California Pepper Commission – Complete Final Report, 2012

Title: Preemergence Weed Control Trials in Peppers

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Objectives

1) Examine pre-transplant (at planting) and layby preemergence herbicides for weed control.
2) Conduct the above trials in the Central Coast and Central Valley production districts.

CENTRAL COAST Summary: Field trials were conducted to evaluate potential new herbicides for use on peppers. Zeus, Nortron and Outlook were compared with the standard herbicides, Dual Magnum and Prowl H_2O. In addition, a new low VOC formulation of Prefar was compared with the standard EC formulation of Prefar. Two trials were conducted in commercial bell pepper fields with cooperating growers. **Trial No. 1** was conducted to evaluate pre-transplant applications and **Trial No. 2** was conducted to evaluate layby applications. There was a high population of hairy nightshade at trial No. 1, but the population was spotty which made determining statistical differences among the treatments difficult. However, a trend indicated that Zeus and Outlook had greater weed control. Zeus at 3.0 fl oz was safer than 6.0 fl oz on the soil type at the trial site (silty clay). The Nortron and Prefar treatments had the highest yields in this trial. In the layby trial, the treatments were applied between and to the sides of the seedlines. The sprays were directed, but inevitably some material contacted the foliage of the plants. Where Zeus and Nortron contacted the foliage they caused phytotoxicity on the leaves: burned lesions with the use of Zeus and distortion of the foliage with Nortron. All materials reduced the number of hairy nightshade plants on two evaluation dates and there were no differences in yield among the treatments.

CENTRAL VALLEY Summary: Three field trials evaluated 5 preemergence herbicides: Zeus, Nortron and Outlook were compared with the standard herbicides, Dual Magnum and Prowl H_2O. All were applied at 1x and 2x rates, and a 4x rate of Outlook was also applied, and all were compared to an untreated check. The treatment list was the same for each trial. In two trials the herbicides were applied one day before transplanting the peppers and the difference between the trials was that one was completely grown using subsurface drip irrigation and the other was grown using sprinkler irrigation followed by furrow irrigation. In the pre-transplant furrow application all herbicide applications resulted in some crop phytotoxicity, but crop damage by Outlook (4x) and Zeus (2x) was significantly higher than the rest. A third trial applied the herbicides at layby and the trial was grown using furrow irrigation, however sprinkler

irrigation was used to incorporate the layby herbicides. As in the Central Coast layby trial, where Zeus and Nortron contacted the foliage they cause initial phytotoxicity on the leaves: burned lesions with the use of Zeus and distortion of the foliage with Nortron, however these symptoms were greatly reduced with time. A 4x application of Outlook resulted in less phytotoxicity to pepper leaves than a 2x rate of Nortron or a 1x rate of Zeus. An application of a 2x rate of Outlook showed the same pepper phytotoxity as a 1x application of Prowl H_2O, both of which diminished as the peppers grew. In all trials Dual Magnum, Prowl H_2O, and Outlook provided excellent results in broadleaf and grass weed control.

CENTRAL COAST Methods: ***Trial No. 1:*** The trial was conducted in a commercial bell pepper field with a cooperating grower east of Gilroy. The soil at the site was Campbell silty clay. Beds were shaped and treatments were applied prior to transplanting on May 15 with two passes of a one-tip boom (8008EVS) at 30 psi applying the equivalent of 70 GPA of water. The bell pepper variety Baron was transplanted in two seedlines on the beds and was watered the same day. Each plot was one 40-inch bed wide by 20 feet long and replicated three times in a randomized complete block design. Treatments listed in Table 1. See tables for evaluations and dates. Twelve plants per plot were harvested and graded as shown in Table 2.

Trial No. 2: The trial was conducted in a commercial bell pepper field with a cooperating grower north of Hollister. The soil at the site was Sorrento silty clay loam. The peppers variety Baron planted on two seedlines on a 40 inch wide bed in May. The treatments were applied at the layby stage when the plants were 7-9 inches tall on June 15 with three passes with a one-tip wand with an 8008EVS nozzle applying the equivalent of 104 GPA; one pass was made between the seedlines and the other two were made to either side of the seedlines. The plots were carefully weeded to remove all weed seedlings prior to the layby applications (see photos). The applications were made as directed a spray, however some contact with foliage was inevitable. Seven plants per plot were harvested and graded as shown in Table 4.

CENTRAL COAST Results: ***Trial No. 1:*** Zeus at 6.0 fl oz had significant phytotoxicity ratings on both evaluation dates (Table 1). There was a great deal of variability between plots in the number of weeds and no statistical differences in total weeds was observed; however, there are strong trends indicating that Zeus at 6.0 fl oz and Outlook at 14.0 fl oz greatly reduced weed pressure and hand weeding time. The untreated, both Nortron and Prefar treatments had the highest yields in the trial (Table 2).

Trial No. 2: Both rates of Zeus and Nortron caused phytotoxicity on the leaves of peppers (Table 3). Even though the spray applications were directed, there was some contact with the materials on the foliage. Zeus caused burned lesions and Nortron caused deformity of the foliage. All materials greatly reduce hand weeding time. There were no statistical differences in yield among treatments (Table 4).

CENTRAL VALLEY Methods: Three field trials investigating five preemergence herbicides at 1x and 2x rates were compared to an untreated check in transplanted bell peppers. In two trials the applications were made at planting and in the third trial the application was made at layby where the crop had no other previous at planting herbicides. The herbicide trials were conducted at the UC West Side Research and Extension Center in Five Points in Fresno County where the soil type is a Panoche Clay Loam. On May 8, 2012 the bell pepper variety "Grande Rio" was transplanted in single rows into 40" beds using a commercial transplanter. Within row spacing was 10" between plants, but stand establishment was not as good as in previous years.

Five preemergence herbicides: Zeus, Nortron and Outlook were compared with the standard herbicides, Dual Magnum and Prowl H_2O. All were applied at 1x and 2x rates, and a 4x rate of Outlook was also applied, and compared to an untreated check. In all trials the 12 treatments were replicated 4 times for a total of 48 plots. Plot size was one 40-inch bed wide by 70-feet of row length. The sprayer was a commercial sprayer outfitted with 8003 evs Teejet nozzles and a water volume of 40 GPA at the 1x rate. The 2x rate and 4x rate received 2 passes for a total of 80 GPA. At planting applications were broadcast applied uniformly over the beds and furrows. Prior to the layby application on June 7, the trial area was mechanically cultivated and hand weeded (June 5-6) so that the plots were weed free at the time of application. The layby herbicide application was aimed at the base of the plants (not over the top), but drop nozzles were not used for a directed spray. The layby treatments were applied on June 7, 2012 with weather conditions of 85° F average temperature, clear skies, and wind at 3-4 mph. The herbicides were set with sprinklers, but the trial was grown under furrow irrigation.

Initial weed populations were very high from planting to layby and included: pigweeds (prostrate, redroot, and tumble), purslane, lambsquarters, puncturevine, nightshades (hairy, black, and groundcherry), and jungle rice (very similar to barnyardgrass) as the main weeds. Bindweed was sporadic throughout the area. However, these weed populations were not high in the untreated check plots after layby cultivations; so weed pressure was considerably lower in this trial compared to the at planting applications, even after several furrow irrigations. Weed counts and evaluations were conducted May 31 in the at-planting applications and on June 7, June 29 and August 16 in the layby application. Yield data was not collected this year.

CENTRAL VALLEY Results: ***Trial #1: Pre-transplant application, Drip Irrigation (Table 5)***
In this trial overall weed control ratings (where 10 is a perfect score) for all treatments averaged 6.8 for broadleaf weeds and 7.3 for grass weeds three weeks after transplanting. Weed populations of purslane, lambsquarters, and puncturevine were too low and spotty for significant differences, but nightshade and junglerice populations were particularly heavy in this field. Prowl H_2O (1x and 2x), Dual Magnum (2x), and Outlook (2x and 4x) had the highest broadleaf weed control ratings (all were 8.6 or higher) and worked well on pigweeds and nightshades. Nortron (1x = 5.1, 2x = 6.8) and Zeus (1x = 3.8, 2x = 4.5) were considerably weaker, but better than the untreated check (2.5). Prowl H_2O (1x and 2x) had the best grass control followed by Outlook (2x and 4x) and Dual Magnum (1x and 2x). Zeus (1x) was no better than the untreated check. Results of this trial (grown completely using subsurface drip irrigation) revealed that at the 1x rate Prowl H_2O provided the best weed control. Although the data is not shown, all plots, even the untreated, showed a few dead plants or plants with curly leaves, so phytotoxicity was too hard to distinguish from stand establishment problems. However, in general, phytotoxicity as

a result of pre-transplant herbicide application was minimal. Even Outlook at the 4x rate showed very little crop damage symptoms. Only weed control data was collected; the trial was not harvested because poor crop stand, poor weed control with no layby cultivation, and bindweed became too much of an issue.

Trial #2: Pre-transplant application, Furrow Irrigation (Table 6) – Weed control ratings were higher in the sprinkler-furrow trial averaging 8.0 for total broadleaf and grass weed control. Weed counts were similar between drip and furrow treatments but the furrow plots had higher broadleaf counts especially in untreated plots (data shown below).

	Number of weeds per 12 square feet	
Untreated Plots	**Subsurface Drip**	**Sprinkler to Furrow**
Broadleaf weeds (total)	77	97
Grass weeds (total)	58	56

Dual Magnum (1x, 2x) Outlook (1x, 2x, 4x) and Prowl H_2O (2x) had the best overall ratings in both broadleaf and grass control. Zeus weed control was improved under furrow irrigation, but Nortron was still very weak. Nightshade was significantly reduced by Dual (2x) Outlook (1x, 2x, and 4x) and Prowl (2x) and Zeus (2x). Junglerice was controlled by Dual (1x, 2x), Outlook (1x, 2x, and 4x), and Prowl H_2O (1x, 2x). There was no difference in grass control between these herbicides at the 1x rate. Crop phytotoxicity was apparent with all herbicide applications. Even plants in the untreated check plots showed curling, cupping, and stunting symptoms, a result of crop stress from winds, warm temperatures, and thrips damage. The 2x rates had higher ratings, but these were not statistically different from the 1x rates. Only Zeus (2x) and Outlook (4x) had statistically higher crop phytotoxicity ratings than the other herbicide treatments. All symptoms decreased over time as the crop grew (data not shown).

Trial #3: Layby application, Furrow Irrigation (Table 7) – Crop stand counts were collected on the day of layby application just to be sure that there was no difference in pepper stand as a result of mechanical and hand weeding cultivations. Average phytotoxicity ratings were higher on June 29 (2.31) than on August 16 (0.58). The 2x herbicide rate typically had more crop phytotoxicity symptoms with the exception of Dual Magnum. However most crop phytotoxicity was not that damaging and difficult to distinguish from normal wind and stress damage. The exceptions are Nortron and Zeus (especially the 2x rate). Weed populations were low, so only herbicide ratings were collected from this trial. Broadleaf weed control was excellent (greater than 8.0) with all herbicide treatments. Grass weed control was higher than 7.0 for all herbicides except Zeus (1x and 2x = 4.3), which was no different from the untreated plot (3.5). Prowl H_2O gave the best results closely followed by Dual Magnum and Outlook.

CENTRAL VALLEY Conclusions: Of the three trials crop phytotoxicity was most obvious in the Pre-transplant herbicide trial where the herbicides were sprinkled in immediately after transplanting and then furrow irrigated for the remainder of the crop production season. Weed control was also best achieved when the herbicides were sprinkler incorporated.

Table 1. CENTRAL COAST: Trial 1

Phytotoxicity ratings and weed counts (per 20 ft^2) on two dates and time of weeding

Treatments	Lbs a.i./A	Material/A	June 1				June 14		
			Phyto-toxicity[1]	Night-shade	Sow thistle	Lambs-quarter	Phyto-toxicity[1]	Total weeds	Weed time Hrs/A
Untreated	---	---	0.0	12.0	2.0	0.0	0.0	76.7	19.1
Dual Magnum 7.62	1.43	24.0 fl oz	0.0	1.7	0.0	0.3	0.0	15.7	5.6
Nortron 4SC	0.75	24.0 fl oz	0.3	8.0	0.3	0.3	2.3	43.7	12.4
Nortron 4SC	1.00	32.0 fl oz	0.7	5.0	0.0	0.3	2.3	33.3	10.4
Zeus 4F	0.094	3.0 fl oz	1.0	2.0	0.3	0.0	2.3	11.0	4.8
Zeus 4F	0.188	6.0 fl oz	3.7	0.0	0.0	0.0	4.3	2.3	2.8
Outlook 6.0	0.60	14.0 fl oz	0.7	1.0	0.0	0.0	1.7	6.7	4.0
Prefar 4EC	6.0	6 qt	0.0	2.0	0.7	0.3	0.0	25.0	8.8
Prefar (low VOC)	6.0	6 qt	0.0	1.0	1.7	0.3	0.0	18.0	7.4
		Pr>treatment	0.0001	0.131	0.5116	0.8119	0.0001	0.3963	0.2733
		LSD (0.05)	**1.0**	**ns**	**ns**	**ns**	**1.1**	**ns**	**ns**

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

Table 2. CENTRAL COAST: Trial 1.
Harvest evaluations on October 1

Treatments	Lbs a.i./A	Material/A	Red		Green		Breaker		Culls		Total Fruit		
			lbs	No.	lbs	No.	lbs	No.	lbs	No.	lbs	No.	Mean fruit wt lbs
Untreated	---	---	31.0	57.7	0.8	2.0	1.3	4.7	6.4	19.7	39.5	84.0	0.47
Dual Magnum 7.62	1.43	24.0 fl oz	25.7	48.7	1.3	3.3	4.2	9.7	4.4	16.0	35.6	77.7	0.46
Nortron 4SC	0.75	24.0 fl oz	30.0	60.7	2.2	5.7	4.4	12.0	3.9	13.0	40.5	91.3	0.44
Nortron 4SC	1.00	32.0 fl oz	26.4	50.0	3.7	8.0	4.2	9.0	5.3	16.3	39.7	83.3	0.48
Zeus 4F	0.094	3.0 fl oz	29.4	56.0	0.0	0.0	3.8	9.7	5.7	17.0	38.9	82.7	0.47
Zeus 4F	0.188	6.0 fl oz	25.9	48.7	1.6	4.7	4.4	11.7	4.5	12.7	36.3	77.7	0.47
Outlook 6.0	0.60	14.0 fl oz	24.8	45.3	1.4	3.3	3.8	8.7	4.3	12.0	34.3	69.3	0.49
Prefar 4EC	6.0	6 qt	31.1	61.3	0.8	2.3	2.5	6.7	6.3	18.7	40.6	89.0	0.46
Prefar (low VOC)	6.0	6 qt	31.5	61.0	0.8	2.0	3.8	11.3	4.3	14.7	40.3	89.0	0.45
		Pr>treatment	0.0467	0.0361	0.2205	0.1917	0.1264	0.2199	0.5881	0.6967	0.0606	0.0245	0.6446
		LSD (0.05)	**4.9**	**11.1**	**ns**	**ns**	**ns**	**ns**	**ns**	**ns**	**4.6**	**11.7**	**ns**

Table 3. CENTRAL COAST: Trial 2.

Phytotoxicity ratings and weed counts (per 15 ft^2) on two dates, and time to weed

Layby Application	Lbs a.i./A	Material/A	June 27		August 27			
			Phyto-toxicity[1]	Night-shade	Phyto-toxicity[1]	Night-shade	Malva	Weed time Hrs/A
Untreated	---	---	0.0	3.7	0.0	15.3	0.7	12.0
Dual Magnum 7.62	1.43	24.0 fl oz	0.0	1.3	0.0	4.3	0.0	4.8
Prowl H2O 3.8EC	1.50	1.58 qt	0.0	1.7	0.0	9.0	0.3	6.1
Dual Magnum 7.62 + Prowl H2O 3.8EC	1.43 1.50	24.0 fl oz 1.58 qt	0.0	0.7	0.0	6.3	0.0	5.3
Outlook 6.0	0.60	14.0 fl oz	0.0	0.0	0.0	3.7	0.0	3.2
Zeus 4F	0.094	3.0 fl oz	2.7	0.0	0.0	3.7	0.0	4.0
Zeus 4F	0.188	6.0 fl oz	3.0	0.0	1.3	3.0	0.0	3.1
Nortron 4SC	0.75	24.0 fl oz	2.3	0.3	0.0	8.0	0.0	6.0
Nortron 4SC	1.00	32.0 fl oz	2.7	0.0	2.3	6.3	0.0	6.6
		Pr>treatment	0.0001	0.0086	0.0014	0.0007	0.5696	0.0001
		LSD (0.05)	**0.6**	**1.8**	**1.1**	**4.5**	**ns**	**9.7**

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

Table 4. CENTRAL COAST – Trial 2.
Harvest evaluations on September 20

Treatments	Lbs a.i./A	Red		Green		Breaker		Culls		Total Fruit		
		Lbs	No.	lbs	No.	lbs	No.	lbs	No.	lbs	No.	Mean fruit wt lbs
Untreated	---	21.3	42.3	2.9	6.7	5.5	13.3	2.2	6.7	31.9	69.0	0.46
Dual Magnum 7.62	1.43	17.9	36.7	2.7	7.7	6.0	13.0	1.8	5.7	28.4	63.0	0.45
Prowl H2O 3.8EC	1.50	16.7	33.7	3.0	8.3	6.9	16.7	2.0	6.0	28.6	64.7	0.44
Dual Magnum 7.62 + Prowl H2O 3.8EC	1.43 1.50	19.6	38.3	4.0	9.3	6.5	14.7	2.0	5.7	32.2	68.0	0.47
Outlook 6.0	0.60	21.5	43.3	2.8	6.7	4.8	12.0	1.7	4.7	30.8	66.7	0.46
Zeus 4F	0.094	18.9	37.3	2.6	7.3	7.5	18.0	1.8	5.0	30.9	67.7	0.46
Zeus 4F	0.188	16.8	33.7	2.5	7.3	5.2	12.7	3.4	10.0	27.9	63.7	0.44
Nortron 4SC	0.75	20.2	44.3	1.5	3.3	5.2	13.7	2.0	5.7	28.9	67.0	0.43
Nortron 4SC	1.00	17.1	34.0	3.1	8.3	5.2	12.7	3.4	9.0	28.7	64.0	0.45
Pr>treatment		0.1241	0.0804	0.7186	0.7116	0.5695	0.7178	0.4571	0.1436	0.2570	0.9745	0.7297
LSD (0.05)		**Ns**	**ns**	**ns**	**ns**	**ns**	**ns**	**ns**	**ns**	**ns**	**ns**	**ns**

Table 5. CENTRAL VALLEY: Trial #1 – Pre-transplant Preemergence Herbicides – Subsurface DRIP IRRIGATION

Weed Control Ratings and Counts – May 31, 2012

Code	Treatments		Lbs a.i./A	Material/ Acre	Weed Control Rating*		Counts/12 ft^2							
					Brdlf	Grass	Pig	Purs	Lambs	Punct	Night	All Brdlvs	Grass	Bind
1	Dual Magnum 7.63	1x	1.43	1.5 pts	8.0	7.2	5.3	0.8	2.0	0.3	22.0	11.3	11.3	0.8
2	Dual Magnum 7.63	2x	2.86	3 pts	8.6	9.3	3.0	0.5	1.8	0.8	13.3	9.0	9.0	0.5
3	Nortron 4sc	1x	1.75	3.5 pts	5.1	5.8	17.5	1.0	2.3	0.5	37.5	38.5	38.5	1.3
4	Nortron 4sc	2x	3.50	7.0 pts	6.8	7.5	9.8	0.5	2.3	0.5	42.5	24.0	24.0	1.0
5	Outlook 6.0	1x	0.05	10.7 ozs	6.9	8.1	7.8	1.0	1.8	0.8	32.5	20.8	20.8	0.5
6	Outlook 6.0	2x	1.0	21.4 ozs	8.6	8.6	12.0	1.0	1.8	1.3	25.3	15.3	15.3	0.3
7	Prowl H_2O 3.8 EC	1x	1.5	3 pts	9.1	9.6	0.5	0.8	0.8	0.0	14.8	1.3	1.3	2.3
8	Prowl H_2O 3.8 EC	2x	3.0	6 pts	9.6	9.9	0.8	0.3	0.0	0.0	9.3	1.8	1.8	1.3
9	Zeus 4F	1x	0.094	3 ozs	3.8	4.1	20.8	1.3	1.5	0.5	35.3	45.0	45.0	1.3
10	Zeus 4F	2x	0.188	6 ozs	4.5	4.4	12.3	2.8	2.5	0.3	31.8	38.0	38.0	0.0
11	Outlook	4x	2.0	42.8 ozs	8.6	9.3	2.5	0.8	1.8	0.8	11.5	7.0	7.0	0.3
12	Untreated	-			2.5	3.8	25.3	3.5	3.0	1.0	44.3	57.8	57.8	0.5
				Average	**6.8**	**7.3**	**9.8**	**1.2**	**1.8**	**0.5**	**26.6**	**22.5**	**22.5**	**0.8**
				LSD (0.05)	**1.1**	**2.1**	**8.7**	**2.4**	**1.9**	**1.1**	**11.6**	**14.9**	**14.9**	**2.1**
				Pr>Trt	0.0000	0.0000	0.0000	0.2105	0.2032	0.4174	0.0000	0.0000	0.0000	0.7138
				Pr>Bl	0.0241	0.0049	0.0109	0.4912	0.9722	0.4706	0.2014	0.0000	0.0000	0.0072
				CV%	11.4	19.9	61.7	139.2	74.1	136.7	30.3	46.2	46.2	181.0
					**	**	**	NS	NS	NS	**	**	**	NS

* 10 = perfect weed control; 1= no weed control

Weeds = pigweeds, purslane, lambsquarters, puncturevine, nightshades, barnyardgrass, Total broadleaves, bindweed

Table 6. CENTRAL VALLEY: Trial #2 – Pre-transplant Preemergence Herbicides – FURROW IRRIGATION

Weed Control Ratings and Counts – May 31, 2012

Code	Treatments		Lbs a.i./A	Material /Acre	Weed Control Rating		Weed Counts/12 ft^2 – May 31, 2013								June 1, 2013
					Brdlf	Grass	Pig	Purs	Lamb	Punct	Night	Brdlf	Grass	Bind	Phyto
1	Dual Magnum 7.63	**1x**	1.43	1.5 pts	8.5	9.8	5.0	2.5	2.5	2.0	22.5	34.5	3.0	0	1.8
2	Dual Magnum 7.63	**2x**	2.86	3 pts	9.4	10	0.5	0.5	4.0	0.3	4.3	9.5	0.5	2.5	2.3
3	Nortron 4SC	**1x**	1.75	3.5 pts	5.6	5.6	14.3	2.0	8.3	3.0	62.0	89.5	36.8	1.3	1.6
4	Nortron 4SC	**2x**	3.50	7.0 pts	7.8	7.9	6.3	0.8	4.8	1.5	22.0	35.3	22.3	0.5	2.5
5	Outlook 6.0	**1x**	0.05	10.7 ozs	8.6	9.0	3.3	0.5	5.5	2.8	11.5	23.5	9.0	1.3	3.0
6	Outlook 6.0	**2x**	1.0	21.4 ozs	9.5	9.9	1.5	0.3	3.5	0.3	3.0	8.5	2.0	0.3	3.2
7	Prowl H_2O 3.8EC	**1x**	1.5	3 pts	8.4	8.5	5.8	0.8	0.5	0.5	26.3	33.8	11.3	0.3	1.1
8	Prowl H_2O 3.8EC	**2x**	3.0	6 pts	9.1	9.1	1.8	1.3	0.5	0.5	6.5	10.5	12.3	2.3	1.5
9	Zeus 4F	**1x**	0.094	3 ozs	8.0	6.0	5.8	2.8	1.0	1.3	13.3	24.0	56.0	0	2.1
10	Zeus 4F	**2x**	0.188	6 ozs	8.8	7.6	3.0	1.5	0.0	2.0	1.8	8.3	28.5	0.5	3.5
11	Outlook	**4x**	2.0	42.8 ozs	9.9	10.0	0.3	0.3	0.3	0.3	2.0	3.0	0.5	1.3	4.6
12	Untreated	**-**			1.8	1.8	16.5	6.0	5.0	3.3	66.0	96.8	55.5	0	1.3
				Average	**8.0**	**8.0**	**5.3**	**1.6**	**3.0**	**1.5**	**20.1**	**31.4**	**19.8**	**0.8**	**2.4**
				LSD (0.05)	**1.2**	**1.7**	**4.4**	**2.8**	**3.6**	**2.4**	**23.3**	**26.2**	**17.5**	**2.8**	**1.5**
				Pr>Trt	0.0000	0.0000	0.0000	0.0095	.0005	.0946	0.0000	0.0000	0.0000	0.6191	0.0009
				Pr>Bl	0.3146	0.4607	0.8135	0.2123	.1860	0.0357	0.5061	0.5661	0.0672	0.0569	0.5624
				CV%	10.4	14.8	58.2	121.9	84.8	115.8	80.5	58.0	61.5	229.8	43.4
					**	**	**	**NS**	**	**NS**	**	**	**	**NS**	**

* 10 = perfect weed control; 1= no weed control

Weeds = pigweeds, purslane, lambsquarters, puncturevine, nightshades, barnyardgrass, Total broadleaves, bindweed

Table 7. CENTRAL VALLEY: Trial #3 - Layby Application – Preemergence Herbicides – FURROW IRRIGATION

Pepper Stand, Crop Phytotoxicity, Weed Control Ratings

Code	Treatments		Lbs a.i./A	Material/A	June 7, 2012		June 29	August 16, 2012		
					Pepper Stand		Phyto	Phyto	Broadleaf	Grass
					W bed	E bed	Rating	Rating	Control	Control
1	Dual Magnum 7.63	**1x**	1.43	1.5 pts	36.0	33.5	0.50	0	8.8	8.8
2	Dual Magnum 7.63	**2x**	2.86	3 pts	37.3	35.3	0.25	0.25	9.1	9.1
3	Nortron 4SC	**1x**	1.75	3.5 pts	35.0	33.0	2.00	0	7.0	7.0
4	Nortron 4SC	**2x**	3.50	7.0 pts	37.3	35.3	4.75	0	7.0	7.0
5	Outlook 6.0	**1x**	0.05	10.7 ozs	33.0	35.0	0.50	0.25	7.3	7.3
6	Outlook 6.0	**2x**	1.0	21.4 ozs	38.5	34.0	1.25	0.50	8.3	8.3
7	Prowl H^2O 3.8EC	**1x**	1.5	3 pts	31.8	32.8	1.25	0	9.0	9.0
8	Prowl H^2O 3.8EC	**2x**	3.0	6 pts	36.8	34.3	1.75	0	9.6	9.6
9	Zeus 4F	**1x**	0.094	3 ozs	36.0	31.8	3.50	0.50	4.3	4.3
10	Zeus 4F	**2x**	0.188	6 ozs	37.3	32.3	8.25	3.25	4.3	4.3
11	Outlook	**4x**	2.0	42.8 ozs	35.3	31.3	3.00	2.25	8.1	8.1
12	Untreated	**-**			34.5	34.8	0.75	0.0	3.5	3.5
				Average	**35.7**	**33.6**	**2.3**	**0.7**	**8.7**	**7.2**
				LSD (0.05)	**8.1**	**7.2**	**1.2**	**1.3**	**0.7**	**1.5**
				Pr>Trt	0.905	0.981	0.000	0.0001	0.00	0.000
				Pr>Bl	0.496	0.709	0.143	0.4574	0.297	0.2061
				CV%	15.75	15.02	36.89	154.6	5.7	14.2
					NS	**NS**	**	**	**	**

* Weed Control Rating: 10 = perfect weed control; 1= no weed control
Phytotoxicity Rating: 10 = crop totally dead; 0 = no crop injury

CENTRAL COAST TRIALS

Trial 1 on June 15

1. untreated

2. Dual Magnum

3. Zeus 3.0 fl oz

4. Outlook 14.0 fl oz

Note: removed weeds in furrow

Trial 2

5. Layby timing

6. Small nightshade removed before treatment

7. Plot at harvest