Poa annua Control in Cool Season Grasses with Trimmit 2SC (Paclobutrazol)

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Introduction

Field research conducted in the eastern United States has shown that Trimmit 2SC (paclobutrazol) exhibits both plant growth regulation and activity on annual bluegrass (*Poa annua*). For years Golf Course Superintendents throughout the Midwest and east coast have been using multiple applications of the old Scotts TGR (paclobutrazol) product on creeping bentgrass putting greens and fairways to regulate biomass and to reduce annual bluegrass populations. Field reports indicate that multiple paclobutrazol treatments applied at very low rates result in plant growth regulator effects including biomass control, darkening of turf and a reduction in annual bluegrass populations. Unfortunately, one of the less than desirable and unusual effects of paclobutrazol applications is the tendency for desirable grasses, particularly creeping bentgrass, to exhibit an increase in leaf texture or leaf widening. This increase in width of individual leaf blades can be an undesirable characteristic particularly on creeping bentgrass greens at private golf clubs with high expectations.

From the years 2000 to 2004 a series of replicated field research trials were conducted in California to determine the potential for Trimmit 2SC to control *Poa annua* in creeping bentgrass putting greens in Northern California, and in bermudagrass fairways over seeded with perennial ryegrass located in the true desert areas of Southern California (Palm Springs). This presentation will highlight the key results of these Trimmit 2SC field research trials.

Trimmit 2SC for *Poa annua* Control in Creeping Bentgrass Putting Greens

The objectives of these two Trimmit/creeping bentgrass field studies were to determine the following: 1) Will multiple spring and fall treatments of Trimmit 2SC exhibit acceptable suppression/control of *Poa annua* in creeping bentgrass putting greens? 2) Will the level of *Poa annua* suppression and control be similar in a coastal and inland microclimate? 3) Is such a program safe for use on high quality bentgrass putting surface? 4) Is Trimmit 2 SC a practical tool for golf course superintendents to consider within the scope of an effective *Poa annua* management program?

Similar field protocols were conducted at two golf courses, Salinas Fairways Golf Course (SFGC) located in the coastal climate of Salinas, California and Poppy Ridge Golf Course

(PRGC) located in the inland climate of Livermore, California. "Dominant" creeping bentgrass practice putting greens were chosen as the trial site location at each course. The creeping bentgrass putting green at SFGC averaged 32.3% *Poa annua* cover on the day of the first Trimmit application on March 30, 2002. The creeping bentgrass putting green at PRGC averaged 14.8% *Poa annua* cover on the day of the first Trimmit application on April 1, 2002. The putting green at SFGC received eight Trimmit applications at rates of 4, 8, 12 and 16 oz/A on March 30, April 26, May 24, June 24, July 30, September 9, October 8, and November 4, 2002. The putting green at PRGC received seven Trimmit applications at rates of 4, 8, 12 and 16 oz/A on April 1, April 28, May 28, September 11, October 9, November 4, and December 12, 2002.

Individual treatment plots at both locations measured 5' x 10' with 2" aisle ways. Treatments were replicated four times in a randomized complete block design. A calibrated CO_2 propelled spray system pressurized to 28 psi and equipped with 11004LP Tee-Jet nozzles applied treatments at a spray volume of 65 gallons per acre. A pacing watch was used for all spray applications to ensure the uniform and accurate delivery of all treatments. At the SFGC location treatment evaluations were conducted on March 30, April 26, May 24, June 24, July 30, September 9, October 8, November 4 and December 11, 2002. At the PHGC location treatments were evaluated on April 1, April 28, May 28, September 11, October 9, November 4, December 12, 2002, and January 23, 2003. Turf color was rated utilizing a 0-10 scale with 0 representing no green color, 6 minimally acceptable green color and 10 very dark green color. Turf quality was rated on a 0-10 scale with 0 representing no live turf and the poorest surface quality possible, 6 minimally acceptable putting green quality and 10 perfect putting green conditions. Turf injury was rated on a 0-10 scale with 0 representing no injury, 3 the maximum level of acceptable injury and 10 dead turf. Percent annual bluegrass cover was estimated with visual evaluations. Percent annual bluegrass control was statistically calculated against the percent *Poa annua* cover in the untreated check plot. Data were summarized and statistically analyzed. Differences between means were determined via LSD.

Eight Trimmit treatments applied at rates of 4, 8, 12 and 16 oz/A during the spring, summer and fall failed to control *Poa annua* in a creeping bentgrass putting green at SFGC located in a cool coastal climate. It is hypothesized that cool coastal climates create an ideal moderate environment for the aggressive year-round growth of *Poa annua*. Under such conditions, *Poa annua* is less susceptible to the plant growth regulating properties of Trimmit. Creeping bentgrass prefers warmer summer conditions for active growth and does not grow aggressively under moderate summer temperatures. These factors combined to change the competitive balance of the grass stand, ultimately favoring the growth of *Poa annua* over creeping bentgrass.

Seven Trimmit treatments applied at rates of 8, 12 and 16 oz/A during the spring, late summer and fall resulted in good control (64% to 77%) of *Poa annua* in a creeping bentgrass putting green at PRGC located in a hot inland climate. It is hypothesized that the much hotter summer temperatures of the inland climate increased the total stress level on *Poa annua* while creating an environment for more aggressive growth of the creeping bentgrass. These two factors combined with the active growth regulation of *Poa annua* with Trimmit, changed the competitive balance of the grass stand, favoring the growth of creeping bentgrass over that of *Poa annua*.

The most dynamic reductions in Poa populations at the inland location were observed following the late summer and fall applications. It is possible that properly timed late summer and fall applications serve to control young emerging *Poa annua* seedlings, which are known to germinate between September and December. Continuing to apply monthly treatments of Trimmit during September, October, November and December is recommended in order to maintain consistent growth regulation of newly emerging Poa seedlings.

When used in inland microclimates with warm to hot summer temperatures, Trimmit would appear to be a very valuable agronomic tool for the suppression/control of *Poa annua* in creeping bentgrass putting greens.

Trimmit 2SC for *Poa annua* Control in Overseeded Bermudagrass Fairways

The objectives of this Trimmit application rate and frequency field trial were as follows: 1) determine the influence of Primo on perennial ryegrass density, 2) evaluate effects of Trimmit on perennial ryegrass surface quality, and 3) compare the effects of Trimmit application frequency (3 versus 4 versus 5 applications) and application rate (8.0 oz/A versus 10 oz/A).

The field trial was conducted on a mixed stand of 328 hybrid bermudagrass and common bermudagrass recently overseeded with perennial ryegrass and located on the fairway of the twelfth hole at the Cove Course at Indian Wells Country Club in Indian Wells, California. This field plot location was chosen for this trial based on the significant *Poa annua* pressure observed on this specific fairway during the spring of 2003. A two-way perennial ryegrass blend consisting of the varieties Stellar and Pearl II was broadcast seeded on October 6, 2003 at a rate of 700 pounds per acre.

Trimmit only program treatments at 8 and 10 oz/A were applied three, four or five times at four-week intervals beginning on December 15, 2003, and compared to a Primo plus Trimmit program receiving sequential Primo applications at 13 oz/A during October and November followed by the described Trimmit treatments.

Individual treatment plots measured 9' x 9' with a 4' x 9' in-plot check. Treatments were replicated four times in a randomized complete block design. A calibrated CO_2 propelled spray system pressurized to 28 psi and equipped with 11004LP Tee-Jet nozzles applied treatments at a spray volume of 65 gallons per acre. A pacing watch was used for all spray applications to ensure the uniform and accurate delivery of all treatments. Treatment evaluations were conducted during November and December of 2003, and then again during January, February, March and April of 2004. Turf color was rated utilizing a 0-10 scale with 0 representing no green color, 6 minimally acceptable green color and 10 very dark green color. Turf quality was rated on a 0-10 scale with 0 representing no live turf and the poorest fairway quality possible, 6 minimally acceptable fairway quality and 10 perfect fairway conditions. Turf injury was rated on a 0-10 scale with 0 representing no injury, 3 minimally acceptable injury and 10 dead turf. Percent annual bluegrass cover and calculated percent annual bluegrass control were rated during March and April 2004. Data were summarized and statistically analyzed. Differences between means were determined via LSD.

Primo Maxx greatly enhanced speed to cover of perennial ryegrass. Two sequential treatments of Primo applied at a rate of 13 oz/A at three-week intervals resulted in a 30% increase in perennial ryegrass cover 35 days after the second application. Primo also greatly reduced the presence of bermudagrass during the first ten critical weeks following overseeding. Suppressing bermudagrass growth and increasing speed to cover of perennial ryegrass are two key components of a successful overseed. Trimmit treatments at the 8 and 10-ounce rates had no statistically significant effect on perennial ryegrass cover when applied to perennial ryegrass that was 70 days old.

Three applications of Trimmit alone at the 8-ounce rate resulted in 77% *Poa annua* control 53 days after the third treatment. Four applications of Trimmit alone at the 8-ounce rate resulted in 83% *Poa annua* control 21 days after the fourth treatment. Three applications of Trimmit alone at the 10-ounce rate resulted in 95% *Poa annua* control 53 days after the third application. Similar trends of 94% *Poa annua* control were observed with four applications of Trimmit alone at the 10-ounce rate. The 10-ounce Trimmit rate showed greater herbicidal activity than the 8-ounce rate with better Poa knockdown and collapse. This effect was particularly noticeable with heavy stands of *Poa annua*. Three applications of the 10-ounce rate performed as well as four applications.

Trimmit alone exhibited almost equivalent *Poa annua* control when compared to Trimmit plus Primo treatment programs. Differences between these two program concepts were not statistically significant. However, there was a trend of improved Poa control with the Trimmit plus Primo program concept. Primo greatly enhanced color and density of perennial ryegrass, while the follow-up Trimmit applications controlled *Poa annua*.

Reducing the number of Primo treatments from two applications to one application, and increasing the number of Trimmit applications to five did not result in an improvement in Poa control. It would appear that sequential Primo applications are an essential component of a successful Primo/Trimmit program.

When used within a properly managed agronomic program, Primo Maxx will improve perennial ryegrass color and density, and Trimmit 2 SC will greatly suppress and control *Poa annua*. This two-prong approach can serve to greatly enhance the surface quality of perennial ryegrass in overseeded bermudagrass fairways.

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