

**CUTT**

## Healthy Ecosystem

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# Improving Soil Test Recommendations for Turfgrass

*Summary report on the project for 2008*

### Purpose of Project:

**S**oil testing can be one of the most useful ways to determine the amount of nutrient (phosphorus, potassium, calcium and magnesium) and pH modification that is needed to produce a healthy turfgrass stand. Soil testing may also be a best management practice used to reduce the risk of phosphorus runoff. Fertilizer recommendations based on soil testing are developed from years of turf performance-soil test calibration research. Making nutrient recommendations base on soil test calibration research requires that around 20 sets of data are collected, a set being one location for one year. There has been a lack of current soil test calibration studies especially when one considers newer varieties and contemporary fertilization practices. Thus, the purpose of the project is to improve the Cornell University fertilizer recommendations made by the Cornell Nutrient Analysis Laboratory by conducting soil test-turf response studies with newer varieties managed under various management practices on several sites across New York.

### 2008 Update

This is the seventh year of this long-term research and extension project. Three study sites included the Robert Trent Jones Golf Course at Cornell University and two other locations around New York (Bethpage golf course on Long Island, and Lake Placid Resort Club in the Adirondacks,). The study at each site involves the cooperation of the investigators with extension field staff and on-site cooperators.

Sites were selected because they initially had both a low level of phosphorus and potassium. The sites have different soil textures (sandy to silt loams) but the same turfgrass species/varieties. All sites were seeded with a mixture of 70 % Kentucky bluegrass, 20 % perennial ryegrass and 10% fine fescue, seeded at a rate of 4-lbs/1000 sq.ft. To create a wide range of soil nutrient levels at each site, 3 levels of phosphorus (P) and potassium (K) (1/2 X, 1X and 2X the soil test recommendation) were applied coupled with 3 different nitrogen levels (2, 4, 8 lbs N/1000 sq.ft./yr), an unfertilized control and a high rate of N, P, and K. Three repetitions of

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each treatment were included for each site. Starting in 2005, half of each P and K plot was also fertilized with 4 lbs N/1000 sq.ft./yr. Turf performance was evaluated monthly by standard measurements of turf quality, density, pest infestation when evident and other special methods based on turf use. Quality is based on percent of weeds, bare, and turfgrass, along with overall appearance. Soil nutrient levels, clipping yield and tissue samples were collected two times (summer and fall) during the year. Soils and clippings will be analyzed at the Cornell Nutrient Analysis Laboratories for analysis of N, P and K (and 15 other elements for the foliar analysis). Turf performance versus soil and tissue nutrient values will be correlated to determine the optimum performance based on soil test levels. This will require evaluating 1,800 soil sample results (for K and P), 1,800 clipping samples results for 17 elements, 1,800 clipping yield values and about 4,100 turf quality values. This will be accomplished over the winter of 2008-2009 with anticipation of making changes to the Cornell Nutrient Analysis Laboratories

turfgrass recommendations in 2009.

Results for the first part of the study found that application of P and K at all sites did not affect turfgrass quality while the application of N improved turfgrass quality. Soil P levels (4.2 lbs/acre) were identified below which a tissue P content or quality response is likely. These levels were in line with current soil test recommendations (though twice as high). Similar levels for soil K were not identified indicating that soil K was adequate (although deemed low by current soil test interpretation). The application of N increased tissue K content, but application of K alone did not. Tissue levels of N, P, and K content were not well correlated with quality. The results of this study suggest current soil test K and P interpretations are too high and should be re-evaluated, and P and K application recommendations may need to be based on N application amount. The additional data will allow us to make substantial improvements to the fertilizer recommendation for turf in New York.

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### New York State Turfgrass Association Calendar of Events



#### 2009

- January 7-9**      **Empire State Green Industry Show**  
Rochester Riverside Convention Center, Rochester, NY
- January 19-23**    **Cornell Turfgrass Short Course**  
Cornell University Campus, Ithaca, NY
- February 23-25**   **Cornell Turfgrass Advanced Short Course**  
Cornell University Campus, Ithaca, NY
- February 24-25**   **Southeast Regional Conference**  
Holiday Inn Suffern, Suffern, NY
- March 2**            **Western Regional Conference**  
The Millennium Hotel, Buffalo, NY
- March 11**          **2009 Turfgrass Advocacy - NYSTA's Lobby Day**  
Empire State Plaza, Albany, NY
- March 19**          **Adirondack Regional Conference**  
Crowne Plaza Lake Placid Resort, Lake Placid, NY

#### 2010

- January 6-8**        **Empire State Green Industry Show**  
Rochester Riverside Convention Center, Rochester, NY

