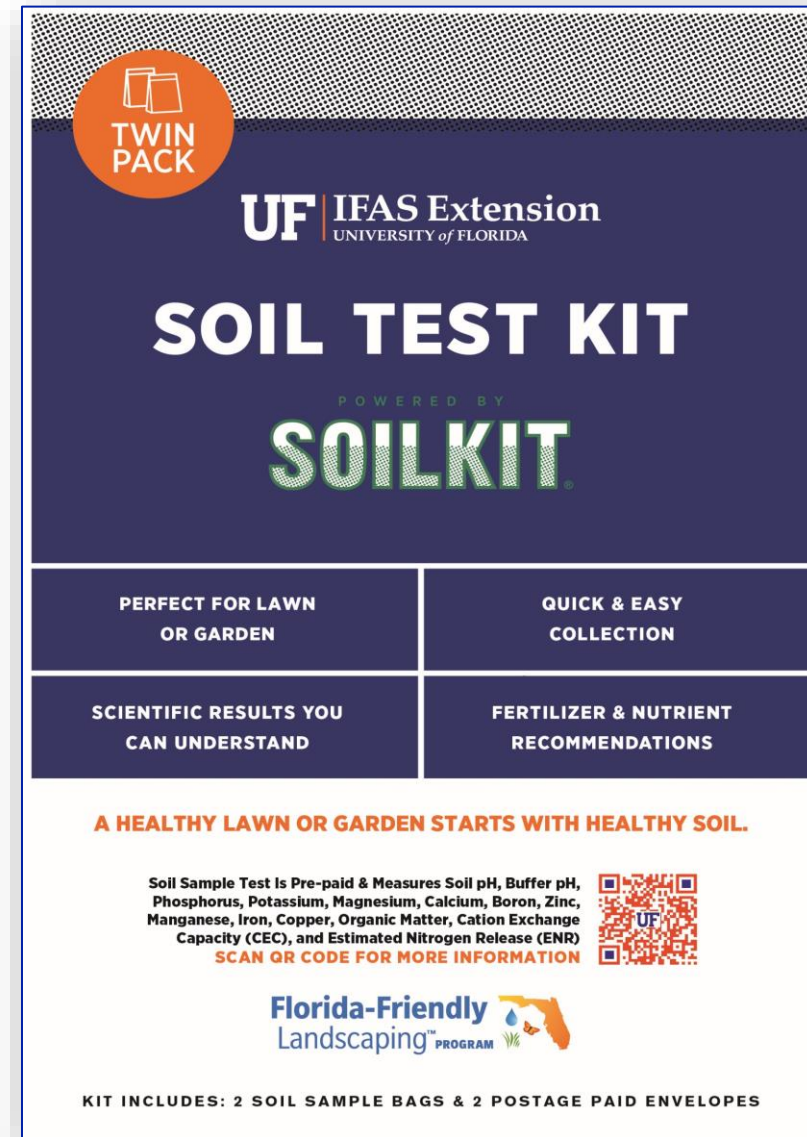
SCAN QR CODE FOR MORE INFORMATION

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PERFECT FOR LAWN OR GARDEN	QUICK & EASY COLLECTION
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A HEALTHY LAWN OR GARDEN STARTS WITH HEALTHY SOIL.

Soil Sample Test is Pre-paid & Measures Soil pH, Buffer pH, Phosphorus, Potassium, Magnesium, Calcium, Boron, Zinc, Manganese, Iron, Copper, Organic Matter, Cation Exchange Capacity (CEC), and Estimated Nitrogen Release (ENR)

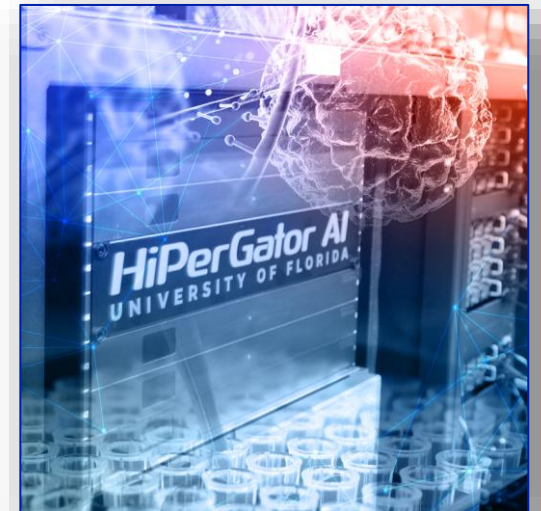
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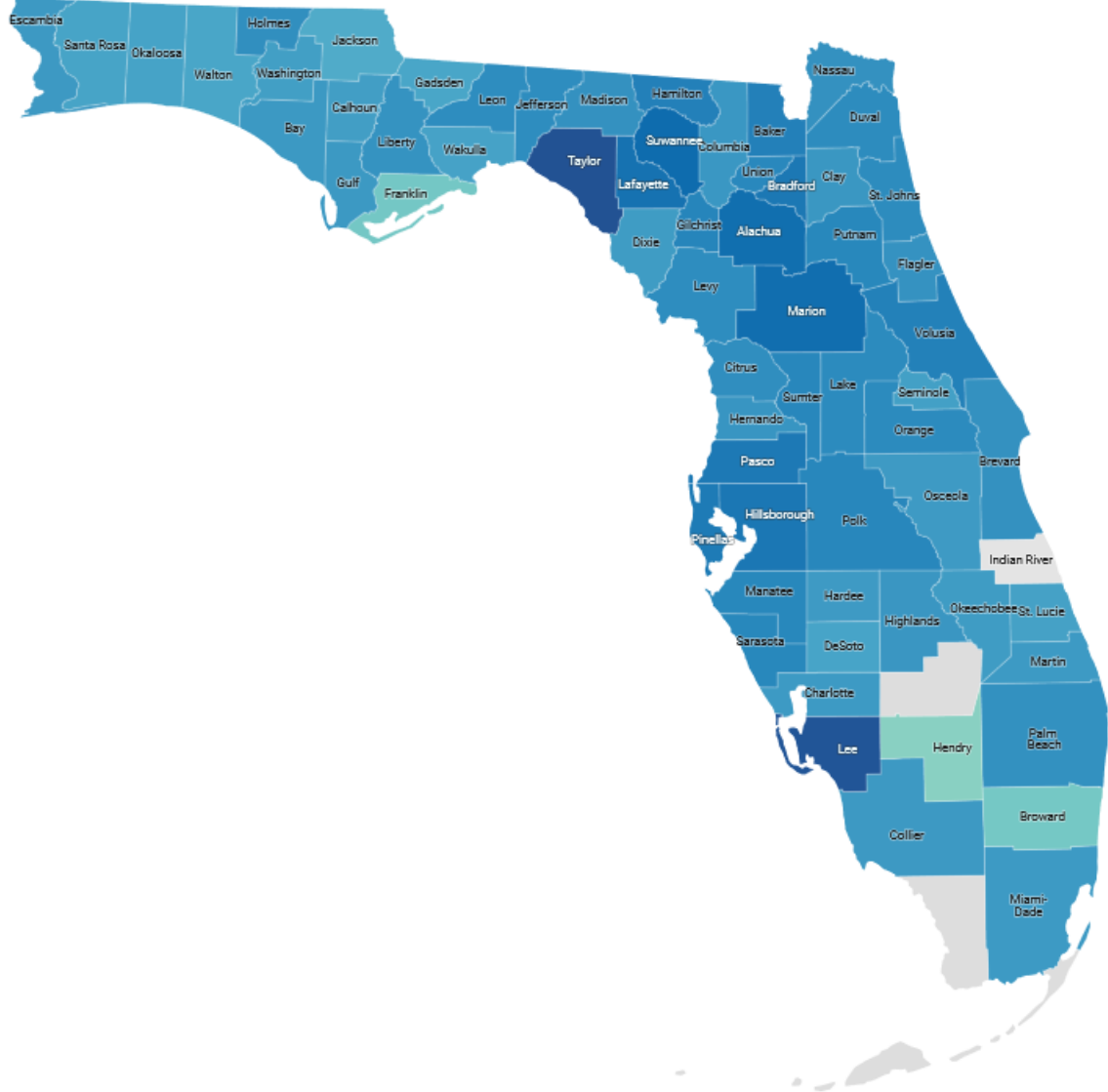
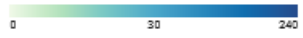
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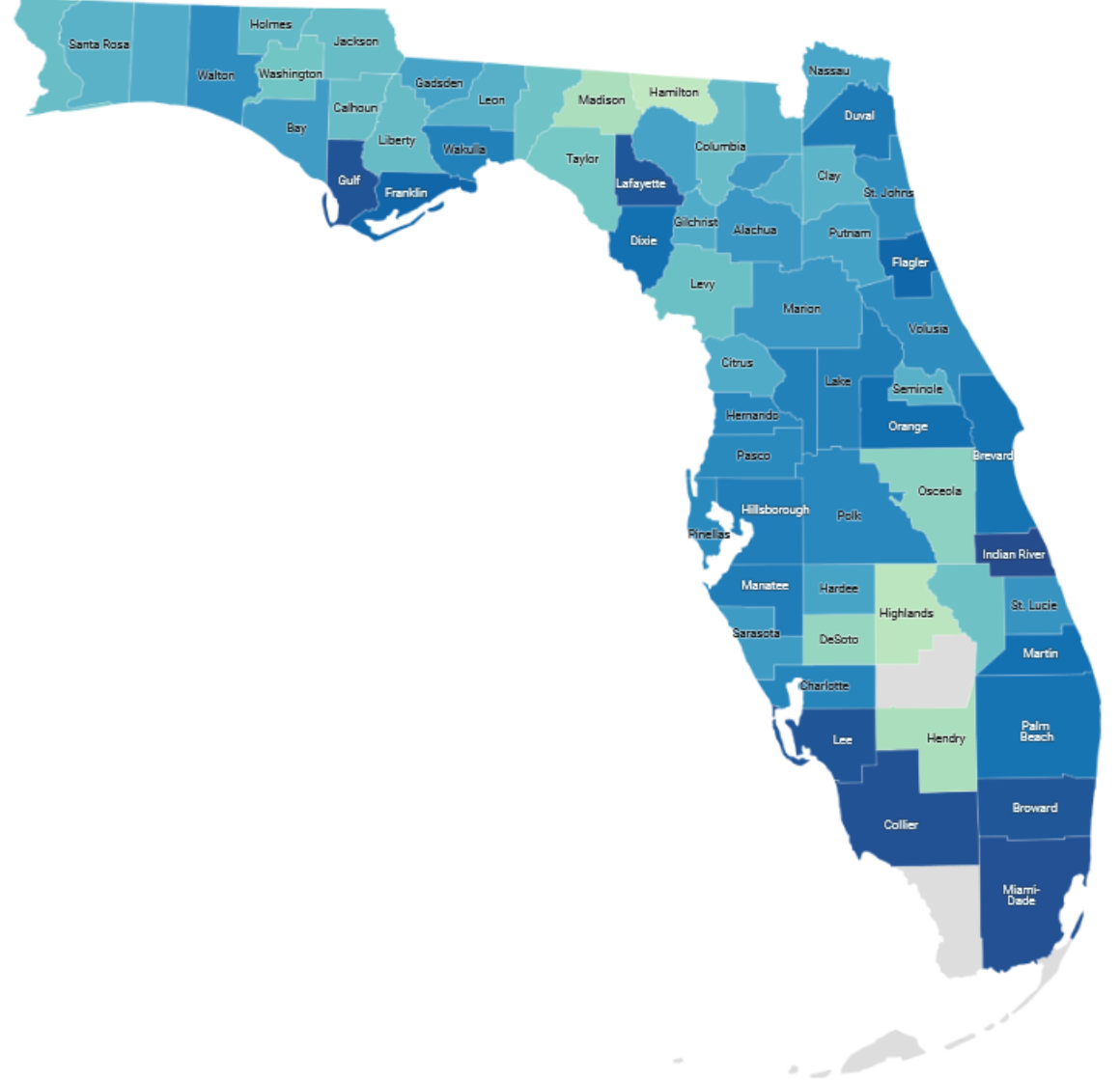
- Access to a data-sharing platform that provides useful datasets for the artificial intelligence (AI) initiative.
 - Generate improved landscape fertilizer recommendations leading to reduced environmental impact



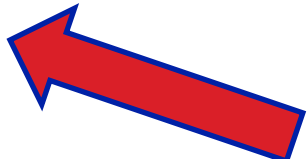
Average Mehlich-3 P from Turfgrass



Average Soil pH from Turfgrass



Nutrient Recommendation Guidelines

- Nitrogen – based on the species you are growing
 - Phosphorus – apply when soil test < 20 ppm
 - Potassium – apply when soil test < 40 ppm
 - Apply a 2:1 or 1:1 (N:K) fertilizer.
 - Magnesium – apply when soil test < 20 ppm
 - Sulfur – apply when soil test < 7 ppm
 - ALL OTHER NUTRIENTS – we do not have thresholds!
- 
- CHANGED!**



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