

# *A Positive Approach to Poa Annua Management*

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Over the last decade and a half numerous articles have been written on the various means of controlling *Poa annua*. The earliest talked about literally cutting *Poa annua* plants out of the putting greens. An article that appeared in *The Bulletin of the Green Section of the United States Golf Association* in July, 1922, stated that *Poa annua* was removed "with a knife, with a hole cutter, with a chisel or any other tool that may best suit according to the size of the patch infested."

How then did *Poa annua* develop into such a major turfgrass species from its meager beginnings as a common weed? The answer principally lies in cutting height and water. With the advent of improved irrigation systems and the desire for closer cut turf, *Poa annua* populations increased and took over the major playing areas of the golf course. In the beginning this takeover was encouraged because *Poa* provided a beautiful playing turf for several weeks of the year, usually in the spring and fall. The *Poa annua* was the one grass species that could thrive under the close cuts, excessive water and the compacted soil resulting from foot traffic on continually moist soils. The heavy soils used in early construction techniques only aided its development. Therefore, when the *Poa annua* turf thinned during the summer and membership pressure dictated a green grass cover at all times, extensive study was given to means of controlling *Poa annua* on large turf areas.

## **Poa Annua Controls**

From the 1930s through the 1950s, lead arsenate was widely used for *Poa annua* control. The mechanism by which the arsenical selectively suppressed the *Poa* was not completely understood at that time. Practical experience, however, had shown that it did in fact work, so lead arsenate was used for *Poa annua* control on greens. On fairways its use was usually impractical and was not extensive.

During the late 1950s the use of tri-calcium arsenate was being tested and studied. Its erratic early performance would result in fur-

ther testing until finally it became widely publicized and used by some superintendents, especially in the mid-west and Eastern areas. During the 1960s, pre-emergent crabgrass killers (Balan, Dacthal, Pre-San, and Betasan) were shown to control *Poa annua* seed germination. They worked reasonably well and their use for *Poa* control has now become rather extensive.

In recent years the growth retardant chemicals (Endothal and Po-San) have come into use for *Poa annua* control. Principally, their mode of action is to limit seed head formation and thus reduce the potential for a re-growth from seed which is the primary means of *Poa annua*'s dissemination.

Finally, a relatively new material called Kerb is finding popularity for *Poa annua* control on many bermudagrass fairways today. It has performed very well.

Whatever means of chemical control used, the goal of the user is the same—to eradicate *Poa annua* so its inherent weaknesses do not give the type of playing conditions that the membership finds objectionable. As with most chemicals, an understanding of how it behaves is essential to success.

## **Poa Annua—The Weed**

Exactly what is *Poa annua* and why is it considered a weed? Annual bluegrass (*Poa annua* L.) is a native plant of Europe. Over centuries of emigration it has distributed itself over all the world as a contaminant in seed mixtures. It is sometimes referred to as annual meadowgrass, winter grass or simply *Poa*. Its leaves are light to yellowish-green in color; the plant is low growing; it is capable of producing seed heads at various times during the growing season and at extremely low cutting heights. *Poa annua* has the unique ability to produce viable seeds capable of germinating only one to two days after pollination. It has been reported that a single *Poa* plant has produced 360 seeds in a four-month period.

Why then is *Poa annua* considered a weed? In most areas and under certain conditions,



*Comparative pictures of balls on putting greens. Excellent lie with a ball resting on *Poa annua* putting green turf.*

annual bluegrass is a weed. Simply defined, a weed is a plant that is out of place.

On putting greens in the South a heavy *Poa* population during the transition months tends to shade the desired bermudagrass species and slows its emergence from its winter dormancy. In some cases this results in a painfully late and slow transition resulting in poor playing conditions. In the North it is considered a weed because of its competition with bentgrasses and Kentucky bluegrasses for the dominant grass species on the main playing areas of the course (greens, collars, tees and fairways). When *Poa annua* is only a small percentage of the total grass population on the course there are few problems. However when the population becomes a majority, the possibility exists that the *Poa* could be thinned out or entirely lost during the summer stress period. This poor summer performance is the principal reason why *Poa annua* is considered a weed under most cool-season turfgrass cultures.

#### Other *Poa Annua* Weaknesses

Exactly what are other annual bluegrass weaknesses? When subject to severe cold, drought or heat, *Poa annua* has a difficult time surviving. Unfortunately, two of these stress factors (heat and drought) often occur during the summer at the height of the golf season in

the cool humid regions of the country. In these areas, some refer to it as "failure grass."

Because *Poa annua* is classified as either a summer or a winter annual, once the plant has died there is no re-growth from its roots or stems. The plant is dead. Any re-growth comes only when the seeds that were disseminated earlier in its life cycle can germinate and grow into mature plants. As stated before, the undependable nature of the grass is its greatest liability, but there are others.

*Poa Annua* is highly susceptible to almost all turfgrass diseases, both summer and winter. The extent of "winter kill" is also greater. In regard to putting qualities, there are times when very heavy seedhead formation causes bumpy, uneven putting surfaces, especially late in the day after mowing. Varietal differences within the species have a similar effect. Different volunteer varieties have different growth rates, growth habits, seeding habits, leaf widths, etc. These factors affect putting qualities.

Although *Poa annua* may not thatch as heavily as bentgrass on greens, it does develop grain and puffyness, especially at higher cutting heights. At lower cutting, it becomes more difficult to hold during stress periods. This grass does not take traffic as well as bentgrass, particularly during high temperatures. Recovery from any kind of stress is also restricted in hot weather. *Poa annua* requires very critical and



*Bentgrass turf; also a fine lie.*

careful management at all times. Even then success can swiftly slip away.

#### **Poa Annua Strengths**

With all these real and apparent weaknesses, why is so much *Poa annua* grown in the cooler regions? Perhaps one reason is that when *Poa annua* is right, it provides one of the best playing surfaces for golf that we have! A good stand of *Poa* forms a fine textured turf of high shoot density, uniformity and quality under almost all cutting heights ranging from 1/8 inch to over one inch. Its leaves are usually shorter, broader, softer and lighter green than most varieties of Kentucky bluegrass. This also makes the grass easier to mow. Field data, along with research has shown that annual bluegrass has a root system comparable to Kentucky bluegrass in density and depth. It can survive and thrive under compacted soil conditions that deter the growth of both bentgrasses and Kentucky bluegrasses. It produces a good supply of viable seed under all cutting heights assuring self-perpetuation. It grows well in the sun or shade and is in fact one of the north's best shade grasses. It is quick to germinate and re-form a turf naturally when conditions are right. It affords an excellent lie for golf balls due to its upright growth habit and strong blade that keeps the ball from nestling down into the turf. It does not thatch up as much as bentgrasses. Except at

the prime seeding time, *Poa annua* can make one of the finest playing surfaces that we have today . . . if it can be kept from dying. See figures 1-5 on the comparative lies resulting from the various turf species grown in the cool-season regions. As the pictures illustrate, *Poa annua* makes for excellent lies equal to or even better than the other grasses. Therein lies the incentive for most superintendents who have accepted the challenge to maintain it.

#### **Managing To Maintain Poa Annua**

Superintendents and their golf clubs often prefer *Poa annua* turf. They find renovation programs too long, expensive, and painful to play during the year. Therefore, the question has been asked, "What management practices can we perform to help the annual bluegrass survive and thrive the year-around?" Following are some steps that we feel can be performed to help make this possible.

(1) **Watering.** Irrigate a lot, in fact every day. In the heat of the summer, syringe once or twice a day depending on the temperature and humidity. With higher temperatures and higher humidity, there is a likelihood of more kill. Also, higher wind-blown spots generally require more watering. In this all-important syringing operation an automatic irrigation system would be a tremendous if not an essential asset.

(2) **pH.** Soil reaction should be in a range



*Comparative pictures of golf balls resting on fairway turf. A close fairway lie on an improved strain of Kentucky bluegrass.*

of 6.5 to 7.0. Not less than 6.0 and not over 7.0.

(3) **Soil Cultivation.** Core (aerate) and thatch (vertical mow) in the spring and fall. This stimulates *Poa annua* seed germination and adds juvenile vigor to the turf.

(4) **Cutting Height.** The optimum cutting height for maximum rooting of *Poa annua* is  $\frac{3}{4}$  to 1 inch. Above and below these heights the root systems become shortened, resulting in less water and nutrient uptake and thus more careful management.

(5) **Nutrients.** Fertilize with materials to keep the phosphorus and potassium values high. Abundant nitrogen but not excessive nitrogen is also required. Fertilize lightly to moderately in the spring and lightly in the summer and push the *Poa* in the early fall. However be certain not to overstimulate the *Poa*, as lush growth going into the winter could bring on possible winter injury.

(6) **Fungicides.** Because *Poa annua* is susceptible to almost all turf diseases, it is essential that a complete fungicide program be followed. Literally, this involves a spring, summer, fall and winter spray program to keep the annual bluegrass healthy when the various disease organisms are working. It is interesting to note that we have observed where systemic fungicides are used in the overall summer disease

program, there appears to be less likelihood of the *Poa annua* thinning. Also, in areas where the annual bluegrass weevil (*Hyperodes weevil*) is active, a good insecticide program must also be followed.

These then are the most important factors in stimulating the growth of *Poa annua*. There are some secondary ones like good air and water drainage; careful use of pre-and post-emerge herbicides; chemical wilt control programs utilizing phenyl mercuric acetate (PMA) (where not restricted); and wetting agents. All of these management practices, therefore, are essential to the good growth and development of *Poa annua* as a year-around turfgrass species.

#### **Conclusion**

The purpose of this article is to reiterate what is already known. *Poa annua* may be a good turfgrass species exhibiting many of the qualities that can make for an excellent playing surface. If a good management program is followed, incorporating the points made in this article, then *Poa annua* has a good chance of being kept all season long. But there is another purpose; perhaps an even more important one. It is to show that no matter what species or combination of grass species grown on a golf course, it is the good management practices exercised by the superintendent that helps the grasses survive and provide the excellent playing



*A fine lie on fairway turf of *Poa annua*.*



*Ball resting on bentgrass fairway turf. Also a good playing lie.*

surface that the membership wants. There was an extremely foresighted statement made in an early 1922 turf article on *Poa annua*: "It is not a scientific problem, it is a practical problem. It is not one of indolence and superficial manage-

ment—it is one of eternal vigilance, of common sense . . . of good management."

Therefore, good management should provide good turf which should result in better golf. Is this not the goal of all of us?