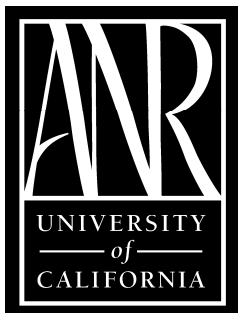


# Alfalfa

## WEED AND INSECT CONTROL 2008 TRIAL RESULTS

### SAN JOAQUIN COUNTY



Cooperative Extension      University of California  
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2008 ALFALFA

WEED & INSECT CONTROL RESEARCH PROGRESS REPORT

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San Joaquin County

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Caution

This report is a summary of alfalfa weed and insect control studies conducted in San Joaquin County. **It should not in any way be interpreted as a recommendation of the University of California.**

Herbicide and insecticide trade names are used in this report, as well as the less familiar common names to familiarize the reader with the various products tested. No endorsement of products mentioned or criticism of similar products is intended.

Herbicide and insecticide rates in this report are always expressed as **active ingredient (a.i.) of material per treated acre.**

<b><u>Trade Name</u></b>	<b><u>Common Name</u></b>	<b><u>Company</u></b>
Buctril	Bromoxynil	Bayer
Butyrac 200	2,4-DB amine	Albaugh, Inc
Chateau	Flumioxazin	Valent
Dimethoate	Dimethoate	Drexel
DPX-E2Y45	Experimental	DuPont
DPX-HGW86	Experimental	DuPont
Gramoxone	Paraquat	Syngenta
Intrepid	Methoxyfenozide	Dow
Lorsban Advanced	Chlorpyrifos	Dow
Lorsban	Chlorpyrifos	Dow
Movento	Spirotetramet	Bayer
Prowl H <sub>2</sub> O	Pendimethalin	BASF
Pursuit	Imazethapyr	BASF
Raptor	Imazamox	BASF
Roundup	Glyphosate	Monsanto
Steward	Indoxacarb	DuPont
Success	Spinosad	Dow
Treflan (TR10)	Trifluralin	Dow
V-10142	Imazsulfuron	Valent
Velpar	Hexazinone	DuPont
Warrior	Lambda-cyhalothrin	Syngenta

### **2008 Alfalfa Weed Control Trial Results**

During the 2008 season, five weed control and three insecticide trials were established in San Joaquin County. Weed control trials were established to evaluate the effectiveness of candidate herbicides for controlling annual and perennial weeds in established alfalfa. The insecticide trials were conducted to evaluate a number of insecticides for controlling aphids, beet armyworms, Western yellow-striped armyworm, alfalfa caterpillar and alfalfa weevil in established alfalfa. Complete trial descriptions, insect counts and weed control/crop phytotoxicity ratings for each trial follow.

**Winter Weed Control in Established Alfalfa Trial 1** Mick Canevari, Don Colbert, Scott Whiteley and Randall Wittie

**OBJECTIVE:** Evaluate winter herbicide applications for weed control in an established alfalfa field.

**MATERIALS & METHODS:** A field study was initiated on December 13, 2007 in an established alfalfa field located near Tracy, CA. Plots were 10 by 15 ft arranged in a randomized complete block design with three replications. Applications were made with a CO<sub>2</sub> backpack sprayer, 35 psi in 20.4 gpa of water. Growth stages prior to application were: (1) December 13, 2007; Alfalfa = Semi dormant, green foliage, 25% 3 to 5 inch height, 50% 6 to 8 inch height and 25% 10 to 12 inch height; Burning nettle (*Urtica urens*) = 15% cotyledon, 70% 2 leaf, 10% 4 leaf, 5% 6 leaf and 1 to 2 inch height; Common chickweed (*Stellaria media*) = 80% cotyledon to 2 leaf, 20% >20 leaf and 0.5 to 3 inch height; Prickly lettuce (*Lactuca serriola*) = 2 to 6 leaf, 2 to 8 inch diameter; Annual sowthistle (*Sonchus oleraceus*) = cotyledon to 2 leaf, 0.5 inch diameter; Common groundsel (*Senecio vulgaris*) = 1 to 4 leaf, 0.5 to 1 inch height; Annual bluegrass (*Poa annua*) = 4 leaf, 1 to 3 tillers, 1 to 2.5 inch height; London rocket (*Sisymbrium irio*) = 4 to 8 leaf, 3 to 6 inch diameter; Shepherd's purse (*Capsella bursa-pastoris*) = 4 to 8 leaf, 0.75 inch diameter; Fiddleneck (*Amsinckia intermedia*) = cotyledon, 0.75 inch diameter and Panicle willowweed (*Epilobium paniculatum*) = preemergence. (2) Application January 2, 2008; Alfalfa = Semi dormant, green foliage, 3 to 12 inch height; Burning nettle = 10% cotyledon, 40% 2 leaf, 40% 4 leaf, 10% 6 to 8 leaf and 1 to 2 inch height; Common chickweed = 2 to 20 leaf, 0.5 to 3 inch diameter; Prickly lettuce = 4 to 10 leaf, 2 to 3 inch diameter; Annual sowthistle = 2 to 4 leaf, 0.5 to 1 inch diameter; Common groundsel = 2 to 8 leaf, 1 to 2 inch height; Annual bluegrass = 1 to 3 tillers, 1.5 to 3 inch height; London rocket = 6 to 10 leaf, 4 to 8 inch diameter; Shepherd's purse = 6 to 10 leaf, 1-2 inch diameter, Fiddleneck = 6 leaf, 1.5 inch diameter and Panicle willowweed = cotyledon to 4 leaf, 0.5 inch height.

**RESULTS & DISCUSSIONS:**

Alfalfa Injury (Table 1)

Application 12/13/08: All treatments showed some moderate to severe necrosis (23-100%) with the standard Gramoxone treatments giving 100%. However, within 30 days the alfalfa recovered. One month after application, Sandea alone treatments were giving 17-57% alfalfa growth reduction. Prior to the first cutting, growth reduction ratings were still in the 27-43% range. Sandea tank mixed with Chateau, Gramoxone or Velpar were giving 42-90% growth reduction. Prior to the first cuttings ratings had dropped to 12-15%. Chateau alone treatments gave 63-75% alfalfa growth reduction with only 0-12% ratings before cutting. The Chateau fertilizer formulation plus Gramoxone split applications gave severe alfalfa injury early with complete recovery prior to cutting. The standards, Gramoxone and Velpar gave 93% and 55% growth reduction, respectively. Prior to cutting both treatments recovered completely.

Applications 1/2/08: Early ratings showed Shark alone or tank mixed with Velpar giving 22% and 30% alfalfa growth reduction, respectively. Prior to cutting treatments were still giving 18-20% growth reduction. Shark tank mixed with Gramoxone gave some early 73% alfalfa growth reduction with only 5% reduction prior to cutting. Gramoxone alone gave similar results as the above tank mixture.

#### Weed Control (Table 1 & 2)

Sandea alone: The two lower rates 0.031 and 0.047 lb ai/A did not give commercial (85%) control of burning nettle, common groundsel, willowweed, annual bluegrass and annual sowthistle. The 0.031 lb ai/A rate did not control fiddleneck. The high rate gave commercial control of all weed species except annual bluegrass, common groundsel and willowweed.

Sandea tank mixtures: Sandea + Chateau gave excellent control of all weed species. Tank mixtures with Velpar or Gramoxone gave excellent weed control except for poor control of willowweed.

Chateau: Chateau WG formulation alone and Chateau Fertilizer formulation plus Gramoxone split application gave complete weed control.

Velpar: Resulted in 90-100% control of all weed species.

Gramoxone: Applied early or late gave commercial control of annual bluegrass, prickly lettuce, common chickweed, London rocket, common groundsel and annual sowthistle. It took the 0.5 lb ai/A rate applied late to obtain 85% control of shepherd's purse. None of the treatments controlled fiddleneck, willowweed, and burning nettle.

Shark: Alone applications gave excellent control of burning nettle, prickly lettuce, London rocket, annual sowthistle, shepherd's purse, fiddleneck and willowweed with poor control of annual bluegrass, common chickweed and common groundsel. Shark tank mixed with Velpar missed annual bluegrass. Shark plus Gramoxone tank mixtures gave poor control of burning nettle.

**Table 1 – Alfalfa injury and weed control in established alfalfa**

Treatment <sup>2</sup>	Rate lb ai/A	App Date	% Alfalfa Injury <sup>1</sup>				% Weed Control <sup>1</sup>	
			Necrosis 12/26	Growth Reduction		Burning nettle	Prickly lettuce	
				1/11	2/19	3/25		
Sandea	0.031	12/13/07	20	17	50	27	73	93
Sandea	0.047	12/13/07	23	20	50	27	82	97
Sandea	0.094	12/13/07	27	57	70	43	90	99
Sandea + Chateau WG <sup>3</sup>	0.031 + 0.094	12/13/07	32	67	60	25	100	100
Sandea + Gramoxone	0.031 + 0.5	12/13/07	100	90	13	17	92	100
Sandea + Velpar	0.031 + 0.5	12/13/07	22	42	28	12	96	100
Chateau WG <sup>3</sup>	0.094	12/13/07	30	63	32	0	100	100
Chateau WG <sup>3</sup>	0.125	12/13/07	33	73	34	5	100	100
Chateau WG <sup>3</sup>	0.25	12/13/07	33	75	35	12	100	100
Chateau Fert <sup>4</sup> + Gramoxone <sup>5</sup>	0.125 0.5	12/13/07	100	92	15	2	100	100
Chateau Fert <sup>4</sup> Gramoxone <sup>5</sup>	0.25 + 0.5	12/13/07	100	93	13	0	100	100
Velpar	0.5	12/13/07	27	55	28	3	90	100
Gramoxone	0.5	12/13/07	100	93	18	3	60	93
Shark	0.031	1/2/08	-	22	33	18	90	93
Shark + Velpar	0.031 + 0.5	1/2/08	-	30	33	20	92	95
Shark + Gramoxone	0.031 + 0.5	1/2/08	-	73	20	5	60	95
Gramoxone	0.25	1/2/08	-	70	7	0	63	93
Gramoxone	0.5	1/2/08	-	70	25	2	53	97
Untreated	-	-	0	0	0	0	0	0

<sup>1</sup>0 = No weed control or crop injury, 100 = Complete weed control; crop dead

<sup>2</sup>No Foam A (NIS) added to all herbicide treatments at 0.25% V/V (1qt/100gal)

<sup>3</sup>Chateau formulation 51% WG

<sup>4</sup>Chateau formulation 0.032% impregnated on fertilizer applied with a fertilizer spreader

<sup>5</sup>Gramoxone applied after Chateau Fertilizer formulation

**Table 2 – Weed control in established alfalfa**

Treatment <sup>2</sup>	Rate lb ai/A	App Date	% Weed Control <sup>1</sup> 3/25							
			AB <sup>3</sup>	CW	LR	GR	ST	SP	FN	WW
Sandea	0.031	12/13/07	0	90	100	70	77	97	63	33
Sandea	0.047	12/13/07	10	87	100	80	70	91	100	47
Sandea	0.094	12/13/07	30	97	100	77	93	100	100	67
Sandea + Chateau WG <sup>4</sup>	0.031 + 0.094	12/13/07	98	100	100	100	100	100	100	100
Sandea + Gramoxone	0.031 + 0.5	12/13/07	98	98	100	97	100	96	97	40
Sandea + Velpar	0.031 + 0.5	12/13/07	99	100	100	100	98	100	100	57
Chateau WG <sup>4</sup>	0.094	12/13/07	96	100	100	80	100	100	100	100
Chateau WG <sup>4</sup>	0.125	12/13/07	100	100	95	100	100	100	100	100
Chateau WG <sup>4</sup>	0.25	12/13/07	100	100	100	100	100	100	100	100
Chateau Fert <sup>5</sup> + Gramoxone <sup>6</sup>	0.125 0.5	12/13/07	100	100	99	100	100	100	100	100
Chateau Fert <sup>5</sup> Gramoxone <sup>6</sup>	0.25 + 0.5	12/13/07	100	100	100	100	100	100	100	100
Velpar	0.5	12/13/07	98	100	98	100	98	93	93	97
Gramoxone	0.5	12/13/07	90	96	87	87	93	80	47	37
Shark	0.031	1/2/08	7	73	95	67	93	97	97	90
Shark + Velpar	0.031 + 0.5	1/2/08	67	90	90	95	100	97	97	93
Shark + Gramoxone	0.031 + 0.5	1/2/08	93	92	92	93	97	90	83	90
Gramoxone	0.25	1/2/08	97	97	90	90	88	83	77	53
Gramoxone	0.5	1/2/08	93	95	87	92	90	85	67	77
Untreated	-	-	0	0	0	0	0	0	0	0

<sup>1</sup>0 = No weed control, 100 = Complete weed control

<sup>2</sup>No Foam A (NIS) added to all herbicide treatments at 0.25% V/V (1qt/100gal)

<sup>3</sup>Weeds evaluated; AB = Annual bluegrass, CW = Common chickweed, LR = London rocket, GR = Common groundsel, ST = Annual sowthistle, SP = Shepherd's purse, FN = Fiddleneck and WW = Panicle willowweed

<sup>4</sup>Chateau formulation 51% WG

<sup>5</sup>Chateau formulation 0.032% on fertilizer applied with a fertilizer spreader

<sup>6</sup>Gramoxone applied after Chateau Fertilizer formulation

**OBJECTIVE:** Evaluate winter herbicide applications for weed control and crop tolerance in established alfalfa.

**MATERIALS & METHODS:** Trial was established on October 24, 2007 in an established alfalfa field located near Stockton, CA. Plots were 10 by 18 ft arranged in a randomized complete block design with three replications. Applications were made with a CO<sub>2</sub> backpack sprayer, 35 psi in 19.5 gpa of water. Growth stages prior to application were: (1) October 24, 2007; Alfalfa = semi dormant, green foliage, 70% 3 to 6 inch height, 15% 7 to 9 inch height and 15% 10 to 13 inch height. Henbit (*Lamium amplexicaule*) = cotyledon; Common chickweed (*Stellaria media*) = cotyledon, Annual bluegrass (*Poa annua*) = 1 to 3 leaf, Common groundsel (*Senecio vulgaris*) = preemergence, Annual sowthistle (*Sonchus oleraceus*) = preemergence, Prickly lettuce = (*Lactuca serriola*) = preemergence, Shepherd's purse (*Capsella bursa-pastoris*) = preemergence and Barnyardgrass (*Echinochloa crus-galli*) = preemergence. (2) January 2, 2008 application; Alfalfa = semi dormant, 2-5 inch height; Annual bluegrass = 3 leaf to 3 tillers, 1 to 2.5 inch height; Common chickweed = 2 to 4 inch diameter; Prickly lettuce = 2 to 8 leaf, 1-3 inch diameter; Annual sowthistle = 4 to 10 leaf, 2 to 4 inch diameter; Shepherd's purse = 4 to 8 leaf, 1-2 inch diameter; Henbit = 2 to 10 leaf, 0.25 to 1.5 inch height and Barnyardgrass = preemergence.

### **RESULTS & DISCUSSIONS:**

#### Alfalfa Injury 10/24/07 Application (Table 1)

Sandea: Alfalfa recovered from early Chlorosis and necrosis. Early ratings were showing 79-88% alfalfa growth reduction. Prior to first cutting growth reduction ratings were 22-33%.

Chateau: Chateau 51% WG formulation early alfalfa chlorosis and necrosis with complete recovery within 60 days. Chateau .032% fertilizer formulation showed no alfalfa chlorosis or necrosis. Both formulations gave 53-63% alfalfa growth reduction early with only 0-5% prior to cutting.

#### Alfalfa Injury 1/2/08 Application (Table1)

Sandea: All treatments applied alone gave 50-68% alfalfa growth reduction early with 18-33% ratings prior to cutting. Tank mixtures with Chateau, Gramoxone or Velpar gave 47-80% growth reduction early with only 2-13% before the first cutting.

Gramoxone: Early growth reduction 90% with complete recovery prior to cutting.

Chateau: All rates of Chateau 51% WG formulation applied alone or as a split application of Chateau .032% fertilizer followed by Gramoxone gave 75-85% alfalfa growth reduction early with only 0-7% visible prior to cutting.

#### Weed Control 10/24/08 Application (Table 2)

Sandea: The low rate 0.031 lb ai/A gave commercial control (>85%) of common chickweed, henbit and shepherd's purse. The 0.047 lb ai/A rate gave control of the above weeds plus annual sowthistle. It took the high rate of 0.094 lb ai/A to control groundsel and prickly lettuce. None of the treatments controlled annual bluegrass or barnyardgrass.

Chateau: The 51% WG formulation gave excellent control of all weed species except for annual bluegrass and 75% preemergence activity on barnyardgrass. Chateau 0.032% fertilizer formulation poor control of all weeds except common chickweed 93%.

#### Weed Control 1/2/08 Application (Table 2)

Sandea: Shepherd's purse and sowthistle were the only weeds controlled with the 0.031 lb ai/A rate. The 0.047 and 0.094 lb ai/A rates gave excellent control of henbit and shepherd's purse with the high rate giving 97% prickly lettuce control. All three rates were not effective in controlling annual sowthistle, common groundsel, annual bluegrass, common chickweed and barnyardgrass. Sandea tank mixed with Chateau gave 93-100% control of common chickweed, henbit, annual sowthistle, prickly lettuce and shepherd's purse. Annual bluegrass and common groundsel control were 82% and 80%, respectively. Sandea tank mixed with Gramoxone gave commercial control of all weed species except for 70% henbit and 13% barnyardgrass control. Sandea tank mixed with Velpar gave only commercial control of common groundsel, annual sowthistle and prickly lettuce.

Gramoxone: Excellent control of all weeds with only 73% control of henbit. As expected no preemergence activity on barnyardgrass.

Chateau: The 0.094 lb ai/A rate of Chateau 51% WG formulation gave excellent control of all weed species with 75% control of groundsel and barnyardgrass. The 0.125 and 0.25 lb ai/A rates gave excellent control of all weeds. Preemergence barnyardgrass control was 88%. The split applications of Chateau 0.032% fertilizer formulation followed by a Gramoxone application gave excellent weed control but needed the 0.25 lb ai/A of Chateau to obtain burning nettle control. Poor preemergence control of barnyardgrass.

**Table 1 – Alfalfa injury and yields in an established alfalfa stand**

Treatment <sup>3</sup>	Rate lb ai/A	App Date	% Alfalfa Injury <sup>1</sup>						Alfalfa <sup>2</sup> Yield lb/A
			Chlorosis		Necrosis		Growth Reduction		
			11/2 <sup>4</sup>	12/21	11/26	12/21	1/14	3/20	
Sandea	0.031	10/24/07	7	0	17	58	70	22	1721
Sandea	0.047	10/24/07	10	0	25	70	78	28	1678
Sandea	0.094	10/24/07	12	0	32	83	88	32	1979
Chateau WG <sup>5</sup>	0.125	10/24/07	20	0	47	50	63	5	1882
Chateau Fert <sup>6</sup>	0.125	10/24/07	0	0	6	2	53	0	1786
Sandea	0.031	1/2/08	-	-	-	-	65	18	2270
Sandea	0.047	1/2/08	-	-	-	-	68	27	2474
Sandea	0.094	1/2/08	-	-	-	-	50	33	2291
Sandea + Chateau WG <sup>5</sup>	0.031 + 0.094	1/2/08	-	-	-	-	75	10	1861
Sandea + Gramoxone	0.031 + 0.5	1/2/08	-	-	-	-	80	2	2614
Sandea + Velpar	0.031 + 0.5	1/2/08	-	-	-	-	47	13	1914
Gramoxone	0.5	1/2/08	-	-	-	-	90	0	1959
Chateau WG <sup>5</sup>	0.094	1/2/08	-	-	-	-	75	3	2334
Chateau WG <sup>5</sup>	0.125	1/2/08	-	-	-	-	85	6	2044
Chateau WG <sup>5</sup>	0.25	1/2/08	-	-	-	-	85	7	2076
Chateau Fert <sup>6</sup> + Gramoxone <sup>7</sup>	0.125 + 0.5	1/2/08	-	-	-	-	72	0	2667
Chateau Fert <sup>6</sup> + Gramoxone <sup>7</sup>	0.25 + 0.5	1/2/08	-	-	-	-	72	0	2258
Untreated	-	-	0	0	0	0	0	0	2102

<sup>1</sup>0 = No crop injury, 100 = Crop dead

<sup>2</sup>1<sup>st</sup> cutting, Alfalfa + weeds 90% D.M.

<sup>3</sup>No Foam A (NIS) added to all herbicide treatments at 0.25% V/V (1qt/100gal)

<sup>4</sup>Rating date

<sup>5</sup>Chateau formulation 51% WG

<sup>6</sup>Chateau formulation 0.032% impregnated on fertilizer applied with a fertilizer spreader

<sup>7</sup>Gramoxone applied after Chateau Fertilizer formulation

**Table 2 – Weed control in an established alfalfa stand**

Treatment <sup>2</sup>	Rate lb ai/A	App Date	% Weed Control <sup>1</sup>							
			AB <sup>3</sup>	CW	HB	GR	ST	PL	SP	BG
Sandea	0.031	10/24/07	0	87	97	72	77	13	87	10
Sandea	0.047	10/24/07	0	93	100	83	100	67	98	17
Sandea	0.094	10/24/07	50	95	100	85	98	93	100	33
Chateau WG <sup>4</sup>	0.125	10/24/07	72	100	100	98	100	97	97	75
Chateau Fert <sup>5</sup>	0.125	10/24/07	13	93	13	43	57	60	67	73
Sandea	0.031	1/2/08	18	55	47	63	100	36	92	55
Sandea	0.047	1/2/08	0	67	93	32	50	77	93	70
Sandea	0.094	1/2/08	23	65	97	52	73	97	98	53
Sandea + Chateau WG <sup>4</sup>	0.031 + 0.094	1/2/08	82	93	100	80	100	100	100	73
Sandea + Gramoxone	0.031 + 0.5	1/2/08	100	85	70	100	100	87	93	13
Sandea + Velpar	0.031 + 0.5	1/2/08	60	73	73	90	100	97	82	23
Gramoxone	0.5	1/2/08	93	93	73	95	100	100	97	0
Chateau WG <sup>4</sup>	0.094	1/2/08	87	100	100	75	100	100	100	75
Chateau WG <sup>4</sup>	0.125	1/2/08	88	100	100	87	92	100	100	88
Chateau WG <sup>4</sup>	0.25	1/2/08	98	100	100	100	100	100	100	88
Chateau Fert <sup>5</sup> + Gramoxone <sup>6</sup>	0.125 + 0.5	1/2/08	93	98	62	100	100	100	98	30
Chateau Fert <sup>5</sup> + Gramoxone <sup>6</sup>	0.25 + 0.5	1/2/08	100	100	100	100	100	100	100	67
Untreated	-	-	0	0	0	0	0	0	0	0

<sup>1</sup>0 = No weed control, 100 = Complete weed control

<sup>2</sup>No Foam A (NIS) added to all herbicide treatments at 0.25% V/V (1qt/100gal)

<sup>3</sup>Weeds evaluated; AB = Annual bluegrass, CW = Common chickweed, HB = Henbit, GR = Common groundsel, ST = Annual sowthistle, PL = Prickly lettuce, SP = Shepherd's purse and BG = Barnyardgrass

<sup>4</sup>Chateau formulation 51% WG

<sup>5</sup>Chateau formulation 0.032% impregnated on fertilizer applied with a fertilizer spreader

<sup>6</sup>Gramoxone applied after Chateau Fertilizer formulation

**Winter Applications of Prowl H<sub>2</sub>O for Summer Grass Control in Established Alfalfa**  
Mick Canevari, Don Colbert, Scott Whiteley and Randall Wittie

**OBJECTIVE:** Evaluate winter applications of Prowl H<sub>2</sub>O tank mixed with paraquat for winter weed and summer grass control in an established alfalfa stand.

**MATERIAL & METHODS:** Trial was established on January 2, 2008 in an established alfalfa field located in Stockton, CA. Plots were 6 by 18 ft arranged in a randomized complete block design with three replications. Applications were made with a CO<sub>2</sub> backpack sprayer, 35 psi in 19.5 gpa of water. Treflan (TR10) was applied with a fertilizer spreader prior to the paraquat application. Growth stages prior to application were: Alfalfa = semi-dormant, 2-5 inch height; Common chickweed (*Stellaria media*) = 1-3 inch height; Shepherd's purse (*Capsella bursa-pastoris*) = 8 to 14 leaf, 1.5 to 4 inch height; Henbit (*Lamium amplexicaule*) = 2 to 10 leaf, 0.25 to 1 inch height; Common groundsel (*Senecio vulgaris*) = 2 to 6 leaf, 1 to 2 inch height; Annual sowthistle (*Sonchus oleraceus*) = 4 to 6 leaf, 2 inch diameter; Prickly lettuce (*Lactuca serriola*) = 4 to 6 leaf, 2 to 3 inch diameter and barnyardgrass (*Echinochloa crus-galli*) = preemergence.

**RESULTS & DISCUSSIONS:**

All treatments (Table 1) gave 93-100% control of annual bluegrass, common chickweed, common groundsel, annual sowthistle and prickly lettuce. Shepherd's purse and henbit control ranged from 78-87% and 67-77%, respectively. All treatments (Table 2) showed good crop tolerance with excellent season long control of barnyardgrass.

**Table 1 - % Winter weed control in an established alfalfa stand**

Treatment <sup>2</sup>	Rate lb ai/A	% Weed Control <sup>1</sup> -Rating Date 2/12 & 3/20/08						
		<u>AB</u> <sup>3</sup> 3/20	<u>CW</u> 3/20	<u>SP</u> 3/20	<u>HB</u> 2/12	<u>GR</u> 2/12	<u>ST</u> 2/12	<u>PL</u> 2/12
Prowl H <sub>2</sub> O + Gramoxone	2.0 + 0.5	97	100	87	73	93	100	100
Prowl H <sub>2</sub> O + Gramoxone	3.0 + 0.5	97	100	83	67	93	100	100
Prowl H <sub>2</sub> O + Gramoxone	4.0 + 0.5	100	100	85	70	100	100	100
Gramoxone + Treflan <sup>4</sup> (TR10)	0.5 + 2.0	93	100	78	73	100	100	100
Gramoxone	0.5	90	100	87	77	100	100	100

<sup>1</sup>0 = No weed control, 100 = Complete weed control

<sup>2</sup>No Foam A (NIS) added to all herbicide treatments at 0.25% V/V (1qt/100gal)

<sup>3</sup>Weeds species evaluated: AB = Annual bluegrass, CW = Common chickweed, SP = Shepherd's purse, HB = Henbit, GR = Common groundsel, ST = Annual sowthistle and PL = Prickly lettuce

<sup>4</sup>TR10 applied with a fertilizer spreader after the Gramoxone application

**Table 2 – Alfalfa injury, barnyardgrass control and alfalfa yields**

Treatment <sup>3</sup>	Rate lb ai/A	% Alfalfa Injury <sup>1</sup>			% Barnyardgrass Control <sup>1</sup>				Alfalfa <sup>2</sup>
		Necrosis 1/14 <sup>4</sup>	Stunting 2/12	3/20	4/28	5/27	7/7	8/25	Yield lb/A
Prowl H <sub>2</sub> O+ Gramoxone	2.0 + 0.5	87	10	0	100	92	97	94	1828
Prowl H <sub>2</sub> O+ Gramoxone	3.0 + 0.5	84	10	0	100	99	100	98	1839
Prowl H <sub>2</sub> O+ Gramoxone	4.0 + 0.5	82	10	0	100	100	100	99	2011
Gramoxone+ Treflan <sup>5</sup> (TR10)	0.5 + 2.0	90	10	0	100	99	97	99	1931
Gramoxone	0.5	90	10	0	0	0	0	0	1828

<sup>1</sup>0 = No injury or no weed control, 100 = Complete weed control; crop dead

<sup>2</sup>1<sup>st</sup> cutting, 90% D. M.

<sup>3</sup>No Foam A (NIS) added to all herbicide treatments at 0.25% V/V (1qt/100 gal)

<sup>4</sup>Rating date

<sup>5</sup>TR10 applied with a fertilizer spreader after Gramoxone application

## **Prowl H<sub>2</sub>O and Chateau In-between Cutting Applications for Alfalfa Tolerance**

Mick Canevari, Don Colbert, Scott Whiteley and Randall Wittie

**OBJECTIVE:** Evaluate Prowl H<sub>2</sub>O and Chateau applications applied in-between cuttings for crop tolerance in an established Roundup Ready alfalfa stand.

**MATERIALS & METHODS:** Trial was established on April 17, 2008 in an established alfalfa field located near Tracy, CA. Plots were 10 by 25 ft arranged in a randomized complete block design with four replications. Applications were made with a CO<sub>2</sub> backpack sprayer, 34 psi in 15 gpa of water. Alfalfa growth stage prior to application: (1) April 17, 2008 ten days after the 1<sup>st</sup> cutting = 20% 2 inch height, 35% 3 inch height, 35% 4 inch height, 10% 5 to 6 inch height and alfalfa green foliage. Trial area flood irrigated April 23, 2008 and (2) June 18, 2008 ten days after the 3<sup>rd</sup> cutting = 2 to 5 inch height with 85% stem and 15% green foliage. Soil moisture was dry. Flood irrigated trial area June 23, 2008. No weeds were present in the trial area.

### **RESULTS & DISCUSSIONS:**

Applications after the 1<sup>st</sup> cutting (Table 1 & 2): Prowl 2 and 4 lb ai/A rates showed good crop tolerance. The tank mixture treatment of Prowl + Raptor gave some early alfalfa growth reduction but recovered prior to the 2<sup>nd</sup> cutting. Chateau gave some early 13% chlorosis and 79% necrosis with complete recovery prior to the 2<sup>nd</sup> cutting. However, alfalfa height and fresh weights were significantly lower than the other treatments including the untreated check. As expected, Roundup showed no alfalfa injury.

Applications after the 3<sup>rd</sup> cutting: Roundup alone and tank mixtures with Prowl gave no alfalfa necrosis with very slight 1-10% alfalfa growth reduction prior to the 4<sup>th</sup> cutting. There was no visible growth reduction after the 4<sup>th</sup> cutting. Chateau with and without No Foam A gave very slight alfalfa necrosis 3-8% with complete recovery prior to the 4<sup>th</sup> cutting. Alfalfa growth reduction was only 4-9% with only a 3% reduction prior to the 4<sup>th</sup> cutting. Chateau with and without No Foam A gave similar alfalfa tolerance data. The early application of Chateau was more injurious to the alfalfa than the later application. This probably could be attributed to the alfalfa growth stage prior to application. On the first date the alfalfa was actively growing (more green foliage), 3-6 inch height and good soil moisture. Alfalfa on the 2<sup>nd</sup> date was under moisture stress, 2-5 inch height with only 15% green foliage.

**Table 1 - Alfalfa injury in an established roundup ready field**

Treatment	Rate lb ai/A	App <sup>1</sup> After Cutting	% Alfalfa Injury <sup>2</sup>						
			% Necrosis				% Chlorosis		
			4/21 <sup>3</sup>	4/30	6/23	7/7	4/21	4/30	5/5
Prowl H <sub>2</sub> O	2.0	First	0	0	0	-	0	0	0
Prowl H <sub>2</sub> O	4.0	First	0	0	0	-	0	0	0
Prowl H <sub>2</sub> O + Raptor + COC <sup>4</sup> + UN32 <sup>5</sup>	2.0 + 0.047	First	5	0	0	-	16	0	0
Roundup	1.0	First	0	0	0	-	0	0	0
Chateau + No Foam A <sup>6</sup>	0.125 +	First	79	6	0	-	0	13	0
Prowl H <sub>2</sub> O + Roundup	2.0 + 1.0	Third	-	-	0	0	-	-	-
Prowl H <sub>2</sub> O + Roundup	4.0 + 1.0	Third	-	-	0	0	-	-	-
Roundup	1.0	Third	-	-	0	0	-	-	-
Chateau + No Foam A <sup>6</sup>	0.125 +	Third	-	-	8	0	-	-	-
Chateau	0.125	Third	-	-	3	0	-	-	-
Untreated	-	-	0	0	0	0	0	0	0

<sup>1</sup>Treatments applied 10 days after cutting<sup>3</sup>Rating dates<sup>2</sup>0 = No injury, 100 = Crop dead<sup>4</sup>Crop oil concentrate (COC) added at 1.0% V/V<sup>5</sup>Liquid Nitrogen 32% added at 2.5% V/V<sup>6</sup>No Foam A added at 0.25% V/V (1 qt/100 gal)**Table 2 – Alfalfa growth reduction, height and fresh weights**

Treatment	Rate lb ai/A	App <sup>1</sup> After Cutting	% Alfalfa Growth Reduction <sup>2</sup>				Alfalfa -5/6 <sup>3</sup>	
			4/30 <sup>3</sup>	6/23	7/7	7/28	Ht Inch	Fresh wt-Gm <sup>4</sup>
			Prowl H <sub>2</sub> O	2.0	First	1	0	-
Prowl H <sub>2</sub> O	4.0	First	5	0	-	-	15.8	495
Prowl H <sub>2</sub> O + Raptor + COC <sup>5</sup> + UN32 <sup>6</sup>	2.0 + 0.047	First	10	0	-	-	-	-
Roundup	1.0	First	0	0	-	-	-	-
Chateau + No Foam A <sup>7</sup>	0.125 +	First	45	0	-	-	12.0	364
Prowl H <sub>2</sub> O + Roundup	2.0 + 1.0	Third	-	6	1	0	-	-
Prowl H <sub>2</sub> O + Roundup	4.0 + 1.0	Third	-	13	10	0	-	-
Roundup	1.0	Third	-	0	0	0	-	-
Chateau + No Foam A <sup>7</sup>	0.125 +	Third	-	9	3	0	-	-
Chateau	0.125	Third	-	4	3	0	-	-
Untreated	-	-	0	0	0	0	16.3	453

<sup>1</sup>Treatments applied 10 days after cutting<sup>3</sup>Rating dates.<sup>2</sup>0 = No injury, 100 = crop dead<sup>4</sup>Alfalfa fresh weight, grams/3 sqft<sup>5</sup>Crop oil Concentrate (COC) added at 1.0% V/V<sup>6</sup>Liquid nitrogen 32% added at 2.5% V/V<sup>7</sup>No Foam A (NIS) added at 0.25% V/V

**OBJECTIVE:** A field study was established to evaluate multiple glyphosate applications for controlling yellow nutsedge in glyphosate resistant alfalfa.

**MATERIALS & METHODS:** Alfalfa was seeded February 26, 2006. Plots were 10 by 25 ft arranged in a randomized complete block design with four replications. All herbicide treatments were applied with a CO<sub>2</sub> pressurized backpack sprayer calibrated to deliver 20 gpa. Treatments were applied after the first cutting June 15, 2006, after the second cutting July 17, 2006 and after the third cutting on August 10, 2006 (Table 1). In 2007 treatments were applied after the third cutting June 18, 2007, fourth cutting July 17, 2007, fifth cutting August 16, 2007 and after the sixth cutting September 17, 2007 (Table 2). In 2008 treatments were applied after the fourth cutting July 21, 2008, fifth cutting August 25, 2008 and after the sixth cutting September 25, 2008 (Table 3). Visual evaluations and yellow nutsedge (*Cyperus esculentus*) plant counts were taken at various times throughout the growing season (Table 4).

*Table 1* Application information 2006.

	June 15, 2006	July 17, 2006	August 10, 2006
Timing	First cutting	Second cutting	Third cutting
Crop stage	7 to 12 inch	6 to 18 inch	3 to 8 inch
Yellow nutsedge stage	3 to 4 lf, 3 to 10 inch	3 to 5 lf 6 to 8 inch	3 to 5 lf 3 to 8 inch
Air temperature (F)	68	76	81
Relative humidity (%)	58	55	47
Wind (mph)	5	5	1
Cloud cover (%)	0	0	0

*Table 2* Application information 2007.

	June 18, 2007	July 17, 2007	August 16, 2007	September 17, 2007
Timing	Third cutting	Fourth cutting	Fifth cutting	Sixth cutting
Crop stage	6 to 9 inch	4 to 12 inch	4-10 inch	5 to 8 inch
Yellow nutsedge stage	2 to 6 lf 3 to 7 inch	3 to 7 lf 3 to 11 inch	2 to 12 lf 1 to 10 inch	2 to 8 lf 2 to 7 inch
Air temperature (F)	66	74	68	76
Relative humidity (%)	54	66	71	47
Wind (mph)	1	5	4	4
Cloud cover (%)	0	10	0	0

*Table 3* Application information 2008

	July 21, 2008	August 25, 2008	September 24, 2008
Timing	Fourth cutting	Fifth cutting	Sixth cutting
Crop stage	3 to 5 inch	4 to 7 inch	2 to 5 inch
Yellow nutsedge stage	2 to 9 lf 2 to 8 inch	2 to 7 lf 2 to 5 inch	1 to 6 lf 1 to 6 inch
Air temperature (F)	65	76	70
Relative humidity (%)	57	53	44
Wind (mph)	1	3	0
Cloud cover (%)	0	0	0

**RESULTS & DISCUSSIONS:**

All treatments showed no alfalfa injury except for halosulfuron-methyl which caused some early moderate growth reduction and chlorosis. Alfalfa recovered five weeks after application (data not shown). Multiple applications of glyphosate significantly reduced the yellow nutsedge population compared to the untreated control (Table 4). A single 1.5 or 2.0 lb ai/A glyphosate treatment applied after a cutting in July or August gave similar yellow nutsedge control from multiple applications of glyphosate. Glyphosate is most effective when applied after irrigation. Halosulfuron-methyl gave poor to fair nutsedge control.

**Table 4 - Yellow nutsedge control in glyphosate resistant alfalfa**

Treatment	Rate	Application timing <sup>1</sup>			Yellow nutsedge control										
		2006	2007	2008	9/06	6/07	7/07	8/07	9/07	10/07	7/08	8/08	9/08		
	lb ai/A				...%...	.....plant count/plot.....									
Glyphosate	1.0	1 <sup>st</sup> ,2 <sup>nd</sup> ,3 <sup>rd</sup>	3 <sup>rd</sup> ,4 <sup>th</sup> ,5 <sup>th</sup>	4 <sup>th</sup> ,5 <sup>th</sup> ,6 <sup>th</sup>	98	35 <sup>2</sup>	35 <sup>2</sup>	9 <sup>2</sup>	1	1	28 <sup>2</sup>	14 <sup>2</sup>	5 <sup>2</sup>		
Glyphosate	1.5	1 <sup>st</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	85	28 <sup>2</sup>	22	11	12	18	33 <sup>2</sup>	15	3		
Glyphosate + glyphosate	2.0 1.0	1 <sup>st</sup> 2 <sup>nd</sup> ,3 <sup>rd</sup>	3 <sup>rd</sup> ,4 <sup>th</sup> ,5 <sup>th</sup>	4 <sup>th</sup> ,5 <sup>th</sup> ,6 <sup>th</sup>	97	23 <sup>2</sup>	22 <sup>2</sup>	7 <sup>2</sup>	1	1	18 <sup>2</sup>	11 <sup>2</sup>	2 <sup>2</sup>		
Glyphosate + glyphosate + glyphosate	1.5 1.0 1.5	1 <sup>st</sup> 2 <sup>nd</sup> ,3 <sup>rd</sup>	3 <sup>rd</sup> ,4 <sup>th</sup> ,5 <sup>th</sup>	4 <sup>th</sup> ,5 <sup>th</sup> ,6 <sup>th</sup>	98	22 <sup>2</sup>	14 <sup>2</sup>	6 <sup>2</sup>	0	2	15 <sup>2</sup>	8 <sup>2</sup>	2 <sup>2</sup>		
Glyphosate + BB5natural+ glyphosate	1.5 .25% 1.5	1 <sup>st</sup> 1 <sup>st</sup>		6 <sup>th</sup>	87	42	70	45	28 <sup>2</sup>	5	30	32	7 <sup>2</sup>		
Glyphosate	2.0		5 <sup>th</sup>	6 <sup>th</sup>	0	79	120	99 <sup>2</sup>	4	5	53	92 <sup>2</sup>	8		
Glyphosate	1.5	2 <sup>nd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	96	24	46 <sup>2</sup>	9	9	7	41	70 <sup>2</sup>	8		
Halosulfuron- Methyl + No foam A	0.047 .25%		3 <sup>rd</sup>	4 <sup>th</sup>	0	59 <sup>2</sup>	24	53	42	38	95 <sup>2</sup>	54	19		
Untreated	-	-	-	-	0	68	93	82	52	27	56	61	18		
LSD (05)					4	26	37	16	11	13	28	38	9		

<sup>1</sup>Application after cutting<sup>2</sup>Herbicide application applied

**Aphid Control in Established Alfalfa** Mick Canevari, Randall Wittie, Don Colbert, Scott Whitely

**OBJECTIVE:** Evaluate new insecticides for aphid control and crop tolerance in established alfalfa.

**MATERIALS AND METHODS:** Experimental insecticides were applied as a foliar spray to established alfalfa on August 5, 2008 for cowpea aphid (*Aphis craccivora*) control (Table 1). Plots were 10 x 25 ft and replicated four times in a RCBD. Treatments were applied with a CO<sub>2</sub> backpack sprayer at 35 psi with 8002 flat fan nozzles in 20 gallons water per acre. Alfalfa was 80% blooming and 24-30 inch height. Alfalfa stems were 100% infested with cowpea aphid and estimated at 150 – 750/stem. Crop tolerance and aphid counts (5 stems/plot) were made at 3 and 7 days after treatment.

**Table 1 - Treatment list**

Treatment	Formulation	Rate LbAi/A	Rate Fl Oz/A
1.Movento + Hasten	24% SC 100%	0.05 0.1% V/V	3.0 0.1% V/V
2.Movento + Hasten	24% SC 100%	0.08 0.1% V/V	5.0 0.1% V/V
3.DPX HGW86	10% SE	0.05	7.0
4.DPX HGW86	10% SE	0.1	14.0
5.DPX E2Y45	20% SC	0.07	5.0
6.DPX E2Y45	20% SC	0.1	8.0
7.DPX E2Y45 + Hasten	20% SC 100%	0.07 0.5% V/V	5.0 0.5% V/V
8.Dimethoate	4 EC	0.25	8.0
9.Untreated Check			

**RESULTS AND DISCUSSIONS:** Movento at 3 and 5 fl oz/A + Hasten at 0.1% V/V provided excellent control of the cowpea aphid 3 days after treatment (DAT). Control was comparable to the dimethoate treatment. Control provided by Movento and dimethoate at 7 DAT was significantly better than either of the DPX materials. Neither of the DPX materials provided acceptable control. All treatments showed excellent alfalfa tolerance (Table 2).

**Table 2 - Control of the cowpea aphid in established alfalfa**

Treatment	Rate Fl Oz/A	---Aphids/Stem <sup>1</sup> ---		% Control		Alfalfa
		3 DAT <sup>2</sup>	7 DAT	3 DAT	7 DAT	Phytotoxicity <sup>3</sup> 7 DAT
1.Movento + Hasten	3.0 0.1% V/V	79 c	11 d	75	94	0
2.Movento + Hasten	5.0 0.1% V/V	44 c	3 d	83	98	0
3.DPX HGW86	7.0	219 b	151 bc	22	12	0
4.DPX HGW86	14.0	224 b	132 c	17	26	0
5.DPX E2Y45	5.0	194 b	167 abc	33	1	0
6.DPX E2Y45	8.0	253 ab	199 a	7	0	0
7.DPX E2Y45 + Hasten	5.0 0.5% V/V	188 b	148 bc	35	11	0
8.Dimethoate	8.0	11 c	0.1 d	96	100	0
9.Untreated Check		304 a	179 ab			0
LSD (P=.05)		75.99	46.47			

<sup>1</sup> Aphids/Stem = Average of 5 stems/plot

<sup>2</sup> DAT = Days after treatment

<sup>3</sup> Phytotoxicity = 0% no injury, 100% crop dead

**OBJECTIVE:** Evaluate new insecticides for alfalfa weevil (*Hyperia postica*) and aphid (*Acyrtosiphon kondoi*, *A. pisum*) control in established alfalfa.

**MATERIALS AND METHODS:** Experimental and commercial insecticides were applied to an increasing population of alfalfa weevil and aphids on March 17, 2008 in an established alfalfa field on Union Island, San Joaquin County, (Table 1). Plots were 10 ft x 25 ft arranged in a randomized complete block design with four replicates. Treatments were applied broadcast foliar with a CO<sub>2</sub> backpack sprayer at 32 psi 20 gpa water using 8002VS nozzles. Alfalfa was 14-16 inch height. Alfalfa weevil (AW) pre-counts indicated small to large larvae averaging 20/sweep. Post treatment counts were made by dividing the plots into segments so a new area was swept on each evaluation 3, 7 and 14 days after treatment (DAT). Five 180° sweeps were made per segment and emptied into a yellow tray for counting. Data recorded as number per sweep. Aphid population included the blue alfalfa aphid (BAA 90%), pea aphid (PA 5%) and cowpea aphid (CPA 5%).

**Table1 - Treatment list**

Treatment	Formulation	Rate Lb Ai/A	Rate Fl Oz/A
1.DPX HGW86	10% SE	0.044	6.76
2.DPX HGW86	10% SE	0.088	13.5
3.DPX E2Y45	20% SC	0.066	5.07
4.DPX E2Y45	20% SC	0.1	7.7
5.DPX E2Y45 + Hasten	20% SC 100% EC	0.066 0.5% V/V	5.07
6.Movento + Hasten	24% EC 100% EC	0.047 0.1% V/V	3.0
7.Movento	24% EC	0.078	5.0
8.Steward	1.25 SC	0.11	11.3
9.Warrior	1.0 EC	0.03	3.84
10.Untreated Control			
11.Steward	1.25 SC	0.088	9.0

**RESULTS AND DISCUSSION:** Sweep count data collected on AW and aphids at 3, 7 and 14 DAT.

Three Day Counts The untreated control (UTC) averaged 38 AW/sweep and 16 aphids/sweep. Steward and Warrior averaged 5.4, 2.2 and 0.2 AW/sweep, respectively. DPX HGW86 at both rates was the only new insecticide that provided good control of the AW. Results showed 8.3 and 5.8 AW/sweep. Warrior was the only treatment that reduced the aphid population (Table 2&3).

Seven Day Counts UTC AW population was down slightly to 20.5/sweep while the aphid population increased to 20.9/sweep. Excellent AW control was the result of DPX HGW

at both rates, Steward at both rates and Warrior. Warrior and Movento + Hasten provided control of the aphids (Table 2&3).

Fourteen Day Counts UTC counts dropped to 16.4 AW/sweep while the aphid population continued to increase. Warrior and both rates of DPX HGW86 and Steward gave excellent control of AW. Warrior was the only material showing any aphid control. Alfalfa was harvested shortly after the 14 day count (Table 2&3).

**Table2 - Alfalfa weevil control in established alfalfa**

----- Control Days After Treatment -----  
----- 3 DAT -----7 DAT --- -----14 DAT -----

Treatment	Fl Oz/A	AW/Swp <sup>1</sup>	%C <sup>2</sup>	AW/Swp	%C	AW/Swp	%C
1.DPX HGW86	6.76	8.3 d	78	4.8 d	77	1.4 d	91
2.DPX HGW86	13.5	5.8 de	84	4.4 d	79	0.5 d	97
3.DPX E2Y45	5.07	19.7 c	48	19.4 bc	5	13.0 ab	21
4.DPX E2Y45	7.7	18.3 c	52	16.3 bc	20	8.7 b	47
5.DPX E2Y45 + Hasten	5.07	19.0 c	50	15.3 c	25	7.7 bc	53
6.Movento + Hasten	3.0	27.0 b	29	25.0 a	0	17.9 a	0
7.Movento	5.0	26.9 b	29	20.9 ab	0	12.5 ab	24
8.Steward	11.3	2.2 de	94	0.2 d	99	0.4 d	98
9.Warrior	3.84	0.2 e	99	0.2 d	99	0.1 d	99
10.Untreated Control		37.9 a		20.5 abc		16.4 a	
11.Steward	9.0	5.4 de	86	0.7 d	97	2.4 cd	85
LSD(P=.05)		6.59		5.44		6.17	

<sup>1</sup> AW/Swp = Alfalfa Weevil/Sweep (Avg 5 sweeps/evaluation)

<sup>2</sup> %C = % Control of the UTC

**Table 3 - Aphid control in established alfalfa**

Treatment	FlOz/A	----- Control Days After Treatment -----					
		----- 3 DAT -----		----- 7 DAT -----		----- 14 DAT -----	
		Aphid/Swp <sup>1</sup>	%C <sup>2</sup>	Aphid/Swp	%C	Aphid/Swp	%C
1.DPX HGW86	6.76	16.8 ab	0	16.1 abc	24	37.0 a	0
2.DPX HGW86	13.5	10.0 cd	38	19.6 ab	5	36.3 a	0
3.DPX E2Y45	5.07	12.6 bc	19	20.6 ab	0	44.0 a	0
4.DPX E2Y45	7.7	14.4 ab	13	19.5 ab	5	42.8 a	0
5.DPXE2Y45 + Hasten	5.07	16.1 ab	0	23.5 a	0	43.8 a	0
6.Movento + Hasten	3.0	17.7 a	0	10.6 cde	48	24.5 a	0
7.Movento	5.0	14.9 ab	6	15.2 bcd	29	26.8 a	0
8.Steward	11.3	15.4 ab	6	20.5 ab	0	42.8 a	0
9.Warrior	3.84	6.3 d	63	7.3 de	67	16.0 a	33
10.UTC		16.0 ab		20.9 ab		24.0 a	
11.Steward	9.0	16.0 ab	0	3.4 e	86	33.3 a	0
LSD(P=.05)		4.27		8.02		24.93	

<sup>1</sup> Aphid/Swp = Aphid/Sweep (Avg 5 Sweeps/evaluation)

<sup>2</sup> %C = % Control of the UTC

**Alfalfa Worm Control in Established Alfalfa** Mick Canevari, Randall Wittie, Don Colbert, Scott Whitely

**OBJECTIVE:** Evaluate new insecticides for control of the worm complex in established alfalfa. Species present in sufficient populations for evaluations were sugar beet armyworm (*Spodoptera exigua*) and Western yellowstriped armyworm (*Spodoptera praefica*).

**MATERIALS AND METHODS:** Several experimental and commercial insecticides were applied as a foliar spray to a 3-year old alfalfa field on Kaiser Road, San Joaquin County on August 20, 2008 (Table 1). Plots were 10 x 25 ft and replicated four times in a RCBD. Treatments were applied with a CO<sub>2</sub> backpack sprayer at 32 psi with 8002VS flat fan nozzles in 20 gallons water per acre. Alfalfa stage: pre-bloom and 20-36 inch height. The worm complex consisted of the following: (1) sugar beet armyworm larvae 0.25-1.25 inch (2.7/sweep) and, (2) Western yellowstriped armyworm 0.5-1.25 inch (1.0/sweep). Worm counts were taken by making 5 sweeps per evaluation at 2 and 13 days after treatment. A crop tolerance rating was made 7 days after treatment.

**Table 1 - Treatment list**

<b>Treatment</b>	<b>Formulation</b>	<b>Rate Lb AI/A</b>	<b>Rate Fl OZ/A</b>
1.Intrepid	2 F	0.09	6.0
2.Intrepid	2 F	0.12	8.0
3.Success	2 SC	0.06	4.0
4.Steward	1.25 SC	0.1	10.0
5.DPX E2Y45	20% SC	0.14	10.7
6.DPX HGW86	10% SE	0.04	6.76
7.DPX HGW86	10% SE	0.09	13.5
8.Lorsban Advanced	45% SC	0.9	32.0
9.Lorsban	4 E	1.0	32.0
10.Untreated Check			
11.Warrior	1 SC	0.03	3.84

**RESULTS AND DISCUSSIONS:**

Evaluation 2 Days After Treatment Five sweeps were made at each evaluation. The plots were divided into segments so each evaluation would sweep a new area. Contents of the net were shaken into a yellow box that was marked on the bottom into 6 squares for ease of counting the worms. Data recorded as larva per sweep. The foliage was dry when the sweeps were made. The UTC averaged 5.2 beet armyworms (BAW)/sweep and 3.0 Western yellowstriped armyworms (WYSAW)/sweep. The best treatments for initial knockdown of the BAW were Success, Steward, Lorsban Advanced and Lorsban. These treatments had 0.5 or less BAW/sweep. All treatments except Success and Intrepid gave excellent control of the WYSAW (Table 2 & 3).

Evaluation 7 Days After Treatment This evaluation was eliminated due to irrigation and wet field conditions.

Evaluation 13 Days After Treatment Five sweeps were made in the remaining segment of the plot. Contents of the net were counted as in the 2 day count. The foliage was very dry as the grower was beginning to swath the field. Western yellowstriped armyworm counts were very low with DPX HGW86 the best treatment. The best treatments for beet armyworm control were DPX E2Y45, Intrepid and Success. DPX HGW86 and Lorsban Advanced gave fair control (Table 2).

**Table 2 - Beet Armyworm control in established alfalfa**

Treatment	Rate Fl OZ/A	Beet Armyworm Control <sup>1</sup>			
		2 DAT <sup>2</sup>	% C <sup>3</sup>	13 DAT	% C
1.Intrepid	6.0	3.4 ab	35	1.1 a	0
2.Intrepid	8.0	2.7 bc	48	0.4 a	64
3.Success	4.0	0.4 de	92	0.5 a	55
4.Steward	10.0	0.3 de	94	0.7 a	36
5.DPX E2Y45	10.7	2.4 bcd	54	0.1 a	91
6.DPX HGW86	6.76	1.1cde	79	0.3 a	73
7.DPX HGW86	13.5	1.6 b-e	65	0.5 a	55
8.Lorsban Advanced	32.0	0.5 de	90	0.3 a	73
9.Lorsban	32.0	0.3 e	94	0.5 a	55
10.Untreated Check		5.2 a		1.1 a	
11.Warrior	3.84	5.0 a	4	1.9 a	0
LSD (P=.05)		2.11		1.06	
CV		70.74		111.64	

<sup>1</sup>Beet Armyworm Control = Number/Sweep

<sup>2</sup> DAT = Days After Treatment

<sup>3</sup> % C = % Control of UTC

**Table 3 - Western yellowstriped armyworm control in established alfalfa****WYSAW Control<sup>1</sup>**

<b>Treatment</b>	<b>Rate Fl OZ/A</b>	<b>2 DAT<sup>2</sup></b>	<b>% C<sup>3</sup></b>	<b>13 DAT</b>	<b>% C</b>
1.Intrepid	6.0	0.8 bc	73	0.1 a	0
2.Intrepid	8.0	1.5 abc	50	0.1 a	0
3.Success	4.0	2.2 ab	27	0.2 a	0
4.Steward	10.0	0.1 c	97	0.1 a	0
5.DPX E2Y45	10.7	0.4 c	87	0.1 a	0
6.DPX HGW86	6.76	0.5 c	83	0.0 a	100
7.DPX HGW86	13.5	0.4 c	87	0.0 a	100
8.Lorsban Advanced	32.0	0.1 c	97	0.1 a	0
9.Lorsban	32.0	0.0 c	100	0.1 a	0
10.Untreated Check		3.0 a		0.1 a	
11.Warrior	3.84	0.9 bc	70	0.2 a	0
LSD (P=.05)		1.63		0.21	
CV		129.57		175.45	

<sup>1</sup>Western Yellow-stripe armyworm control = Number/Sweep

<sup>2</sup>DAT = Days After Treatment

<sup>3</sup>% C = % Control of UTC

This is a work in progress only. The chemicals and uses contained in this publication are experimental data and should not be considered as recommendations for use.

Until the products and their uses given in this report appear on a registered pesticide label or other legal, supplementary direction for use, it is illegal to use the chemicals as described.

## **WARNING ON THE USE OF CHEMICALS**

Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in their original labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets and livestock.

Recommendations are based on the best information currently available, and treatments based on them should not leave exceeding the tolerance established for any particular chemical. Confine chemicals to the area being treated. **THE GROWER IS LEGALLY RESPONSIBLE** for residues on his crops as well as for problems caused by drift from his property to other properties or crops.

Consult your County Agricultural Commissioner for correct methods of disposing of leftover spray material and empty containers. Never burn pesticide containers.

## **PHYTOTOXICITY**

Certain chemicals may cause plant injury if used at the wrong stage of plant development or when temperatures are too high or when overcast conditions occur. Injury may also result from excessive amounts or the wrong formulation or mixing incompatible materials. Inert ingredients such as wetters, spreaders, emulsifiers, diluents, and solvents, can cause plant injury. Since formulations are often changed by manufacturers, it is possible that plant injury may occur, even though no injury was noted in previous seasons.

**No endorsement of named products is intended, nor is criticism implied of similar products which are not mentioned.**

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