



FLORIDA-FRIENDLY
BEST MANAGEMENT PRACTICES
FOR PROTECTION OF WATER RESOURCES
BY THE GREEN INDUSTRIES

GREEN INDUSTRIES BEST MANAGEMENT PRACTICES (GI-BMP)

MODULE 5: FERTILIZER

1/2024

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TRAINING OBJECTIVES

At the end of this module you will be able to:

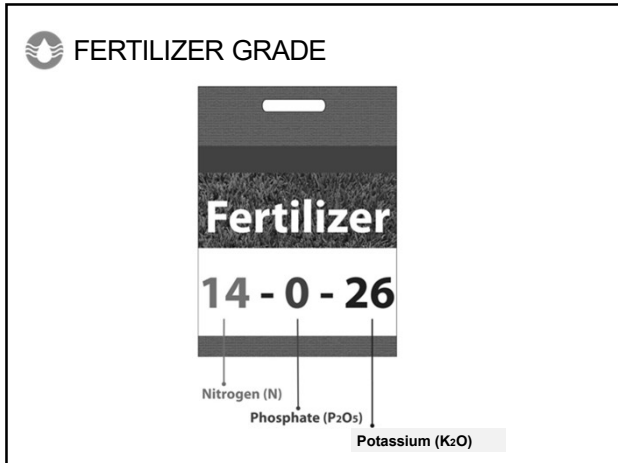
1. Define fertilizer and terms associated with fertilizers.
2. Interpret and apply the information on a fertilizer label.
3. Calculate the amount of fertilizer to be applied according to the recommended rates.
4. Implement practices to avoid runoff and leaching of fertilizers.
5. Explain how to properly store fertilizer and clean up spills.

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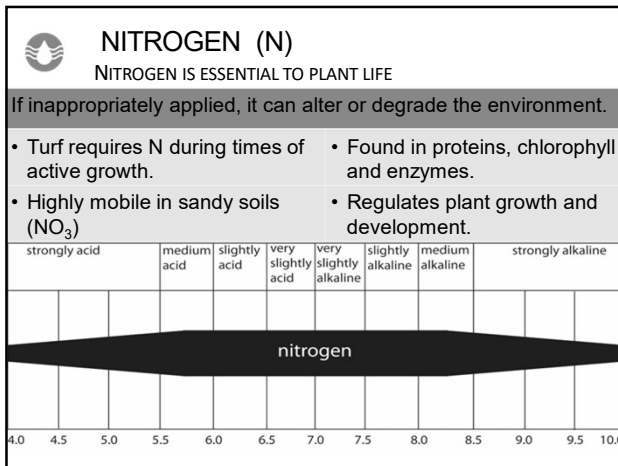


 **FERTILIZER**

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NITROGEN SOURCES

Form	Quick or Soluble	Slow or Controlled
Organic	Urea (synthetic)	Bio-Solids
Inorganic	Ammonium nitrate Ammonium sulfate Ammonium phosphate	Urea types: Sulfur coated (SCU) Polymer sulfur coated (PCU) Formaldehyde products Ureaform Materials Methylene Methylenediurea Dimethylenetriurea Triazone

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NITROGEN SOURCES

Quick or Soluble

- Typically have about a 30-day response period.
- Readily dissolvable in water and are often applied dissolved in water through a sprayer.
- May also be applied in a granular form.

Slow-Release

- Release nitrogen at a rate more consistent with plants' needs
- Release N at a rate more consistent with plant's needs
- Extend availability.
- More efficient use of Nitrogen
- Usually more expensive than soluble fertilizers.

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SLOW- OR CONTROLLED-RELEASE

ENVIRONMENTAL INFLUENCES ON NITROGEN

Release mechanisms include:

- Microbial action
- Hydrolysis
- Temperature
- Osmotic diffusion



D. Caldwell

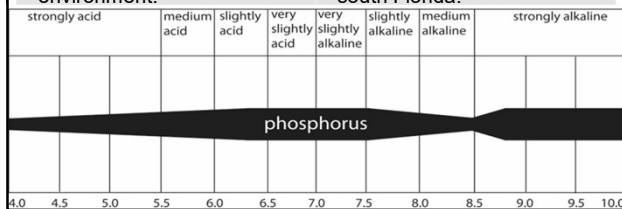
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PHOSPHORUS (P)

Fertilization of Grasses and Ornamentals:

- Should be applied based on soil and/or tissue test.
- Established turf and ornamental needs are low.
- If inappropriately applied, it can alter or degrade the environment.
- Often ample in plant-available form in central and south Florida.



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FDACS PHOSPHORUS RULE

FDACS Fertilizer Rule limits use:

0.25 lb 1,000 ft ² per application	0.5 lb 1,000 ft ² annually
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POTASSIUM (K)

Potassium is similar to a “multi-vitamin” for turf/ornamental plants

- Improves drought/cold tolerances and disease resistance.
- Aids in producing a deep root system and plant resiliency.
- Mobile in sandy soils, but not a pollutant.
- N:K ratios: 3:1, 2:1 or 1:1.

strongly acid	medium acid	slightly acid	very slightly acid	very slightly alkaline	slightly alkaline	medium alkaline	strongly alkaline					
4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0

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MAGNESIUM (Mg)

- A magnesium deficiency may be found in many parts of the state.
- Helps activate many plant enzymes needed for growth.
- May affect landscape plants and palms.
- Soil application treatment to deficient palms provides effective, long-term results.

strongly acid	medium acid	slightly acid	very slightly acid	very slightly alkaline	slightly alkaline	medium alkaline	strongly alkaline					
4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0

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DETERMINE NITROGEN SOURCE / RATE GRANULE OR LIQUID FORMS OF N

Quick or Soluble	Slow or Controlled
Nitrate-N	Sulfur Coated Urea (SCU)
Ammonical-N	Urea-Formaldehyde
Urea – N	Ureaform
Other water soluble N	Polymer Coated Urea (PCU)
	Biosolids (Note N:P ratio)

FDEP recommends applying no more than the following rates for **soluble N*** and **slow-release N**.

Soluble: 0.5 lb N / 1000 ft²

Slow Release: 1 lb N / 1000 ft²

*where it is permissible, up to 0.7 lb of the nitrogen in the application may be in **soluble** form according to UF/IFAS Research
Rule 5E-1.003(2) Labeling Requirements for Urban Turf Fertilizers; EDIS Pub. #SL21

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CALCULATION TO DETERMINE WHAT IS THE SLOW-RELEASE PERCENTAGE (%)?

14 - 0 - 26

% of Total N as
Slow-Release Nitrogen (SRN) =

$$\frac{7}{14} \times 100 = 50\%$$

Guaranteed Analysis	
TOTAL NITROGEN (N)	14.00%
14.45% Urea Nitrogen (N)*	
SOLUBLE POTASH (K ₂ O)	26.00%
SULFUR (S) Total	19.70%
10.5% Free sulfur (S)	
9.20% Combined sulfur (S)	
IRON (Fe) Total	0.96%
0.19% Water Soluble Iron (Fe)	
MANGANESE (Mn) Total	0.48%
0.1% Water Soluble Manganese (Mn)	
DERIVED FROM: Polymer Coated Sulfur Coated Urea, Sulfate or Potash, Iron Oxide, Manganese Oxide.	
CHLORINE (Cl) Max	2.00%
*7.00% Slowly Available Urea Nitrogen from Polymer Coated Sulfur Coated Urea	

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FERTILIZER CALCULATOR SLOW-RELEASE NITROGEN – 1 LB / 1000 FT² RATE

Example:

	6% N	10% N	12% N	15% N	16% N
Big-O-Bag Fertilizer™ 16-0-8	1,000 ft ² 16.5 lbs	10 lbs	8.25 lbs	6.5 lbs	6.25 lbs
70% Quick/Soluble N	1,200 ft ² 20	12	10	8	7.5
	1,500 ft ² 25	15	12.5	10	9.25
30% Slow/Insoluble N	2,000 ft ² 33.25	20	16.5	13.25	12.5
	2,500 ft ² 41.5	25	20.75	16.5	15.5
3,000 ft ²	50	30	25	20	18.75

1 lb. constant

$$100 \div 16 = 6.25 \text{ lbs.}$$

% N

Total fertilizer to get 1 lb N

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HOW MUCH FERTILIZER PER 1000 FT²?
SLOW RELEASE

Example: 15-0-15

$100 \div 15 = 6.6 \text{ lbs.}$

5.6 lbs of other materials
1 lb of Nitrogen
6.6 lbs of total fertilizer
6.60 LBS

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HOW MUCH FERTILIZER PER 1000 FT²?
QUICK RELEASE NITROGEN – NO MORE THAN 0.5 LB. / 1000 FT²

Example: 46-0-0

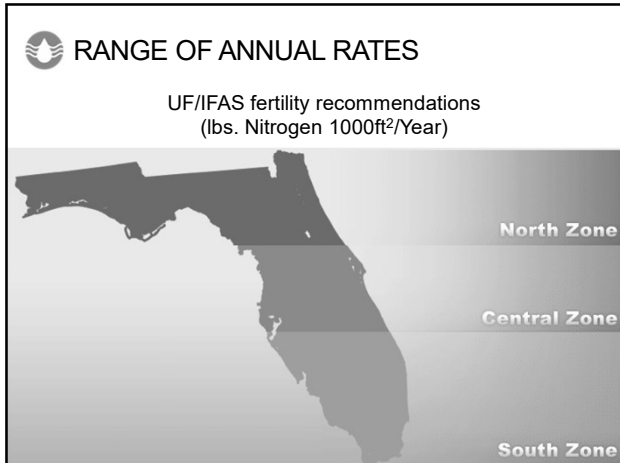
$50 \div 46 = 1.1 \text{ lbs.}$

0.6 lbs of other materials
0.5 lbs of Nitrogen
1.1 lbs of total fertilizer
1.10 LBS

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RECOMMENDED FERTILIZER RATES

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RECOMMENDED RATES FOR FLORIDA

Nitrogen recommendations (lbs. N / 1000 ft² / year)*

Turfgrass	North	Central	South
Bahiagrass	1-2	1-2	1-2
Bermudagrass	3-5	4-6	5-7
Centipedegrass	0.4-2	0.4-3	0.4-3
St. Augustinegrass	2-4	2-5	4-6
Zoysiagrass	2-3	2-4	2.5-4.5

*Suggested rates based on years of nitrate leaching and turf health research

Rate and timing of N fertilization depends on the turfgrass species, season of the year, level of maintenance desired, source of N applied, and location in the state.

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ANNUAL FERTILIZER RECOMMENDATIONS FOR ESTABLISHED LANDSCAPE PLANTS

Maintenance Level	lbs. N / 1000 ft ² / yr
Basic	0-2
Moderate	2-4
High	4-6

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PALMS HAVE SPECIALIZED NEEDS



- Fertilization of field-grown and landscape palms in Florida, <http://edis.ifas.ufl.edu/EP261>
- Nutrient deficiencies of landscape and field-grown palms in Florida, <http://edis.ifas.ufl.edu/EP273>

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FERTILIZER APPLICATION AND HANDLING

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REVIEW

1. Define fertilizer and terms associated with fertilizers.
2. Interpret and apply the information on a fertilizer label.
3. Calculate the amount of fertilizer to be applied according to the recommended rates.
4. Apply recommended rates.
5. Implement practices to avoid runoff and leaching of fertilizers.

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THANK YOU!