Practical Considerations for Minimizing Environmental Impact of Turf Nutrition

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Two Ways That Fertilizers Can Pollute

- Leaching through soil profile – this is what nitrogen will do in soils – especially sandy soils.

Two Ways That Fertilizers Can Pollute

- Surface water run-off – this is what nitrogen and phosphorus can do.
Clean Up Properly

• Be careful not to apply fertilizer particles onto sidewalks, roadways, or other impervious surfaces where they might wind up in the storm drain.
200 linear feet X 5 feet wide mower = 1,000 ft²

2,000 grams clippings (dry weight)
3.5% nitrogen in the clippings = 70 grams nitrogen = 0.15 lbs nitrogen

How To Properly Apply Fertilizer

- Use a deflector shield when fertilizing near water bodies or impervious surfaces.

Fertilizing Around Water

“Ring of Responsibility”

Nutrient Import from Sod

- Properly harvested sod comes with ~ ½” of soil. – Nutrients applied at the farm are likely transported with the sod.
- Irrigation during sod establishment can be excessive if guidelines are not followed properly.
Nutrient Import from Sod

Nutrient Export

Practical Considerations

At the onset of each trial, recently cut sod was installed in each of the lysimeters. Sod produced on muck soil for trials 1 and 2 was received from King Ranch (Belle Glade, FL). Soil analysis from the site showed 81.2% organic matter, 0.6% total N, and 0.06% total P. Sod from muck soil and for trial 3 was received from TJ Turf Farms (Delray Beach, FL), and was lower in organic matter, 56.8%, total N, 0.2%, and total P, 0.02%. Sod produced on sandy mineral soil was received from A. Duda and Sons (La Belle, FL). Soil analysis from the site showed 2.6% organic matter, 0.2% total N, and 0.0% total P. All soil analyses were conducted by A. and I. Southern Agricultural Laboratories, Inc. (Pompano Beach, FL).

- How much does a pallet of sod weigh?
- How much total N and P is contained in a pallet of sod?

<table>
<thead>
<tr>
<th>Pallet Weight</th>
<th>% Nutrient</th>
<th>Lbs/Nutrient</th>
<th>Ft²/Pallet</th>
<th>Lbs/Nutrient/1,000 Ft²</th>
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<tbody>
<tr>
<td>Mineral</td>
<td>2800</td>
<td>0.2 %N</td>
<td>5.6</td>
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<tr>
<td></td>
<td>2800</td>
<td>0.02 %P</td>
<td>0.56</td>
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<tr>
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<td>0.6 %N</td>
<td>12</td>
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<tr>
<td></td>
<td>2000</td>
<td>0.06 %P</td>
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Impact of Fertilizer Applications to Semi-Dormant and Dormant Lawn Grasses on Environmental Quality

Nutrient Import from Sod

- Avoid fertilization of newly laid sod for 30 – 60 days.
  - Sufficient nutrients likely exist.
- Encourage sod installers/landscapers to inquire about the timing of the last farm-applied nutrients.
  - Use ranges rather than specific dates
    - < 2 weeks = no fertilizer for 60 days
    - 2 – 4 weeks = no fertilizer for 30 – 60 days
    - > 4 weeks = no fertilizer for 30 days
  - This could prove burdensome for less “tech-savvy” producers.

- In some regions of the US, waste products are being used on sod production fields with the intent of exporting nutrients into the urban environment where they will be used by the turf.
\[ GP = \ln \left( \frac{1 + \frac{e^{100GP}}{sd}}{1 + e^{100GP}} \right) \]

GF = growth potential
obs\(T\) = observed temperature (F)
opt\(T\) = optimum turf growth temperature (F)
sd = standard deviation of the distribution
(sd\(warm\) = 12, sd\(cool\) = 10)
e = natural logarithm base 2.718282…

**Fertilization** — Apply 1 to 2 pounds of nitrogen per 1,000 square feet in the spring, and 2 to 3 pounds of nitrogen in the fall. Slow-release fertilizers containing water insoluble nitrogen are preferred (see PM 1057, Maintenance Fertilization of Turfgrasses). When farm grade (water soluble) fertilizers are used, do not apply more than 1 pound of nitrogen per 1000 square feet in one application.
Figure 5. Percentage of applied N released from selected nitrogen sources over 189 day soil incubation.

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Estimating Release Properties of Slow-Release Fertilizer Materials

Dr. Jerry Sartain

Getting a Response...

- Research shows that you need 0.3 lbs / 1,000 ft² of available nitrogen to see a response in turf.
Practical Considerations

- Timing of application of enhanced efficiency (SR) nutrient sources should coincide with periods of active growth potential.
  - The "release period" should not extend beyond periods of active growth.

- Healthy, dense turf is the key to minimizing environmental impact of applied nutrients.
  - As the health of the plant deteriorates – one can expect problems.

- Nutrients must be applied based on the plant’s ability to assimilate them.
  - This should supersede any calendar-based regimen.

Arrow denotes fertilizer application dates.

SR Nitrogen Source Study – Jay, FL