

Weed control in Clearfield sunflower, Carrington, 2007. (Greg Endres). The experimental design was a randomized complete block with three replicates. The dryland, conventional-till trial was established on a Heimdal loam soil with 3.2% organic matter and 6.9 pH. Mycogen '8N386CL' oil sunflower were planted in 30-inch rows on May 21. Herbicide treatments were applied with a CO₂-hand-boom plot sprayer delivering 11.5 gal/A at 30 psi through 8001 flat fan nozzles to the center 6.7 ft of 10 by 30 ft plots. Pre-emergence (PRE) treatments were applied on May 21 with 75 F, 62% RH, 100% cloudy sky on a dry soil surface. Rainfall totaling 1.6 inches occurred the day following application of PRE treatments. Post-emergence (POST) treatments were applied on June 28 with 54 F, 82% RH, 100% cloudy sky, and 3 mph wind to V8- to V10-stage sunflower, 2- to 4-inch tall (tillering) green and yellow foxtail, tillering volunteer wheat, 0.5- to 5-inch tall common lambsquarters, 3- to 6-inch diameter common purslane, 2- to 6-inch tall lanceleaf sage, 1- to 4-inch tall hairy nightshade, 0.5- to 8-inch tall (blooming) wild mustard, 1- to 2-inch tall biennial wormwood, 3- to 5-inch tall redroot pigweed, 0.5- to 4-inch tall prostrate pigweed, and 3- to 4-inch tall wild buckwheat. Sunflower density on June 29 was 26,000 plants/A and weed density generally was low, ranging from 1- to 7-plants/ft² for all species. The trial was harvested with a plot combine on November 19.

Common lambsquarters control was excellent (94-98%) with PRE Spartan followed by Beyond (Table 1). Biennial wormwood control was excellent with PRE Spartan at 3 fl oz/A followed by Beyond. Redroot pigweed and wild mustard control generally was excellent with all treatments, ranging from 85 to 98%. Control of other broadleaf and grassy weeds was generally fair with all treatments, ranging from 53 to 80%. Plant chlorosis occurred with Beyond when visually evaluated on July 14 (Table 2). Crop injury was not detected on July 26, and days required to reach crop flowering and physiological maturity were similar among treatments (data not shown). Sunflower yield improved with herbicide treatments compared to the untreated check. Test weight and oil were generally similar among treatments.

Table 1. Weed control in Clearfield sunflower, Carrington, 2007.

		Weed control ¹																			
Herbicide		7/14											7/27								
Treatment ²	Application ³	Rate	fota	wht	colq	copu	llsa	hans	wimu	biww	rrpw	prpw	wibw	fota	colq	copu	llsa	hans	rrpw	prpw	wibw
		fl oz product/A	%																		
Prowl H ² O/ Beyond + NIS	PRE/POST	48/4 + 0.25% v/v	68	77	72	83	75	83	95	66	91	91	66	70	78	74	72	77	90	75	63
Spartan/Beyond + NIS	PRE/POST	3/4 + 0.25% v/v	73	77	96	72	78	85	95	99	98	78	70	70	94	73	75	77	96	82	71
Prowl H ² O + Spartan/Beyond + NIS	PRE/POST	24 + 1.5/4 + 0.25% v/v	77	80	98	85	75	83	95	73	96	73	65	70	95	72	72	77	93	72	53
Beyond + NIS	POST	4 + 0.25% v/v	72	79	70	65	77	78	95	59	90	67	68	69	68	72	75	75	85	73	56
Beyond + MSO	POST	4 + 1% v/v	74	80	72	68	76	78	95	70	90	72	69	70	70	72	73	75	90	72	65
untreated check			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C.V. (%)			3.9	5	5.8	10.3	2.3	3.7	0.0	15.2	5.2	13.7	4.5	0.8	12.1	3.9	3.7	3.3	6.7	10.7	15.3
LSD (0.05)			4	5	7	12	3	5	0	19	7	16	5	1	15	4	4	4	9	12	14

¹fota=green and yellow foxtail; whe=volunteer wheat; colq=common lambsquarters; copu=common purslane; llsa=lanceleaf sage; hans=hairy nightshade; wimu=wild mustard; biww=biennial wormwood; rrpw=redroot pigweed; prpw=prostrate pigweed; and wibw=wild buckwheat.

²NIS=Preference, a nonionic surfactant from Winfield; MSO=Destiny, a methylated seed oil from WinField. Urea ammonium nitrate include in all herbicide tank mixtures at 2.5% v/v.

³PRE=May 21; POST=June 28.

Table 2. Clearfield sunflower response to herbicides, Carrington, 2007.						
			Sunflower			
Herbicide			Injury	Seed yield	Test weight	Oil
Treatment ¹	Application ²	Rate	Chlorosis			
			0-9 ³	bu/A	lb/A	%
Prowl H ² O/Beyond + NIS	PRE/POST	48/4 + 0.25% v/v	2	1121	29.1	39.5
Spartan/Beyond + NIS	PRE/POST	3/4 + 0.25% v/v	1	1009	29.4	38.7
Prowl H ² O + Spartan/Beyond + NIS	PRE/POST	24 + 1.5/4 + 0.25% v/v	1	1280	28.8	39.6
Beyond + NIS	POST	4 + 0.25% v/v	2	1116	27.7	37.8
Beyond + MSO	POST	4 + 1% v/v	2	963	29.0	38.0
untreated check			0	573	28.1	38.1
C.V. (%)			27.4	18.3	2.1	2.4
LSD (0.05)			1	341	1.1	NS
¹ NIS=Preference, a nonionic surfactant from Winfield; MSO=Destiny, a methylated seed oil from WinField. Urea ammonium nitrate include in all herbicide tank mixtures at 2.5% v/v.						
² PRE=May 21; POST=June 28.						
³ 0=none; 9=yellow.						