Purpose of Project:

Soil 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
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.