

California Pepper Commission – Final Report, 2016

Title: Preemergence Weed Control Trials in Peppers

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Summary: There have been few new herbicides developed for use on vegetables in the past 10-15 years. This phenomena has been due to changes in the agricultural chemical industry brought about by the advent of glyphosate tolerant corn and soybeans which resulted in reduced demand for research and development of traditional preemergent herbicides. Three years ago Kumiai Chemical Corp. began researching the use of pyroxasulfone (Zidua) on vegetables. In 2015 we initiated trials of this materials in collaboration with the California Pepper Commission and cooperating growers. The 2015 trials indicated that the safety of this material is strongly correlated with the soil type. However, we saw greater safety on a fine sandy loam soil than on a silty clay loam which goes against the normal pattern of greater selectivity on heavier soils. The 2016 trial was conducted on a silty clay loam soil (30% sand, 34% silt and 36% clay). Zidua rates at and above 1.0 ounce both pre and post transplanting provided significant reductions in the number of hairy nightshade and reduced weeding time. However, these rates also reduced the tonnage of marketable peppers. The 0.5 ounce rate of Zidua was safe on peppers and did not reduce the yield, however, it provided only marginal control of nightshade and reductions in weeding time.

Methods: Trial was conducted in a commercial pepper production field near east of Gilroy. Materials were applied either immediately pre-transplant or post-transplant on May 3. Sprinkler irrigation was applied within four hours after transplanting to set the plants and incorporate the herbicide treatments. Phytotoxicity and weed evaluations were made on three dates (Tables 1&2). Harvest evaluations were conducted on September 21. Soil type was Campbell silty clay loam: pH = 7.67; organic matter = 3.41; sand = 30, silt = 34 and clay = 36%. The variety was 'Baron'. See table for evaluations and dates. Each plot was one 40-inch bed wide by 10 feet long and replicated three times in a randomized complete block design. All treatments were applied with 2 passes of a one tip wand with an 8008EVS nozzle at 30 psi applying the equivalent of 55 GPA

Results: There was a high population of hairy nightshade at this site. Dual Magnum at 1.67 pints/A was the standard treatment and provided excellent hairy nightshade control on May 16 and 26 (Table 1). The 1.0 ounce rate of Zidua applied post-transplant provided the best level of control of hairy nightshade on May 26, but it had unacceptable levels of phytotoxicity. The 0.5 ounce rate of Zidua had acceptable phytotoxicity but only controlled half of the hairy nightshade plants. Weeding time was reduce with increasing rate of Zidua applied pre-transplant. The post

transplant application of Zidua had the lowest weeding time of all the Zidua treatments. There was greater phytotoxicity evident in the higher rates of Zidua on June 16 (Table 2), but the higher rates provided greater reductions in weeding time on June 16 and overall weeding time (total of May 26 and June 16). All rates of Zidua above 0.5 ounce/A reduced overall tonnage of marketable pepper fruit (reds + breakers) on September 21.



Overview of the trial area



Pepper on May 26 with hairy nightshade



0.5 ounce Zidua pre transplant



1.0 ounce Zidua pre transplant



2.0 ounce Zidua pre transplant



1.0 ounce Zidua post transplant

Table 1. Phytotoxicity, weed evaluation (No. weeds/10 ft²) and weeding time

Treatments	lbs a.i./A	Material/A	Timing	May 16		May 26		
				Phyto ¹	Hairy Night-shade	Phyto ¹	Hairy Night-shade	Weeding time Hrs/A
Dual Magnum 7.62	1.50	1.67 pt	Post	0.0	0.0	0.0	2.3	5.1
Zidua 85WG	0.027	0.50 oz	Pre	0.0	5.7	0.3	53.7	15.3
Zidua 85WG	0.053	1.00 oz	Pre	0.0	2.3	1.7	14.0	7.8
Zidua 85WG	0.106	2.00 oz	Pre	0.7	1.7	3.7	13.0	8.8
Zidua 85WG	0.053	1.00 oz	Post	1.0	1.7	3.3	0.0	4.1
Untreated	---	---	---	0.0	22.0	0.0	106.3	23.0
Pr>Treat				0.1749	<0.0001	<0.0001	<0.0001	<0.0001
LSD _{0.05}				ns	4.8	0.8	14.6	4.5

1 – scale: 0 = no crop damage to 10 crop dead.

Table 2. Phytotoxicity, weed evaluation (weeds/10 ft²) and weeding time and yield evaluation

Treatments	lbs a.i./A	Material/A	Timing	June 16			Total	Sept. 21	
				Phyto ¹	Hairy Night-shade	Weeding time Hrs/A	Weeding time Hrs/A	Mkt Fruit No./A	Mkt Fruit Tons/A
Dual Magnum 7.62	1.50	1.67 pt	Post	0.0	1.4	1.8	6.9	215,853	56.711
Zidua 85WG	0.027	0.50 oz	Pre	0.7	5.7	4.2	19.5	229,982	57.456
Zidua 85WG	0.053	1.00 oz	Pre	2.3	3.0	2.7	10.5	213,498	49.882
Zidua 85WG	0.106	2.00 oz	Pre	4.7	0.3	1.5	10.4	193,090	47.449
Zidua 85WG	0.053	1.00 oz	Post	4.3	0.0	1.4	5.1	195,445	49.175
Untreated	---	---	---	0.0	8.7	5.6	28.6	234,691	55.847
Pr>Treat				<0.0001	0.0001	0.0025	<0.0001	<0.0001	<0.0001
LSD _{0.05}				1.1	2.7	2.0	4.1	36,367	7.435

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