

## 2012 Table Beet Weed Control Trials

University of California Cooperative Extension

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**Methods:** The trial was conducted at the Hartnell East Campus Research Station in Salinas, CA. The beet variety 'Red Ace' was seeded with a Planet Jr. seeder in two seedlines on a 40-inch wide bed on April 9, 2012. The soil at the site was Chualar loam (organic matter = 2.06; pH = 7.4; sand – 53, silt – 30 and clay – 17%). All treatments were applied and irrigated with 0.75 inch of water with sprinklers on the same day. The weather on the day of application was cloudy and temperatures were 68 F with winds <3 miles per hour. Each plot was one 40-inch bed wide by 20 feet long and replicated 4 times in a randomized complete block design. Materials were applied with a CO<sub>2</sub> backpack sprayer using a one wand nozzle with an 8008E tip at 30 psi. Two passes with the wand were used to apply the material to each plot applying the equivalent of 65 GPA of water. The materials included in the evaluation included: s-metolachlor (Dual Magnum 7.63); clomazone (Command); pendimethalin (Prowl H2O); pyroxasulfone (Zidua 85 WDG); cycloate (RoNeet 6E); amicarbazone 75WG.

The beets were grown with standard production practices. The crop was sprinkler irrigated the entire season and the beets were topdressed with 80 lbs of N as ammonium sulfate on May 9. Weeds and phytotoxicity were rated on April 27 and May 3. Phytotoxicity was rated again on May 17 and weeding time was evaluated by hand pulling weeds from a 333 ft<sup>2</sup> area and the numbers of weeds removed were recorded. Yield was evaluated by harvesting all beets in a 167 ft<sup>2</sup> area on June 25. See tables for more details on the evaluations.

**Results:** All materials except 0.63 lb a.i./A s-metolachlor and cycloate had unacceptable phytotoxicity on April 27 (Table 1). S-metolachlor at 1.26 lb a.i./A and clomazone at 0.5 lb a.i./A were less phytotoxic but still had unacceptably high ratings. Overall weed control by s-metolachlor at 0.63 lb a.i./A and cycloate at 1.5 lb a.i./A was fair. Most of the other materials with high phytotoxicity provided excellent weed control. The same trend continued on the second weed and phytotoxicity evaluation date (Table 2). The untreated control took the equivalent of 244 hours/A to weed on May 17 (Table 3), and the s-metolachlor at 0.63 lb a.i./A and cycloate had weeding times of 100 and 154 hours/A, respectively; the weed pressure at this site was very high and, although these materials reduced weeding time, the weeding times were still very high. S-metolachlor at 1.26 lb a.i./A had weeding time of 23.6 hours/A which was much less than the 0.63 lb a.i./A rate. The untreated control yielded 33.3 T/A and s-metolachlor at 0.63 lb a.i./A and cycloate at 1.5 lb a.i./A yielded 41.5 and 48.2 T/A indicating that the reduced weed pressure that they provided improved the yield of beets. S-metolachlor at 1.26 lb a.i./A yield 32.0 T/A. The other treatments had lower number of beets and tonnage.

These results indicate that both s-metolachlor and cycloate can provide improved weed control over the untreated control, but at this site with extremely high weed pressure, only a higher rate of s-metolachlor (1.26 lb a.i./A) was able to satisfactorily reduce weeding time to almost acceptable levels. However, the higher level of s-metolachlor, had lower yield than a lower rate of the same material. All other materials tested in this trial had unacceptably high phytotoxicity at this site.

Table 1. Phytotoxicity and weed control ratings on April 27, 2012

Treatment	lbs a.i./A	Material/A	Phyto- toxicity <sup>1</sup>	Little mallow	Hairy nightshade	Cheno- pods <sup>2</sup>	Burning Nettle	Redroot Pigweed	Overall rating
Untreated	----	----	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>s</i> -metolachlor	0.63	0.66 pt	0.8	9.5	6.8	9.5	7.8	10.0	7.9
<i>s</i> -metolachlor	1.26	1.32 pt	3.0	8.5	9.3	10.0	9.1	9.8	9.0
amicarbazone 75WG	0.0556	1.19 oz	7.3	10.0	9.0	10.0	8.3	9.3	8.5
amicarbazone 75WG	0.111	2.36 oz	6.3	8.5	7.6	10.0	7.1	10.0	8.4
amicarbazone 75WG	0.223	4.76 oz	8.5	9.6	7.4	10.0	7.6	10.0	7.9
clomazone	0.5	1.33 pt	3.8	9.5	10.0	9.8	8.0	10.0	9.1
clomazone	1.0	2.66 pt	8.0	9.5	9.5	10.0	9.5	10.0	9.5
pendimethalin	1.0	2.0 pts	5.3	7.5	4.5	10.0	9.8	10.0	6.8
pendimethalin	2.0	4.0 pts	6.5	7.8	5.0	10.0	10.0	10.0	8.1
pyroxasulfone	0.015	0.28 oz	5.5	8.0	4.3	10.0	6.0	10.0	5.8
pyroxasulfone	0.032	0.60 oz	7.5	9.3	8.0	10.0	7.8	10.0	8.5
cycloate	1.5	2.0 pts	0.5	9.0	6.8	8.8	7.0	8.8	7.3
			0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
		LSD (0.05)	1.6	2.5	2.7	1.1	2.6	0.9	1.8

1 – Scale: 0=no crop damage to 10=crop dead; 2 – lambsquarters and nettle leaf goosefoot.

Table 2. Phytotoxicity and weed control ratings on May 3, 2012

Treatment	lbs a.i./A	Material/A	Phyto- toxicity <sup>1</sup>	Little mallow	Hairy nightshade	Cheno- pods <sup>2</sup>	Burning Nettle	Redroot Pigweed	Overall rating
Untreated	----	----	0.3	0.0	0.0	0.0	0.0	0.0	0.0
<i>s</i> -metolachlor	0.63	0.66 pt	1.0	8.0	7.5	8.3	7.5	8.3	7.5
<i>s</i> -metolachlor	1.26	1.32 pt	6.0	8.6	8.9	9.8	8.5	9.8	8.9
amicarbazone 75WG	0.0556	1.19 oz	6.8	7.3	7.0	8.8	7.3	7.3	7.1
amicarbazone 75WG	0.111	2.36 oz	6.1	7.5	7.0	9.0	7.0	8.3	7.8
amicarbazone 75WG	0.223	4.76 oz	8.6	7.5	7.9	8.5	8.5	8.5	8.1
clomazone	0.5	1.33 pt	5.3	9.5	9.8	10.0	8.0	10.0	9.1
clomazone	1.0	2.66 pt	8.3	10.0	10.0	10.0	9.0	10.0	9.5
pendimethalin	1.0	2.0 pts	7.5	7.8	7.5	10.0	9.0	10.0	8.1
pendimethalin	2.0	4.0 pts	8.4	7.8	7.8	10.0	9.0	10.0	8.5
pyroxasulfone	0.015	0.28 oz	7.8	7.3	5.5	9.0	6.5	9.0	7.0
pyroxasulfone	0.032	0.60 oz	8.6	9.3	8.8	10.0	8.3	10.0	8.9
cycloate	1.5	2.0 pts	0.3	7.0	6.5	7.3	5.0	5.3	6.3
			0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
		LSD (0.05)	1.6	1.7	1.9	1.8	1.0	1.7	1.4

1 – Scale: 0=no crop damage to 10=crop dead; 2 – lambsquarters and nettle leaf goosefoot.

Table 3. Weed time, number of weeds and phytotoxicity on May 17 and harvest evaluation on June 25

Treatment	lbs a.i./A	Material/A	Weed time Hours/A	Weeds/A	Phyto- toxicity <sup>1</sup>	Harvest No. Beets/A	Harvest T/A	Harvest mean lbs/beet
Untreated	----	----	244.8	516,701	0.0	250,944	33.3	0.28
s-metolachlor	0.63	0.66 pt	100.2	237,874	0.3	280,352	41.5	0.30
s-metolachlor	1.26	1.32 pt	23.6	44,002	4.7	300,610	32.0	0.21
amicarbazone 75WG	0.0556	1.19 oz	64.5	186,901	7.5	143,117	20.8	0.34
amicarbazone 75WG	0.111	2.36 oz	66.6	205,635	6.5	180,366	22.3	0.36
amicarbazone 75WG	0.223	4.76 oz	14.8	39,646	9.2	15,031	3.1	0.26
clomazone	0.5	1.33 pt	5.9	2,614	6.3	172,524	34.6	0.43
clomazone	1.0	2.66 pt	4.7	0	9.2	5,228	0.9	0.28
pendimethalin	1.0	2.0 pts	4.2	0	10.0	0	0.0	0.00
pendimethalin	2.0	4.0 pts	4.5	436	10.0	0	0.0	0.00
pyroxasulfone	0.015	0.28 oz	120.4	309,323	7.3	276,431	18.9	0.14
pyroxasulfone	0.032	0.60 oz	21.7	77,984	9.5	43,785	0.5	0.02
cycloate	1.5	2.0 pts	154.1	341,998	0.0	327,404	48.2	0.30
			0.0001	0.0007	0.0001	0.0001	0.0001	0.0014
		LSD (0.05)	84.2	225,016	1.5	110,496	11.1	0.21

1 – Scale: 0=no crop damage to 10=crop dead;

Photos of the treatments on May 3, 2012



Untreated



s-metolachlor 0.63 lb a.i./A



s-metolachlor 1.26 lb a.i./A



amicarbazone 0.11 lb a.i./A



clomazone 0.5 lb a.i./A



pendimethalin 1.0 lb a.i./A



pyroxasulfone 0.015



cycloate 1.5 lb a.i./A