

Comparison of Spring Application Timings of Broadleaf Herbicides in Cool Season Turf

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Background/Objective: Determine effectiveness of broadleaf herbicides when applied at different times in the spring.

Site Information

Location:	Purdue Cross Country Course
Turfgrass Species:	Tall fescue
Turf Condition:	poor
Turf Management:	Mowing Height in: 3
	Fertilization: none
	Irrigation: none
Target Pest:	Dandelion (<i>Taraxacum officinale</i>) White clover (<i>Trifolium repens</i>)

Application Information

Application Dates: in 2005	18 April	4 May	16 May
Spray Volume L gal 1000 ft⁻²:	2		
Spray Equipment:	CO ₂ backpack		
Experimental Design:	Randomized complete block		
Replications:	3		
Plot Size ft:	5 X 10		

Report:

Effect on dandelion

Early spring applications

- 2,4-D ester at 1.5 pt/A + Turflon Ester at 0.5 pt/A + Banvel at 0.2 pt/A produced the highest injury on 7DAT, whereas Triplet and Millenium Ultra produced the lowest injury at 7DAT (Table 1)
- Chaser and the two three way products with 2.4-D ester, Turflon ester and Banvel produced the highest control ratings by 56 DAT
- Triplet provided the lowest dandelion control ratings of all early spring products.
- Triplet and NUP 9B 04 produced less than acceptable long-term control of dandelion as measured on 14 July (Table 2).

Mid-spring applications

- There were few significant differences among the herbicides in injury or control ratings (Table 1). All products worked equally.
- There were no differences in long term control of dandelion from mid-spring applications as measured on 14 July (Table 2).

Late spring applications

- NUP 9B 04 produced the highest injury at 7DAT while Millenium and Chaser produced the lowest injury at 7DAT. (Table 1)
- There were few differences in control ratings by any of the treatments applied in late spring.
- There were no differences in long term control of dandelion from late-spring applications as measured on 14 July (Table 2).

Effect on clover

Early spring applications

- Products containing 2,4-D ester produced the highest control ratings at 15 and 30DAT (Table 3).
- NUP 9B 04, the two three-way ester treatments, and Millennium Ultra produced control ratings of 10 at 56 DAT.
- Chaser produced the poorest clover control ratings at 56DAT

Mid- and late spring applications

- There was little difference in injury due to any of the treatments on either application timing (Table 3).
- All mid-spring applications produced clover control ratings >9.5 by 56 DAT
- Chaser produced the poorest clover control ratings by 30DAT of all the late spring applications.
- All treatments provided 94% or greater control of clover when rated 14 July (Table 4).

Table 1. Control of dandelion from spring applications of broadleaf herbicides. Comparisons between means can only be made within applications timing and not across application timing.

Treatment	Rate of application	App timing ^a	Injury ^b 7DAT	Control ^c		
				15DAT	30DAT	56DAT
	pt/A					
Chaser	3.0	early	4.0	7.7	9.0	10.0
Triplet SF	3.5	early	3.0	6.7	7.3	2.0
NUP 9B 04	3.0	early	4.0	8.3	10.0	7.3
2,4-D Ester	1.5	early	4.7	8.3	8.7	10.0
Turflon Ester	0.5					
Banvel	0.2					
2,4-D Ester	2.0	early	4.0	8.7	10.0	10.0
Turflon Ester	0.75					
Banvel	0.25					
Millenium Ultra	2.67	early	3.0	6.7	6.0	6.3
Check		early	1.0	1.0	1.0	1.0
LSD (0.05)			1.1	1.6	2.0	3.9

Chaser	3.0	mid	4.0	9.3	9.3	9.7
Triplet SF	3.5	mid	4.3	9.7	9.3	10.0
NUP 9B 04	3.0	mid	5.0	10.0	10.0	9.7
2,4-D Ester	1.5	mid	4.3	10.0	10.0	10.0
Turflon Ester	0.5					
Banvel	0.2					
2,4-D Ester	2.0	mid	4.3	10.0	10.0	10.0
Turflon Ester	0.75					
Banvel	0.25					
Millenium Ultra	2.67	mid	4.3	9.3	9.7	10.0
Check		mid	1.0	1.0	1.0	1.0
LSD (0.05)			0.8	0.9	1.0	0.6

Chaser	3.0	late	3.7	8.7	9.3	
Triplet SF	3.5	late	4.0	7.0	8.0	
NUP 9B 04	3.0	late	5.0	0.0	10.0	
2,4-D Ester	1.5	late	4.3	9.3	10.0	
Turflon Ester	0.5					
Banvel	0.2					
2,4-D Ester	2.0	late	4.7	9.3	10.0	
Turflon Ester	0.75					
Banvel	0.25					
Millenium Ultra	2.67	late	3.7	7.7	9.0	
Check		late	1.0	1.0	1.0	
LSD (0.05)			1.1	2.5	2.8	

^a Application timing: early was 18 April, mid was 4 May, and late was 16 May.

^b Injury was rate on a scale of 1 to 5 with 1=no injury and 5=leaves severely curled and becoming necrotic.

^c Control was rated on a scale of 1 to 10 with 1=no control and 10=100% control.

Table 2. Percent control of dandelion as rated on 14 July from early, mid, or late spring herbicide applications.

Treatment	Rate of application	% Control ^a		
		Early ^b	Mid	Late
Chaser	3.0	100.0d ^c	98.3cd	98.3cd
Triplet SF	3.5	63.3b	100.0d	98.3cd
NUP 9B 04	3.0	83.3c	98.3cd	100.0d
2,4-D Ester	1.5	100.0d	100.0d	100.0d
Turflon Ester	0.5			
Banvel	0.2			
2,4-D Ester	2.0	100.0d	98.3cd	100.0d
Turflon Ester	0.75			
Banvel	0.25			
Millenium Ultra	2.67	90.0cd	95.0cd	100.0d

^a Percent control was calculated as (%cover check - %cover treatment)/ %cover check * 100.

^b Application timing: early was 18 April, mid was 4 May, and late was 16 May.

^c Means followed by the same letter are not significantly different at P=0.05.

Table 3. Control of dandelion from spring applications of broadleaf herbicides. Comparisons between means can only be made within applications timing and not across application timing.

Treatment	Rate of application	App timing ^a	Injury ^b 7DAT	Control ^c		
				15DAT	30DAT	56DAT
	pt/A					
Chaser	3.0	early	2.3	5.0	6.7	6.3
Triplet SF	3.5	early	2.0	4.3	5.7	9.7
NUP 9B 04	3.0	early	2.7	4.7	8.3	10.0
2,4-D Ester	1.5	early	2.7	6.3	10.0	10.0
Turflon Ester	0.5					
Banvel	0.2					
2,4-D Ester	2.0	early	3.3	7.0	10.0	10.0
Turflon Ester	0.75					
Banvel	0.25					
Millenium Ultra	2.67	early	2.3	4.0	5.7	10.0
Check		early	1.0	1.0	1.0	1.0
LSD (0.05)			0.9	2.6	2.9	2.3

Chaser	3.0	mid	2.3	5.3	6.7	9.7
Triplet SF	3.5	mid	3.0	5.7	8.3	10.0
NUP 9B 04	3.0	mid	3.0	7.7	8.7	10.0
2,4-D Ester	1.5	mid	2.7	6.3	9.3	10.0
Turflon Ester	0.5					
Banvel	0.2					
2,4-D Ester	2.0	mid	3.3	7.0	7.3	10.0
Turflon Ester	0.75					
Banvel	0.25					
Millenium Ultra	2.67	mid	2.7	5.7	9.0	10.0
Check		mid	1.0	1.0	1.0	1.0
LSD (0.05)			1.3	3.7	3.5	0.4

Chaser	3.0	late	3.0	6.0	6.7	
Triplet SF	3.5	late	3.0	7.3	9.7	
NUP 9B 04	3.0	late	3.3	6.0	10.0	
2,4-D Ester	1.5	late	3.0	5.0	8.7	
Turflon Ester	0.5					
Banvel	0.2					
2,4-D Ester	2.0	late	3.3	5.7	9.7	
Turflon Ester	0.75					
Banvel	0.25					
Millenium Ultra	2.67	late	2.7	6.0	9.3	
Check		late	1.0	1.0	1.0	
LSD (0.05)			1.3	2.0	1.4	

^a Injury was rate on a scale of 1 to 5 with 1=no injury and 5=leaves severely curled and becoming necrotic.

^b Control was rated on a scale of 1 to 10 with 1=no control and 10=100% control.

^c Application timing: early was 18 April, mid was 4 May, and late was 16 May.

Table 4. Percent control of clover as rated on 14 July from early, mid, or late spring herbicide applications.

Treatment	Rate of application	% Control ^a		
		Early ^b	Mid	Late
Chaser	3.0	99.3b ^c	94.6b	95.9b
Triplet SF	3.5	94.4b	100.0b	100.0b
NUP 9B 04	3.0	100.0b	100.0b	100.0b
2,4-D Ester	1.5	100.0b	98.7b	100.0b
Turflon Ester	0.5			
Banvel	0.2			
2,4-D Ester	2.0	100.0b	100.0b	100.0b
Turflon Ester	0.75			
Banvel	0.25			
Millenium Ultra	2.67	100.0b	100.0b	100.0b

^a Percent control was calculated as (%cover check - %cover treatment)/ %cover check * 100.

^b Application timing: early was 18 April, mid was 4 May, and late was 16 May.

^c Means followed by the same letter are not significantly different at P=0.05.