Crabgrass: From Valuable Grain Crop to Hated Weed

There are two species of crabgrass that are troublesome weeds in the Northeast. Smooth, or small, crabgrass (Digitaria ischaemum) is a common problem in turf, landscaped areas and container nurseries. Large, or hairy, crabgrass (Digitaria sanguinalis) is more commonly seen in field and row crops.

Crabgrass was one of the earliest grain crops, preceding wheat and other grains in its native lands of Africa and Asia. In the 1880s, crabgrass was intentionally introduced into the US to serve as a drought-tolerant forage crop for cattle in the south. When other nutritious crops replaced crabgrass, it escaped and became a very successful weed!

Crabgrass is probably the most troublesome annual weed that we have, annually costing millions of dollars for control by chemicals and mowings. Despite this intensive level of control, crabgrass continues to be a serious weed in many of the same sites that it is managed, like home lawns and landscaped areas.

Many Unhappy Returns

There are many reasons for the annual return of crabgrass. It has several characteristics of an ‘ideal’ weed. It produces prodigious numbers of nutrient-rich seed. This source of fat and protein is readily consumed by migrating birds and other wildlife in the fall as they prepare for winter. Not all of the seed is completely digested, and birds act as a major source of movement of crabgrass seed to new sites.

Crabgrass is also very ‘plastic’. For instance, a single plant can grow into a large available bare spot on a lawn, producing many tillers and seed heads. However, if many seedlings were to emerge in the same bare spot, the individual plants would be crowded by their neighbors, but in total, the same number of seed would still be produced within the bare patch. This characteristic allows the weed to compensate for variability in germinating seed population to still produce sufficient number of seed to overwinter for the next season.

Crabgrass Management

There are several preemergence herbicides which can be very effective in preventing crabgrass from establishing in the spring. These can be used in turf, landscaped areas, and nurseries, and in the field. Refer to the Cornell Pest Management Guidelines for specific information.

In turf, particularly, there is often a problem with obtaining season-long control of crabgrass with a single preemergent application made in early spring. This is partially due to the long period that crabgrass can germinate. On Long Island, we usually see germination begin in early May and continue into August. It is simply asking too much of a single preemergence application to persist for 3 to 4 months. For this reason, a split application (half applied in April and half or two thirds applied in June) will extend the control period considerably.

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The Water’s Edge

Many turfgrass areas border water features, whether they are golf course fairways or lakeside home lawns. This often raises concern over the potential influence of turfgrasses on water quality and the runoff of fertilizers and pesticides. Therefore, it behooves the turfgrass manager to be mindful of management practices implemented on these critical buffer areas that border water bodies to minimize runoff.

Research has been underway at Oklahoma State University for the last ten years on Bermudagrass buffer strip size and management. Recently the research has focused on the effect of consistent versus graduated mowing heights within a buffer strip. This study evaluated a buffer strip mowed consistently at 2” versus mowing the strip at 1”, 1.5” and 2” within the same strip creating a mowing gradient within the plot.

Runoff amounts and fertilizer runoff were evaluated under natural rainfall and irrigation events. The graduated mowing regime reduced overall runoff water volume over 15 percent and nitrogen and phosphorous losses by as much as 20 percent compared to the single mowing height of 2”. Furthermore the time when runoff occurred was extended by 4 hours on the gradually mowed plots compared to the single mowing height of 2”.

In general, 2 percent of the applied nitrogen and 6 percent of the applied phosphorus were lost to irrigation just four hours after fertilization regardless of treatment. This was determined to be sufficient to cause unacceptable nutrient loading to surface water bodies. Therefore, any effort that reduces runoff amount, even by a small percentage can have a dramatic effect on the nutrient movement from turf adjacent to water features.

While this work was conducted on Bermudagrass there are clear lessons for cool season turf. The ability of various turf heights to slow runoff from occurring and reducing overall volume is worthy of implementation rather than mowing the buffer strip at a single mowing height right to the edge of the water.


K and Soil Testing

Potassium is an important macronutrient that is typically applied in the greatest amount after nitrogen. While the recommended method for determining potassium need is by soil testing, many turfman managers simply assume it is needed and will apply it in similar amounts to nitrogen. Clearly we need to more fully understand if potassium is in fact required to be applied at these rates and it seems getting better soil testing methods for potassium would be a logical first step.

Research at Cornell University has been investigating the use of potassium, especially striving to improve the efficiency of potassium use. The first of several experiments focused on assessing the ability of soil testing methods for detecting differences in potassium levels and if soil potassium levels provide evidence of changes in tissue potassium levels in case of deficiency.

A mixed stand of creeping bentgrass and annual bluegrass putting green turf was grown on a calcareous sand, pH 8.2 and treated with 0, 5, 10, and 20 pounds of potassium per 1000 square feet for three years. The plots all received the same amount of nitrogen and phosphorus. We evaluated five soil extraction methods and found each method was able to detect differences in soil potassium levels albeit to different degrees. In addition, we found that maximum nitrate loading from turf adjacent to water features was reached at soil test values well below what would be considered adequate to maintain healthy turf. This suggests that soil test interpretation may be overestimating need and that soil tests do not correlate with tissue levels in a way that would help identify deficiencies.

Our research has consistently shown that there is much to learn (or relearn) about potassium management. Having precise soil testing methods would be a good first step but it appears that while we can detect differences, there is much work to do regarding whether an application of potassium fertilizer is needed. We believe that the published K:N ratios of 1.05 or 1.25 is likely adequate to maintain high quality turf.