



A Great Summer for Crabgrass

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This year was a great summer for crabgrass. Crabgrass showed up in greater numbers, and in some instances new places, compared to recent years. At the O.J. Noer Turfgrass Research and Educational Facility any place we seeded turf after the beginning of May appeared to be mostly crabgrass by August. In some cases even applications of pre-emergent herbicides in existing turf didn't seem as effective as in other years. What was behind the population explosion?

Summer conditions dictate grass growth

The cool-season grasses adapted for Wisconsin grow best

when air temperatures range between 60-75° F and soil temperatures range from 50-65° F. As temperatures increase above these ranges, leaf and root growth slow down and the lifetime of leaves and roots is decreased. While temperatures may have periodically been above normal, moisture also played a critical role in causing severe crabgrass infestations. In the northern two-thirds of the state lengthy periods of drought combined with high temperatures to reduce cool-season grass growth. In the southern third of the state, rainfall occurred consistently enough so that a drought period was never truly

experienced. In fact, on some days we had too much precipitation which caused localized flooding. Even the bottom floor of our building on campus flooded, something that had not happened in anyone's memory.

Crabgrass is a warm-season grass and grows best when air temperatures are greater than 75 F. Being a warm-season grass it is remarkably efficient at photosynthesis during high temperatures. Cool-season grasses, however, cannot maintain photosynthesis very well at high temperatures because their enzyme system doesn't function well. Crabgrass also has lower water requirements



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than cool-season grasses which allow it to grow and stay green long after our cool-season grasses have become dormant.

Why didn't my herbicide work?

In some cases crabgrass developed in areas that had even been treated with a pre-emergent herbicide. This doesn't necessarily mean the herbicide didn't work. On the contrary, if the herbicide hadn't been applied the crabgrass stand would have undoubtedly been much greater.

Most pre-emergent crabgrass products need to be irrigated into the soil before they are effective. Pre-emergent herbicides work by forming a "layer" of active ingredient just above/around the crabgrass weed seed. The herbicide makes contact with crabgrass roots and shoots as they emerge from the seed, preventing mitosis (cell division) and stopping weed seedling growth. Without the ability to quickly penetrate the soil and develop leaves for photosynthesis, the affected seedling(s) die(s).

In reality the "layer" of herbicide is rarely uniform and the herbicide may be at varying depths in the soil profile due to differential porosities and drainage rates. Moreover, crabgrass seeds certainly do not form a single layer but instead are scattered throughout the soil profile, although seed density declines with depth. Finally, and perhaps just as importantly, not all crabgrass seeds are capable of germinating at any given time. Pre-emergent herbicides ONLY kill germinating weeds; they do not harm dormant seeds. Some seeds are capable of remaining dormant for years. This differential dormancy within the seed population allows a "seed bank" to develop over time. Even if crabgrass hasn't been a problem for several years, conditions which reduce growth and density of cool-season grasses sufficiently to expose soil may stimulate the germination of long-dormant crabgrass seed. Such was often the

case this year.

While drought in the northern part of the state encouraged crabgrass growth, in the southern part of Wisconsin frequent and intense rainfall combined with high temperatures may have been to blame. The wetting/drying cycles overcome the inherent dormancy factors in seed and probably encouraged more

seed to germinate than normal. The high temperatures combined with moist soil may have hastened the natural degradation of pre-emergent herbicides, most of which normally last six to nine months after application. In 2006, it was not uncommon to see crabgrass germinating in August even in areas that had been treated in April.



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One of the local lawn care company operators asked me the other day if they should switch to two applications of pre-emergent herbicide in the future. While long ago they used to apply an early spring application followed by a late summer treatment to catch the second "flush" of crabgrass, they now only apply dithiopyr in spring due to its longevity and ability to provide season-long control.

In the long run

We did see some "breakthrough" of crabgrass in our research plots this year. While control from a single spring time application was still excellent, the emulsifiable concentrate formulation did not provide as good of control as the wettable powder (Fig. 1). In our trial the turf was a creeping bentgrass mowed at one-half inch height. While normally the turf receives two 1 lb N applications per thousand square feet each year, the last application was 1 lb N/1000 ft² applied as a dormant application during autumn 2005.

To return to the lawn care question: Considering two treatments instead of one is very much a

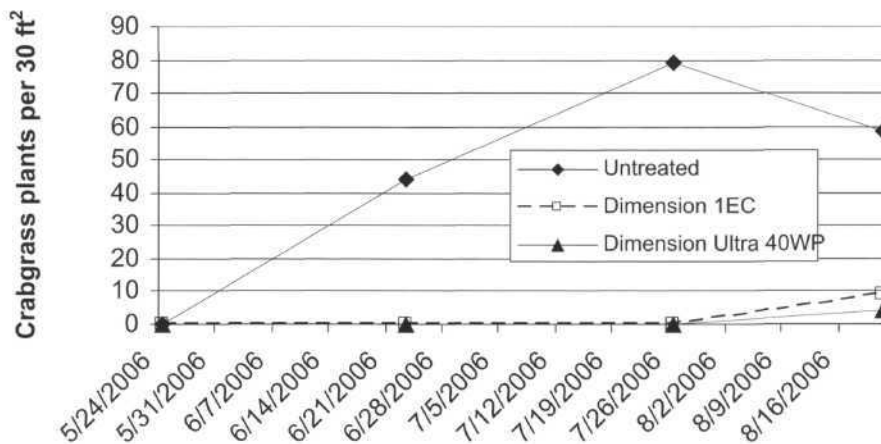


Fig. 1. Crabgrass (*Digitaria* spp.) control in creeping bentgrass turf maintained at 0.5 inch cutting height when treated with one of two formulations of dithiopyr pre-emergent herbicide (Dimension(r)) on 26 April 2006, O.J. Noer Turfgrass Research and Educational Facility, Verona, WI.

financial decision that depends mostly on the need to provide complete versus good to excellent control. Even though we saw a slight breakthrough by August, the EC formulation still provided 85% control while the Dimension Ultra 40 wettable powder provided nearly 95% control. Without being able to predict the summer conditions, my guess is that two pre-emergent applications each year to

control crabgrass on golf course fairways would not be worth the cost. It may be better to spot-treat crabgrass infestations with post-emergent compounds such as quinclorac (Drive®). Maintaining good turf density by using the best cultivar or species along with proper mowing, fertility, irrigation and cultivation will also go a long way towards preventing crabgrass infestations. ♣



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