CORNELL Turfgrass
Your Weekly Link to Turfgrass Information!
Short CUTT

Gazing in the Grass

Frank S. Rossi, Ph.D.

Warm and now wet conditions across much of the Northeast have changed concerns to excessive top growth, persistent leaf wetness and increases in foliar disease pressure. With a calendar month left of Spring weather it looks like Summer is coming with an early surge. Temperatures along the coast are now at Normal for the period with North and West conditions 6 to 10 degrees above normal. Clipping yields have increased 2-3 times compared to the last two weeks of growth and with wet weather, maintaining consistent mowing is a primary concern.

When more than 30% of the leaf tissue is mowed off, top growth resumes at a greater rate. Grass plants perceive the "drastic" removal of leaf tissue in one event as extremely stressful and respond with what can be called "compensatory growth". This phenomenon is studied in animals and can be applied to all biological organisms. Simply it is an increased growth rate from acute stress in this case too much leaf tissue removed. *After removing more than 30% of grass leaf tissue, growth rate increases and will require more frequent mowing in the short term.* Other options include raising of the mowing height in Spring to compensate for the increased growth rate, inability to mow, or poor mowing conditions. Avoid rates of soluble N fertilization above 0.3 lbs/M(=1000sqft) in single application and when using granular products for extended release use sources with higher percentages of slow-release N. This will minimize the typical growth surge that occurs under these conditions in Spring.

The warming soils are now regularly contributing to the N needs of grasslands. Soil temperatures greater than 60F with adequate moisture provide ideal conditions for soil microbial activity. This microbial activity includes, but is not limited to, processing of organic matter and release of nutrients including N for growth. Also, N fertilization at this time is best in moderation as the N supply rate from soil organic matter is not well understood. N release from OM can be excessive on grasslands established over 25 years when adequate moisture is available. Older turf areas (>25 years) need less N than younger swards (0-15 yrs). Grasses have an enormous nutrient and water scavenging ability that is at peak performance under the current conditions. Now's the time for traffic! Now's the time the turf will recover rapidly, as will weeds when voids and disturbance are common. Monitor growth rate to enhance decisions.

Frequently Asked Questions (FAQ):

Does the turfgrass industry have a defensible rate of Nitrogen required to produce a functional and aesthetically pleasing turf?

Establishing a defensible N rate is required as a result of the offensive assertion that N serves only aesthetic (cosmetic) purposes and leads to increased N loss into surface and subsurface water bodies. Urban grasslands (turf in urban environments) serves a variety human needs and an important role in the functioning of urban environments. *However there is a growing misunderstanding that an urban grassland can provide these benefits with little or no applied supplemental N and that when applied the N pollutes water.*

Cornell University has been conducting research on Long Island's groundwater resources for over 50 years as it relates to potential contamination from chemicals and fertilizers applied to grasslands. In those 50 years the Cornell Turfgrass Program has conducted 12 studies and three large scale nutrient education and reduction programs on Long Island to preserve water quality. In fact, a comprehensive N management review was conducted for Suffolk County in 2010 and is available @ http://healthylawns.suffolkcountyny.gov/bmps/FinalReport_Edited_01_19_11.pdf.

The only turfgrass textbook on soil fertility (Carrow et al., 2001), recommends nitrogen fertilizer amounts from an annual 40 to 60 lbs of N per acre for average grassland to 130 to 260 lbs. N per acre for high maintenance grassland. Soil properties have a significant influence on N rate, as does the age of site, drainage, amount of traffic, shade and irrigation. For example, sandy well-drained soils may require more nitrogen, more traffic requires more nitrogen, irrigated lawns need more nitrogen, shady lawns need less nitrogen, older turf areas need less nitrogen, removing clipping requires more nitrogen. In general the higher the expectation of visual turf quality especially when combined with traffic requires more N.

So how can a defensible N rate be determined based on these factors. In short the most responsible method is to work backward from the potential for off-site movement. In this case the data are more specific, reveal the impressive ability grasses have to scavenge for N, and are more dependent on soil type and water movement. Long term studies investigating leaching of N in Michigan on Kentucky bluegrass lawn grown on moderately well drained soil for over 25 years found that annual N rates <100 lbs actual N per acre do not result in N leaching above background levels. Longer term (60-100 yrs) predictive models suggest between 83 and 95 lbs of actual N per acre will eliminate N leaching. More recent research at Cornell University found 20 lbs per acre of actual soluble N could be applied in a single application on a sandy soil with no risk of leaching, poorly drained soils could receive 30 lbs of soluble N before leaching occurred from a single application. Finally, restricting N application in Spring and Autumn when the average air temperatures are below 50F will significantly reduce N leaching when leaching potential is greatest on LI.

The risk of not applying N fertilizer or supplying in an amount too low to sustain growth has also been shown to have negative effects on water quality. Cornell University research conducted on Long Island indicated that when Phosphorus levels in the soil are above 28ppm (>80% of soil samples indicate this level in NY) a turf with low shoot density (inadequate N) will have large increases in sediment runoff and associated P loss to runoff. Additionally, from a climate change perspective research at Purdue University found that maintaining active growing grasslands with proper N fertilization increases carbon sequestration, improves water infiltration during high rainfall events, and does not contribute to increased emissions from mowing.

Therefore, the defensible annual N rate for Long Island is between 80-100 lbs of actual N depending on the age of the turf and clippings management and a single applications of soluble N should not exceed 20 lbs actual N per acre.