Granular Fertilizers and Helena Products, What is right for you?

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Basic Information for Fertilizers

- Primary Macronutrients: %N:%P:%K or Nitrogen Phosphorus and Potassium (besides C, H, and O)
- Secondary Macronutrients: Calcium, Magnesium and Sulfur. Gain these from soil and fertilizers
- Micronutrients: 8 or 9 critical micronutrients
- These are also analyzed with soil samples
- My opinion used to be: Use fertilizers that contain micronutrients, but that was all small scale...
Get your Soil Tested

- Helena will take and run soil samples for $15-$20 each.
- Benefits: fairly quick turnaround and standard analysis. Bar graphs to show if nutrients are very low, low, medium, optimum or high.
- It seems that our biggest benefit (to the customer) is the quick turn around and rapid results.
Analytical Research Lab at UF

- U.F. will run soil samples: Expect to pay $2 per element requested, Organic matter is $10/sample and all samples must be air dried and screened to pass through a 2 mm sieve (according to the paperwork).
- All samples must be scheduled with the Analytical Research Laboratory for an assigned appointment date. All samples received after the apt. date are returned.
- Expect 4-6 weeks between date request and actual appointment.
Why Have Soils Tested?

- To KNOW precisely what Nutrients are needed and how much.
- Only purchase fertilizers containing those limiting nutrients.
- Helps to avoid toxic levels of minor nutrients, and waste.
- My opinion now is to take a soil sample and see what you need.

- Moving into the presentation: Florida soils are normally high in Phosphates so we will be discussing Nitrogen, primarily. It is 4th behind C, H and O.
$1 Million Question: What do you need in a granular fertilizer product?

- How long of a nitrogen feed is desired?
  - 1 month – typical of most quick release products
    - Ammonium Sulfate (AMS)
    - Urea
    - Ammonium Nitrate
  - 2 months – typical of poly coated sulfur coated products
    - PCSCU- Poly-Coated, Sulfur Coated Urea
    - XCU- Same as PSCU, but improved- Slow Release
    - PolyPlus- Polymer Coated Fertilizer- another brand of PCSCU
  - 3-4 months
    - Methylene Urea
    - Polymer Coated Materials
  - 6 months or Longer
    - UreaForm (Urea Formaldehyde)
    - Polymer Coated Materials
One Month Materials

AMS (21-0-0) Ammonium Sulfate
- Feed time is normally 7-10 days, but effects are seen for roughly 30 days
- Sulfate form of nitrogen
  - Best greening of the choices due to sulfur
- Easiest for plant to take up
- Readily soluble
- Will reduce pH of soil due to chemical process to breakdown nitrogen— not the sulfate component
- Will “push” turfgrass growth
- Feed time is short lived
- Typically a beige color
- High salt index
- Readily leaches through soil profile
One Month Materials

- **Urea (46-0-0)**
  - Typical feed time of 7-10 days, but effects are seen for roughly 30 days
  - pH neutral effect on soils
  - Plant must convert the nitrogen to usable form
  - Slightly less green up of turf, but plenty acceptable
  - Widely used in fertilizer blends
  - Readily soluble
  - Will “push” turgrass growth
  - Typically a snowy white prill
  - High salt index
  - Readily leaches through soil profile & volatilized into the atmosphere
One Month Materials

- **Ammonium Nitrate (34-0-0 or 32-0-0)**
  - Regulated by many local governments and states
    - Restricted use product in many areas
  - Feeds roughly 7-10 days, with effects lasting up to 30 days
  - Most soluble of all forms
  - Will “push” turf growth
  - Will slightly lower pH of soil
  - Typically a brilliant white prill
  - High salt index
  - Readily leaches into soil profile & volatilizes into the atmosphere
Two Month Materials

- PCSCU (39-0-0, 41-0-0, 43-0-0), XCU, or Poly Plus
  - Urea with a thin polymer & thin sulfur coating
  - Economical choice for “slower” feed
  - Differences in coating dictate the quality of the material and feed time
  - Typically the lower the analysis the longer the feed
    - Usually, thicker coating means longer feed, but not always
  - Less “push” for immediate turf growth
  - Coating is subject to failure through application or crushing
    - When this happens, you have a more expensive quick release product (due to the damaged coating)
Three – Four Month Materials

- Methylene Urea (Nutralene, Meth-Ex, 40-0-0)
  - Chemically reacted urea
    - Medium chain reaction
  - Broken down by water and soil microbes
  - Dependable, consistent feed
  - Will not “push/flush” growth of turf
    - 30% is readily available to the plant, remaining 70% feeds for the next 12-16 weeks
  - Typically a light blue color
  - Failure of particle is not a concern
    - Crushed MU will last as long as a prill of MU
Methylene ureas have a distinctly different release pattern. They begin with a small burst of nitrogen which is a result of the fact that every MU contains some free urea and also short-chain polymers which are fairly water soluble.

In the burst phase, which releases about one-third of the available nitrogen over a two- to three-week period, MUs provide quick greenup, which is a desirable trait. This burst also builds momentum for the overall application so smaller amounts of nitrogen being released later are able to sustain excellent color and growth. As will be noted, lower levels of nitrogen later in the fertilization cycle are often exactly what the plant requires.

Further, methylene ureas do not exhibit a response to temperature where they will double their nitrogen output for every 18 degree F increase in soil temperature. There is a slight response to temperature but it is minor compared to a coated product. And, if extreme temperatures slow down microbial activity as the turf goes into “survival mode”, the rate of nitrogen release/availability slows down to further protect the plant.
Three – Four Month Materials

- Polymer Coated Urea (41-0-0, 44-0-0)
  - Polymer coating releases nitrogen through osmosis
  - Release depends on temperature, moisture, coating thickness
  - Good consistent feed in ideal situation
  - Particle failure is a possibility during spreading and traffic over the turf (mower, trampling, etc.)
  - Not a good choice when turf is thin, no cushion is provided and prills break easily under pressure
  - Many good choices available in the marketplace. Haifa, Agrium & Florikote all have different materials available
  - %N is typically related to the release curve, the lower the analysis, the longer the feed potential
  - All “Brands” have different positive points, no two are identical
Here is an illustration of a polymer coated urea behaving perfectly. To set this up, one must select the proper coating thickness as well as the proper amount of nitrogen based on the expected soil temperature during the response period.

Even though the initial response is not particularly good for the first three weeks, after that the polymer coated urea releases a consistent amount of nitrogen each week as long as the soil temperature is close to nominal. If this is the amount of nitrogen required by the turfgrass species, you have an ideal situation.

Response will continue until approximately 80% of the nitrogen has been released, after which time it begins to tail off somewhat, in this case, after the 13th week.
However, PCUs are very dependent upon soil temperature for their release rate. For every 18 degree F change, the release rate will either double (increase) or be cut in half (decrease). So, if at week 28 the soil temperature kept increasing and peaked at only 9 degrees higher, the release rate would continue to climb until it equilibrated at a point 50% higher than what was originally desired.

Two things happen when the release rate is increased by 50%. First, the plant will be getting more nitrogen than it actually needs if the lower temperature is where we wanted to dial in the release rate. Second, the application will hit its 80% nitrogen delivery mark at the 77-day point rather than the 91-day point, essentially losing two weeks worth of feeding.
If the temperature increases by 18 degrees F and the release rate doubles, the plant will receive twice as much nitrogen as it needs and the effective feeding time will be reduced by as much as three weeks. On the other hand, if the temperatures never reach the desired level, the proper amount of nitrogen release will not be attained.
6 month and Longer Products

- **Urea Formaldehyde (UF, 39-0-0), (Nitroform, Bluechip)**
  - Long chain chemically reacted urea
  - Can last up to 12 months or longer
  - Very suitable for turfgrass growth cycle
  - Broken down by soil microbes
    - Microbes are active when turf is growing
  - Failure of particle is not a concern, no coating to break
    - Similar to MU – Particle reacts the same whether whole or crushed
  - Dark Blue in color
  - Very stable in the soil solution
Why Does all of this Matter?

- Quick release materials will “push” or “flush” growth
  - Requiring more frequent mowing following application
  - Leading to more erosion triggers on slopes, including....
  - More traffic on turf
- Quick release materials have more opportunity for loss of nitrogen
  - Through leaching and...
  - Through volatilization of the nitrogen = less for the plant
  - Nitrogen can move to bodies of water, creating other issues
- More frequent applications needed to maintain health
  - Monthly to keep a consistent feed to turf
- Typically, quick release is necessary to “jumpstart” turf and to trigger the growing in of thin areas
Why Does that Matter?

“Technology” fertilizers – slow release materials
- Provide a consistent slow feed to turf
- Better for overall health of plants
- Slow release is Comparable to: A Buffet vs. Steady Diet
  - Similar to a human over eating and living off of the nutrients for extended period vs. smaller meals over a long period of time
- Many products available to meet budgets, demands of the turf, turf variety being managed, and environmental conditions
- Typically cost more per application, but lower cost over the season or year of maintenance
  - Less labor to apply – fewer applications
  - Less traffic on turf, and overall health is better
- Best choice for sandy soils in high rainfall areas
Let’s Do Some Math

- **16-4-8 is 50% PCSCU - $12.25/bag**
  - 5.4375 bags per acre to achieve 1 lb of nitrogen/ac
  - $66.61/acre cost
  - Last 8 weeks (best case scenario)
  - That equals $8.33/acre/week for 1 lb of N

- **16-4-8 is 50% Methylene Urea - $14.60/bag**
  - 5.4375 bags per acre to achieve 1 lb of nitrogen/ac
  - $79.39/acre
  - Last 16 weeks (best case scenario)
  - That equals $4.97/acre/week for 1 lb of nitrogen

Does not include labor to apply
2 apps of PCSCU material to get same feed time

*Pricing is for example purposes only, do not reflect true cost*
Factors To Consider When Choosing Fertilizers

- Type of turf being managed – each needs differing amounts of nitrogen to maintain year long health

- Bahia 1.5-2 lbs of nitrogen/year/1000 sq ft.
- Centipede 1.5-3 lbs of nitrogen/year/1000 sq ft.
- St. Augustine 3-9 lbs of nitrogen/year/1000 sq ft.
- Bermuda 3-9 lbs of nitrogen/year/1000 sq ft.
- Zoysia 1.5-6 lbs of nitrogen/year/1000 sq ft.

These are ballpark numbers: It all Depends on level of maintenance, variety within type of turf, rainfall, soil type, soil needs, etc.
Factors To Consider When Choosing Fertilizers

- **Terrain**
  - Slope
  - Water bodies in runoff path
  - Irrigation provided or dependant on rainfall
  - Thickness of turf
  - Ease of application
    - Granular or Liquid Considerations
- **Budget**
- **Environmental Factors**
- **Fertilizer Regulations**
Ways to Improve the Fertilizer Material

- **Nfixx N-Butyl-thiophosphoric triamide (NBPT)**
  - An additive used to reduce the amount of leaching and volatilization of urea based fertilizer components
  - Can be impregnated on dry fertilizer or added to spray mix
  - Minimal addition to cost of material for ultimate return on investment
Ways to Improve the Fertilizer Material

- **HydraHume DG**
  - Humic Acid product to improve nutrient availability to the plant
  - Holds nutrients in place for plant availability, Increases Cation-Exchange Capacity of soil solution (CEC ++)
  - Adds carbon back to depleted soils
  - Aids soil in maintaining moisture
  - Feeds soil microbes for healthier turf
  - Stabilizes all fertilizer components to reduce leaching and volatility
  - Improves soil structure to resist erosion
Ways to Improve the Fertilizer Material

- RenovA
  - Increases nutrient uptake during naturally stressful growth periods
  - Contains only plant derived amino acids
  - Enables plants to resume natural growth following stress from unfavorable conditions
  - Enables a plant to use nutrients more efficiently
  - Acts as a carrier for foliar nutrients and chemicals
  - Use rate for turf – 1 gallon per acre per month
Ways to Improve the Fertilizer Material

Utilize

- Increase chlorophyll production
- Increase photosynthesis
- Improve nutrient acquisition & utilization
- Low use rate (10 ounces per acre)
- Derived from *Ascophyllum nodosum* (seaweed extract) algal extract
Soil Wetting Agents

Soaker Plus

- Promotes healthier soils for healthier, higher quality turf
- Improves soil wetting with vertical & lateral infiltration
- Works as both a preventative and curative to drying soils
- Corrects water repellency problems (less runoff)
- Can be applied from a tank mix or through irrigation systems
- Wide margin of safety
- Remains active 25-40 days
- Use Rate – 6 oz/1000 sq ft. or 2 gals/acre
The End!

- [http://polkhort.ifas.ufl.edu/Power%20Point%20presentations/Fertilize_Appropriately[1].pdf](http://polkhort.ifas.ufl.edu/Power%20Point%20presentations/Fertilize_Appropriately[1].pdf)
- Above is a good power point from Polk County