The Use of Turf Colourants to Reduce Discolouration of Creeping Bentgrass Following Application of the Herbicide Velocity SP

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Summary

A trial was developed to determine if turf colourants could reduce the discoluration caused by applications of the herbicide Velocity SP. Green Lawnger, the heavier pigmented product, was better at concealing turf discolouration caused by the Velocity SP herbicide than the Indicator Green. Over the course of the trial the level of concealment of both products was affected by regular mowing. It was thought that a portion of the colourant was removed with each mowing. Irrigating the turf also reduced the masking ability of the Indicator Green WSP as the colorant was washed off the treated plants.

Introduction

The product, Velocity SP Herbicide (active ingredient bispyribac-sodium), has been registered for use in Canada to remove annual bluegrass (*Poa annua*) from creeping bentgrass. A condition of the registration is that the product not be applied to bentgrass that is mowed lower than 9mm (0.35"). Unfortunately, the majority of bentgrass grown in western Canada is for use on golf course putting greens, which is typically mowed at a height of 3-5mm.

In earlier studies conducted by the PTRC at the Carstairs Community Golf Club, creeping bentgrass maintained at a height of 3.2mm (0.125") was noticeably discoloured after applications of Velocity SP Herbicide at the label rate (0.31g/100m^2) or lower. Discolouration was thought to be a phytotoxic reaction to the applications and was high enough to be of concern. This discolouration appeared after the second application and was particularly noticeable at the two higher rates (0.23g and 0.31g/100m^2). As a result, applications were discontinued after the third application. The lower rates of application (0.08g and 0.16g/100m^2) produced good control of annual bluegrass with less discolouration after six weekly applications.

This trial was developed to determine whether discolouration of turfgrass due to the application of the herbicide Velocity SP could be masked with the application of turf colourants.

Methodology

In August of 2010 a test was conducted at the Prairie Turfgrass Research Centre (Olds College, Olds, Alberta) to determine whether discolouration of creeping bentgrass due to the application of Velocity SP Herbicide could be concealed with the application of turf colorants. This test was conducted on a Penncross creeping bentgrass putting green, built to USGA specifications and mowed at a height of 6.2 mm (0.250"). Plot sizes were 0.5 X 0.5 meters and were replicated four times in a completely randomized block design.

To induce discolouration on the turf, double rate applications (0.62g/100m^2) of the herbicide Velocity SP were made. Two applications of the herbicide and turf colorants were made seven days apart. The colorants tested were Green Lawnger, a permanent green pigment turf paint, and Indicator Green WSP, a highly visible but temporary green marking colorant. A CO_2 compressed air sprayer equipped with one Teejet 8002 even flat fan nozzle calibrated to spray 3L/100m^2 was used to make the applications. The various treatments are outline in Table 1.

Table 1 – Treatments applied to creeping bentgrass.

Product & rate	
No colorant applied	
Green Lawnger	200mls/100m^2
Green Lawnger	300mls/100m^2
Green Lawnger	400mls/100m^2
Indicator Green	1g/100m^2
Indicator Green	2g/100m^2
Indicator Green	3g/100m^2

Discolouration of the creeping bentgrass, which is an indication of herbicide toxicity was determined using a 1 - 5 scale (Table 2). Plots were rated 3, 7 & 14 days after the first application date.

Table 2 - Rating scale for discolouration of bentgrass following product applications.

Value	Description of Discolouration
1	No turf discolouration evident.
2	Negligible turf discoloration observed.
3	Slight turf discoloration observed.
4	Moderate turf discoloration observed.
5	Substantial turf discoloration observed.

Results

Matching turf colour between the turf colourant and the untreated plots proved to be a challenge as colour intensity varied greatly with height of cut, spray rates, irrigation even light intensity. Both manufacturers indicated that the application rates could be adjusted up or down depending on the shade of green required. In general, the higher rates increased the darkness of the green colour.

Insert Velocity discolouration

Green Lawnger, the heavier pigmented product, reduced discolouration more than did the Indicator Green following application of the Velocity SP herbicide (Table 3). All three rates of Green Lawnger significantly reduced discolouration with the highest rate of application showing the greatest reduction. It was observed that colouration was affected by both mowing and irrigation. As mowing occurred a portion of the colourant was removed with the clippings while the irrigation may have washed the colourant from the leaves. This was particularly noticeable for the Indicator Green WSP.

Table 3 – Discolouration reduction following application of turf colourants.

Product & rate	0 DAT	3 DAT	7 DAT	14 DAT
		1- 5 scale		

No colorant applied		1.0a	1.2a	3.0a	4.0a
Green Lawnger	200mls/100m^2	1.0a	1.0a	2.0b	3.0b
Green Lawnger	300mls/100m^2	1.0a	1.0a	1.2c	2.7c
Green Lawnger	400mls/100m^2	1.0a	1.0a	1.0c	2.0d
Indicator Green	1g/100m^2	1.0a	1.0a	3.0a	4.0a
Indicator Green	2g/100m^2	1.0a	1.0a	2.5ab	4.0a
Indicator Green	3g/100m^2	1.0a	1.0a	2.5ab	4.0a
		n/s	n/s	0.5	0.2

Discussion

The high rates of application of the Velocity SP caused a moderate discolouration of the turf. Lower rates of application would be expected to produce less discolouration, and in turn, would likely require less colourant. The Carstairs study in 2009 showed substantial discolouration after four applications of Velocity SP, which would indicate that rate and the number of applications affects the amount of discolouration.