## Poa Biology and Control in Turf

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Annual bluegrass (*Poa annua*) is one of the most troublesome weeds in cool season golf turf. It's growth characteristics and taxonomically close relationship to desirable turf species such as Kentucky bluegrass (*Poa pratensis*) makes selective removal very challenging. *Poa annua's* ability to rapidly and prolifically produce seedheads means it can spread quickly, forming ever widening "colonies" that out compete the desirable turf species. Generally, P*oa annua* has a paler colored leaf blade than most desirable cool season turf species, which makes the plant noticeable when growing among a mix stand of turfgrass.

*Poa annua* can be identified by a distinct boat-shaped leaf tips (common to several species in the *Poa* genus), lack of auricles, folded vernation, long, membranous ligule, and bunch-type growth. According to the book "Poa annua" by Vargas and Turgeon, seeds can ripen on the panicle in just one day. This characteristic along with the ability of certain biotypes to flower continually throughout the growing season means the plant can rapidly expand it's initial point of infestation. *Poa annua* also adapts readily to different growing environments leaving cultural control techniques such as lowering or raising the mowing height and changing the irrigation frequency ineffective as a tool to manage this weed.

The chemical control choices are limited and, if not used properly, can injure the desirable turf species. Commonly, there are two windows to initiate herbicide control of *Poa annua*. Preemegence applications are made prior to the plant germination, while postemergence control targets the plant after it has germinated and in most cases has at least 2 true leaves present. The choices of preemergence herbicides are especially limited in situations where perennial ryegrass is overseeded on semi-dormant or dormant bermudagrass. In this case, poa germinates along with the ryegrass and has a very similar emergence pattern. Thus there is no "window" where a preemergence herbicide can be applied with little to no injury to the ryegrass. In terms of postemerge control, there are a few options but an understanding of P*oa's* germination patterns and growth habits is necessary to maximize control. As is the case with almost all postemergence herbicides, applications initiated when the target plant is small and vegetative growth is occurring will result in a higher level of control than if the target plant is in the reproductive growth phases.

According to studies conducted by Ron Calhoun at Michigan State University, P*oa annua* germination peaks at soil temperatures (0 to 2") of 68° to 72° F. Germination drops significantly when soil temperatures are below 58° and above 78° F. This means that about 3 weeks following a period of time when soil temperatures (2" level) are 60° or greater, a control measure targeting young P*oa* plants should begin.

A fairly new entry into the *Poa annua* control market, Velocity (bispyribac-sodium) selectively reduces *Poa annua* populations and is minimally harmful to perennial ryegrass or creeping bentgrass. Velocity is a systemic herbicide and inhibits the production of certain branched chain amino acids. Once in the plant, the active ingredient is moved to the location in the plant that has the highest metabolic activity. In young P*oa annua* plants, this means most of the chemical is translocated to the growing point, where it will prevent the formation of new plant tissue, and eventually, to plant death. Once *Poa annua* has begun to form a seedhead, the metabolic focus of the plant is to ensure the seeds complete development. Velocity symptoms on *Poa annua* targeted in the reproductive stage is shortened seedhead development, "blank" seed heads and the production of inviable seeds. However, overall plant control, as defined by plant death is low when applied to reproductive poa plants. Thus, based on the characteristics of how Velocity works, applications while *Poa annua* is still young and vegetatively growing result in better overall control. A recent label change has allowed Velocity applications at rates of 10 gmai/A to be applied to perennial ryegrass as soon as 30 days after seeding. Optimal control is achieved when applications are made on a 14 day interval. Once the perennial ryegrass has been established for at least 60 days, the Velocity application rate can be increased to a maximum of 30 gmai/A. A note of caution is needed when rates of 30gmai/A are used is in order. *Poa annua* death may occur rapidly and there may be a transitory yellowing of the ryegrass. Rapid death of *Poa* may leave empty spots or open holes in the turf. A lower rate, multiple application program, using 15 to 20 gmai/A on a 14 day application interval results in a slow P*oa annua* population reduction. In the case of creeping bentgrass, this program gives the bentgrass a chance to fill in as the *Poa* becomes less competitive. This also results in a more gradual change to the playing surface, which may be of more interest to golf turf managers who must maintain a playable surface while removing the *Poa*.

Lastly, there is much to learn about the interactions between turf plant growth regulators (PGR's) and Velocity. PGR's have been shown to reduce poa populations and keep seedheads from forming. Current research is being conducted to explore the effects of combining PGR and Velocity programs for both *Poa annua* management and quality of the desirable turf species.