

Controlling Annual Bluegrass With Growth Retardants

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Annual bluegrass (*Poa annua* L.) is considered a weed by some and a turfgrass by others. In some cases, these references have been made almost simultaneously. All those that have considered annual bluegrass to be a weed have probably attempted some cultural and/or chemical controls. While admirable successes (usually not using the same techniques) have occurred, others have had disappointing failures and, unfortunately in a few cases, jobs have even been lost.

Regardless of the situation, the ideal control program would cause a gradual reduction of annual bluegrass to a tolerable level. This program must be the combination of cultural management changes and effective chemical control. Ultimately, the necessity for the chemical part of the program would be greatly restricted, and finally eliminated. For the past several years at Penn State University, several growth retrdants (alone and in combination) have been used to reduce annual bluegrass populations in fairway turf. This report is a review of that work.

Seedhead Inhibition as a Control

Initially, most of the research dealt with determining the correct proportions of the growth retardants chlorflurenol (CF-125) and maleic hydrazide (MH) needed to inhibit seedheads. By 1973, chlorflurenol at 0.5 lb a.i./A plus MH at 1.0 lb. a.i./A was concluded to be an appropriate mixture to supress seedheads. Multiple spring applications resulted in a higher percentage seedhead inhibition than single treatments but caused more discoloration. Repeat application was made at approximately one half the initial rate to reduce injury.

Samples taken of the soil under treated turf revealed that the application of chlorflurenol + MH significantly reduced the amount of seed shattered onto the soil during the treatment year, but the amount of seed shattered in previous years was sufficient to allow the stand to be self-perpetuating. In addition, these growth retardants were not found to significantly effect the viability of the seed that was produced by treated plants.

Postemergence Fall Applications

In 1971, experiments using chlorflurenol (0.5 lb. a.i./A) plus MH (1.0 a.i./A) applied in late September (after most of annual bluegrass germination) produced encouraging results. These growth retardants controlled annual bluegrass seedlings and, with the onset of cold weather, reduced the amount of mature plants. During the winter months, all treated turf was severely discolored, but in the spring the desired species had a normal "green-up". In the spring, the surviving annual bluegrass had a significant decrease in seedhead production. Spray dilutions of 70 gallons/acre were necessary to insure adequate distribution of the chemicals to the seedling plants which were under the leaves of older plants.

When the turf population was 30% annual bluegrass or less, overseeding was not necessary. Voids, due to effective control, were rapidly filled in by the desired species. Populations greater that 30% can most effectively be reduced by overseeding after treatment. There is no time delay between treatment and overseeding as chlorflurenol and MH have no preemergence properties. Due to the

lateness of chemical treatment (late September or early October), spring overseeding should be considered, particularly if the overseeded species is Kentucky bluegrass or bentgrass. Regardless of overseeding time, a groover-type seeder should be used to insure good seed to soil contact.

More recently MH applied alone in the fall (1.5 lbs. a.i./A) has reduced annual bluegrass at nearly the same level as when combined with chlorflurenol. In comparison tests, MH controlled annual bluegrass the same as the combination, while chlorflurenol alone was not appreciably different from the check. The main advantage of the combination appeared to be that knotweed and clover were controlled due to chlorflurenol. MH alone did not provide significant broadleaf weed control.

In tests on mixed bentgrass-annual bluegrass fairways, MH (1.5 lbs. a.i./A) has significantly reduced annual bluegrass. Discoloration of bentgrass during the winter months was more severe than that observed on Kentucky bluegrass, however spring "green-up" was not different. When the annual bluegrass in bentgrass fairways represented half or more of the population, a two directional overseeding (bentgrass one way and ryegrass the other) has been used successfully. The ryegrass germinated quickly and competed with the annual bluegrass, but did not compete with the bentgrass once the bentgrass became established. Research to date indicates that the conversion of a mixed bentgrass-annual bluegrass stand to predominately bentgrass is a much more gradual process than converting a Kentucky bluegrass-annual bluegrass mixture to predominately Kentucky bluegrass.

Three consecutive fall applications (with overseeding if necessary) are required for significant annual bluegrass reduction. After three years, the decision must be made concerning continued application or perhaps the initiation of a preemergence program. Application of preemergence materials, however, precludes further overseeding and for all practical purposes eliminates fall aerification programs. Preemergence control is also quite expensive.

What Are The Drawbacks?

Although the cost of applying MH at 1.5 lbs. a.i./A can be justified, this type of control program requires excellent communication with club officials. Due to the discoloration associated with the application of MH (even though it occurs in late fall and winter), it is important that those using the golf course be informed and prepared for the appearance of the fairways.

Spray equipment must be precisely calibrated and functioning properly (new nozzles, proper overlap, etc.). A sloppy application of MH will be very obvious, particularly after severe discoloration occurs with colder weather.

There is evidence that fall application of growth retardant on turf-type perennial ryegrasses has caused stand losses due to winter injury. Therefore, retreating areas that have been overseeded with perennial ryegrasses should be avoided.

Initially, use of MH for annual bluegrass control should be tried on a limited scale (one fairway or part of a fairway) in combination with overseeding. Observation of this area will assist in determining the degree of discoloration at a particular location and the amount of control associated with the injury. Also, any sprayer problems can be identified and corrected before expanding the program. Several golf course superintendents have initiated control programs with fall applied MH and in almost all cases, have decreased the amount of annual bluegrass in their fairways.