Is My Annual Bluegrass (*Poa annua*) a Perennial, Annual, or Something Else?

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The annual biotype of annual bluegrass (*Poa annua*) and the perennial biotype, *Poa annua* var. *reptans*, are the most troublesome weeds on golf courses in the world. These weeds infest many other highly maintained turfgrass areas, such as home lawns, sports fields, etc. From a management standpoint, it is appropriate to think of annual bluegrass as a group of weeds rather than an individual species. This is because there is a great deal of variation within the *Poa annua* species. There are true annual types and true perennial types, but to add to the confusion there are many intermediate biotypes that can act as either perennials or annuals, depending on environmental conditions.

As a general rule, **the warmer the climate, the greater the proportion of the annual bluegrass population that will be annuals.** Conversely, **cooler climates tend to have more perennial types.** This is because the annual bluegrass species does not have a great deal of heat tolerance. In transitional areas, there are annual and perennial biotypes growing side by side. In addition, perennial types tend to survive better under very high maintenance, such as putting greens, because of water and fungicide inputs.

So how do turfgrass managers determine whether you have the annual or perennial type? One question to ask is, does the annual bluegrass at your site survive the summer? If it does, then the type you have is acting as a perennial. If your annual bluegrass has an explosion of seedheads in the spring and the plant cannot be seen in the summer, then most likely you have the annual type. The fact that the plant cannot be seen in summer is not an absolute determination of the annual type because the plant can go dormant in summer and reappear when weather conditions become more favorable in autumn. Many perennial weeds go dormant in either winter or summer, depending on species.

Why is it important to know whether you have the perennial or annual biotype? From a turfgrass management standpoint, this is *the* critical question. This is **because the annual type is much easier to control with herbicides than the perennial type. Because the annual type must come back from seed every year, turfgrass managers have the opportunity to use a preemergence herbicide prior to annual bluegrass seed germination.** Contrary to popular belief, many herbicides provide very good control of the annual biotype if applied and activated (watered-in) prior to annual bluegrass seed germination. Most of the preemergence herbicides used for crabgrass (*Digitaria* spp.) and goosegrass (*Elusine indica*) control are effective for control of the annual types of *Poa annua*. **Premergence herbicides are not effective for controlling the perennial *Poa annua* types because it does not have to come back from seed.** With perennial types, you always have a mixture of plants of different age growing simultaneously.

The important question to address for management of annual types of *Poa annua* is when does it germinate? **Annual bluegrass can germinate over a wide range of environmental conditions.** And this is probably the most important reason why annual bluegrass is so prevalent in turfgrasses. **In warmer climates, where the annual types are more common, previous research has shown that germination can occur throughout the winter. However, research has also shown that a majority of the annual types germinate in the autumn.** This may sound confusing because annual bluegrass is not obvious until the spring, when seedheads start to form, or in the winter where warm-season turfgrasses go dormant. In addition, small annual bluegrass plants are very difficult to see because the seedling is tiny and seed germination usually occurs when the turfgrass species is actively growing or at least has not gone dormant.

Consider the following data from a research trial conducted at North Carolina State University. This trial was conducted to help determine the ideal application time for preemergence herbicides for control of the annual types of *Poa annua*. Many herbicides were used in this trial, but only oxadiazon (Ronstar®) at 2 lbs a.i./ac is shown here. This is because oxadiazon is a true preemergence herbicide. If any annual bluegrass seed has germinated, oxadiazon will not provide control. **Note that mid-August and mid-September applications provided excellent control, but applications after mid-September provided very poor control.** This is because between mid-September and mid-October, a large flush of annual bluegrass

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seed germination occurred. We also can interpret these data to say that only about 20–25% of the annual bluegrass seed germinated after mid-October while the remainder germinated prior to mid-October.

Of course, we have to keep in mind that these dates apply for this particular site and other areas with a similar climate. In addition, yearly variations in weather conditions at this site may produce different results in other years. But the point is that annual types of *Poa annua* germinate early in the autumn and a majority of germination occurs in the autumn for many climates.

Comparative Timings of Herbicide Application for Annual Bluegrass Control. North Carolina State University, Raleigh, NC. 1996–97.

Application Date	Percent Control *
August 13	91
September 12	99
October 11	21
November 13	24

* Percent control ratings were recorded April 25 of the following spring.

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with a dark brown border. Gray or brown lesions with or without a dark brown border frequently develop along the edges or margins of leaf blades. A yellow halo occasionally can be observed bordering lesions. Lesions, however, may be the size of a pinhead and very dark brown. These lesions are similar to those caused by the net blotch pathogen, *Drechslera dictyoides.* Net blotch, however, generally is associated with extended periods of overcast and rainy weather of spring. Because leaf spotting pathogens such as *D. dictyoides, Bipolaris sorokinana,* and *Curvularia* spp. can cause leaf lesions and leaf twisting that mimic *P. grisea,* **disease diagnoses based on leaf lesions in the field are difficult.**

In the early morning hours the twisted leaf tips of lesions on the margins of leaves may appear felted, and infected tissues may be gray, dark brown, purple, or yellow. The felted appearance is the result of the production of huge numbers of spores and their spot-bearing stalks known as conidiophores. **The most effective means of positively diagnosing gray leaf spot is to microscopically confirm the presence of the spores.**

From a standing position, the first observable symptom is the appearance of reddish brown or gray colored spots 1 to 2 in. (2–5 cm) in diameter, which could easily be confused with *Pythium* blight or dollar spot, respectively. **There is, however, no foliar mycelium associated with gray leaf spot.** During prolonged hot, humid, and dry weather the dead spots of turf enlarge to 3 to 18 in. (8–46 cm) in diameter. At this point disease symptoms mimic brown patch (*Rhizoctonia solani*). Large areas of turf may collapse in 3 to 5 days. Under less favorable environmental conditions, large pockets of dead turf may require a 3- to 4-week period to develop. Infected stands often develop a bluish-gray hue, which is typical of drought stress symptoms. Hence, perennial ryegrass in roughs or fairways that appear wilted in the presence of good soil moisture is a good indicator of gray leaf spot. The disease is most severe in heat-sink areas, such as south-facing hillsides and knolls. To date, the disease has been restricted to perennial ryegrass, while creeping bentgrass (*A. stolonifera*), annual (*P. annua*), rough (*P. trivialis*) and Kentucky bluegrass, fescues, and bermudagrasses growing in severely damaged perennial ryegrass fairways and roughs have been unaffected.

Another feature of the disease was that **it generally begins and is more destructive in golf course roughs, particularly the intermediate rough where the soil was compacted by cart traffic.** Evidently, the higher canopy in the rough provides a more favorable microenvironment for the pathogen. This is supported by the observation that the disease is generally less severe in low-cut perennial ryegrass approaches and collars.

Cultural management

Research conducted by Vaiciunas and Clarke (1998) showed that **gray leaf spot was less severe as mowing height was reduced from 3.5 to 0.5 in. (7.6–1.5 cm) during low disease pressure periods.** Under high disease pressure, however, mowing height did not impact disease severity. They also found that **nitrogen**

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