Growth regulator may help in crabgrass control

By Greg Wiecko

Plant Growth Regulators (PGRs) are typically used to inhibit the growth and/or development of plants. PGRs act by interfering with the biochemical processes responsible for cell division or cell development, especially in organs such as crowns, rhizomes and stolons (i.e. the primary sites of plant growth and development processes).

PGRs are classified into two groups: Type I PGRs inhibit or suppress both development and growth. Type II PGRs inhibit only plant growth. In recent years, more attention has been devoted to Type II. Primo (trinexapac-ethyl) belongs to this group and presently enjoys considerable attention from researchers representing various disciplines of turf science.

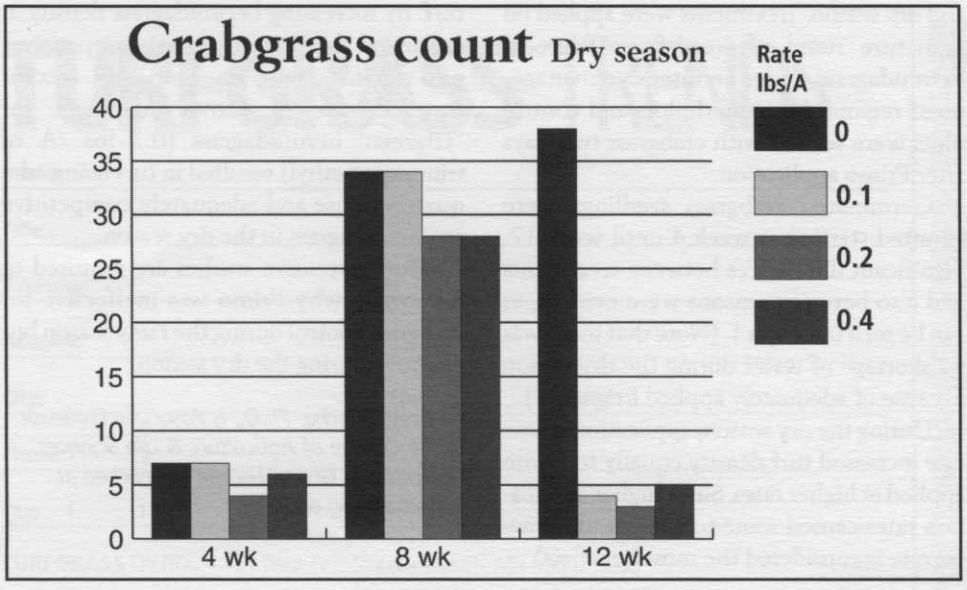
During the 1999 American Society of Agronomy Conference, more than half of all presentations addressing the usage of PGRs in turf focused on Primo which suppresses plant growth by inhibiting gibberellin synthesis.

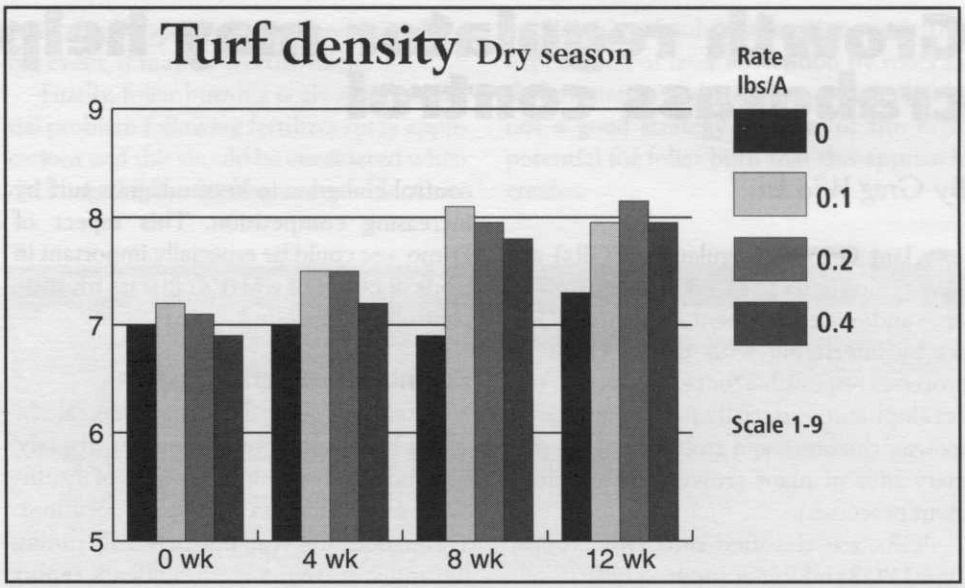
Studies conducted on Guam provide evidence that Primo can also be used to control crabgrass in bermudagrass turf by increasing competition. This aspect of Primo use could be especially important in tropical climates where crabgrass must be controlled year-round.

Bermuda and crabgrass

Maintaining bermudagrass in tropical climates has several limitations. Surprisingly, bermudagrass exhibits symptoms of insufficient solar radiation in tropical locations. Throughout the year, but especially during the rainy season, superintendents report problems typical for bermudagrass grown in shady conditions. In general, these are manifested by reduced density and increased weed infestation. Bermudagrass in general does not tolerate low light intensity and if grown without adequate light, thins out and alters its growth habit from horizontal to vertical, making it more vulnerable to weed, insect and disease infestation and wear.

Application of PGRs such as Primo increases turf density by decreasing the internode distance between blades. Researchers have collected a body of evidence indicating that increased turf density reduces opportunities for weed germination





and infestation. There is also substantial evidence indicating an increase in turfgrass density can be achieved by using the label recommended rate of Primo.

The manufacturer recommended rate of Primo for 'Tifgreen' bermudagrass is 0.75 pts/A (0.1 lbs/A trinexapac-ethyl). However, previous studies in tropical climates on bermudagrass showed an effective rate that was double the manufacturers' recommended rate to provide the desired results.

Consequent studies conducted on Guam examined Primo application at three rates: label recommended (1X), double (2X) and quadruple (4X) rates during both the rainy and dry season. Treatments were applied on a mature stand of weed-free 'Tifgreen' bermudagrass under an intensive management regime. All treated plots and control plots were seeded with crabgrass two days after Primo application.

Germinated crabgrass seedlings were counted starting at week 4 until week 12. Significant differences between treatments and also between seasons were evident, as can be seen in Graph 1. (Note that there was no shortage of water during the dry season because of adequately applied irrigation.)

During the dry season, application at low rate increased turf density equally to Primo applied at higher rates. Since higher application rates caused some turf injury, the lowest rate is considered the most beneficial.

In all instances, denser turf effectively prevented infestation by crabgrass. The number of seedlings found on 5x5 plots dropped from around 30 at week 6 to 5 and below at week 12. On the other hand, Primo appeared rather ineffective during the rainy season. Graph 2 shows that turf density remained unchanged regardless of what rate was applied.

Crabgrass counts during the rainy season were approximately three times higher than the dry season, and did not change substantially over the evaluation period.

It appears that Primo can be used to prevent crabgrass infestation of bermudagrass turf. By increasing bermudagrass density, it enhanced the bermudagrass' competitiveness against crabgrass. The label recommended rate of active ingredient for 'Tifgreen' bermudagrass (0.1 lbs /A of trinexapac-ethyl) resulted in turf being adequately dense and adequately competitive against crabgrass in the dry season.

More extensive studies are required to determine why Primo was ineffective for crabgrass control during the rainy season but effective during the dry season.

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