

Substitutions for Clopyralid for Broadleaf Weed Control

Zac Reicher and Dan Weisenberger

Background/Objective:

Clopyralid can no longer be used in residential lawns, and thus it is important to evaluate potential clopyralid replacements for broadleaf weed control.

Site Information

Location:	William H. Daniel Research and Diagnostic Center, W. Lafayette, IN.
Soil Type:	Starks-Fincastle silt loam
Soil pH:	7.2
Soil Organic Matter (%):	NA
Turfgrass Species:	Kentucky bluegrass
Turf Condition:	Fair
Turf Management: Mowing Height cm (in):	6.35 (2.5)
Fertilization:	None
Irrigation:	To prevent moisture stress
Testing on Site Previous Year:	None
Target Pest:	Dandelion (<i>Taraxacum officinale</i>)
Growth Stage:	Actively growing

Application Information

Application Date:	May 14
Application Time:	7:00 AM
Air Temperature C⁰(F⁰):	16.1 (61)
Relative Humidity(%):	58
Wind Speed m s⁻¹ (mph):	Calm
Soil Temperature (7.6 cm depth) C⁰(F⁰):	12.8 (55)
Soil Moisture:	Moist
Spray Volume L ha⁻¹ (gal 1000 ft⁻²):	814 (2)
Spray Pressure:	30psi
Spray Nozzle:	8001.5
Spray Equipment:	CO ₂ backpack
Irrigation After Application:	None
Experimental Design:	Randomized complete block
Replications:	3
Plot Size m (ft):	1.5 X 3 (5 X 10)

Results:

By 19 and 22 May (5 and 8 days after treatment, respectively) almost all treatments produced more phytotoxicity on dandelion than did clopyralid (Table 1). RIV02-3, Garlon EV at 3.0 and 6.0 pts/A, and Vista at 2.67 pts/A burned dandelions the most. XDE-638 alone or tankmixed with Vista caused little or no burn to dandelions.

There was no phytotoxicity to Kentucky bluegrass at any of the three rating dates (Table 2).

All treatments reduced dandelion cover compared to the check (Table 3). None of the treatments performed significantly better than clopyralid and only Garlon EV at 1.5 pts/A, Bastion T at 0.8 pts/A, and Vista at 0.67 pts/A performed worse than clopyralid. Curiously, XDE-638 alone or tankmixed with Vista provided significant dandelion control in spite of little obvious burn to dandelion by 22 May. Garlon, Bastion, and Vista at their respective high rates and RIV02-03 and RIV04-03 appear to be satisfactory replacements for clopyralid-containing products.

Though Vista+Quicksilver cannot be compared with the other treatments, it appears that this combination gives very poor control of dandelion.

Table 1. Phytotoxicity^a to dandelion after an application with various liquid herbicides.

Treatment	Rate of application	17 May	19 May	22 May
	pints/A			
RIV02-03	2.5	7.7	6.0	3.7
RIV04-03	3.5	7.7	6.7	5.3
Millenium Ultra	2.5	7.7	7.0	6.3
Momentum	3.5	8.7	8.0	6.7
Garlon EV (EF-1518)	1.5	8.0	7.3	5.0
Garlon EV (EF-1518)	3.0	8.0	6.0	4.3
Garlon EV (EF-1518)	6.0	7.3	6.3	4.3
Bastion T (EF-1063)	0.8	8.7	8.3	6.0
Bastion T (EF-1063)	1.66	8.3	7.0	6.7
Bastion T (EF-1063)	3.33	7.7	6.7	5.0
Vista	0.67	8.0	7.3	5.3
Vista	1.33	7.3	6.7	5.3
Vista	2.67	6.7	6.0	4.7
Vista	0.67	7.7	7.3	7.0
+ XDE-638 (GF-443)	0.25			
XDE-638 (GF-443)	0.25	8.3	8.3	7.0
+ NIS	0.125 ^b			
Confront	1.5	8.3	8.0	7.3
Triplet SF	3.5	7.7	7.0	6.0
Check	-	9.0	9.0	8.3
LSD (0.05)		1.2	1.1	1.8
Vista	1.33	5.0	4.3	2.7
+ Quicksilver ^d	1.3 ^c			

^a Phytotoxicity was rated on a scale of 1 to 9, with 1 = total brown, 5 = 50% of the plant brown/yellow and/or twisted/curled, and 9 = no phytotoxicity.

^b Application rate was percent volume per volume.

^c Application rate was fluid ounces of product per acre.

^d Vista+Quicksilver was a late addition and was not randomized within the other treatments. Therefore, means cannot be compared with the others and are presented for information only.

Table 2. Phytotoxicity^a to Kentucky bluegrass after an application with various liquid herbicides.

Treatment	Rate of application	22 May	30 May	12 June
	pints/A			
RIV02-03	2.5	9	9	9
RIV04-03	3.5	9	9	9
Millenium Ultra	2.5	9	9	9
Momentum	3.5	9	9	9
Garlon EV (EF-1518)	1.5	9	9	9
Garlon EV (EF-1518)	3.0	9	9	9
Garlon EV (EF-1518)	6.0	9	9	9
Bastion T (EF-1063)	0.8	9	9	9
Bastion T (EF-1063)	1.66	9	9	9
Bastion T (EF-1063)	3.33	9	9	9
Vista	0.67	9	9	9
Vista	1.33	9	9	9
Vista	2.67	9	9	9
Vista	0.67	9	9	9
+ XDE-638 (GF-443)	0.25			
XDE-638 (GF-443)	0.25	9	9	9
+ NIS	0.125 ^b			
Confront	1.5	9	9	9
Triplet SF	3.5	9	9	9
Check	-	9	9	9
LSD (0.05)		NS	NS	NS
Vista	1.33	9	9	9
+ Quicksilver ^d	1.3 ^c			

^a Phytotoxicity was rated on a scale of 1 to 9, with 1 = total brown, 7 = acceptable damage, and 9 = no phytotoxicity.

^b Application rate was percent volume per volume.

^c Application rate was fluid ounces of product per acre.

^d Vista+Quicksilver was a late addition and was not randomized within the other treatments. Therefore, means cannot be compared with the others and are presented for information only.

Table 3. Percent cover^a of dandelion after treatment with various broadleaf herbicides.

Treatment	Rate of application	30 May	7 June	12 June	27 June	8 July
	pints/A					
RIV02-03	2.5	5.7	0.7	0.0	0.3	1.0
RIV04-03	3.5	5.3	1.0	1.7	2.3	5.7
Millenium Ultra	2.5	15.0	4.3	2.0	0.7	1.7
Momentum	3.5	8.3	2.0	1.7	2.3	3.0
Garlon EV (EF-1518)	1.5	13.3	3.7	10.0	21.7	26.7
Garlon EV (EF-1518)	3.0	9.0	2.0	3.3	9.0	14.0
Garlon EV (EF-1518)	6.0	5.0	1.0	0.3	2.0	4.3
Bastion T (EF-1063)	0.8	11.0	7.3	11.7	20.0	23.3
Bastion T (EF-1063)	1.66	10.0	2.7	4.0	11.0	15.0
Bastion T (EF-1063)	3.33	8.3	2.0	2.7	5.0	6.7
Vista	0.67	15.0	11.0	14.7	21.7	28.3
Vista	1.33	5.7	2.3	5.0	12.7	16.3
Vista	2.67	8.3	2.3	2.0	6.7	6.3
Vista	0.67	10.0	2.7	3.0	6.0	11.0
+ XDE-638 (GF-443)	0.25					
XDE-638 (GF-443)	0.25	11.7	4.0	2.7	3.0	5.7
+ NIS	0.125 ^b					
Confront	1.5	6.0	4.0	2.0	4.7	6.7
Triplet SF	3.5	10.0	4.3	4.3	4.3	6.7
Check	-	38.3	31.7	36.7	45.0	41.7
LSD (0.05)		8.0	7.3	11.7	15.8	15.4
Vista	1.33	11.7	16.7	33.3	65.0	63.3
+ Quicksilver ^d	1.3 ^c					

^a Percent of the plot area that was covered by dandelion plants.

^b Application rate was percent volume per volume.

^c Application rate was fluid ounces of product per acre.

^d Vista+Quicksilver was a late addition and was not randomized within the other treatments. Therefore, means cannot be compared with the others and are presented for information only.