Transition Herbicide Effects on Overseeded Meadow Fescue and Tetraploid Perennial Ryegrass

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Photo by Mike Richardson

Overseeded grasses treated with herbicides to hasten transition

Summary. Bermudagrass is often overseeded with a cool-season grass species in the fall to provide a green surface during cool weather. Recently, two new turfgrass species, meadow fescue and tetraploid ryegrass, have shown promise for use in overseeding situations. The objective of this study was to determine the performance of herbicides commonly used to remove (transition) perennial ryegrass from an overseeded bermudagrass. Ten herbicides that are commonly used to eradicate diploid perennial ryegrass from overseeded bermudagrass were tested on tetraploid perennial ryegrass and meadow fescue at recommended label rates. Most of the herbicides commonly used to transition diploid perennial ryegrass produced similar results on tetraploid ryegrass, with flazasulfuron providing the best control. Meadow fescue was more easily removed with herbicides compared to ryegrass and is easily removed with lower herbicide application rates. These data will provide turfgrass managers with information regarding herbicide efficacy on new overseeding grasses.

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Bermudagrass (*Cynodon* spp.) is an extensively used turfgrass species in the southern region of the United States, although it can be partially or completely dormant for up to six months during winter. Bermudagrass loses its green pigment during winter resulting in a tan/straw color. To improve turfgrass color during winter, a cool-season grass is often overseeded into bermudagrass during winter dormancy to produce a dense, green playing surface. One problem with overseeding is the persistence of the cool-season grass in the spring. This is referred to as the transition period and is commonly aided by removing the overseeding species with herbicides. Recently, two new overseeding species, tetraploid perennial ryegrass (*Lolium perenne*, 2n = 4x = 28) and meadow fescue (*Festuca pratensis*), have shown promise as alternatives to traditional overseeding grasses (Richardson et al., 2007). The objective of this study was to determine how transition herbicide strategies that are commonly used for overseeded perennial ryegrass (*L. perenne*, 2n=2x=14) will affect these new species.

Materials and Methods

A field study was conducted during the 2006-2007 season at the University of Arkansas Research and Extension Center in Fayetteville, Arkansas. The study was conducted on two different soil types, including a native soil and a sand-capped rootzone. The sand-capped site had a 5-inch base of medium-coarse sand over a native Captina silt loam. Three overseeding species, including diploid perennial ryegrass (cv. Integra), tetraploid perennial ryegrass (cv. T3), and meadow fescue (Expt. AMF29) were compared to a non-overseeded control. Overseeding grasses were established in a mature Tifway bermudagrass turf on both soil types and were seeded at rates designed to produce equal seeding densities for each species (Table 1). The plots were maintained before and after overseeding under simulated fairway conditions, with a mowing height of 0.5 inch.

Ten herbicide treatments (Table 2) commonly used for transitioning overseeding grasses were applied at either 30 or 70% bermudagrass greenup, as determined by the non-overseeded control. These dates corresponded to 2 April 2007 and 12 May 2007. Each species x herbicide treatment was replicated four times, with overseeding species as whole plots and herbicide treatments as split-plots within each species plot. All herbicides were applied in a spray volume of 39 gallons / A at a spray pressure of 30 psi with a CO_2 sprayer using a single nozzle spray wand with a hollow cone nozzle and a spray shield to prevent drift between plots.

A line-intersect analysis (LIA) was conducted at 6 weeks after herbicide treatment to assess the percentage overseeded grass remaining in each plot. For LIA analysis, a 12 by 12-inch frame was constructed that contained a line grid with 1.0 by 1.0-inch openings. The grid was randomly tossed on each plot, the species of turf at each line intersect determined, and grid counts were converted to percentage overseeded grass.

Results and Discussion

Greater efficacy was observed on the sand site compared to the soil site for most herbicides tested in this trial when averaged over the 30% and 70% application timings (Table 3). Flazasulfuron provided the most complete control on both sites and with all species. When applied to meadow fescue, rimsulfuron, metsulfuron, and trifloxysulfuron performed similarly within the soil and sand sites (Table 3). Pronamide also provided excellent control of meadow fescue on the sand site (Table 3). Diploid and tetraploid perennial ryegrass behaved similarly to most treatments tested in the trial, whereas meadow fescue had the lowest percent overseeded grass after herbicides applications (Table 3). Several herbicides that have been very popular transition herbicides in recent years, especially foramsulfuron and rimsulfuron, provided poor control of all species in this trial, especially on the soil site.

In summary, herbicides that are commonly used to transition diploid perennial ryegrass can be used as a tool to transition two new overseeding species, meadow fescue and tetraploid perennial ryegrass. Meadow fescue is an overseeding species that was easier to control with lower rates of herbicides, which would be an economical and environmental advantage for this species. More work needs to be done to confirm whether or not these herbicides provide more consistent control of overseeded grasses on sand rootzones compared to soil-based rootzones.

Literature Cited

Richardson, M.D., K.W. Hignight, R.H. Walker, C.A. Rodgers, D. Rush, J.H. McCalla, and D.E. Karcher. 2007. Meadow fescue and tetraploid perennial ryegrass - two new species for overseeding dormant bermudagrass. Crop Sci. 47:83-90.

Table 1. Number of pure live seeds per pound and seeding rates for the three overseeding grass species.

Species	Seed counts	Seeding rate	Seeding Density
	pure live seeds / lb	lb / 1000 ft^2	PLS / ft^2
Tetraploid ryegrass	135097	23.4	3158
Meadow fescue	242245	13	3158
Diploid ryegrass	254089	12.4	3158

Table 2. Transition herbicides tested in this study. All herbicides were applied in spring at both 30% and 70% bermudagrass greenup.

Herbicide	Product rate	Active ingredient	Active ingredient rate
	(per acre)		(oz / a)
Kerb	2.0 lb	pronamide	15.98
Manor	0.5 oz	metsulfuron	0.30
Revolver (Low)	8.8 fl oz	foramsulfuron	0.21
Revolver (High)	17.4 fl oz	foramsulfuron	0.41
Monument (Low)	0.11 oz	trifloxysulfuron	0.08
Monument (High)	0.33 oz	trifloxysulfuron	0.25
Katana (Low)	0.5 oz	flazasulfuron	0.13
Katana (High)	1.0 oz	flazasulfuron	0.25
Tranxit (Low)	1.0 oz	rimsulfuron	0.25
Tranxit (High)	2.0 oz	rimsulfuron	0.50
Control			

Table 3. Percent overseeding grass coverage at 6 weeks after treatment on both the soil and sand site.

Species	pronamide	metsulfuron	flazasulfuron		trifloxysulfuron		foramsulfuron		rimsulfuron		control	LSD (0.05)[z]
			high	Low	high	low	high	low	high	Low		
	---------------- % overseeding coverage ----------------											
					Soil							
Diploid	31.5	38.3	13.8	24.6	55.4	59.8	56.1	64.8	47.4	57.9	58.5	
Tetraploid	29.3	35.8	10.9	20.3	41.3	53.5	50.0	49.6	47.9	52.0	54.3	11.8
Meadow	23.0	1.9	0.4	5.6	10.3	49.3	39.4	66.4	11.8	41.5	56.5	
					Sand							
Diploid	1.9	14.9	3.3	12.6	9.3	26.0	27.3	33.0	17.6	27.0	57.8	
Tetraploid	2.9	10.9	3.0	7.5	8.0	36.4	20.9	32.1	6.8	22.1	65.0	11.8
Meadow	4.5	1.5	1.1	2.3	6.6	5.6	21.3	15.8	1.4	3.3	57.5	
					LSD (0.05)[y] = 12.7							

[z] Least significant difference (LSD) values (P=0.05) for comparing herbicide means within a species

[y] Least significant difference (LSD) values (P=0.05) for comparing species means within a herbicide