



Velocity: A Potentially New Herbicide for Selective Removal of *Poa annua*

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What did you miss at field day this summer? Besides information on new soil test calibration results, nutrient loading into runoff from prairies, breeding of Wisconsin-adapted grasses, and fine fescue/colonial bentgrass fairways, you missed seeing a potentially new means of selectively controlling *Poa annua* in creeping bentgrass.

Velocity, containing the active ingredient bispyribac-sodium, is one of the most exciting herbicide chemistries for turf in the past 10 years. The product was originally developed for and used in rice production in southeast Asia beginning in 1997. Bispyribac-sodium belongs to the class of herbicides known as the ALS inhibitors: susceptible plants turn light brown about 10 days after application because they can't produce several necessary amino acids necessary for proteins. The product has a relatively short half life in soil of about 2 weeks. Combined with its relatively low toxicity, the product offers a potential solution to reducing or eliminating *P. annua* from creeping bentgrass turf with minimal risk of environmental problems. The extremely low use rate, measured in grams per acre, is also attractive from the point of using relatively little chemical.

Materials and Methods

The study was coordinated with Jason Fausey of Valent Corp. in order to develop information required on proper use rates and formulations to support product registration. Treatments were applied beginning 3 June 2004 to a mature mixed stand of creeping bentgrass (*Agrostis stolonifera* L.) and annual bluegrass (*Poa annua* L.). The treatment list and

Table 1. Application information for testing *Poa annua* control in bentgrass using Velocity herbicide, Verona, WI, 2004. Dollar spot infection data represent the percentage of bentgrass turf area affected by the disease; ratings were collected 56 days after the initial Velocity treatment.

Formulation	Rate (grams ai/acre)	Number of applications	Application interval	% Dollar Spot
80 WP	45	One	---	18.8
80 WP	30	Two	14 day	6.2
80 WP	45	Two	14 day	5.0
80 WP	30	Three	14 day	0.0
17.6 WDG	10	Four	7 day	15.0
80 WP	10	Four	7 day	7.5
80 WP	20	Four	14 day	4.2
Untreated check	---	---	---	27.5
LSD (0.05)	---	---	---	2.1

schedule is shown in Table 1. All formulations were wettable powders (WP) except for one wettable dry granule (WDG). Applications were made using a CO₂-powered backpack sprayer and 8004 EVS flat fan nozzles using 2 gal water per thousand square feet. Turf mowing height was 0.5 inch with clippings returned to simulate a typical fairway program. Plots were irrigated twice weekly to avoid drought stress.

Plots were rated at 3, 7, 14, 21, 28, 42, and 56 days after initial treatment application. Ratings collected included the percentage of *P. annua* and creeping bentgrass, phytotoxicity to both *P. annua* and bentgrass, and turf color. The extent of dollar spot disease in each treatment was rated during epidemics at 21 and 56 days after the initial treatment.

Results

All Velocity treatment programs provided statistically significant control of *P. annua* within 56 days of the initial application (Fig. 1), though initial discoloration occurred within 3-7 days of treatment. The best control was achieved using 30 or 45 g ai/acre at either three or two

applications on a 14 day interval (74 and 80% control, respectively). The WP formulation gave much better control (58%) than the WDG (34%) applied at 10 g ai/acre four times at 7 day intervals. A single application at the high rate of 45 g ai/acre gave poor control (28%) compared to two applications (74%).

Velocity caused slight discoloration of creeping bentgrass within one week of application but was within an acceptable range for fairway turf, especially since the discoloration was short-lived. *Poa* discoloration continued to worsen over time until plants were obviously dead within two to four weeks after application, depending on the initial rate and frequency of application.

Data on broadleaf weed suppression was not collected because it wasn't part of the study, but all Velocity applications virtually eliminated any of the broadleaf weeds in the study, including white clover, dandelion, and mouse-eared chickweed. Velocity did not seem to have a noticeable effect on crabgrass, though since no data were collected its possible a rate-response could have existed.

An unexpected benefit of the Velocity application was an obvious suppression of dollar spot disease (*Sclerotinia homeocarpa*) as shown in Table 1. The amount of dollar spot control was fairly consistent with rates and application frequency: the greater the rate and/or application frequency, the better the disease was controlled. In fact, no disease occurred when 3 applications were made at 14 day intervals, though all of the multiple applications of the WP formulation gave statistically similar control. Again, the WDG formulation was less effective, as was the single application of the high rate of the WP.

Although it wasn't officially part of the study, we applied Velocity to small areas of perennial ryegrass, fine fescue, and Kentucky bluegrass and found them to be unaffected. These results indicate Velocity may be useful for eliminating *P. annua* in these turf species as well as bentgrass. We have not yet tested it for safety on tall fescue. For those who are interested, Velocity did not appear to harm the one patch of rough bluegrass (*Poa trivialis*) we had in the plots, though this result is not definitive due to the limited treatment rates and small sample size.

Discussion

Our results show Velocity can be an effective herbicide to remove *P. annua* from creeping bentgrass. Control is best with two or more applications, particularly at rates of 30 to 45 g ai/acre. The WP formulation is vastly superior to the WDG formulation for reasons we have not yet determined. The actual rate and timing interval useful to superintendents may depend on the amount of *P. annua* in the turf stand, the degree of injury/discoloration that can be accepted, and the management practices before, during, and after Velocity application. In our trial we effectively killed up to 80% of the existing *P. annua*, but

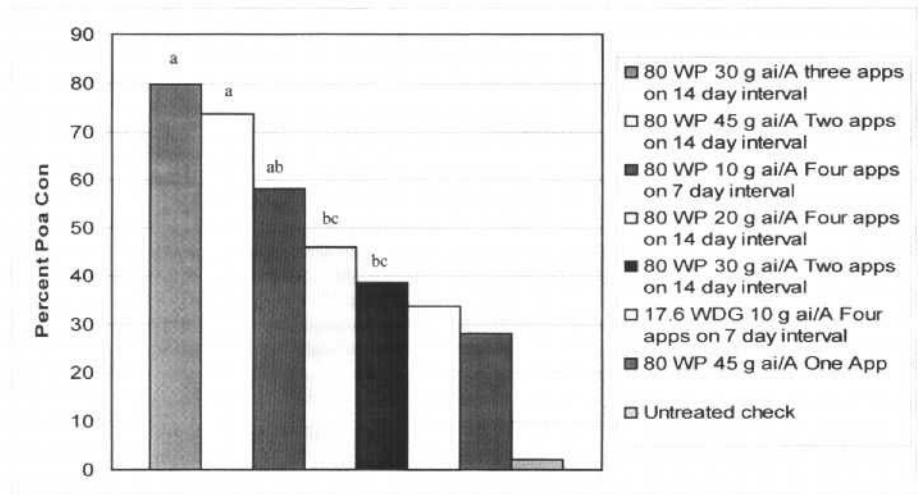


Fig. 1. *Poa annua* control in creeping bentgrass fairway turf using Velocity herbicide in June through July, 2004, at the O.J. Noer Turfgrass Research and Educational Facility in Verona, WI. Treatment means followed by the same letter are not statistically different at $P < 0.05$.

bentgrass cover did not change during the study, i.e., the bare areas were not filled in by bentgrass. In many situations it will likely be desirable to implement an overseeding or sprigging program which coincides with Velocity application in order to have bentgrass fill in the turf as the *P. annua* dies. Current information suggests Velocity can be applied 7 days prior to overseeding; otherwise Velocity application should be delayed 42 days after seedling emergence.

The dramatic suppression of dollar spot is an unexpected bonus. Part of the application cost of Velocity would likely be offset by a reduction of fungicide cost to control dollar spot as well as broadleaf weeds. Additional information is needed on the longevity of the dollar spot suppression and activity of Velocity herbicide on other diseases. Additional studies are also needed over time and in other locations to ensure our results were not an anomaly.

Some readers will undoubtedly question if Roundup-Ready creeping bentgrass is still desirable should Velocity become registered for use. Yes, for two reasons: 1)

Velocity is an ALS herbicide, having a fairly specific mode of action which could result in weeds becoming resistant to it unless it is interspersed with applications of completely different chemistry such as Roundup. Herbicide resistance to other ALS herbicides has been previously noted in agricultural settings where the chemicals were used routinely; 2) Roundup will generally provide 100% control of *P. annua* with a single application. In fact, from a turf manager's standpoint, registration of both Velocity herbicide and commercialization of Roundup-Ready bentgrass would be the best of both worlds. For example, Roundup might be used at the beginning of a 5-year program to eliminate existing *Poa*, while Velocity is used once or twice afterwards in the ensuing years to remove new *P. annua* plants. In order to avoid herbicide resistance, Roundup could be used again in the 4th or 5th year, after which the cycle would continue.

Word has it Valent Corp. is seeking EPA registration which would allow Velocity to be used on golf course turf for *Poa* control in the near future. Stay tuned. 🌿