

Updates in Turfgrass Plant Growth Regulator Research. Jeff Atkinson, Turf and Landscape Portfolio Leader, SePRO Corporation, jeffa@sepro.com

Plant growth regulators (PGR) are an important tool for modern turfgrass managers. Recently, Cutless MEC (flurprimidol); Legacy (flurprimidol + trinexapac-ethyl); and Musketeer (flurprimidol + paclobutrazol + trinexapac-ethyl) were registered for use by professional turfgrass managers in California.

Several studies were conducted to demonstrate how these PGRs fit into various California turfgrass systems. A study in Tucson, Arizona evaluated the effect of these PGRs alone and following ethofumesate application on *Poa annua* control, seedhead suppression, and turfgrass quality in perennial ryegrass (*Lolium perenne*) overseeded dormant bermudagrass (*Cynodon dactylon* x *C. transvaalensis*). PGR treatments were applied 9 February and 10 March 2015. Treatments included: Cutless MEC 25 fl oz/A; Legacy 20 fl oz/A; and Musketeer 20 fl oz/A. Ethofumesate was applied in treatments including ethofumesate on 4 and 24 January at 64 fl oz/A. All treatments controlled *Poa annua* relative to the nontreated. Inclusion of ethofumesate into the treatment program improved *Poa annua* control to >85% compared to PGRs alone (60-75%). Seedhead suppression and turfgrass quality followed a similar trend.

A second study evaluated the effect of application date relative to perennial ryegrass seeding on establishment in dormant bermudagrass. Treatments included: Cutless MEC 49 fl oz/A, Legacy 22 fl oz/A, and Musketeer 30 fl oz/A. Treatments were applied to individual plots 2 weeks before seeding (WBS), day of seeding (DOS), 2 weeks after seeding (WAS) or 4 WAS. Treatments applied DOS reduced perennial ryegrass density 60% 4 WAS. Treatments applied 2 WBS or 2 WAS did not affect perennial ryegrass density relative to the nontreated. Six WAS perennial ryegrass density in all PGR treatments were similar. This result suggests turfgrass managers can continue to implement a PGR program during perennial ryegrass establishment without impacting perennial ryegrass density if label recommendations are followed.

A third study modeled the appropriate PGR application interval for creeping bentgrass putting greens utilizing growing degree days (GDD). The GDD model was developed by applying Cutless MEC at 6 and 24 fl oz/A; Legacy at 5 and 10 fl oz/A; and Musketeer at 12 and 22 fl oz/A to individual plots then collecting clipping yield every 2-3 days for a period of 1000 GDD on a base 0°C scale. These data were then used to model and predict the appropriate application interval for these PGRs based on environmental temperatures and accumulation of GDD units. The experiment determined that based on rate, Cutless MEC should be applied 210-270 GDD; Legacy 270-300 GDD; and Musketeer 290 GDD. These values are appropriate for creeping bentgrass putting greens. Additional work should be conducted to establish appropriate intervals for other turf species and turf maintained at different heights of cut.

A fourth study evaluated PGRs as a tool for turfgrass drought management. Creeping bentgrass was grown under a poly-house to exclude rainfall then irrigated with 0, 60, or 80% water lost through ET every 2-3d. Plots not receiving irrigation received no PGR, Cutless MEC 30 fl oz/A,

Legacy 15 fl oz/A, or Musketeer 30 fl oz/A. Although PGR application did not entirely prevent drought stress symptoms from appearing, PGR application did improve retention of green color and improved recovery of turf when irrigation was returned in comparison to turf not treated with a PGR.

PGRs are an important and versatile tool for professional turfgrass managers. Among the many uses for PGRs, the studies presented here demonstrate their role in *Poa annua* management and water use. Further investigation and refinement of their use patterns will improve the stewardship of these technologies and expand their effective use by turfgrass managers.