

Many golf superintendents still feel it is a losing battle to try to control *Poa annua*.

Those who have had the privilege of maintaining perfect stands of turfgrasses free of *Poa annua* can appreciate the need and desirability of maintaining stand purity. On putting greens it creates an uneven putting surface, and the prolific seedhead development is unsightly.

Dr. V. A. Gibeault, University of California, Riverside, in a recent publication sums up *Poa annua* in

greens. Grasses mowed between 3/16 and 1/4 inch in height frequently will not withstand this treatment. Bensulide (Petasan, Pre-san, Prefar) has given best control of *Poa annua* under putting green conditions in our tests for the last four years.

the normal practice of applying 15 pounds active ingredient per acre once a year, which was the original recommendation, does not work. Tricalcium arsenate has been recommended in the midwestern area for some years and excellent results re-

free of *Poa annua*, a relatively successful system.

From this study, it can be concluded *Poa annua* can be controlled with Bensulide, a relatively harmless treatment on putting green turf, if diligently and accurately applied. Other pre-emergence herbicides are currently being investigated to determine both efficacy in the control of *Poa annua* and their phytotoxic effects to bentgrass turf.

Post-emergent chemicals. Whether Tricalcium arsenate and Bensulide had a direct effect on established *Poa annua* plants was not necessarily determined from our tests.

It is felt the Tricalcium arsenate did weaken and kill mature *Poa annua* within the first year, and it is possible Bensulide, at the rates applied, had some post-emergence effects as well. It is felt, however, that many of the *Poa annua* plants simply lived out their life and disappeared, and without new seedlings to replace them, resulted in a relatively *Poa*-free turf.

So far, no other post-emergence herbicides have appeared that will selectively remove *Poa annua* from established bentgrass, bluegrass or fescue turf. One new material that has not been labeled nor marketed has shown some promise in this direction and is being actively pursued.

It is a known fact the manipulation of sulfur and phosphorous levels is extremely important in both pre- and post-emergence control of *Poa annua*. Results of seven years of applications of sulfur on putting green bent at our Station has demonstrated variable effects on *Poa annua* populations. When sulfur was applied at 1.15 pounds per thousand square feet annually (50 pounds an acre), all turfgrasses were apparently equally stimulated and *Poa annua* actually increased.

However, when the sulfur was increased to 3.45 pounds per thousand (150 pounds an acre), *Poa annua* was significantly reduced, and especially with variable combinations of phosphorus fertilization. The highest level of sulfur reduced *Poa annua* at the highest level of phosphorous application (four pounds P₂O₅ per thousand square feet per season), but was highly significant in plots where no phosphorous was applied.

Poa Annua: Is It A Losing Battle?

by Dr. Roy L. Goss
Washington State University

this way: "If a turfgrass stand has from zero to 40 per cent *Poa annua* present, the chances of removing it and stimulating the more desired species by cultural and chemical approaches are pretty good. Therefore, it can be considered a weed. If the turfgrass location has from 60 to 100 per cent *Poa annua* perhaps it is not such a bad species after all. Total renovation may be out of the question, so let's consider annual bluegrass a friend and learn to live with it. If the turfgrass location has from 40 to 60 per cent *Poa annua*, the decision must be made whether to take steps to eliminate it or take steps to foster its growth."

I subscribe to this summary made by Dr. Gibeault. Consider then some of the cultural and chemical methods by which *Poa annua* can be controlled or eliminated.

Pre-emergence control. Many chemicals have been tested in research programs at the Western Washington Research and Extension Center at Puyallup for control of *Poa annua* in both putting green turf and lawn type turf.

Not all chemicals for pre-emergence control are equally effective under all systems of management. Many of our pre-emergent chemicals are not registered nor recommended for use on putting

ported from many locations. The problems associated with Tricalcium arsenate, however, make many superintendents very skeptical about its use. One has to be extremely careful if soils tend to be too wet or poorly drained, and other factors can affect the activity of arsenic as well, including phosphorus levels.

Bensulide and Tricalcium arsenate were the basis for a four-year study at Puyallup to determine their affect on *Poa annua* control on Highland bentgrass maintained as putting green. Plot evaluations made on Aug. 20 reveal all plots treated with Bensulide at 15 pounds an acre annually averaged from 47.5 to 65 per cent *Poa annua* in the plot area.

Bensulide, however, applied at 15 pounds an acre initially followed by repeat applications of three pounds active ingredient per acre every three months has maintained plots with less than 10 per cent *Poa annua* after the first two year's treatment. The initial populations of *Poa annua* in this particular instance was over 40 per cent of the plot area.

Tricalcium arsenate applied at the rate of 18 pounds of product (Chip Cal granular) over a four-month period, then maintained with two pounds of product in May and October for maintenance levels have maintained plots nearly 100 per cent

The most significant decrease in *Poa annua* in all plots was found where only six pounds of nitrogen per thousand square feet per season was applied and where no phosphorous was supplied to the grass. Plots receiving six pounds of nitrogen, four pounds P²O⁵ phosphorous, and 1.15 pounds of wettable sulfur per thousand square feet per season had extremely high populations of *Poa annua* as compared with those receiving the highest level of sulfur with or without phosphorous; although the plots that received no phosphorous were nearly 100 per cent free of *Poa annua*.

Plots receiving 20 pounds and 12 pounds of nitrogen per thousand square feet per year with P and no P responded similarly to those receiving six pounds of nitrogen, although *Poa annua* populations are slightly higher in these higher nitrogen-treated plots.

Topdressing and reseeding program. Dr. John Madison has pre-

sented an approach to putting green quality improvement and the elimination of *Poa annua*. His data indicates frequent light topdressings combined with balanced nutrition can significantly reduce or eliminate *Poa annua* under putting green conditions.

The program he has outlined also calls for elimination of aerification. The holes left after aerification become planting sites and establishment routes for *Poa annua*.

Other *Poa annua* control possibilities:

- Use of vigorous varieties. Many of our highly stoloniferous bentgrasses are vigorous enough to provide a dense turf that resists *Poa annua* invasion. These should be closely analyzed. One hundred fifty-seven different bentgrass cultivars are being observed at the Puyallup Station for any such traits.

- Overseeding. Superintendents who provide bentgrass seed to establish turf increase the possibilities of maintaining higher bentgrass

populations or other grass populations as well. This constant replenishment of seed supply will produce some competition for the abundance of *Poa annua* seeds produced.

- It is essential to control turfgrass diseases to help keep down *Poa annua* populations or eliminate it. Spots killed or severely injured by turfgrass diseases are excellent establishment sites for this weed.

- Balanced nutrition. If you wish to maintain good stands of *Poa annua*, maintain high phosphorous levels and adequate nitrogen; but if you wish to eliminate *Poa*, you must severely reduce phosphorous applications and maintain good nitrogen, potassium and sulfur levels.

- Make no mistakes in judgment that will injure or otherwise kill your turf.

One final caution should be made. If you are practicing overseeding, do not apply pre-emergence chemicals unless judicious timing is worked out. □

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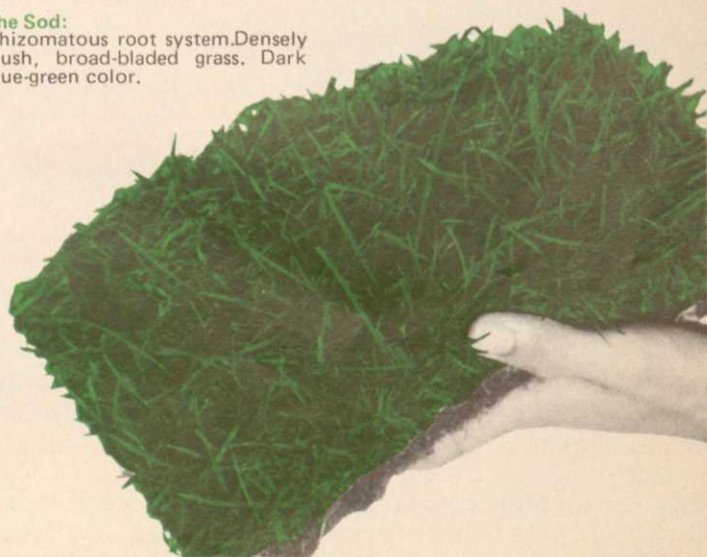
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