Safety of Velocity™ on Kentucky Bluegrass Cultivars Maintained at Fairway Height

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Each year I receive many calls about controlling annual bluegrass (*Poa annua* L.) in turf. It appears to be one of the more "successful" weeds as some biotypes compete well with creeping bentgrass at putting green height and other biotypes compete well with bentgrass and Kentucky bluegrass at fairway heights. Ethofumesate is labeled for selective, post-emergent control in Kentucky bluegrass (*Poa pratensis* L.) though its efficacy is inconsistent and typically requires multiple applications in fall and spring. Cultural and biological controls are generally impractical or ineffective once a site is infested with *P. annua*. For the past few years we have been conducting trials and reporting data on the efficacy of a relatively new herbicide, Velocity™ (bispyribac-sodium), to remove annual bluegrass from creeping bentgrass fairway turf (Stier, 2004; Koeritz and Stier, 2006). Velocity™ is currently labeled for use on creeping bentgrass and perennial ryegrass species. Missing from the label is inclusion of Kentucky bluegrass, which is important given the large percentage of bluegrass fairways in Wisconsin and other northern states.

Product labels often evolve over time for various reasons. Some changes are prompted by regulations, others by formulation changes or additional active ingredients. Many times, however, labels change because new information is made available. Our goal was to evaluate the potential phytotoxicity on Kentucky bluegrass cultivars in case a label change to include Kentucky bluegrass might be appropriate.

MATERIALS AND METHODS

Over 170 varieties of Kentucky bluegrass in the 2000 National Turfgrass Evaluation Program (NTEP) were assessed for tolerance to Velocity in Wisconsin

during summer 2005. We maintained the turf throughout the study as a fairway by mowing at one-half inch height three times weekly and returned the clippings. The soil type was a Troxel silt loam with pH 7.2. Turf was fertilized each spring, late summer and late autumn with 1 lb N per 1000 ft^2 each time using a combination of slow and fast-release fertilizers. Irrigation was provided twice weekly to replace 100% estimated evapotranspiration during the growing season. Apart from one broadleaf herbicide application the year following establishment, no other pesticides were used.

The NTEP plots, measuring 5 ft x 5 ft, were planted in autumn 2000 as a randomized block with three replications. Velocity™ 17.6 SG was applied to one-half of each plot as a strip-plot treatment on 17 June 2005 with a second application 14 days later at a rate of 30 grams active ingredient per acre (less than 6 oz of product per acre). Applications were made with a CO_2-powered backpack sprayer using 8004 flat fan nozzles and a carrier volume of 2 gal water per 1000 ft^2. We rated phytotoxicity on a 1 to 9 scale, with 9=no injury and 1=100% dead turf, at 3, 7, 14, 21, 28, 42, and 56 days after treatment (DAT). Since many of the plots were heavily infested with either *P. annua* or creeping bentgrass, only those varieties which maintained 70% or better desirable turf cover by autumn 2005 (in untreated portions) were used for statistical analysis.

RESULTS AND DISCUSSION

About half of the 173 varieties in the NTEP provided 50% or better Kentucky bluegrass cover by June 2005, though only 55 maintained 70% or better cover. Most injury did not start to show itself until 14 days or more after application, with the worst injury seen about 28 days after application (Table 1). Discoloration started as a slightly lighter shade of green which was only noticeable when compared against the untreated half of each plot. By day 28, though, most cultivars had significant portions of the leaves or entire plants discolored a straw-yellow color. Some notable exceptions like Chateau, Alpine, Coventry and Lily had minimal discoloration and returned to full color within two months of application. Several other cultivars such as Courtyard, Alexa, and Blue Velvet also returned to full color and quality. Otherwise, a wide range of recovery was seen in the two months following Velocity™ application, from full to partial to no recovery. For example, Princeton 105, an old cultivar known for traffic tolerance, was essentially killed by Velocity. Most cultivars made at least a partial recovery within two months with 32 cultivars having acceptable recovery, with a lighter green tint being the only noticeable effect of Velocity.

We coordinated our trial with Dr. Brian Horgan at the University of Minnesota who applied Velocity to

	Days after first application		
Cultivar	**14**	**28**	**56**
Courtyard	8.0	4.7	9.0
Alexa	8.0	5.0	9.0
Blue Velvet	8.0	5.3	9.0
Excursion	8.0	6.0	9.0
Liberator	8.0	5.0	9.0
Chateau	8.0	7.0	8.7
Impact	8.0	6.0	8.7
Tsunami	8.3	5.6	8.7
Alpine	8.0	7.3	8.3
Ginney	8.0	5.0	8.3
Awesome	8.0	5.3	8.3
Nu Destiny	8.0	5.3	8.3
Beyond	8.0	5.0	8.3
Midnight	8.3	6.7	8.0
Nu Glade	8.0	5.3	8.0
Barrister	8.0	5.0	8.0
Rugby II	8.0	5.0	8.0
Serene	8.3	6.3	8.0
Moonshine	8.0	5.7	8.0
Coventry	8.0	7.0	7.7
Blue-tastic	8.0	6.3	7.7
Rambo	8.0	5.7	7.7
Lily	8.0	7.0	7.3
Brooklawn	8.0	5.3	7.3
Chicago II	8.0	4.0	7.3
Diva	8.3	4.7	7.0
Blackstone	7.7	6.0	7.0
Award	7.7	3.7	7.0
Arcadia	8.0	3.7	6.7
Royce	7.3	4.3	6.3
Chelsea	8.0	5.3	6.0
Brilliant	8.0	4.0	6.0
Blue Knight	8.0	4.3	5.7
Shamrock	8.0	4.3	5.3
Limousine	7.7	4.7	5.3
Skye	6.7	3.0	5.3
Baron	7.0	3.3	5.0
Hallmark	8.0	3.7	5.0
Voyager II	8.0	3.7	5.0
Delight	8.0	3.3	4.7
Unique	8.0	4.0	4.7
Bedazzled	8.0	4.0	4.3
Wildwood	8.0	3.3	4.3
Mallard	7.3	3.3	4.3
Arrow	7.7	3.0	4.3
Valor	8.0	3.0	4.0
Washington	6.0	2.3	3.7
North Star	7.3	2.0	3.7
Monte Carlo	7.0	3.3	3.3
Langara	7.7	3.0	3.0
Julius	5.0	1.7	2.7
Royale	7.7	2.3	2.3
Avalanche	6.0	1.7	1.7
Champagne	6.7	1.7	1.7
Princeton 105	5.3	1.3	1.0
Tukey's HSD (0.05)	2.6	2.9	4.4

Table 1. Kentucky bluegrass ground cover and sensitivity to bispyribac-sodium (Velocity™) when maintained at 0.5 inch mowing height after four years in Madison, WI. Cultivars listed all maintained 70% or better turf cover by autumn 2005. Bispyribac-sodium was applied at 30 grams active ingredient per acre on 17 June and 2 July 2005. Phytotoxicity was rated on a 1 to 9 scale with 9 = no injury, 6 = acceptable fairway turf, and 1 = 100% dead foliage.

turf maintained at 2.5 inches. When the same cultivars were maintained at 2.5 inch height, no cultivars were killed and overall phytotoxicity was minimal (Stier et al., 2006). Only three cultivars of the ones shown in Table 1 had less than acceptable quality at 56 DAT when maintained at 2.5 inch height, and most maintained a phytotoxicity rating of 6.5 or better throughout the trial.

While we were able to eliminate 80% or more of the *P. annua* from the plots, we need additional information on ways to prevent *P. annua* from re-establishing itself. The label allows overseeding 10 days after the final application. For Kentucky bluegrass fairways, aggressive cultivars may be able to cover the ground as *P. annua* is eliminated, depending on the degree of *P. annua* infestation. Otherwise, overseeding might be necessary though information on the time needed after Velocity application for Kentucky bluegrass overseeding is still needed.

CONCLUSION

Our results suggest that if Kentucky bluegrass is ever added to the Velocity label it will likely be limited to specific cultivars and/or mowing heights. However, we used only one approach in our treatment: a sequential application of a high rate. In our current trials on bentgrass we are using multiple applications of much lower rates. Preliminary data indicate we can still achieve good to excellent *Poa* control, and it will be important to evaluate phytotoxicity on Kentucky bluegrass with multiple, low-rate applications of Velocity. The use of multiple, low-rate applications might have the extra benefit of allowing Kentucky bluegrass to fill in the voids as *P. annua* is removed and avoid the need to overseed.

REFERENCES

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