2006 Broccoli Pre and Post Emergence Weed Control Trial

Richard Smith, Farm Advisor
University of California Cooperative Extension, Monterey County

Summary: One objective of these trials was to examine the safety of post emergence weed control materials in the cooler part of the Salinas Valley where theoretically there would be less cuticle development on the plants and more potential for damage. Based on phytotoxicity ratings, there was generally more damage by Goal Tender on broccoli at rates over 4 oz/A. Unfortunately we were not able to confirm an effect on yield with the post emergence materials applied at the normal 2-3 true leaf stage. However, Goal Tender and Scythe applied at an older stage of the broccoli (3–5 leaf) did not reduce yield. Spartan and KIH-485 did not effectively control chickweed and Everest was highly injurious to broccoli when applied preemergence.

Methods: ***Trial No. 1:*** Conducted in cooperation with Ed Mora of D'Arrigo Brothers west of Castroville. The variety Marathon was planted on May 3 and first irrigation water was applied on May 4. Preemergence applications were made on May 3 and post emergence applications were made on May 31 at the 2-3 true leaf stage. Each plot was one 40-inch bed by 20 feet long. There were four replications arranged in a randomized complete block design. Materials were applied in 72 gallons of water using a CO_2 backpack at 30 psi using two passes of a one-nozzle wand with an 8008E tip. Soil type was Salinas clay loam (pH – 6.5; organic matter – 3.0%). ***Trial No. 2:*** Conducted in cooperation with Chris Drew of Ocean Mist Farms off Espinosa Road between Castroville and Salinas. The variety was Marathon. All treatments were post emergence and were made on August 4 when the plants were at the 4-5 true leaf stage which is about 7-10 days later than normal. The weeds were too mature for effective control with the materials being tested and the emphasis of this trial was on phytotoxicity and yield.

Results: ***Trial No. 1.*** Chickweed was the dominant weed at this site (other weeds included wild radish, annual bluegrass and swine cress). Evaluations of the preemergent treatments on May 31 showed that the standard, Dacthal, provided excellent control of the weeds present at this site (Table 1). Everest, Spartan and KIH-485 were weak on chickweed. Everest was highly phytotoxic to broccoli. The June 9 evaluation, following the postemergence treatments, indicated high levels of phytotoxicity by the AN 20 and increasing rates of Goal Tender (especially >4.0 oz/A). Unfortunately, the trial was located in a small part of the field that was affected by club root and we were not able to get a good measure of the impact of the various materials on yield. The yield data from one healthy replicate is presented, but no firm conclusions can be drawn from them.

Trial No. 2. This trial was sprayed at the 3 to 5 leaf stage which is a bit later than desirable because the weeds are generally too big by then to be able to control them with most post emergence materials. It did however give us an opportunity to observe the yield impact of the post emergence materials applied at this older growth stage. Goal Tender applied at more than 4 oz/A had high phytotoxicity ratings (Table 2). Matran and Scythe were applied as directed sprays and Matran had higher phytotoxicity rating when applied in two passes per seedline. Scythe had acceptable phytotoxicity at both application rates. There were minor impacts by the various materials on yield. Matran at 5% had significantly lower yield than the untreated, but all other treatments were did not differ from the untreated control.

Table 1. Weed evaluations on May 31 (preemergent materials) and June 9 (pre and postemergent materials – following cultivation) and yield on July 21[1].

Treatment	Material/A	Application	May 31 33 ft^2			June 9 16.7 ft^2			July 21		
			Chick weed	Total Weeds	Phyto	Chick weed	Total Weeds	Phyto	No./plot	Lbs/plot	Mean head lbs
Untreated	----	----	10.3	12.7	0.0	2.0	3.0	0.0	28	11.8	0.42
Dacthal 75W	10 lbs	Pre	0.0	0.0	0.0	0.3	0.8	0.5	32	12.2	0.38
Dacthal 75W AN 20	10 lbs 70 gals	Pre Post	0.0	1.0	0.0	0.0	0.3	4.3	29	12.0	0.41
Dacthal 75W Goal Tender4F	10 lbs 2 oz	Pre Post	0.3	1.3	0.0	0.3	0.3	2.3	29	11.4	0.39
Dacthal 75W Goal Tender4F	10 lbs 4 oz	Pre Post	0.0	1.0	0.0	0.5	0.5	3.5	23	9.6	0.42
Dacthal 75W Goal Tender4F	10 lbs 6 oz	Pre Post	0.0	1.3	0.0	0.3	0.3	3.8	23	9.0	0.39
Dacthal 75W Goal Tender4F	10 lbs 8 oz	Pre Post	2.3	2.3	0.0	0.3	0.3	4.5	26	9.9	0.38
Everest 70	0.286 lb	Pre	7.3	7.7	8.7	3.5	3.8	8.5	0	0.0	0.00
Spartan 75DF	0.10 lb	Pre	8.0	9.3	0.0	1.0	2.8	0.0	20	7.9	0.40
Spartan 75DF	0.10 lb	Post	9.3	10.3	0.0	3.5	4.5	2.0	29	11.5	0.40
Spartan 75DF	0.13 lb	Pre	6.7	8.0	0.0	2.0	2.3	0.5	28	13.8	0.49
Dacthal 75W Outlook 6.0	10 lbs 14 oz	Pre Post	0.0	0.3	0.0	0.0	0.0	0.8	30	12.6	0.42
Dacthal 75W Prowl H2O 3.8	10 lbs 0.26 gal	Pre Post	0.0	0.0	0.0	0.0	0.0	1.3	27	12.1	0.45
KIH-485 60	0.15 lb	Post	5.3	5.7	0.0	0.3	1.3	2.5	23	9.6	0.42
LSD (0.05)			3.9	4.0	0.3	1.2	1.7	0.9	----	----	----

1 – The trial area was affected by club root and only one replication was healthy and was harvested

Table 2. Phytotoxicity rating on August 16 and yield evaluations on September 25 and 29.

Treatment	Material/A	Application	Phyto Aug 16	Sept 25			Sept 29			Total		
				Wt/plot lbs	No/plot	Mean Head lbs	Wt/plot lbs	No/plot	Mean Head lbs	Wt/plot lbs	No/plot	Mean Head lbs
Untreated	----	----	0.0	12.9	26.7	0.48	1.6	5.0	0.32	14.6	31.7	0.45
AN 20	70 gals	Post	2.7	11.4	27.0	0.42	1.4	4.3	0.34	12.9	31.3	0.41
Goal Tender4F	2 oz	Post	2.3	11.3	25.0	0.45	2.0	5.7	0.36	13.3	30.7	0.43
Goal Tender4F	4 oz	Post	2.7	12.3	28.3	0.43	1.7	4.7	0.35	13.9	33.0	0.43
Goal Tender4F	6 oz	Post	3.7	12.1	29.3	0.41	0.9	3.0	0.22	13.0	32.3	0.41
Goal Tender4F	8 oz	Post	4.3	12.8	30.3	0.42	1.1	3.7	0.31	14.0	34.0	0.41
Matran Natural Wet Sulfur	5 % v/v 0.125 % 10 lbs	1 pass/seedline @ 46 GPA	3.0	12.0	24.0	0.50	0.6	1.7	0.33	12.6	25.7	0.49
Matran Natural Wet Sulfur	2.5 % v/v 0.125 % 10 lbs	2 pass/seedline @ 92 GPA	5.3	12.1	25.7	0.47	1.0	3.7	0.26	13.1	29.3	0.44
Scythe	3% v/v	1 pass/seedline @ 46 GPA	2.0	11.9	25.7	0.47	0.9	2.3	0.27	12.8	28.0	0.47
Scythe	1.5% v/v	2 pass/seedline @ 92 GPA	1.7	12.1	26.0	0.46	0.9	2.7	0.34	13.0	28.7	0.46
LSD (0.05)			1.1	n.s.	5.2	n.s.	1.0	3.0	n.s.	n.s.	5.8	n.s.