2008 Celery Weed Trials

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Objectives: 1) Conduct screening trials to evaluate the safety and effectiveness of new herbicides for celery and 2) evaluate alternative cultivators: torsion and finger weeders

Methods

Trial No. 1: Trial was conducted in cooperation with Frank Heffren of Green Valley Farm Supply in Greenfield. All materials were applied pretransplant on June 25, and the celery variety Sonora was transplanted on June 26 by a commercial transplanter. Weed counts were made on July 14 and July 22, 18 and 26 days after planting, respectively. Weeding time was conducted on July 22 by weeding each plot with a hoe and timing how long it took. All treatments were treated with Caparol as a post emergent application following the weed evaluations of the preemergence treatments on July 22. Each treatment was one 40-inch bed wide by 15 feet long and replicated three times in a randomized complete block design. All treatments were applied to the entire bed in 74 gallons of water per acre with two passes of a one-nozzle boom with an 8008E teejet nozzle at 30 psi. The plots were harvested on October 10; 20 heads in each plot were cut and weighed. Soil type at the site was Metz loamy sand (pH – 7.1; organic matter – 1.16; sand – 58%, silt-25%, clay – 17%).

Trial No. 2: This trial was conducted in cooperation with Bill Sullivan of Crown Packing in Salinas. The celery variety conquistador was transplanted on May 22. Chickweed and henbit were the dominant weeds at the site and were at the 2-3 true leaf stage at the time of cultivation. The grower cultivator was set up to cultivate four 40-inch wide beds. Each finger and torsion weeder was attached to back bar of the cultivator and was adjusted to cultivate one seedline of the bed. The cultivator passed the length of the field and passed through strips in the field that had been set up for pre and post cultivation weed counts. Precultivation weed counts were made on June 23 by counting all the weeds in an 8-inch wide strip around the seedline by 20 foot long. The plots were cultivated on June 24; post cultivation weed counts were made of the same area as the precultivation counts following the cultivation. Times of weeding evaluations were conducted on July 7 by timing how long it took to weed 75 foot long strips in each plot. Each plot was replicated eight times. No yield evaluations were conducted.

Results

Trial No. 1: Groundsel was the main weed at this site but there were also measureable amounts of malva and Mexican lovegrass. Chateau and Goal Tender controlled 97.4% of the weeds on the first evaluation date (Table 1). Gallery controlled 78.4% of the weeds on this evaluation date and the remainder of the materials were weak on one or more of the weeds present in the trial and had poor over all weed control. On the second evaluation date Chateau and Goal Tender controlled 100% of the weeds and Gallery 97.9%. The other materials provided less preemergence weed control. The phytotoxicity ratings made on July 22 indicated that Gallery had substantial phytotoxicity (Table 3); Chateau had moderate phytotoxicity and there was no measureable phytotoxicity with the other materials. The site had a loamy sand soil type and could be considered a worst case scenario for potential phytotoxicity from preemergence

herbicides. Chateau, Goal Tender and Gallery had the lowest weeding times. Gallery was the only herbicide that had lower mean head weight and tonnage per acre.

Trial No. 2: Weeds at this site were older (eg 2-3 true leaf stage) and weed pressure was in general light (Table 4). Standard cultivation removed about 41% of the weeds; there was no statistical difference in percent removal of weeds between treatments and none of the alternative cultivators reduced weeding time (Table 5). This trial indicated that when weeds are too large the alternative cultivators are unable to effectively remove them.

Table 1. Trial No. 1: Percent weed control (upper number in each cell) and number of weeds per 20 ft^2 (lower number in each cell) on July 14, 2008.

Treatment	lb a.i./A	Material/A	Malva	Groundsel	Love grass	Others	Total
Untreated	----	-----	0.0 4.3	0.0 15.0	0.0 5.7	0.0 1.7	0.0 26.7
Dual Magnum 7.62	0.63	0.66pt	0.0 5.7	5.9 21.3	100.0 0.0	100.0 0.0	0.0 27.0
Prowl H2O 3.8	0.75	1.58pt	22.2 6.0	0.0 31.3	66.7 0.3	100.0 0.0	0.0 37.7
Chateu 51WG	0.188	6.0 oz	66.7 0.3	100.0 0.0	100.0 0.0	100.0 0.0	97.4 0.3
Sulfentrazone 4F	0.094	3.0fl oz	27.8 3.7	36.9 9.7	48.7 4.0	41.7 2.3	20.8 19.7
Goal Tender 4F	0.25	8.0 fl oz	100.0 0.0	100.0 0.0	100.0 0.0	66.7 0.3	97.4 0.3
Nortron 4SC	1.25	48 fl oz	22.2 4.0	0.0 29.7	66.7 0.3	33.3 1.3	8.3 35.3
Gallery 75W	0.50	0.66 lb	44.4 3.0	95.8 0.3	94.9 0.7	100.0 0.0	78.4 4.0
Caparol 4L	1.5	3.00 pts	50.0 2.0	6.7 30.3	44.4 2.3	33.3 1.7	0.0 36.3
LSD % Control			48.920	21.569	53.907	63.695	21.970
Pr>F % Control			0.0097	<.0001	0.0138	0.0219	<.0001
LSD for weed count			3.870	11.559	NS	NS	13.245
Pr>F for weed count			0.0432	<.0001	0.1320	0.2015	<.0001

Table 2. Trial No. 1: Percent weed control (upper number in each cell) and number of weeds per 20 ft^2 (lower number in each cell) on July 22, 2008.

Treatment	lb a.i./A	Material/A	Malva	Groundsel	Love grass	Others	Total Weeds
Untreated	----	-----	0.0 2.0	0.0 5.0	0.0 4.3	0.0 0.7	0.0 12.0
Dual Magnum 7.62	0.63	0.66pt	16.7 2.0	31.7 3.3	100.0 0.0	100.0 0.0	50.7 5.3
Prowl H2O 3.8	0.75	1.58pt	83.3 0.3	0.0 7.3	100.0 0.0	100.0 0.0	34.0 7.7
Chateu 51WG	0.188	6.0 oz	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0
Sulfentrazone 4F	0.094	3.0fl oz	66.7 1.0	76.7 1.0	66.7 2.3	33.3 0.7	56.9 5.0
Goal Tender 4F	0.25	8.0 fl oz	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0	100.0 0.0
Nortron 4SC	1.25	48 fl oz	16.7 2.0	0.0 6.7	100.0 0.0	66.7 0.3	22.9 9.0
Gallery 75W	0.50	0.66 lb	83.3 0.3	100.0 0.0	100.0 0.0	100.0 0.0	97.9 0.3
Caparol 4L	1.5 ----	3.00 pts	83.3 0.3	17.8 5.3	29.2 2.7	33.3 0.7	29.2 9.0
LSD % Control			49.967	17.776	27.542	56.482	26.833
Pr>F % Control			0.0019	<.0001	<.0001	<.0001	<.0001
LSD for weed count			1.322	2.975	2.634	NS	3.771
Pr>F for weed count			0.0088	0.0001	0.0156	0.0699	<.0001

Table No. 3. Trial No. 1: Time of weeding and phytotoxicity rating on July 22 and yield evaluation on October 10, 2008.

Treatment	lb a.i./A	Material/A	Hrs/A	Phyto[1]	Mean head wt (lbs)	Yield tons/A	Plants/A
Untreated	----	----	28.4	0.0	2.29	64.733	56,635
Dual Magnum 7.62	0.63	0.66pt	16.0	0.0	2.28	66.700	58,668
Prowl H2O 3.8	0.75	1.58pt	17.1	0.0	2.19	63.867	58,087
Chateu 51WG	0.188	6.0 oz	9.3	1.3	2.24	66.833	59,540
Sulfentrazone 4F	0.094	3.0fl oz	14.4	0.0	2.48	71.300	57,797
Goal Tender 4F	0.25	8.0 fl oz	9.6	1.0	2.51	69.500	55,183
Nortron 4SC	1.25	48 fl oz	19.7	0.0	2.24	64.667	57,797
Gallery 75W	0.50	0.66 lb	10.8	2.7	1.82	47.500	51,988
Caparol 4L	1.5	3.00 pts	17.3	0.0	2.24	63.767	57,506
Pr>F			<0.0001	0.0136	0.0431	0.0026	0.2026
LSD 0.05			2.336	0.857	0.36	8.9722	NS

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

Table 4. Trial No. 2: Pre and post cultivation weed counts (number of weeds per 13.3 ft^2)

Treatments	Precultivation counts - June 23						Post cultivation counts - June 24					
	Henbit	Chick	Pigweed	Nettle	Others	Total	Henbit	Chick	Pigweed	Nettle	Others	Total
Standard	4.0	3.3	1.5	1.0	0.1	10.9	2.8	2.3	0.5	0.8	0.1	7.0
14.5" orange	5.1	3.1	0.8	2.0	0.0	11.8	3.0	2.0	0.2	0.7	0.0	6.7
14.5" yellow	4.3	2.1	1.8	0.8	0.1	10.2	3.3	1.7	0.3	1.1	0.0	6.7
9.5" orange	4.1	2.1	1.8	0.8	0.0	10.0	2.0	0.8	0.0	0.8	0.0	4.1
9.5" yellow	2.8	3.1	0.3	1.7	0.0	8.5	1.7	2.1	0.1	0.7	0.0	5.0
Torsion 7mm	3.1	3.1	0.6	0.6	0.2	8.1	1.1	2.2	0.2	0.2	0.1	4.0
Torsion 9mm	3.8	4.2	1.1	0.8	0.1	11.0	1.5	2.0	0.1	1.0	0.0	4.8
Pr>F	0.7941	0.7354	0.5343	0.1901	0.5107	0.6383	0.3556	0.7763	0.2310	0.736	0.5302	0.1964
LSD 0.05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Table 5. Trial No. 2: Percent removal of weeds and time of weeding evaluation

Treatments	Percent Weed Removal						Weeding Time Hr/A
	Henbit	Chickweed	Pigweed	Nettle	Others	Total	
Standard	42.57	31.45	56.06	14.81	50.00	41.84	18.13
14.5" orange	37.11	31.48	66.67	71.43	----	42.73	18.67
14.5" yellow	31.09	47.62	33.33	22.92	100.00	42.30	18.53
9.5" orange	71.07	58.33	100.00	0.00	----	65.20	18.85
9.5" yellow	41.84	31.45	50.00	52.78	----	39.13	16.37
Torsion 7mm	73.61	34.64	50.00	62.50	50.00	55.58	19.24
Torsion 9mm	55.16	49.55	91.67	11.11	100.00	57.46	17.32
Pr>F	0.2619	0.9577	0.1134	0.9793	----	0.8045	0.7687
LSD 0.05	NS	NS	NS	NS	----	NS	NS