Nobody Could Have Predicted How Vital PGRs Have Become

BY KARL DANNEBERGER

Plant growth regulator (PGR) use has evolved from a niche product 20 years ago to an integral part of many golf course management programs. In the past, superintendents may have looked at a PGR application or two for the purpose of reducing mowings in tough-to-mow areas. Usually compounds like maleic hydrazide would provide rapid and long-term growth stoppage. The downside was fairly harsh activity on plant growth, including turf thinning, root loss and enhanced disease development.

In the early 1980s, mefluidide (Embark) found a niche on Northern golf course turf for suppressing *Poa annua* seedstalk/seedhead development. The suppression of seedheads resulted in a more aesthetic-pleasing turf and a higher-quality playing surface. Two additional PGRs, flurprimidol (Cutless) and paclobutrazol (Trimmit), quickly followed suit and found a niche in creeping bentgrass/*Poa annua* fairway conversion. Applications were made once or twice a year at a fairly high rate to exploit the differential suppression of the two grasses. Once applied, *Poa annua* growth was suppressed to a greater extent than the creeping bentgrass. This allowed the creeping bent to grow over the top of the annual bluegrass. PGR applications during this time ranged from one to three applications yearly.

The development of trinexapac-ethyl (Primo) in the early 1990s ushered in a new era of PGR use. Trinexapac-ethyl in many ways catalyzed the use of PGRs beyond niche applications. Research showed that trinexapac-ethyl primarily and a few other PGRs could enhance the stress tolerance of turfgrass to both heat and cold, reduce growth with no detrimental affect to the plant and have no effect on disease development. Superintendents rapidly developed season-long PGR programs for both warm- and cool-season turfgrasses.

PGRs and bermuda

In the Southern United States, rapid bermudagrass growth during the heat of summer has always resulted in excessive clipping production. Clippings are also unsightly and when left on the turf may interfere with ball striking. From a physiological perspective, clippings left on the turf cause shading that impairs the photosynthetic efficiency of bermudagrass. PGRs not only reduce clippings through growth regulation, but provide dense bermudagrass turf.

Trinexapac-ethyl, and to a lesser extent paclobutrazol, are often applied on a three- to four-week schedule beginning with the initiation of bermudagrass growth in the spring and continuing through the summer. Where bermudagrass is overseeded in the fall, trinexapac-ethyl is used to slow bermudagrass growth, providing a competitive advantage to the cool-season turfgrass.

On cool-season turfgrasses, PGR programs are implemented to reduce mowing on creeping bentgrass and creeping bentgrass/*Poa annua* turf. Where PGRs are used for clipping reduction, additional benefits include *Poa annua* seedhead suppression and prestress conditioning. Trinexapac-ethyl is applied through the growing season on a biweekly to monthly depending on the rate.

Battling *Poa*

If *Poa annua* seedheads are a concern, mufluidide is applied during early spring and timed to correspond with seedhead emergence. Currently, there is interest in combining trinexapac-ethyl and ethophon (Proxy) for seedhead control. Although based on a limited number of studies, recent research studies and selected experiments on Midwestern golf courses show promise for combining trinexapac-ethyl and ethophon for *Poa annua* seedhead suppression.

In California, the combination of trinexapac-ethyl and ethophon are commonly used throughout the growing season to suppress seedheads and reduce clippings on *Poa annua*. The combination rate used most is .25 ounces of trinexapac-ethyl per 1,000 square feet and 5 ounces of ethophon per 1,000 square feet.

Fifteen years ago, no one would have predicted how integral PGRs are in golf course management programs. Now, PGRs are not only used to reduce mowing costs but to enhance the aesthetics and health of the turf. ■

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