

Phytotoxic Response of Fairway Creeping Bentgrass to Combinations of Pesticides and Several Application Timings

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Objective

Our objective was to determine the phytotoxic response of fairway creeping bentgrass to combinations of pesticides and several application timings proposed for use to control *Poa trivialis*. A companion study was conducted to determine the efficacy of these same treatments to control *Poa trivialis* (see report on previous pages).

Rationale

Poa trivialis has become a widespread weed in creeping bentgrass fairways across Indiana and the midwest. For selective pesticidal control of *Poa trivialis* to be used by golf course superintendents the recommended pesticide application must control *Poa trivialis* without causing objectionable damage to the creeping bentgrass fairway. This research was initiated to determine the degree of phytotoxic damage to the fairway creeping bentgrass caused by combinations of pesticides and several application timings proposed for control of *Poa trivialis*.

How It Was Done

A mature stand of Penncross creeping bentgrass growing in a silt loam soil at the Purdue Agronomy Research Center was the site for the experiment. The creeping bentgrass was mowed at 0.5 inch three times per week with clippings returned. Fertilizer was applied at the rate of 1 lb N/1000 on 29 May 1998. Turf was irrigated to prevent any sign of drought stress. The only pesticide application made, except for treatments, was Chipco 26019 to control dollar spot. The initial date of treatment application was 3 June 1998 (0 weeks), the second application date was 26 June (3 weeks), and the third application date was 17 July (6 weeks). All treatments were applied using a CO₂ powered hand-held spray boom in 2 gal. water per 1,000 sq. ft. Data collected were phytotoxicity and percent of plot area covered by creeping bentgrass.

Results

- Phytotoxicity damage in plots treated with Drive 75DF plus methylated seed oil (MSO) was more severe as the number of applications and rate of Drive 75DF applied was increased. On only one occasion was phytotoxicity rated to be unacceptable for Drive 75DF plus MSO treatments.
- Daconate 6 (MSMA) alone or mixed with Drive 75DF plus MSO in multiple applications caused unacceptable phytotoxicity to the creeping bentgrass.
- Turflon Ester 4L alone or mixed with Daconate 6 caused unacceptable phytotoxicity to the creeping bentgrass. Turflon Ester 4L plus Daconate 6 caused more phytotoxicity to the creeping bentgrass than either herbicide applied individually.
- Percent cover by creeping bentgrass was not affected by any treatment on any rating date.

Table 1. Phytotoxicity to fairway creeping bentgrass turf caused by commercially available pesticides.

Treatment	Rate of application (lbs ai/A)	Application timing ^b (weeks)	Phytotoxicity ^a								
			6 June	10 June	17 June	29 June	2 July	9 July	20 July	24 July	31 July
Check	---	---	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Drive 75DF	0.25	0	9.0	8.7	9.0	9.0	9.0	9.0	9.0	9.0	9.0
+ methylated seed oil ^c	1.0 ^d										
Drive 75DF	0.257	0, 3	9.0	9.0	9.0	8.7	8.0	9.0	9.0	9.0	9.0
+ methylated seed oil ^c	1.0 ^d										
Drive 75DF	0.25	0, 3, 6	9.0	9.0	9.0	8.7	8.0	9.0	7.3	9.0	8.7
+ methylated seed oil ^c	1.0 ^d										
Drive 75DF	0.5	0	9.0	8.3	8.3	9.0	9.0	9.0	9.0	9.0	9.0
+ methylated seed oil ^c	1.0 ^d										
Drive 75DF	0.5	0, 3	9.0	7.7	7.7	8.3	8.0	8.3	9.0	9.0	9.0
+ methylated seed oil ^c	1.0 ^d										
Drive 75DF	0.5	0, 3, 6	9.0	8.0	8.0	8.0	7.7	8.7	7.0	7.3	8.0
+ methylated seed oil ^c	1.0 ^d										
Drive 75DF	0.75	0	9.0	7.7	7.7	9.0	9.0	9.0	9.0	9.0	9.0
+ methylated seed oil ^c	1.0 ^d										
Drive 75DF	0.75	0, 3	9.0	8.0	8.0	8.0	7.3	8.3	8.7	9.0	9.0
+ methylated seed oil ^c	1.0 ^d										
Drive 75DF	0.75	0, 3, 6	9.0	8.0	7.7	8.0	7.7	8.3	6.7	7.3	8.0
+ methylated seed oil ^c	1.0 ^d										
Drive 75DF	1.0	0	9.0	7.7	8.0	9.0	9.0	9.0	9.0	9.0	9.0
+ methylated seed oil ^c	1.0 ^d										
Drive 75DF	1.0	0, 3	9.0	7.7	7.3	8.0	7.3	8.0	9.0	9.0	9.0
+ methylated seed oil ^c	1.0 ^d										
Drive 75DF	1.0	0, 3, 6	9.0	7.0	7.0	7.7	7.0	7.7	6.3	7.0	6.7
+ methylated seed oil ^c	1.0 ^d										
Daconate 6	2.0	0	9.0	9.0	9.0	9.0	9.0	8.7	9.0	9.0	9.0
Daconate 6	2.0	0, 3	9.0	8.7	9.0	6.7	6.3	8.7	8.7	9.0	9.0
Daconate 6	2.0	0, 3, 6	9.0	9.0	9.0	7.0	6.3	8.3	4.3	7.3	8.0
Drive 75DF	0.5	0	9.0	8.7	8.3	9.0	8.7	9.0	9.0	9.0	9.0
+ methylated seed oil	1.0 ^d										
+ Daconate 6 ^c	2.0										
Drive 75DF	0.5	0, 3	9.0	8.7	9.0	6.3	6.3	7.7	8.0	8.7	9.0
+ methylated seed oil	1.0 ^d										
+ Daconate 6 ^c	2.0										
Drive 75DF	0.5	0, 3, 6	9.0	8.3	8.0	6.3	5.7	8.0	3.3	5.3	7.0
+ methylated seed oil	1.0 ^d										
+ Daconate 6 ^c	2.0										

Table 1. Phytotoxicity to fairway creeping bentgrass turf caused by commercially available pesticides. (continued)

Treatment	Rate of application (lbs ai/A)	Application timing ^b (weeks)	Phytotoxicity ^a								
			6 June	10 June	17 June	29 June	2 July	9 July	20 July	24 July	31 July
Turflon Ester 4L	0.5 ^e	0, 3, 6	9.0	8.0	8.0	7.7	6.7	7.0	7.0	7.3	8.7
Sentinel 40WG	0.33 ^f	0, 3, 6	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Primo	0.5 ^f	0, 3, 6	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Turflon Ester 4L	1.0 ^e	0	9.0	6.7	6.7	9.0	9.0	9.0	9.0	9.0	9.0
Turflon Ester 4L	1.0 ^e	0, 3	9.0	6.7	7.7	7.0	5.7	5.3	8.7	9.0	9.0
Turflon Ester 4L	1.0 ^e	0, 3, 6	9.0	6.7	6.3	7.0	6.3	6.0	5.0	5.0	5.3
Daconate 6	2.0	0	9.0	8.0	6.7	9.0	9.0	9.0	9.0	9.0	9.0
+ Turflon Ester 4L ^c	1.0 ^e										
Daconate 6	2.0	0, 3	9.0	8.0	6.7	6.0	5.0	5.7	8.3	9.0	9.0
+ Turflon Ester 4L ^c	1.0 ^e										
Daconate 6	2.0	0, 3, 6	9.0	8.0	6.0	6.0	5.0	5.7	4.0	4.3	5.3
+ Turflon Ester 4L ^c	1.0 ^e										
LSD (0.05)			NS	0.9	0.8	0.7	0.6	0.8	1.2	0.7	0.9

^a Phytotoxicity was rated on a scale of 1-9 where 1 = completely brown turf, 7 = acceptable damage, and 9 = no phytotoxicity.

^b Denotes weeks from initial application.

^c Denotes products applied as a tank mix.

^d Application rate was percent volume per volume.

^e Application rate was pints product per acre.

^f Application rate was ounces product per thousand square feet.