Response of Creeping Bentgrass Cultivar Pure Distinction to Methiozolin Herbicide

Fayek Negm, Marco Schiavon, and Jim Baird
Department of Botany & Plant Sciences
University of California, Riverside

Background:

Methiozolin (PoaCure™) herbicide is currently under development in the United States for control of annual bluegrass (*Poa annua*) in bentgrass (*Agrostis*) and other turfgrass species. In a greenhouse study, Hoisington et al. (2014) evaluated one colonial, one velvet, and nine creeping bentgrass cultivars for tolerance to this herbicide. All of the creeping bentgrass cultivars were tolerant while the other two species were not tolerant of sequential herbicide applications necessary to achieve effective *Poa* control. In a separate field study (Baird, unpublished) the creeping bentgrass cultivar Pure Distinction (formerly OJO) was found to exhibit remarkable tolerance to exaggerated methiozolin applications, much more than several of the creeping bentgrass cultivars that were included in the Hoisington et al. (2014) study. Unfortunately, this discovery was made shortly after the start of their greenhouse study; thus 'Pure Distinction' was not one of the nine cultivars tested.

Occasionally, field-testing of methiozolin has resulted in creeping bentgrass injury or loss and there has been speculation that the cause may have been related to the bentgrass cultivar(s). In addition, there has been anecdotal evidence that methiozolin can adversely impact rooting of creeping bentgrass.

Objectives:

The objectives of this study were to further explore tolerance of 'Pure Distinction' to methiozolin herbicide under worse case scenario conditions - exaggerated sequential rates applied during the summer months in Riverside when daytime temperatures ranged from the low 90sF to low 100sF. Furthermore, the effects of the herbicide on bentgrass rooting were evaluated.

Materials and Methods:

The study was conducted at the UC Riverside Turfgrass Research Facility on a two-yr-old sand-based creeping bentgrass 'Pure Distinction' putting green maintained at 0.125 inches, 0.125 lbs N/M/month, and 100% ETo irrigation. As the study progressed, irrigation was reduced to encourage drought stress as part of protocols for adjacent studies on the green. PoaCure (methiozolin) was applied on 14-d intervals at rates of 0, 0.6, 1.2, and 2.4 oz/M on 14 and 28 August and 12 Sep 2014. Spray volume was 2 gal/M and the herbicide was watered in with ca. 1/8-1/4 inches of water following application. Experimental design was a randomized complete block with 4 replications. A Mascaro Profile Soil Sampler (www.turf-tec.com) was used to extract a cross section of the turf profile (7-in deep, 3-in wide, ½-in thick) from each plot at 0, 14, and 28 days after initial treatment to monitor herbicide effects on rooting. Roots were washed free of rootzone mix, dried, and weighed. *Poa* populations were minimal at the time of the study, thus the focus was solely on the effects of the herbicide on 'Pure Distinction.'

Results:

Despite three sequential applications of methiozolin made 2-wks apart at 1x, 2x, and 4x rates for putting greens, all made at the worst time of year for bentgrass safety and effective Poa control (i.e., daytime temperatures >85F), coupled with the added stress of solid-tine aeration

and sand topdressing implemented shortly after the second herbicide application, there were no aboveground visual signs of turf phytotoxicity from any of the herbicide treatments. The lone exception occurred shortly after the third application of the 4x rate. Applications were made later in the morning when air temperatures had already reached 90F and irrigation was delayed for two hours. By that time, turf leaves in those plots appeared to be burned by the solvent in the formulation. However, no turf loss resulted and the turf completely recovered within two weeks.

Analyses of roots are provided in Figure 1. Although the 2x (1.2 oz/M) and 4x (2.4 oz/M) herbicide rates did reduce rooting following initial application, rooting of all treatments was equal to or greater than the untreated control by the end of the experiment. These results corroborate our previous unpublished field research that identified 'Pure Distinction' as one of the most tolerant creeping bentgrass cultivars to methiozolin. At the time of writing this report, further greenhouse and field evaluations were underway at UC Riverside to determine the mechanism(s) responsible for tolerance/susceptibility of 'Pure Distinction' and 'Penn A-4' creeping bentgrass and 'Two Putt' creeping bluegrass.

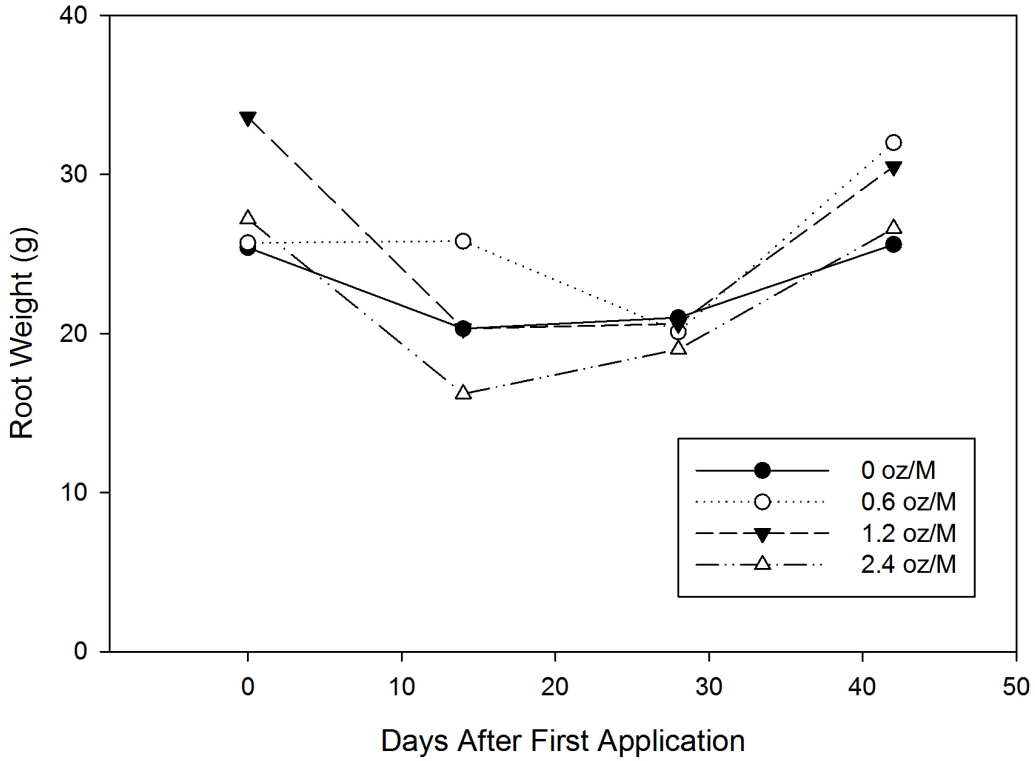

Figure 1. Creeping bentgrass 'Pure Distinction' dry root weight in response to sequential applications of methiozolin herbicide. University of California, Riverside. 2014.

Acknowledgments:

Thanks to Moghu Research Center, the California Turfgrass & Landscape Foundation (CTLF), and Pure Seed Testing for supporting this research.

Reference:

Hoisington, N.R., M.L. Flessner, M. Schiavon, J.S. McElroy, and J.H. Baird. 2014. Tolerance of bentgrass (*Agrostis*) species and cultivars to methiozolin. Weed Technology 28:501-509.