CONTROL OF ANNUAL BLUEGRASS SEEDHEADS ON A GOLF COURSE FAIRWAY USING PLANT GROWTH REGULATOR PRODUCTS, 2019

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This study was conducted at the Joseph Valentine Turfgrass Research Center in University Park, PA on a mixed stand of annual bluegrass (85%) and creeping bentgrass (15%) maintained as a golf fairway. Mowing was performed 3 times per week at a height of 0.5 in. Soil rootzone was a silty loam with a pH of 7.6 and 2.1% organic matter. Individual plots measured 3 ft x 6 ft and were arranged as a randomized complete block design with four replications. Treatments were applied with a CO^2-pressurized backpack sprayer at 40 PSI with a single TeeJet AI9508 EVS nozzle and calibrated to deliver 1.0 gallon of water per 1000 ft^2. All application dates are listed in the tables. Percent seedhead was visually assessed on a 0 to 100 percent scale where 0 = no seedheads present and 100 = entire plot area covered with seedheads. Injury was visually assessed on a 0 to 5 scale where 0 = no injury observed, 2 = maximum level of acceptable injury and 5 = entire area brown or dead. All data were subjected to analysis of variance and means separated at $P \leq 0.05$ according to Fisher's Protected least significant difference test

Seedheads were first observed within the study site on 29 Apr. Seedhead pressure peaked (71%) within the nontreated control plots on 13 May (Table 1.). In general, all plots treated with plant growth regulators significantly reduced percent seedheads on all rating dates when compared to the nontreated plots (Table 1.). Plots treated with Maintain CF at 1.0 lb/A had among the lowest percent seedhead on all rating dates. On 13 May, plots treated with Maintain CF (1.0 and 2.0 lb ai/A) had the fewest seedheads (6 to 8%) when compared to all other treatments (17 to 30%) and the nontreated plots (71%). Embark provided good (7 to 17%) seedhead suppression throughout the study, while plots treated with Primo + Proxy provided good (12 to 17%) seedhead suppression during peak activity and excellent (5 to 8%) on all other rating dates. Turfgrass injury was observed within plots treated with Embark or Maintain CF. Plots treated with Embark and Maintain CF (1.0 lbs or less) had acceptable (≤ 2) injury, while those treated with Maintain CF at 2.0 lbs/A were considered unacceptable on 4 of 6 rating dates (Table 2.).

Based on the results of this study, Maintain CF at 2.0 lbs provided the greatest suppression of annual bluegrass seedheads. However, injury at this rate was considered unacceptable. Applying Maintain CF at 1.0 lb/A provided the greatest level of seedhead suppression with only minor injury. Although Primo + Proxy resulted in no turfgrass injury, it provided only good (12 to 17%) reductions in seedheads relative to Maintain CF applied at the 1 lb rate. Future research should investigate optimum timings of initial seedhead applications as well as options to mask any discoloration and injury caused by the various PGRs.

Table 1. Seedheads on a *Poa annua* fairway following the application of plant growth regulators, 2019.

Treatment and rate		App Code[y]	Percent seedhead[z]					
			29 Apr	6 May	13 May	20 May	27 May	3 Jun
1	Maintain CF 0.063 lb/A	A	9.0 bc[x]	22.0 b	29.5 b	23.8 b	16.3 b	12.0 ab
2	Maintain CF 0.5 lb/A	A	6.5 cd	12.5 cd	13.0 cd	14.0 cd	10.0 c	7.5 bc
3	Maintain CF 1.0 lb/A	A	5.0 d	6.5 e	8.3 de	9.0 ef	7.3 cd	5.3 c
4	Nontreated	-	13.5 a	51.3 a	71.3 a	58.8 a	33.8 a	15.5 a
5	Maintain CF 2.0 lb/A	A	4.0 d	4.8 e	5.8 e	4.5 f	4.0 d	2.8 c
6	Embark 2SC 780 GDD (22) 0.07 fl oz/M.....	BD	10.0 b	14.3 c	17.0 c	17.0 c	9.3 c	7.0 bc
7	Primo MAXX 220 GDD (32) 0.125 fl oz/M	AC						
	Proxy 220 GDD (32) 5.0 fl oz/M	AC	5.3 d	7.8 de	16.5 c	11.8 de	7.0 cd	4.5 c

[z] Percent seedhead was visually assessed on a 0 to 100 percent scale where 0 = no seedheads present and 100 = entire plot area covered in seedheads.

[y] Treatments were applied on the following dates: A = 1 Apr, B = 3 Apr, C = 15 Apr, and D = 17 Apr.

[x] Means in a column followed by the same letter are not significantly different at $P \leq 0.05$ according to the Fisher's Protected least significant difference.

Table 2. Turfgrass Injury on a *Poa annua* fairway following the application of plant growth regulators, 2019.

	Treatment and rate per 1000ft^2	App Code[y]	Injury[z]					
			8 Mar	22 Mar	29 Apr	6 May	13 May	20 May
1	Maintain CF 0.063 lb/A	A	0.5 c	0.5 d	0.3 d	0.0 c	0.0 b	0.0 a
2	Maintain CF 0.5 lb/A	A	1.8 b	1.3 c	1.0 c	1.0 b	0.8 a	0.0 a
3	Maintain CF 1.0 lb/A	A	1.8 b	2.0 b	2.0 b	2.0 a	0.8 a	0.0 a
4	Nontreated	-	0.0 c	0.0 d	0.0 d	0.0 c	0.0 b	0.0 a
5	Maintain CF 2.0 lb/A	A	2.5 a	2.8 a	2.8 a	2.3 a	1.0 a	0.0 a
6	Embark 2SC 780 GDD (22) 0.07 fl oz/M.....	BD	1.3 b	1.8 bc	1.3 b	1.3 b	0.0 b	0.0 a
7	Primo MAXX 220 GDD (32) 0.125 fl oz/M	AC						
	Proxy 220 GDD (32) 5.0 fl oz/M	AC	0.0 c	0.0 d	0.0 c	0.0 c	0.0 b	0.0 a

[z] Injury was visually assessed on a 0 to 5 scale where 0 = no injury observed, 2 = maximum level of acceptable injury for a putting green and 5 = entire area brown or dead.

[y] Treatments were applied on the following dates: A = 1 Apr, B = 3 Apr, C = 15 Apr, and D = 17 Apr.

[x] Means in a column followed by the same letter are not significantly different at $P \leq 0.05$ according to the Fisher's Protected least significant difference.