Broccoli: Organic Weed Control Trials 2006

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Methods: ***Trial No. 1:*** Conducted in cooperation with Bill Peixoto west of Watsonville. The soil type was Elder sandy loam. There were two plantings of broccoli in the field: 1) one was transplanted and 2) was direct seeded. Both plantings were at approximately the same stage of growth (4-5 true leaves). The weeds were smaller in the transplanted area and the beds were less cloddy. The direct seeded area had been hand weeded once, but was still quite weedy and the beds were cloddy. A trial was established in both plantings on March 23. Matran II was applied at two rates as a spray directed towards the bottom of the plant. The sprays were applied as either one pass per seedline of a directed spray from one side of the bed or two passes per seedline of a directed spray from the side of the bed and from the middle of the bed. Each plot was one 40-inch bed by 15 feet long. There were three replications arranged in a randomized complete block design. All materials were applied with Humasol as a surfactant (@ 0.25%) with a one nozzle wand with an 8004 nozzle (6.66 mls/foot) pressurized with a CO_2 backpack sprayer at 30 psi.

Trial No. 2: Conducted with Bill Peixoto west of Watsonville. The soil type was Elder sandy loam. There were two plantings in the field: 1) older, taller transplants (easier to direct the spray away from the leaves of broccoli) and 2) younger broccoli (more difficult to keep the directed spray of the leaves of broccoli. The weeds were similar in the two areas and the bed conditions were also similar. The trial was spray post transplanting on May 31. The plot size and surfactants and application technique were similar to trial No. 1. See table for rates and evaluation dates.

Results: ***Trial No. 1:*** All phytotoxicity ratings for the sprayed treatments were unacceptable (Table 1); however, in the transplanted trial, Matran II at 5 gallons/A applied in a more dilute solution (5.4%) with two passes per seedline looked promising. It provided excellent weed control and it appeared that the level of phytotoxicity could be reduced by lowering the rate of Matran II and/or using a more precise directed spray. In the direct seeded plot, the weeds were bigger and therefore more difficult to kill. In addition, the beds had more clods that intercepted some of the spray material. As a result there was less weed control and increased time to weed this trial. ***Trial No. 2:*** Based on the high phytotoxicity ratings observed in Trial No. 1 we reduced the concentration of Matran II in these trials. The trials were located on a site with two plantings: 1) older transplants that were taller and 2) younger transplants that were shorter. The taller transplants were easier to direct the spray away from the broccoli foliage, whereas on the shorter transplants it was more difficult to do so. The phytotoxicity ratings in the taller transplants were lower with two passes of a directed spray at a lower concentration than with one pass of a higher concentration (Table 2). This was not so for the shorter transplants. The best weed control in the tall transplants was with two passes of Matran II at 3.5% and this was clearly the best treatment because it also had an acceptable phytotoxicity rating. In the short transplants weed control did not differ between Matran II treatments and the phytotoxicity ratings were higher, probably due to more contact with the herbicide spray on the broccoli foliage.

Table 1. Trial No. 1: Phytotoxicity and weed counts per five inch wide strip around each seedline by length of plot (12.5 ft^2) on April 3 and weeding time on May 2 for transplanted and direct seeded broccoli

Treatment	**Material/A**	**Passes per seedline[1]**	**Spray volume/A**	Phyto[2]	Nettle	Chick-weed	Total Weeds	Percent weed control	Weeding Time Hrs/A
Transplanted									
Matran II	5 gallons (10.8% v/v)	One	46 gallons	4.7	23.3	2.7	28.0	78.1	11.7
Matran II	5 gallons (5.4% v/v)	Two	92 gallons	4.0	1.3	0.3	1.7	98.6	8.0
Matran II	7.5 gallons (16.3% v/v)	One	46 gallons	7.3	1.3	0.7	2.7	97.8	6.8
Matran II	7.5 gallons (8.1% v/v)	Two	92 gallons	5.3	0.3	0.3	0.6	99.5	5.8
Untreated	----	----	----	0.0	113.0	11.0	128.0	----	34.9
LSD (0.05)				2.1	26.2	4.0	27.1	----	3.4
Direct Seeded									
Matran II	5 gallons (10.8% v/v)	One	46 gallons	5.3	42.7	4.0	48.3	44.2	28.6
Matran II	5 gallons (5.4% v/v)	Two	92 gallons	5.0	23.7	3.3	27.3	68.5	11.2
Matran II	7.5 gallons (16.3% v/v)	One	46 gallons	8.0	27.3	4.3	33.7	61.1	16.6
Matran II	7.5 gallons (8.1% v/v)	Two	92 gallons	6.3	16.3	2.3	19.0	78.1	9.2
Untreated	----	----	----	0.0	77.0	7.3	86.7	----	37.8
LSD (0.05)				1.1	12.0	3.2	10.8	----	4.1

1 – number of passes per seedline with directed spray; 2 – Scale: 0 = no crop damage to 10 = crop dead

Table 2. Trial No. 2. Phytotoxicity and weed counts per five inch wide strip around each seedline by length of plot (12.5 ft^2) on June 6 and weeding time on June 13

Treatment	**Material/A**	**Passes per seedline**[1]	**Spray volume/A**	Phyto[2]	Chick-weed	Henbit	Other Weeds	Total Weeds	Percent weed control	Weeding Time Hrs/A
Older, taller transplants										
Matran II	2.3 gallons (5.0% v/v)	One	46 gallons	2.7	42.0	3.7	9.0	54.7	59.1	49.7
Matran II	2.3 gallons (2.5% v/v)	Two	92 gallons	1.7	10.0	2.7	6.0	18.7	86.0	39.4
Matran II	3.2 gallons (7.0% v/v)	One	46 gallons	3.3	30.7	3.3	12.0	46.0	65.5	42.7
Matran II	3.2 gallons (3.5% v/v)	Two	92 gallons	1.7	6.7	0.7	4.3	11.7	91.2	39.5
Untreated	----	----	----	0.0	94.7	12.7	26.3	133.7	----	68.5
LSD (0.05)				1.4	20.3	5.5	12.4	28.6	----	9.3
Younger, shorter transplants										
Matran II	2.3 gallons (5.0% v/v)	One	46 gallons	2.3	20.7	5.7	6.3	27.0	53.4	35.6
Matran II	2.3 gallons (2.5% v/v)	Two	92 gallons	3.3	18.3	4.0	6.0	28.3	51.2	31.3
Matran II	3.2 gallons (7.0% v/v)	One	46 gallons	2.6	20.7	4.0	3.7	28.3	51.2	37.8
Matran II	3.2 gallons (3.5% v/v)	Two	92 gallons	3.0	19.0	3.3	4.7	32.7	43.6	19.8
Untreated	----	----	----	0.0	40.7	8.0	9.3	58.0	----	43.6
LSD (0.05)				1.2	12.4	4.6	n.s.	18.7	----	22.3

1 – number of passes per seedline with directed spray; 2 – Scale: 0 = no crop damage to 10 = crop dead