

2012 Spinach Weed Control Trial

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Methods: The trial was conducted at the Hartnell East Campus Research Facility in Salinas on Chualar loam soil. At listing 300 lbs of 6-20-20 was applied (18 lbs N/A). Preplant treatments were applied to shaped beds on September 20 and were watered into the soil with 0.50 inch of water on September 21. Three weeks later on October 11, the beds were lightly worked by running a non-powered bed shaper over the beds to loosen the crust and then planted with the variety 'Racoon' at 1.2 million seeds/A. The at-planting treatments were applied on October 12 and watered with 0.75" of water (and followed by 0.50" applied on October 15; the stand was emerging on October 16). The soil type was Chualar loam (55% sand, 29% silt and 11% clay; 2.0 organic matter and pH 7.7). Each plot was two 40-inch beds wide by 30 feet long; all treatments were replicated four times in a randomized complete block design. Applications were made with a backpack CO₂ applicator with one pass of a one-nozzle wand with an 8008EVS tip pressurized at 30 psi applying the equivalent of 34 gallons of water per acre. Phytotoxicity ratings were made on two dates. Given the relatively uniform distribution and large population of weeds, weed counts were made of a 2 ft² area in each plot on October 23. Yield evaluation was made on November 8 by harvesting a three foot long strip of in each plot. Time of weeding evaluations were made on November 9 by hand weeding a 9.99 ft² section of each bed; the obvious weeds that would be problematic for a mechanical harvest were removed in this evaluation, and smaller weeds that would be below the level of the cutter bar were not removed. See tables for further details on evaluations.

Results: The phytotoxicity ratings made in this study were primarily based on evidence of stunting and reduced vigor of the spinach. On the October 23 evaluations date, phytotoxicity ratings increased with the rate of Dual Magnum in both the preplant and at-planting Dual Magnum treatments (Table 1). We consider a phytotoxicity rating of 0 to 2.0 to be the threshold between "acceptable" crop injury; ratings beyond 2.0 are considered unacceptable. For both pre and at planting applications of Dual Magnum 0.31-0.42 pint/A had acceptable phytotoxicity ratings on October 23 and 0.31 – 0.63 pint/A had acceptable phytotoxicity ratings on October 29. The combination of Dual Magnum 0.31 pint/A + RoNeet 2.0 pint/A and RoNeet alone at 2.0 pint/A had unacceptably high phytotoxicity ratings on both dates. Nettle was the dominant weed at this site and all rates of all materials reduced the population of nettle significantly over the untreated check. There was a trend indicating that higher rates of Dual Magnum increased control of weeds. The combination of Dual Magnum and RoNeet provided the best weed control. The highest yielding treatment in the trial was the untreated control, in spite of heavy weed pressure. A general trend indicating lower yields with increased rate of Dual Magnum is evident, but the yield dropped off suddenly at 0.84 pint/A. The combination of Dual Magnum + RoNeet had the lowest yield (we observed depression of yield with the combination of these two materials in the 2011 trials). RoNeet by itself also had relatively low yield. The most interesting observation was that preplant applications of Dual Magnum at 0.31 to 0.63 pint/A took longer to weed than at planting applications at the same rate. This may have been due to greater stunting of the nettle plants in the at-planting application treatments (see photos). Weeds that were below the level of the cutting bar (1.5 – 2.0 inches) were not removed. This observation needs to be confirmed by further study.

Table 1. Phytotoxicity ratings on two dates, weed counts (per 2 ft²), yield evaluation and time to weed evaluations

Treatments	a.i. lbs/A	Material/A	Application Timing	Oct 23	Oct 29	Oct 23					Nov 8	Nov 9
				Phyto ¹	Phyto ¹	Nettle	Chick- weed	Purs- lane	Other weeds ²	Total weeds	Yield T/A	Weed Time Hrs/A
Dual Magnum	0.30	0.31 pint	21 days preplant	1.0	0.3	32.0	2.5	0.8	2.0	37.3	2.428 ab	67.4
Dual Magnum	0.40	0.42 pint	21 days preplant	1.8	0.0	16.3	4.0	0.0	1.0	21.3	2.347 ab	49.7
Dual Magnum	0.60	0.63 pint	21 days preplant	2.3	0.8	18.8	2.0	0.0	0.5	21.3	2.155 ab	40.7
Dual Magnum	0.80	0.84 pint	21 days preplant	3.5	2.8	16.3	1.0	0.5	0.8	18.5	1.722 bc	13.7
Dual Magnum RoNeet	0.30 1.50	0.31 pint 2.00 pint	21 days preplant At planting	4.3	2.5	6.0	0.8	0.3	0.8	7.8	1.194 c	13.3
Dual Magnum	0.30	0.31 pint	At planting	1.3	0.5	31.3	1.8	0.3	1.8	35.0	2.372 ab	32.3
Dual Magnum	0.40	0.42 pint	At planting	1.5	1.3	28.3	1.0	0.3	1.0	30.5	2.275 ab	16.5
Dual Magnum	0.60	0.63 pint	At planting	2.5	1.5	20.3	0.3	0.3	0.5	21.3	2.436 ab	19.4
Dual Magnum	0.80	0.84 pint	At planting	3.8	1.8	21.3	1.5	0.0	0.3	23.0	1.843 bc	14.5
Dual Magnum RoNeet	0.30 1.50	0.31 pint 2.00 pint	At planting At planting	4.0	2.5	18.0	0.8	0.0	0.3	19.0	1.682 bc	10.9
RoNeet 6E	1.50	2.00 pint	At planting	2.8	2.3	22.8	1.3	1.8	1.5	27.3	1.979 abc	47.6
Untreated	---	---	---	0.0	0.0	94.5	2.0	2.8	1.8	101.0	2.764 a	296.7
			Pr>treatment	0.0002	0.0005	0.0043	0.1412	0.1573	0.7543	0.0037	0.1030	0.0001
			LSD (0.05)	0.2	1.4	35.7	ns	ns	ns	37.4	0.900	34.6

1 – scale: 0 no crop damage to 10 crop dead; 2 – other weeds included malva, pigweed, groundsel and nightshade.

Preplant applications made 21 days prior to planting



Dual Magnum 0.31 pint



Dual Magnum 0.42 pint



Dual Magnum 0.63 pint



Dual Magnum 0.84 pint



Dual Magnum 0.31 pint +
RoNeet 2.0 pint (made at planting)

At planting applications



Dual Magnum 0.31 pint



Dual Magnum 0.42 pint



Dual Magnum 0.63 pint



Dual Magnum 0.84 pint



Dual Magnum 0.31 pint +
RoNeet 2.0 pint



RoNeet 2.0 pint



Untreated



Untreated