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TURFGRASS TRENDS

POA TRIVIALIS

Controlling *Poa trivialis* in Creeping Bentgrass Fairways

The right combination of a herbicide with overseeding and hot weather brings the best results.

By Zac Reicher and James Rutledge

Poa trivialis or roughstalk bluegrass contamination has been problematic in creeping bentgrass fairways and now is becoming a problem in lawns and athletic fields. *Poa trivialis* is usually a lighter and glossier green than the desired turf and will outgrow surrounding turf from fall through spring. *Poa trivialis* becomes infected with dollar spot during summer weather and if the heat worsens, thinning, dormancy and perhaps death ensues. Because of its poor heat tolerance, *Poa trivialis* is used as an overseeded grass for bermudagrass greens and this use has expanded over the last 20 years.

Poa trivialis was first introduced to North America in the 1600s from Europe and has since become naturalized throughout much of its range of adaptability. Some of the contamination of current turf is likely due to this source (Hurley, 1983). However, *Poa trivialis* is also a persistent weed in grass seed production fields of the Pacific Northwest and Levy found that 30% of creeping bentgrass seed lots tested in the late 1990s contained *Poa trivialis* (Levy, 1998). Once established in a turf stand, *Poa trivialis* spreads quickly when stolons are moved with aerification and it makes little difference how initial contamination occurred.

Our previous research has shown that Certainty (sulfosulfuron) and Velocity (bispyribac-sodium) selectively control *Poa trivialis* in creeping bentgrass (Morton et al., 2007; Rutledge et al., 2010). For instance, Velocity at the equivalent of 4.5 or 6.0 oz/A of 17.6SG applied four times on two week intervals decreased *Poa trivialis* cover by > 85% 12 weeks after initial treatment at one location while Certainty at 0.5 oz/A reduced *Poa trivialis* cover by 34% 8 weeks after initial treatment at another location (Morton et al., 2007). In a two-year study conducted in Virginia, three applications of Velocity at the equivalent of 3.0 oz/A of 17.6SG starting in June, August or September reduced *Poa trivialis* 10 weeks after initial treatment by 88%, 48% and 11%, respectively, and increasing the rate to 6 oz/A resulted in 93%, 95% and 31% control, respectively (Askew et al., 2004).

Creeping bentgrass can be safely seeded within two to four weeks of either

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Characteristic metallic green of Poa trivialis *in an otherwise dark green Kentucky bluegrass/ perennial ryegrass soccer field.*

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Velocity or Certainty application (Lycan and Hart, 2005 and 2006; Rutledge et al., 2010). Since *Poa trivialis* likely recovers from both stress and herbicide application through its stolons, adding competition through seeding creeping bentgrass should improve long-term control. Our objectives were to determine the most effective herbicide treatments for short- and long-term *Poa trivialis* control and to determine if interseeding with creeping bentgrass after herbicide treatments will improve long-term control of *Poa trivialis*.

How we did it

Studies were initiated in June 2006, 2007 and 2008 on Laser *Poa trivialis* grown as a fairway on silt loam soil in West Lafayette, Ind. An adjacent and previously untreated plot area was used for each year. Herbicide treatments were selected based on previous studies (Morton et al., 2007) and are listed in Table 1 (see pg. 57).

All herbicide applications were applied in two gallons of water per 1,000 sq ft. One half of each plot was seeded two weeks after the final herbicide application with L93 creeping bentgrass. The seedbed was prepared by aerating the entire experimental area with half-inch solid tines on 2-inch by 2-inch spacing.

We present percent cover data in early August, two weeks after the final herbicide treatment as an indication of short-term herbicide effects prior to creeping bentgrass germination, 16 weeks after treatment in November was prior to winter, and 46 weeks after treatment in June of the following year was after spring recovery to gauge long-term control.

Impact of herbicides

All herbicide treatments applied in 2006 reduced *Poa trivialis* cover to ≤ 50% 2 weeks

In difficult summers,* Poa trivialis *(left and foreground) will first be infected with dollar spot and eventually thin or die with prolonged heat stress while creeping bentgrass (right) stays relatively healthy.

TABLE 1

Herbicide treatments and application dates. Aerification and then overseeding with creeping bentgrass at 1.0 lb/1000 ft^2 was done two weeks after the last application.

Herbicide	oz/A/ application	Application dates ± 1 day in 2006, 2007, 2008
Certainty 75WDG[a]	0.25	July 13 + July 28
Certainty 75WDG[a]	0.25	June 30 + July 13 + July 28
Certainty 75WDG[a]	0.50	July 13 + July 28
Certainty 75WDG[a]	0.50	June 30 + July 13 + July 28
Velocity 17.6SG[b]	3.0	June 16 + June 30 + July 13 + July 28
Velocity 17.6SG[b]	4.5	June 16 + June 30 + July 13 + July 28
Velocity 17.6SG[b]	6.0	June 16 + June 30 + July 13 + July 28

[a] All Certainty treatments included MON 0818 nonionic surfactant at 0.25% v/v.

[b] Velocity formulation used was 80WP, but is presented as the new 17.6WSG formulation for ease of translation.

after treatment compared to the untreated control, which retained 83% cover (Fig. 1).

Certainty at 0.25 oz/A applied three times and Velocity at 3.0, 4.5 or 6.0 oz/A applied four times were the most effective treatments in controlling *Poa trivialis*, resulting in ≤ 1% cover 2 weeks after treatment in 2006 (Fig. 1, pg. 58).

These same four treatments remained most effective through 46 weeks after treatment, reducing *Poa trivialis* cover to ≤ 27% compared to 87% in the untreated control (Fig. 1). Recovery of *Poa trivialis* was likely due to spread from uncontrolled stolons and indicates the need for long-term control data. Treatments most effective in controlling *Poa trivialis* also resulted in the most creeping bentgrass cover (Fig. 1).

Overall *Poa trivialis* cover 2 weeks after treatment was much lower in 2007 than in

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FIGURE 1

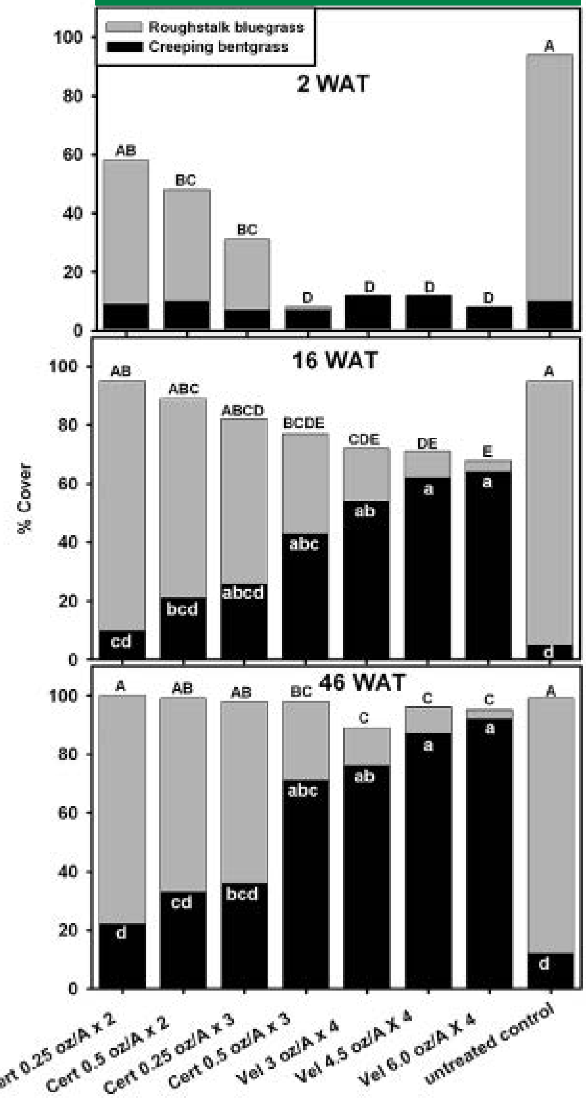

FIG. 1 *Poa trivialis* and creeping bentgrass cover after Certainty or Velocity at 0, 14 and 46 weeks after treatment in 2006. Means are back-transformed and averaged over two seed treatments and three replications. Lower case letters are used to compare creeping bentgrass cover while upper case letter are used to compare roughstalk bluegrass cover. Bars with the same letter and case within the same rating date are not significantly different (P <0.05).

FIG. 2 *Poa trivialis* and creeping bentgrass cover after Certainty or Velocity at 0, 14 and 46 weeks after treatment in 2007. Means are back-transformed and averaged over two seed treatments and three replications. Letters compare roughstalk bluegrass cover. Bars with the same letter within the same rating date are not significantly different (P <0.05).

FIG. 3 *Poa trivialis* and creeping bentgrass cover after Certainty or Velocity at 0, 14 and 46 weeks after treatment in 2008. Means are back-transformed and averaged over two seed treatments and three replications. Letters compare roughstalk bluegrass cover. Bars with the same letter within the same rating date are not significantly different (P <0.05).

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2006, with all herbicide treatments in 2007 reducing *Poa trivialis* cover to ≤ 13% 2 weeks after treatment compared to the untreated control with 50% cover (Fig. 2).

This is likely due to higher temperatures in 2007 compared to 2006 and is consistent with our anecdotal observations that Certainty and Velocity more effectively control *Poa trivialis* when it is heat stressed following applications. All herbicide treatments reduced *Poa trivialis* cover to ≤ 6% compared to 41% in the untreated control 16 weeks after treatment. The same four treatments, Certainty at 0.25 oz/A and all three Velocity treatments, remained the most effective *Poa trivialis* controls by 16 weeks after treatment (Fig. 2). However, modest recovery of *Poa trivialis* occurred by 46 weeks after treatment with cover remaining ≤ 17% in treated plots compared to 66% in the untreated control (Fig. 2).

Three of the four best performing treatments in 2006 and 2007 also performed well in 2008. Certainty applied three times at 0.25 oz/A and Velocity applied four times at 4.5 or 6.0 oz/A reduced *Poa trivialis* cover to between 10% and 45%, compared to 83%

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FIGURE 2

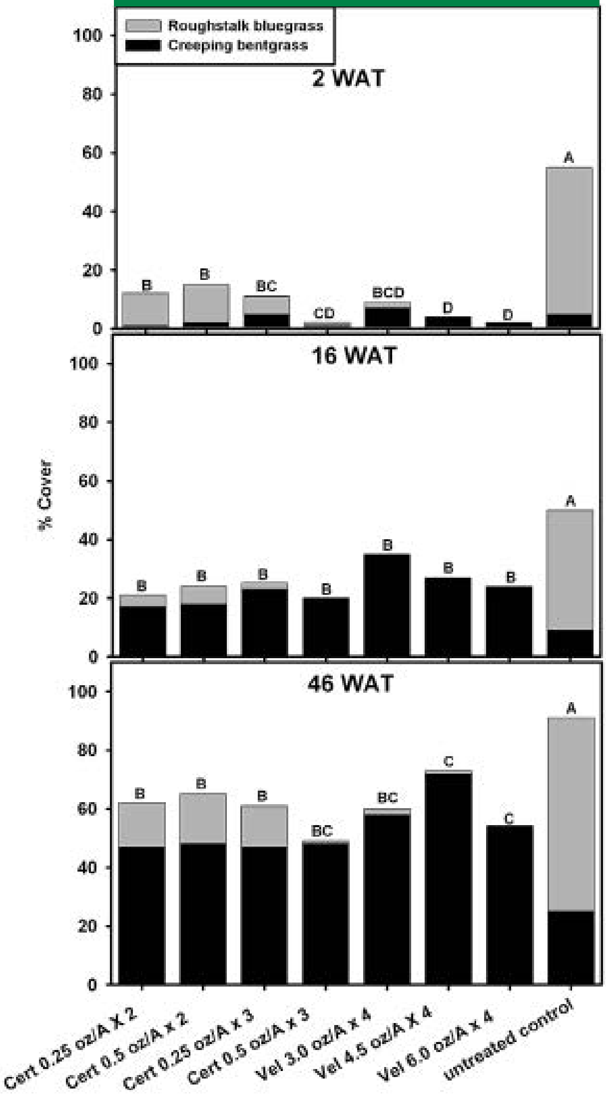
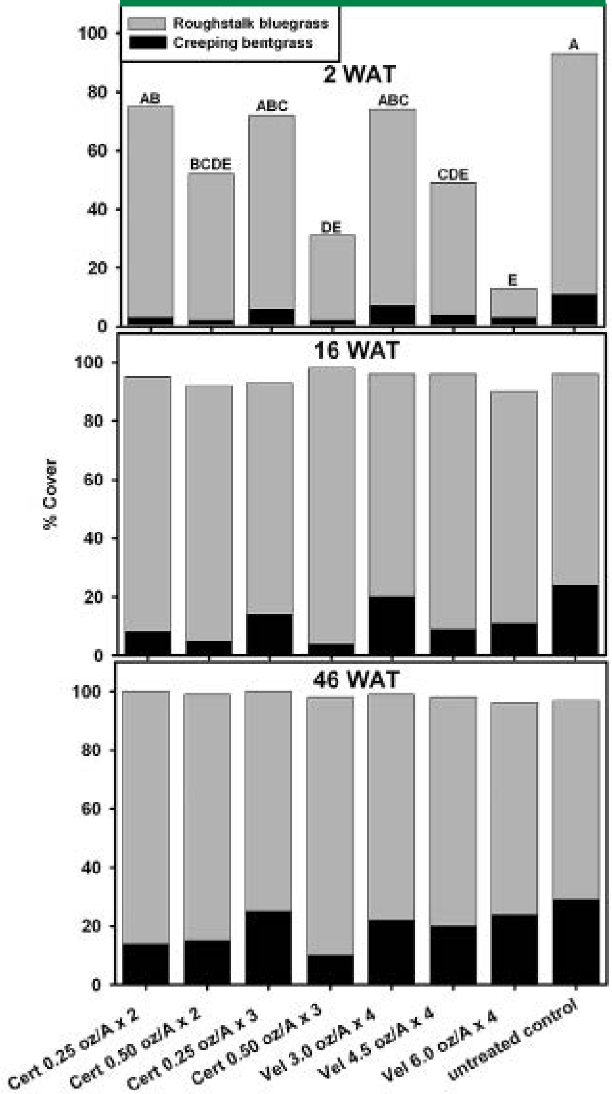


FIGURE 3



cover in the untreated control 2 weeks after treatment (Fig. 3). However, *Poa trivialis* cover following all herbicide treatments fully recovered to equal that of the control by 16 and 46 weeks after treatment (Fig. 3).

We attribute the lack of *Poa trivialis* control to an unseasonably cool summer in 2008. Between June 1 and Sept. 1 in West Lafayette, there were a total of 21, 28 or 7 days on which the maximum air temperature exceeded 85 degrees F in 2006, 2007 or 2008, respectively. Furthermore, daily high temperatures remained above 85 degrees F for more than three consecutive days on 4, 5 or 1 occasion(s) in 2006, 2007 and 2008, respectively, of which 2006, 2007 and 2008 had a maximum of 6, 9 and 3 consecutive days above 85 degrees F, respectively. This further confirms our anecdotal observations that environmental stress compliments herbicide activity which results in better control as reported by McCullough and Hart (2006).

Impact of seeding

Averaged across herbicide treatments, plots seeded with creeping bentgrass had less *Poa trivialis* cover than unseeded plots by 46

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Poa trivialis *can spread quickly from surviving stolons after summer dormancy.*

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weeks after treatment in 2006 and 2007 (data not shown), but had no effect on *Poa trivialis* cover 16 weeks after treatment in either year. This indicates interseeding with creeping bentgrass is advantageous for long-term *Poa trivialis* control, but creeping bentgrass must become well-established before it can pose significant competition to *Poa trivialis*. Seeding did not affect creeping bentgrass cover in 2008 as a result of rapid *Poa trivialis* recovery following herbicide treatments.

The most effective herbicide treatments for *Poa trivialis* control were Velocity at 4.5 or 6.0 oz/A applied four times or Certainty at 0.25 oz/A applied three times. Though these herbicides control *Poa trivialis* and will allow creeping bentgrass already present in the treated areas to spread, interseeding with creeping bentgrass will improve long-term *Poa trivialis* control and speed conversion to creeping bentgrass. Furthermore, both Velocity and Certainty are more effective controlling *Poa trivialis* during warmer summers.

Zac Reicher, Ph.D., is now a Professor of Turfgrass Science in the Agronomy & Horticulture Department at the University of Nebraska-Lincoln after spending the previous 18 years as Turfgrass Extension Specialist at Purdue. James Rutledge received his Ph.D. in May 2010 at Purdue, where he won the Musser Award for the outstanding Ph.D. student in turfgrass science. He currently is a product development manager for Bayer CropScience in Research Triangle Park, N.C. Full details of this project are available in the following article: Rutledge, J. M., D. Morton, D. V. Weisenberger and Z. J. Reicher. 2010. Sulfosulfuron and bispyribac-sodium combined with overseeding creeping bentgrass for fairway conversion. *HortScience*. 2:283-287.

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