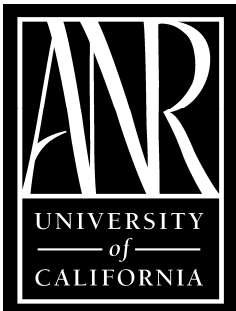




**WEED AND INSECT CONTROL
2009
TRIAL RESULTS
SAN JOAQUIN COUNTY**



**Cooperative Extension University of California
2101 E. Earhart Ave. Ste 200—Stockton—California—95206**

2009 ALFALFA

INSECT AND WEED CONTROL RESEARCH PROGRESS REPORT

Mick Canevari, Farm Advisor

San Joaquin County

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The alfalfa insect and weed control program in San Joaquin County was conducted with the cooperation and management assistance of Mike Rego (DeVries Road) and Kurt Silva (Highway 4) and Dan Rosa (San Jose Road) and Louie Casale (Blossom Road, Thornton) , Eddie Arnaudo (Clifton Court Road) and Keith Robertson (Bird Road, Tracy). Appreciation and many thanks are extended to them for their assistance, interest and patience.

CONTRIBUTING AUTHOR

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Caution

This report is a summary of alfalfa insect and weed 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 rates in this report are always expressed as **active ingredient (a.i.) of material per treated acre.**

<u>Trade Name</u>	<u>Common Name</u>	<u>Company</u>
Ad-Wet 90CA	non ionic surfactant	Simplot
Butyrac 200	2,4-DB	Albaugh, Inc.
Chateau	flumioxazin	Valent
Gramoxone	paraquat	Syngenta
Hasten	esterified vegetable oil adjuvant	Willbur-Ellis
No Foam A	non ionic surfactant	Crop Production Services
Prow H ₂ O	pendimethalin	BASF
Raptor	imazamox	BASF
Roundup	glyphosate	Monsanto
Sandea	halosulfuron-methyl	Gowan
Sencor	metribuzin	Loveland Products, Inc.
Silwet L-77	organo silicone surfactant	OSi Specialties
Scythe	pelargonic acid	Dow AgroSciences LLC
Treflan (TR10)	trifluralin	Dow AgroSciences LLC
UN32	nitrogen fertilizer	Crop Production Services
Velpar	hexazinone	DuPont

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

<u>Trade Name</u>	<u>Common Name</u>	<u>Company</u>
Belt	flubendiamide	Bayer
Cobalt	chlorpyrifos + gamma-cyhalothrin	Dow Agro Sciences LLC
Coragen	chlorantraniliprole	DuPont

DPX HGW86	experimental	DuPont
Intrepid	methoxyfenozide	Dow Agro Sciences LLC
Lorsban Advanced	chlorpyrifos	Dow Agro Sciences LLC
Lorsban	chlorpyrifos	Dow Agro Sciences LLC
Movento	spirotetramat	Bayer
Radiant	spinetoram	Dow Agro Sciences LLC
Steward	indoxacarb	DuPont
Voliam Express	lambda-cyhalothrin + chlorantraniliprole	Syngenta
Warrior	lambda-cyhalothrin	Syngenta
Warrior II	lambda-cyhalothrin	Syngenta

2009 Alfalfa Insect and Weed Control Trial Results

During the 2009 season, eight weed control and four insecticide trials were conducted in San Joaquin County.

Trials were established to evaluate the effectiveness of candidate insecticides and herbicides for controlling weevils and worms and annual weeds in established alfalfa. Complete trial descriptions and insect and weed control/crop phytotoxicity ratings for each trial follow.

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

OBJECTIVE: Evaluate postemergence herbicide applications applied alone and tank mixtures for controlling hairy fleabane and winter weeds in established alfalfa.

MATERIALS & METHODS: Trial was established on December 11, 2008 in an established alfalfa field located near Lodi, CA. Plots were 10 by 25 ft arranged in a randomized complete block design with four replications. Applications were made with a CO₂ backpack sprayer, 35 psi in 20.4 gpa of water. Growth stages prior to application were: Alfalfa = green foliage, 2-6 inch height; Common chickweed (*Stellaria media*) = 6 to 20 leaf, 1 to 3 inch height; Swinecress (*Coronopus didymus*) = 80% 2 to 6 leaf, 0.25 to 2 inch diameter, 20% 8 to 20 leaf, 3 to 6 inch diameter; Shepherd's purse (*Capsella bursa-pastoris*) = 1 to 8 inch diameter, few bolting; Common groundsel (*Senecio vulgaris*) = 2 to 8 leaf, 1 to 3 inch height; Hairy fleabane (*Erigeron bonariensis*) = cotyledon to 4 leaf, 0.25 to 0.5 inch diameter; Henbit (*Lamium amplexicaule*) = 8 to 10 leaf, 1 to 1.5 inch height; Annual sowthistle (*Sonchus oleraceus*) = 2 to 4 leaf, 1 to 3 inch diameter; Grasspoly (*Lythrum hyssopifolia*) = cotyledon to 2 leaf, 0.25 inch height; Annual bluegrass (*Poa annua*) = 1 to 3 tillers, 0.5 to 2 inch height and Prickly lettuce (*Lactuca serriola*) = 2 to 6 leaf, 2 to 4 inch diameter.

RAINFALL DATA: Weather Station: LODI-01 Lodi, CA.
PRECIPITATION AMOUNT (INCHES)

Application Date 12/11/08

<u>Date</u>	<u>Inches</u>
12/12/08	0.01
12/14	0.35
12/15	0.08
12/16	0.16
12/19-12/31	1.14
January Total	1.96
February Total	4.29
March Total	1.70
April Total	0.90
May Total	1.06

RESULTS & DISCUSSIONS:

Alfalfa Injury

All treatments showed good alfalfa tolerance. Alfalfa growth reduction (stunting) ratings were not taken because of a severe stem nematode infestation which caused alfalfa stunting until May.

Weed Control

Velpar 0.5 lb ai/A: Excellent (93-100%) control of common groundsel, common chickweed, swinecress, henbit, annual sowthistle with 83% control of prickly lettuce. Poor control of shepherd's purse and annual bluegrass. March 26th ratings showed 92% hairy fleabane control. Control fell off to 83% on the May 18th rating.

Velpar 0.25 lb + Chateau 0.0625 lb ai/A: Excellent control of most winter weed species and 65% annual bluegrass control and 63% hairy fleabane control. Early March rating gave 91% control of hairy fleabane with 76% and 63% fleabane control on March 26th and May 18th, respectively.

Velpar 0.25 lb ai/A + Chateau 0.094 lb ai/A: Excellent control of all the weed species with 75% hairy fleabane control.

Velpar 0.5 + Chateau 0.125 lb ai/A: Excellent weed control through May.

Velpar 0.5 lb ai/A + Sandea 0.031 lb ai/A: Excellent control (86%-100%) of groundsel, chickweed, swinecress, henbit, sowthistle and prickly lettuce with 74% control of shepherd's purse and only 38% control of annual bluegrass. This tank mixture gave excellent control of hairy fleabane through May.

Gramoxone 0.5 lb ai/A: On the March 5th rating date; annual bluegrass, common chickweed, annual sowthistle, prickly lettuce and common groundsel control were; 78%, 84%, 88%, 90% and 94%, respectively. Early in the season it gave good to excellent control of shepherd's purse, swinecress, henbit and hairy fleabane but resulted in poor control of these weeds later in the season.

Gramoxone 0.25 lb ai/A + Chateau 0.0625 lb ai/A: Gave excellent (95%-100%) control of all weed species with 81% control of hairy fleabane.

Gramoxone 0.5 lb ai/A + Chateau 0.125 lb ai/A: Excellent (94%-100%) control of all weed species.

Chateau 0.125 lb ai/A: Gave 89%-100% control of shepherd's purse, chickweed, henbit, annual sowthistle and prickly lettuce with poor control of groundsel, swinecress, annual bluegrass and hairy fleabane.

Chateau 0.125 lb ai/A + Sandea 0.031 lb ai/A: Gave excellent control of all weed species with 84% groundsel and 73% annual bluegrass control.

Gramoxone 0.5 lb ai/a + Velpar 0.5 lb ai/A: Resulted in 96%-100% control of all weed species.

Summary: For season long weed control the best treatments were: Velpar + Gramoxone and tank mixtures of Chateau with Velpar, Gramoxone or Sandea.

Table 1 – Treatment List and Weed Control in Established Alfalfa

Treatment ²	Rate lb ai/A	Application Date	% - Weed Control ¹ – Data Taken on 1/6 & 3/5/09											
			Shepherd's purse		Common Groundsel		Common Chickweed		Swinecress		Annual Bluegrass		Henbit	
			1/6	3/5	1/6	3/5	1/6	3/5	1/6	3/5	1/6	3/5	1/6	3/5
Velpar L	0.5	12/11/08	50	52	73	100	65	94	88	95	18	13	70	90
Velpar L + Chateau SW	0.25 + 0.0625	12/11/08	90	97	100	100	98	99	94	100	45	65	100	100
Velpar L + Chateau SW	0.25 + 0.094	12/11/08	97	99	100	100	99	100	98	100	55	86	100	100
Velpar L + Chateau SW	0.5 + 0.125	12/11/08	95	100	98	100	98	100	99	100	75	95	100	100
Velpar L + Sandea WG	0.5 + 0.031	12/11/08	45	74	88	100	63	91	78	99	10	38	65	86
Gramoxone ³	0.5	12/11/08	91	58	98	94	99	84	97	40	93	78	80	50
Gramoxone ³ + Chateau SW	0.25 + 0.0625	12/11/08	96	95	95	97	100	99	98	97	100	95	100	100
Gramoxone ³ + Chateau SW	0.5 + 0.125	12/11/08	100	100	99	97	100	100	99	98	100	97	100	100
Chateau SW	0.125	12/11/08	82	96	45	37	94	100	63	30	35	69	100	100
ChateauSW+ Sandea WG	0.125 + 0.031	12/11/08	73	99	80	84	88	95	80	100	20	73	100	100
Sencor DF	0.5	12/11/08	80	95	60	72	85	97	75	96	43	68	88	100
Gramoxone ³ + Velpar L	0.5 + 0.5	12/11/08	100	100	100	100	99	96	100	100	99	100	100	99
Check	-	-	0	0	0	0	0	0	0	0	0	0	0	0

¹0 = No weed control; 100 = Complete weed control

²Ad-Wet 90CA (NIS) added to all herbicide treatments at 0.25% V/V (1 qt/100 gal)

³Gramoxone Inteon formulation 2AS

Table 2 – Treatment List, Alfalfa Injury and Weed Control in Established Alfalfa

Treatment ²	Rate lb ai/A	% Alfalfa Injury ¹			% Weed Control ¹									
		Necrosis			Annual Sowthistle		Prickly Lettuce		Hairy Fleabane					
		12/17 ³	12/29	2/10	1/6	3/5	1/6	3/5	1/6	2/10	3/5	3/26	5/18	
Velpar L	0.5	5	30	0	100	93	93	83	76	98	98	92	83	
Velpar L + Chateau SW	0.25 + 0.0625	11	75	0	100	100	100	100	95	98	91	76	63	
Velpar L + Chateau SW	0.25 + 0.094	11	84	0	100	100	100	100	95	96	88	78	75	
Velpar L + Chateau SW	0.5 + 0.125	13	83	0	100	100	100	100	97	99	97	96	94	
Velpar L + Sandea WG	0.5 + 0.031	10	53	0	100	95	78	90	30	100	100	98	97	
Gramoxone ⁴	0.5	84	96	0	100	88	100	90	95	83	68	59	36	
Gramoxone ⁴ + Chateau SW	0.25 + 0.0625	84	93	0	100	100	100	100	98	99	96	90	81	
Gramoxone ⁴ + Chateau SW	0.5 + 0.125	84	97	0	100	100	100	100	100	100	99	96	94	
Chateau SW	0.125	13	53	0	98	89	100	90	68	28	33	5	0	
Chateau SW + Sandea WG	0.125 + 0.031	0	48	0	100	100	100	95	90	100	100	99	97	
Sencor DF	0.5	3	39	0	98	94	100	85	75	100	97	93	73	
Gramoxone ⁴ + Velpar L	0.5 + 0.5	33	79	0	100	100	100	100	100	99	99	99	98	
Check	-	0	0	0	0	0	0	0	0	0	0	0	0	

¹0 = No weed control or crop injury; 100 = Complete weed control; crop dead

²Ad-Wet 90CA (NIS) added to all herbicide treatments at 0.25% V/V (1 qt/100 gal). Treatment application date: **12/11/08**.

³Data collected on date: 12/17, 12/29/08, 1/6/09 and etc.

⁴Gramoxone Inteon formulation 2AS

Trial 2 – **Weed Control in an Established Stand of Alfalfa Grass Hay Mixture.** Mick Canevari, Don Colbert, Scott Whiteley and Randall Wittie.

OBJECTIVE: Evaluate postemergence herbicide applications for weed control and crop tolerance in an established alfalfa and grass hay field mixed with annual and perennial ryegrass and orchardgrass.

MATERIALS & METHODS: Trial was established on December 29, 2008 in an established alfalfa grass hay field located near Lodi, CA. The hay stand was a mixture of alfalfa, orchardgrass, perennial and annual ryegrass. Plots were 10 by 25 ft arranged in a randomized complete block design with four replications. Applications were made with a CO₂ backpack sprayer, 35 psi in 20.4 gpa of water. Growth stages prior to application were: Alfalfa = 6 to 9 inch height, green foliage; Perennial ryegrass (*Lolium perenne*) established = fully tillered, 4 to 8 inch height; Perennial and Italian ryegrass (*Lolium multiflorum*) newly seeded = 60% 2 leaf, 1 to 2.5 inch height; 30% 1 leaf, 1 to 1.5 inch height and 10% first tiller, 4 inch height; Orchardgrass (*Dactylis sp*) = clumps 4 to 8 inch height; Common chickweed (*Stellaria media*) = 50% cotyledon, 0.25 inch height; 50% >20 leaf, 2 inch height; Shepherd's purse (*Capsella bursa-pastoris*) = 4 to 8 leaf, 0.5 to 1.5 inch diameter an common dandelion (*Taraxacum officinale*) = flowering, 8 to 11 inch diameter.

RAINFALL DATA: Weather Station: LODI-01 Lodi, CA.

PRECIPITATION AMOUNT (INCHES) * Application date: 12/29/08

<u>12/29/08 Application</u>	
<u>Date</u>	<u>Inches</u>
12/31/08	0.01
1/01/09	0.01
1/02	0.03
1/05	0.04
1/06	0.01
1/11	0.01
1/21 – 1/24	1.86
February Total	4.29
March Total	1.70
April Total	0.90
May Total	1.06

RESULTS & DISCUSSIONS:

Crop Injury & Weed Control

Velpar 0.5 lb ai/A: Showed good alfalfa tolerance with 15% stunting on orchardgrass and 8% stunting on the established perennial ryegrass. It severely stunted (64%) the newly planted perennial and Italian ryegrass. Excellent chickweed control with poor control of shepherd's purse and dandelion.

Chateau 0.125 lb ai/A alone & Chateau 0.125 lb ai/A + Prowl H₂O 2.0 lb ai/A tank mixture: Both treatments gave good alfalfa tolerance with moderate to severe injury to orchardgrass, established perennial ryegrass and newly seeded Italian and perennial ryegrass. Chickweed and shepherd's purse control was excellent with 63%-73% dandelion control.

Sencor 0.5 lb ai/A: Good alfalfa and orchardgrass tolerance with some slight stunting (8%) on the perennial ryegrass. Severely stunted the newly seeded perennial and Italian ryegrass. Complete control of shepherd's purse and chickweed with no activity on dandelion.

Sencor 0.5 lb ai/A + Prowl H₂O 2.0 lb ai/A: Good tolerance to alfalfa and established perennial ryegrass. Some slight 13% stunting on the orchardgrass with 68% injury to the newly seeded perennial and Italian ryegrass. Chickweed, shepherd's purse and dandelion control were 100%, 98% and 25%, respectively.

Butyrac 1.0 lb ai/A + Prowl H₂O 2.0 lb ai/A: Good alfalfa tolerance with 8% stunting on the established perennial ryegrass and 5% stunting on the newly seeded perennial and Italian ryegrass. Orchardgrass showed 20% stunting. Shepherd's purse control was 90% with poor activity on chickweed and dandelion.

Table 1 – Treatment List and Crop Injury in an Established Alfalfa Grass Hay Field

Treatment ²	Rate lb ai/A	Application Date	% Crop Injury ¹														
			Alfalfa		Orchardgrass		Perennial ryegrass		Italian & Perennial Ryegrass Newly Seeded								
			Nec ³	Stunt ⁴	Nec ³	Stunt ⁴	Established Nec ³	Stunt ⁴	Nec ³	Stunt ⁵							
Velpar L	0.5	12/29/08	23	0	0	0	35	0	20	15	10	0	20	8	55	0	64
Chateau SW	0.125	12/29/08	75	0	5	0	66	0	23	33	50	0	45	38	60	0	74
Sencor DF	0.5	12/29/08	13	0	0	0	20	0	3	0	23	0	13	8	55	0	59
Chateau SW + Prowl H ₂ O	0.125 + 2.0	12/29/08	69	0	0	0	58	0	13	36	50	0	18	28	53	0	46
Sencor DF + Prowl H ₂ O	0.5 + 2.0	12/29/08	35	0	0	0	18	0	0	13	13	0	10	0	53	0	68
Butyrac 2EC + Prowl H ₂ O	1.0 + 2.0	12/29/08	0	0	0	0	0	0	15	20	0	0	0	8	0	0	5
Check	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

¹0 = No crop injury; 100 = Crop dead

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

³% necrosis injury taken on 1/21 & 2/19/09

⁴% stunting injury taken on 2/19 & 3/25/09

⁵% stunting injury taken on 2/19/09

Table 2 – Treatment List and Weed Control in an Established Alfalfa Grass Hay Field

Treatment ²	Rate lb ai/A	Application Date	% Weed Control ¹ – Data Taken 1/21 & 2/19/09					
			Common Chickweed		Shepherd' purse		Dandelion	
			1/21	2/19	1/21	2/19	1/21	2/19
Velpar L	0.5	12/29/08	75	100	46	0	40	25
Chateau SW	0.125	12/29/08	98	100	98	99	93	71
Sencor DF	0.5	12/29/08	79	100	78	98	23	10
Chateau SW + Prowl H ₂ O	0.125 + 2.0	12/29/08	98	100	96	100	92	63
Sencor DF + Prowl H ₂ O	0.5 + 2.0	12/29/08	80	100	90	98	23	25
Butyrac 2EC + Prowl H ₂ O	1.0 + 2.0	12/29/08	13	38	18	90	20	0
Check	-		0	0	0	0	0	0

¹0 = No weed control; 100 = Complete weed control

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

Trial 3 – **Effects of Paraquat on Three Common Groundsel Growth Stages.** Mick Canevari, Don Colbert, Scott Whiteley and Randall Wittie.

OBJECTIVE: Evaluate a postemergence application of paraquat for controlling different growth stages of common groundsel in established alfalfa.

MATERIALS & METHODS: Trial was established on February 18, 2009 in an established alfalfa field located near Lodi, CA.. Gramoxone Inteon 0.5 lb ai/A + No Foam A (NIS) 0.25% V/V (1 qt/100 gal) was applied on a 10 by 50 ft strip at 35 psi in 20.4 gpa of water. The following three common groundsel (*Senecio vulgaris*) growth stages and number of tagged plants were: (1) 10 plants tagged, flowering, no axil budding, 1 to 4 inch height; (2) 12 plants tagged, flowering, axil budding, 1.25 to 3.5 inch height and (3) 14 plants tagged, flowering, axil budding and 4.5 to 6 inch height. Each plant was given a % control rating and the average was recorded in the following table.

RESULTS & DISCUSSIONS:

Groundsel Control

Gramoxone was most effective in controlling plants that were 1 to 4 inch in height with no axil budding⁴ (92%). As the groundsel plants increased in height with axil budding control fell off to 59% and 47%.

Table – Groundsel Control With Paraquat on Three Growth Stages in Established Alfalfa

Treatment	Rate lb ai/A	% Control ¹ – Common Groundsel Growth Stage - Data Taken 2/25, 3/3 & 3/16/09								
		No Axil Budding			Axil Budding ⁴			Axil Budding ⁴		
		Flowering, 1-4" Height			Flowering, 1.25-3.5" Height			Flowering, 4.5-6" Height		
		2/25	3/3	3/16	2/25	3/3	3/16	2/25	3/3	3/16
Gramoxone ² + No Foam A ³	0.5 + 0.25%	94	94	92	70	68	59	63	55	47

¹0 = No groundsel control; 100 = Complete groundsel control

²Gramoxone Inteon 2AS formulation

³No Foam A (NIS) added at 0.25% V/V (1 qt/100 gal)

⁴Axial budding, branching

Trial 4 – **Winter Weed Control in Established Alfalfa.** Mick Canevari, Don Colbert, Scott Whiteley and Randall Wittie.

OBJECTIVE: Evaluate winter herbicide applications for controlling winter weeds in established alfalfa.

MATERIALS & METHODS: Trial was established on December 9, 2008 in an established alfalfa field located near Stockton, CA. Plots were 10 by 25 ft arranged in a randomized complete block design with three replications. Applications were made with a CO₂ backpack sprayer, 35 psi in 20.4 gpa of water. Growth stages prior to 12/9/2008 application were: Alfalfa = 8 to 12 inch height, green foliage; Common chickweed (*Stellaria media*) = 8 to 20 leaf, 1 to 2 inch height; Common groundsel (*Senecio vulgaris*) = 30% cotyledon to 1 leaf, 0.5 inch height; 70% 2 to 4 leaf, 0.5 to 1 inch height; Henbit (*Lamium amplexicaule*) = 4 to 6 leaf, 1.5 to 2.5 inch height; Prickly lettuce (*Lactuca serriola*) = 2 to 4 leaf, 2 to 4 inch diameter; Annual sowthistle (*Sonchus oleraceus*) = 2 to 4 leaf, 2 to 4 inch diameter and Shepherd's purse (*Capsella bursa pastoris*) = 6 to 20 leaf, 2 to 6 inch diameter.

RAINFALL DAT: Weather Station: STOCKTON.C (NCDC#8560, Stockton Fire Station #4)

PRECIPITATION AMOUNT (INCHES) * Application Dates: 12/09/08

<u>12/09/08 Application</u>	
<u>Date</u>	<u>Inches</u>
12/12/08	0.01
12/14	0.31
12/15	0.10
12/16	0.18
12/19-12/31/08	0.68
January 09 Total	1.61
February Total	4.16
March Total	1.25
April Total	0.81
May Total	0.71

RESULTS & DISCUSSIONS:

Alfalfa Injury

As expected, all treatments showed some moderate to severe necrosis (55%-97%) early with complete recovery by the February 19th rating date. Gramoxone 0.5 lb ai/A tank mixed with Prowl H₂O at 3.0 and 4.0 lb ai/A gave some 20% stunting early with recovery prior to cutting. On the February 19th rating date the tank mixing of Gramoxone with Sandea reduced alfalfa stunting substantially compared to Sandea applied alone at 0.047 lb ai/A. This has been observed in other trials. Overall, all treatments showed good alfalfa tolerance.

Alfalfa Yields

All herbicide treatment alfalfa yields were significantly higher than the check. Yields were not statistically different between herbicide treatments.

Weed Yields

All herbicide treatment weed yields were significantly lower than the check. Gramoxone 0.5 lb ai/A treatment gave a weed yield that was significantly higher than any of the other herbicide treatments. Treatments with the highest weed yield were: (1) Check = 2371 lb/A, (2) Gramoxone 0.5 lb ai/A = 585 lb/A and (3) Gramoxone 0.5 lb ai/A + Prowl H₂O 1.0 lb ai/A = 144 lb/A.

Weed Control

Gramoxone 0.5 lb ai/A: Gave 87-100% control of henbit, prickly lettuce and annual sowthistle with 70% common chickweed control. An early rating showed excellent shepherd's purse and common groundsel control but prior to cutting, control fell off to 47% and 32%, respectively.

Gramoxone 0.5 lb ai/A tank mixed with Prowl H₂O at 1.0, 2.0, 3.0 and 4.0 lb ai/A: All tank mixtures gave 88%-100% control of chickweed, henbit, prickly lettuce and annual sowthistle. Common groundsel control was erratic varying from 53%-91%. Shepherd's purse control ranged from 60%-88%.

Gramoxone 0.5 lb ai/A + Velpar 0.5 lb ai/A: Excellent 96%-100% control of all weed species.

Gramoxone 0.5 lb ai/A + TR10 2.0 lb ai/A: Complete control of prickly lettuce and annual sowthistle with 80% control of chickweed and poor control of groundsel and shepherd's purse.

Velpar 0.5 lb ai/A alone & Velpar 0.5 lb ai/A + Prowl H₂O 2.0 lb ai/A: 95%-100% control of all weed species.

Gramoxone 0.5 lb ai/A tank mixed with Chateau 0.375 lb ai/A or Prowl H₂O 2.0 lb ai/A: 97%-100% control of all weeds.

Sandea 0.047 lb ai/A: Complete control of prickly lettuce and sowthistle with good to excellent control of shepherd's purse, chickweed and groundsel.

Gramoxone 0.5 lb ai/A tank mixed with Sandea 0.031 lb ai/A or Sandea 0.047 lb ai/A: 93%-100% control of all weed species.

Gramoxone 0.5 lb ai/A + Velpar 0.5 lb ai/A + Prowl H₂O 2.0 lb ai/A: Excellent herbicide treatment, complete weed control.

Table 1 – Treatment List and Weed Control in Established Alfalfa

Treatment ²	Rate lb ai/A	Application Date	% Weed Control ¹									
			Common Chickweed		Common Groundsel		Shepherd's purse		Henbit		Prickly Lettuce	Annual Sowthistle
			1/7 ³	3/30	1/7	3/30	1/7	3/30	1/7	2/19	2/19	2/19
Gramoxone ⁴	0.5	12/9/08	94	70	100	32	98	47	95	87	100	97
Gramoxone + Prowl H ₂ O	0.5 + 1.0	12/9/08	99	88	100	81	100	60	100	100	100	100
Gramoxone + Prowl H ₂ O	0.5 + 2.0	12/9/08	100	96	100	91	100	86	97	100	100	100
Gramoxone + Prowl H ₂ O	0.5 + 3.0	12/9/08	99	95	100	53	100	82	100	100	100	100
Gramoxone + Prowl H ₂ O	0.5 + 4.0	12/9/08	98	100	100	75	100	88	97	100	100	100
Gramoxone + Velpar L	0.5 + 0.5	12/9/08	100	96	100	100	100	99	100	100	100	100
Gramoxone + Treflan TR10 ⁵	0.5 + 2.0	12/9/08	90	80	83	53	94	53	100	100	100	100
Velpar L + Prowl H ₂ O	0.5 + 2.0	12/9/08	99	98	100	97	99	96	100	100	100	100
Velpar L	0.5	12/9/08	99	95	98	97	100	95	100	95	100	100
Gramoxone + Chateau SW	0.5 + 0.125	12/9/08	100	100	100	100	100	100	100	100	100	100
Chateau SW + Prowl H ₂ O	0.125 + 2.0	12/9/08	100	99	100	97	100	99	100	100	100	100
Check	-	12/9/08	0	0	0	0	0	0	0	0	0	0
Sandea WG	0.047	12/9/08	82	89	100	93	82	85	93	100	100	100
Gramoxone + Sandea WG	0.25 + 0.031	12/9/08	99	93	100	93	100	94	100	100	100	100
Gramoxone + Sandea WG	0.25 + 0.047	12/9/08	100	99	100	100	100	98	100	100	100	100
Gramoxone + Velpar L + Prowl H ₂ O	0.5 + 0.5 + 2.0	12/9/08	100	100	100	100	100	100	100	100	100	100

¹0 = No weed control; 100 = Complete weed control

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

³Data collected on 1/7, 2/19 and 3/30/09

⁴Gramoxone Inteon 2AS formulation used in this trial

⁵Treflan (TR10) applied with a fertilizer spreader after the Gramoxone application

Table 2 – Treatment List, Alfalfa Injury and Yields in Established Alfalfa

Treatment ³	Rate lb ai/A	Application Date	Yield ² – Lb/A		% - Alfalfa Injury ¹					
					Necrosis			Stunting		
					12/18	1/7	2/19	2/19	3/30	4/21
Gramoxone ⁴	0.5	12/9/08	3122	584	87	92	0	0	0	0
Gramoxone + Prowl H ₂ O	0.5 + 1.0	12/9/08	3043	144	86	92	0	0	0	0
Gramoxone + Prowl H ₂ O	0.5 + 2.0	12/9/08	3109	9	82	93	0	0	0	0
Gramoxone + Prowl H ₂ O	0.5 + 3.0	12/9/08	2854	36	88	95	0	20	7	0
Gramoxone + Prowl H ₂ O	0.5 + 4.0	12/9/08	2884	18	85	95	0	20	0	0
Gramoxone + Velpar L	0.5 + 0.5	12/9/08	3096	0	30	75	0	7	0	0
Gramoxone + Treflan TR10 ⁵	0.5 + 2.0	12/9/08	3321	36	83	91	0	7	0	0
Velpar L + Prowl H ₂ O	0.5 + 2.0	12/9/08	3281	0	12	52	0	0	0	0
Velpar L	0.5	12/9/08	2831	9	13	55	0	0	0	0
Gramoxone + Chateau SW	0.5 + 0.125	12/9/08	3281	0	85	97	0	0	0	0
Chateau SW + Prowl H ₂ O	0.125 + 2.0	12/9/08	2990	0	77	96	0	13	6	0
Check	-	12/9/08	1601	2371	0	0	0	0	0	0
Sandea WG	0.047	12/9/08	2990	18	12	13	0	50	5	0
Gramoxone + Sandea WG	0.25 + 0.031	12/9/08	2752	0	84	94	0	3	0	0
Gramoxone + Sandea WG	0.25 + 0.047	12/9/08	2977	0	87	97	0	7	0	0
Gramoxone + Velpar L + Prowl H ₂ O	0.5 + 0.5 + 2.0	12/9/08	-	-	37	95	0	0	0	0
LSD (05)	-	-	479	209						

¹0 = No crop injury; 100 = Crop dead

²First cutting taken on 3/31/09; 90% DM

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

⁴Gramonone Inteon 2AS formulation used in this trial

⁵Treflan (TR10) applied with a fertilizer spreader after the Gramoxone application

Trial 5 – **Hairy Fleabane, Winter Weed and Summer Grass Control in Established Alfalfa.** Mick Canevari, Don Colbert, Scott Whiteley and Randall Wittie.

OBJECTIVE: Evaluate fall and winter herbicide applications applied alone and tank mixtures for controlling hairy fleabane and winter weeds in established alfalfa. Herbicide treatments were also evaluated for their soil residual activity in controlling subsequently germinating hairy fleabane and summer weeds; lambsquarters and yellow foxtail.

MATERIALS & METHODS: Trial was established after the last cutting (green chopped 10/15/08) on October 29, 2008 in an established alfalfa field located near Lodi, CA. Applications were also made on December 10, 2008, December 17, 2008 and February 18, 2009. Plots were 10 by 25 ft arrange in a randomized complete block design with three replications. Applications were made with a CO₂ backpack sprayer, 35 psi in 20.4 gpa of water. Growth stages prior to 10/29/2008 applications were: Alfalfa = Green foliage, 65% 2 to 3 inch height, 30% 3.5 to 6 inch height and 5% 7 to 8 inch height; Hairy fleabane (*Erigeron bonariensis*) = preemergence. Henbit (*Lamium amplexicaule*) = 2 to 4 leaf, 0.5 to 1 inch height. It started raining 7 hours after applications for a total of 1.6 inches in 4 days. Growth stages prior to December 10, 2008 application: Alfalfa = Green foliage, 6 to 14 inch height; Hairy fleabane previously mowed = 3 to 6 inch height, flowering. All other fleabane = preemergence and cotyledon to 2 leaf, 0.25 inch diameter; Prickly lettuce (*Lactuca serriola*) = 1 to 2 leaf, 1 inch diameter; Persian speedwell (*Veronica persica*) = 6 to 8 leaf, 1 to 2 inch height; Annual sowthistle (*Sonchus oleraceus*) = 4 leaf, 2 inch diameter; Henbit (*Lamium amplexicaule*) = 2 to 4 leaf, 1 inch height; Annual bluegrass (*Poa annua*) = 2 to 6 leaf, 0.5 to 1 inch height; Shepherd’s purse (*Capsella bursa-pastoris*) = 4 to 8 leaf, 1 to 2 inch diameter; Common chickweed (*Stellaria media*) = 2 to 10 leaf, 0.5 to 1 inch height; Common groundsel (*Senecio vulgaris*) = 1 to 2 leaf, 1 inch height; Prostrate knotweed (*Polygonum aviculare*) = preemergence to 2 leaf, 0.25’ height; Mouseear chickweed (*Cerastium vulgatum*) = 2 to 8 leaf, 0.5 to 1 inch height; Yellow foxtail (*Setaria glauca*) = preemergence and Common lambsquarters (*Chenopodium album*) = preemergence. Growth stages prior to February 18, 2009 application were: Alfalfa = 60% of crowns no regrowth, 20% of crowns 1” regrowth and 20% of crowns with 2 to 4 inch regrowth. Alfalfa stand has some severe stem nematode injury. Applications were preemergence to yellow foxtail and common lambsquarters.

RAINFALL DATA: Weather Station: LODI-01 Lodi, CA.

PRECIPITATION AMOUNT (INCHES) * Application dates: 10/29, 12/10 & 12/17/08. 2/18/09

<u>10/29/08 Application</u>		<u>12/10/08 Application</u>		<u>12/17/08 Application</u>		<u>2/18/09 Application</u>	
<u>Date</u>	<u>Inches</u>	<u>Date</u>	<u>Inches</u>	<u>Date</u>	<u>Inches</u>	<u>Date</u>	<u>Inches</u>
10/30/08	0.22	12/12/08	0.01	12/19/08	0.02	2/22/09	0.43
10/31	0.25	12/14	0.35	12/20	0.01	2/23	0.36
11/01	0.73	12/15	0.08	12/21	0.32	2/26	0.21
11/02	0.01	12/16	0.16	12/22	0.04	March Total	1.25
11/03	0.39	12/19-12/31	1.14	12/24	0.26	April Total	0.81
11/09-11/30	0.26	January 09 Total	1.77	12/25	0.48	May Total	0.71
December 08 Total	1.77	February Total	4.16	January 09 Total	1.77		
January 09 Total	1.61	March Total	1.25	February Total	4.16		
February Total	4.16	April Total	0.81	March Total	1.25		
March Total	1.25	May Total	0.71	April Total	0.81		
April Total	0.81			May Total	0.71		
May Total	0.71						

RESULTS & DISCUSSIONS:

Alfalfa Injury

As expected, herbicide treatments gave some early 53%-97% necrosis with full recovery by the Jan 26th rating date. Alfalfa growth reduction (stunting) ratings were not taken prior to the first cutting because of a severe stem nematode infestation. After the first cutting there was no visible alfalfa injury from any of the herbicide treatments.

Weed Control

Prickly Lettuce: All herbicide treatments gave complete control.

Annual sowthistle: All treatments gave complete control except for poor control from the Raptor + Butyrac tank mixtures.

Prostrate knotweed: The most effective treatments on the May 15th rating date were those that included Prowl H₂O or TR10.

Common Chickweed: All herbicide treatments gave commercial control.

Mouseear chickweed: All treatments gave commercial control with no control from the Raptor + Butyrac tank mixtures.

Annual bluegrass: Good control from all treatments with Chateau 0.125 lb ai/A preemergence application (10/29/08) gave 73% control and no control from the Raptor + Butyrac tank mixtures.

Shepherd's purse: Velpar 0.5 lb ai/A 77% control. All other herbicide treatments gave excellent control.

Henbit: All treatments where Chateau was included gave excellent control.

Persian speedwell: Raptor + Butyrac tank mixtures gave poor control. All other herbicide treatments gave complete control.

Hairy fleabane new plants: The most effected treatments were: (1) Chateau 0.125 lb ai/A applied preemergence on 10/29/08 followed by a sequential Chateau 0.125 lb ai/A application applied on 2/18/09 = 92%, (2) Chateau 0.125 lb ai/A + Velpar 0.5 lb ai/A applied postemergence on 12/10/08 = 88%, (3) postemergence application 12/10/08 Chateau 0.125 lb ai/A + Gramoxone 0.5 lb ai/A + Prowl H₂O 2.0 lb ai/A = 87%, (4) Chateau 0.125 lb ai/A applied preemergence on 10/29/08 = 73% and (5) Chateau 0.125 lb ai/A + Gramoxone 0.5 lb ai/A applied postemergence on 12/10/08 = 72%.

Yellow foxtail: All treatments were applied preemergence to this weed specie. Any treatment that included Prowl H₂O or TR10 gave 100% foxtail control. Chateau 0.125 lb ai/A applied preemergence on 10/29/08 followed by Chateau 0.125 lb ai/A applied 2/18/09 gave 96% control. All other Chateau treatments gave erratic yellow foxtail control ranging from 63%-92%.

Lambsquarters: All treatments were applied preemergence to this weed specie. Any treatment that included Prowl H₂O or TR10 gave 94%-100% control. Chateau 0.125 lb ai/A applied preemergence on 10/29/08 followed by a sequential Chateau 0.125 lb ai/A application on 2/18/09 gave 100% control. All other Chateau treatments resulted in erratic control ranging from 63%-83%.

Summary:

Taking into account; preemergence and postemergence applications, dates of applications and the 12 weed species present the most effective herbicide treatments with the highest **% Overall Average Weed**

Control were: (1) Chateau 0.125 lb ai/A + Gramoxone 0.5 lb ai/A + Prowl H₂O 2.0 lb ai/A = 98%, (2) Chateau 0.125 lb ai/A preemergence application 10/29/08 followed by a sequential Chateau 0.125 lb ai/A application applied on 2/18/09 = 95%, (3) Chateau 0.125 lb ai/A tank mixed with Velpar 0.5 lb ai/A or Prowl H₂O 3.0 lb ai/A applied on 12/10/08 = 92%, (4) Gramoxone 0.5 lb ai/A + Prowl H₂O 2.0 lb ai/A applied on 12/10/08 = 91%, (5) Chateau 0.125 lb ai/A preemergence on 10/29/08 or Chateau 0.125 lb ai/A applied alone on 12/10/08 or tank mixed with either Gramoxone 0.5 lb ai/A and Butyrac 1.0 or 2.0 lb ai/A = 86-90% and (6) Gramoxone 0.5 lb ai/A + TR10 2.0 lb ai/A applied on 12/10/08 = 88%.

Table 1 – Treatment List and Weed Control in Established Alfalfa

Treatment ²	Rate lb ai/A	Application Date	% - Weed Control ¹ – Data Taken on 12/30/08 & 2/12/09											
			Common Chickweed		Mouse-ear Chickweed		Annual Bluegrass		Shepherd's purse		Persian Henbit		Speedwell	
			12/30	2/12	12/30	2/12	12/30	2/12	12/30	2/12	12/30	2/12	12/30	2/12
Chateau SW ³	0.125	10/29/08	100	100	100	100	97	73	100	100	98	88	100	100
Chateau SW	0.125	12/10/08	100	100	100	100	72	98	100	100	100	100	100	100
Chateau SW + Gramoxone ⁴	0.125 + 0.5	12/10/08	100	100	100	100	100	100	100	100	100	100	100	100
Chateau SW + Gramoxone + Prowl H ₂ O	0.125 + 0.5 + 2.0	12/10/08	100	100	100	100	100	97	100	100	100	100	100	100
Chateau SW + Velpar L	0.125 + 0.5	12/10/08	100	100	100	100	100	99	100	100	100	100	100	100
Sencor DF	0.5	12/10/08	92	100	91	100	82	96	100	99	83	50	100	100
Chateau SW + Butyrac 200	0.125 + 1.0	12/10/08	100	100	100	100	87	92	100	100	100	100	100	100
Chateau SW + Butyrac 200	0.125 + 1.5	12/10/08	100	100	100	100	83	96	100	100	100	99	100	100
Velpar L	0.5	12/10/08	87	100	85	100	84	92	100	77	93	83	100	100
Gramoxone + Velpar L	0.5 + 0.5	12/10/08	100	100	100	100	100	100	100	100	100	47	100	100
Gramoxone	0.5	12/10/08	100	94	100	84	100	96	100	100	100	27	100	90
Gramoxone + Prowl H ₂ O	0.5 + 2.0	12/10/08	100	100	100	99	100	99	100	99	82	77	100	100
Gramoxone + Prowl H ₂ O	0.5 + 3.0	12/10/08	100	100	100	100	100	100	100	100	100	95	100	100
Gramoxone + Treflan TR10 ⁵	0.5 + 2.0	12/10/08 12/10/08	98	100	98	98	100	100	100	100	83	50	100	100
Raptor AS + Butyrac 200	0.032 + 1.0	12/17/08	0	83	0	54	0	0	0	88	0	35	0	35
Raptor AS + Butyrac 200	0.047 + 1.0	12/17/08	0	90	0	64	0	0	0	90	0	30	0	40
Chateau SW ³	0.125	10/29/08	100	100	100	100	98	98	100	100	100	100	100	100
Chateau SW	0.125	2/18/09												
Check	-	-	0	0	0	0	0	0	0	0	0	0	0	0

¹0 = No weed control; 100 = Complete weed control

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

³Herbicide applied preemergence to the above weed species except for early postemergence on henbit

⁴Gramoxone Inteon 2AS formulation used in this trial

⁵Treflan (TR10) applied with a fertilizer spreader after the Gramoxone application

Table 2 – Treatment List, Crop Injury and Weed Control in Established Alfalfa

Treatment ²	Rate lb ai/A	Application Date	% - Alfalfa Injury ¹				% - Weed Control ¹				
			Necrosis		Phytotoxicity		Sow	Prickly			
			11/12 ³	12/30	1/26	5/15	Thistle	Lettuce	Prostrate	Knotweed	
Chateau SW ⁴	0.125	10/29/08	75	0	0	0	100	100	100	84	43
Chateau SW	0.125	12/10/08	-	78	0	0	100	100	100	92	70
Chateau SW + Gramoxone ⁵	0.125 + 0.5	12/10/08	-	96	0	0	100	100	100	92	57
Chateau SW + Gramoxone + Prowl H ₂ O	0.125 + 0.5 + 2.0	12/10/08	-	97	0	0	100	100	100	99	100
Chateau SW + Velpar L	0.125 + 0.5	12/10/08	-	92	0	0	100	100	100	99	83
Sencor DF	0.5	12/10/08	-	72	0	0	100	100	100	20	0
Chateau SW + Butyrac 200	0.125 + 1.0	12/10/08	-	85	0	0	100	100	100	96	85
Chateau SW + Butyrac 200	0.125 + 1.5	12/10/08	-	80	0	0	100	100	100	95	67
Velpar L	0.5	12/10/08	-	53	0	0	100	100	100	40	53
Gramoxone + Velpar L	0.5 + 0.5	12/10/08	-	87	0	0	100	100	100	0	17
Gramoxone	0.5	12/10/08	-	96	0	0	100	93	100	0	0
Gramoxone + Prowl H ₂ O	0.5 + 2.0	12/10/08	-	95	0	0	100	100	100	95	100
Gramoxone + Prowl H ₂ O	0.5 + 3.0	12/10/08	-	97	0	0	100	97	100	97	99
Gramoxone + Treflan TR10 ⁶	0.5 2.0	12/10/08 12/10/08	-	96	0	0	100	100	100	94	97
Raptor AS + Butyrac 200	0.032 + 1.0	12/17/08	-	0	0	0	0	100	0	19	0
Raptor AS + Butyrac 200	0.047 + 1.0	12/17/08	-	0	0	0	0	100	0	40	0
Chateau SW ⁴	0.125	10/29/08	68	0	0	0	100	100	100	94	53
Chateau SW	0.125	2/18/09									
Check	-	-	0	0	0	0	0	0	0	0	0

¹0 = No weed control or crop injury; 100 = Complete weed control; crop dead

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

³Data taken on 11/12 & 12/30/08 and 1/26, 2/12, 2/25 and 5/15/09

⁴Herbicide applied preemergence to the above weed species

⁵Gramoxone Inteon 2AS formulation used in this trial

⁶Treflan (TR10) applied with a fertilizer spreader after the Gramoxone application

Table 3 – Treatment List and Weed Control in Established Alfalfa

Treatment ⁴	Rate lb ai/A	Application Date	% Hairy Fleabane Control ¹				% Preemergence Control ¹				% Average ^{1,3} Weed Control
			Fleabane New Plants ²				Yellow Foxtail		Common Lambsquarters		
			12/30 ⁵	2/12	3/5	5/15	3/25	5/15	3/25	5/15	
Chateau SW ⁶	0.125	10/29/08	100	94	89	73	80	75	94	83	86
Chateau SW	0.125	12/10/08	65	62	63	13	97	92	94	81	88
Chateau SW + Gramoxone ⁷	0.125 + 0.5	12/10/08	100	98	95	72	88	75	80	63	89
Chateau SW + Gramoxone + Prowl H ₂ O	0.125 + 0.5 + 2.0	12/10/08	100	99	95	87	100	100	100	94	98
Chateau SW + Velpar L	0.125 + 0.5	12/10/08	100	98	95	88	73	63	90	81	93
Sencor DF	0.5	12/10/08	73	95	57	17	0	0	0	0	64
Chateau SW + Butyrac 200	0.125 + 1.0	12/10/08	96	80	69	37	90	75	89	75	89
Chateau SW + Butyrac 200	0.125 + 1.5	12/10/08	100	92	83	40	83	65	71	67	86
Velpar L	0.5	12/10/08	60	99	98	68	0	0	0	0	73
Gramoxone + Velpar L	0.5 + 0.5	12/10/08	100	100	85	43	0	0	0	0	67
Gramoxone	0.5	12/10/08	100	73	23	0	0	0	0	0	57
Gramoxone + Prowl H ₂ O	0.5 + 2.0	12/10/08	100	91	50	17	100	100	97	96	91
Gramoxone + Prowl H ₂ O	0.5 + 3.0	12/10/08	100	95	75	17	100	100	100	100	92
Gramoxone + Treflan TR10 ⁸	0.5 2.0	12/10/08 12/10/08	100	89	78	13	100	100	96	95	88
Raptor AS + Butyrac 200	0.032 + 1.0	12/17/08	0	32	0	0	0	0	0	0	33
Raptor AS + Butyrac 200	0.047 + 1.0	12/17/08	0	82	35	0	0	0	0	0	35
Chateau SW ⁶ Chateau SW	0.125 0.125	10/29/08 2/18/09	100	99	100	92	100	96	100	100	95
Check	-	-	0	0	0	0	0	0	0	0	0

¹0 = No weed Control; 100 = Complete weed control

²Plants that germinated after the first rain event which occurred on 10/30/08

³Average % control for the 12 weed species evaluated

⁴No Foam A (NIS) added to all herbicide treatments at 0.25% V/V (1 qt/100 gal)

⁵Data taken on 11/12 & 12/30/08 and 2/12, 3/5, 3/25 and 5/15/09

⁶Herbicide applied preemergence to the above weed species

⁷Gramoxone Inteon 2AS formulation used in this trial

⁸Treflan (TR10) applied with a fertilizer spreader after the Gramoxone application

Trial 6 – Commercial Herbicide Applications for Controlling Hairy Fleabane in Established Alfalfa.
Mick Canevari, Don Colbert, Scott Whiteley and Randall Wittie.

OBJECTIVE: Evaluate commercial herbicide applications applied in the fall and winter for hairy fleabane control in established alfalfa.

MATERIAL & METHODS: Trial was established after the last cutting (green chopped 10/15/08) on October 29, 2008 in an established alfalfa field located near Lodi, CA. Several herbicide treatments were also applied on December 30, 2008. Plots were 10 acre blocks arranged in a completely random design. Applications were made with the grower’s commercial sprayer, 45 psi in 20 gpa of water. Growth stages prior to 10/29/08 were: Alfalfa = Green foliage, 65% 2-3 inch height, 30% 3.5 to 6 inch height and 5% 7 to 8 inch height and Henbit (*Lamium amplexicaule*) = 2 to 4 leaf, 0.5 to 1 inch height. Preemergence to all other weeds. Started raining in Lodi approximately 4 PM on 10/30/08. After application an accumulative rainfall totaled 1.6 inches in four days. Growth stages prior to December 30, 2008 were: Alfalfa = Green foliage 6 to 12 inch height; Hairy fleabane (*Erigeron bonariensis*) = 30% cotyledon, 0.25 inch diameter and 70% 4 to 6 leaf, 0.5 to 1 inch diameter. Common chickweed (*Stellaria media*) = 1 to 2.5 inch height; Annual sowthistle (*Sonchus oleraceus*) = 3 to 4 leaf, 2 to 3 inch diameter; Annual bluegrass (*Poa annua*) = 4 leaf to tillering, 0.5 to 3 inch height; Henbit = 2 to 8 leaf, 0.5 to 1 inch height; Shepherd’s purse (*Capsella bursa-pastoris*) = 8 to 10 leaf, 1.5 to 2 inch diameter; Common groundsel (*Senecio vulgaris*) = 60% 4 to 6 leaf, 1 inch height; 40% 8 to 14 leaf, 2 to 3.5 inch height; Persian speedwell (*Veronica persica*) = 2 to 3 inch height; Prickly lettuce (*Lactuca serriola*) = 4 to 6 leaf, 3 to 4 inch diameter and Prostrate knotweed (*Polygonum aviculare*) = preemergence.

RAINFALL DATA: Weather Station: LODI-01 Lodi, CA.

PRECIPITATION AMOUNT (INCHES) * Application dates: 10/29 and 12/30/08

<u>10/29/08 Application</u>		<u>12/30/08 Application</u>	
<u>Date</u>	<u>Inches</u>	<u>Date</u>	<u>Inches</u>
10/30/08	0.22	12/31/08	0.01
10/31	0.25	1/01/09	0.01
11/01	0.73	1/02	0.03
11/02	0.01	1/05	0.04
11/03	0.39	1/07	0.01
11/09-11/30	0.26	1/11	0.01
December 08 Total	1.77	1/21-1/24	1.76
January 09 Total	1.61	January 09 Total	1.61
February Total	4.16	February Total	4.16
March Total	1.25	March Total	1.25
April Total	0.81	April Total	0.81
May Total	0.71	May Total	0.71

RESULTS & DISCUSSIONS:

Alfalfa Injury

As expected, all herbicide treatments resulted in some early necrosis with complete recovery on the February 12th rating date. Alfalfa growth reduction (stunting) ratings were not taken prior to the first cutting because of a severe stem nematode infestation. After the first cutting there was no visible alfalfa injury.

Weed Control

Chateau 0.125 lb ai/A preemergence application applied 10/29/08: Good to excellent (85%-100%) excellent early control of prostrate knotweed and annual bluegrass but later ratings were 43% and 73%, respectively. It gave excellent control of fleabane for four months (2/25/09) then control fell off to 82% in March and 68% in May.

Velpar 0.25 lb ai/A + Chateau 0.125 lb ai/A postemergence application applied 12/30/08: Excellent (96%-100%) control of prickly lettuce, annual bluegrass, common groundsel, henbit, annual sowthistle and shepherd’s purse. It gave 96% control of prostrate knotweed through March 9th with no control on the May 15th rating date. Excellent fleabane control for three months (3/9/09) with 70% control on the May 15th rating date.

Gramoxone 0.5 lb ai/A + Chateau 0.125 lb ai/A + Prowl H₂O 2.0 lb ai/A postemergence applied on 12/30/08: 85%-100 control of all weed species except for hairy fleabane. This tank mixture gave 90% fleabane control on the February 12th rating with 81% on March 9th and 50% on May 15th.

Gramoxone 0.5 lb ai/A + Chateau 0.125 lb ai/A postemergence applied on 12/30/08: 87%-100% control of prickly lettuce, common groundsel, henbit annual sowthistle and shepherd's purse. Excellent bluegrass control early with poor control later in the season. Average prostrate knotweed control early with no control on the May 15th rating date.

Table 1 – Treatment List, Crop Injury and Weed Control in Established Alfalfa

Treatment	Rate lb ai/A	Application Date	% - Weed Control ¹											
			% Alfalfa Injury ¹			Prickly Lettuce	Annual Bluegrass			Hairy fleabane				
			11/12 ²	1/16	2/12		3/9	1/16	2/25	3/9	1/16	2/12	2/25	3/9
Chateau SW ³ + Ad Wet 90CA	0.125 + 0.25% V/V	10/29/08	68	0	0	100	100	78	73	100	98	93	82	68
Velpar L + Chateau SW + Ad Wet 90CA	0.25 + 0.125 + 0.25% V/V	12/30/08	-	90	0	100	50	96	96	95	98	91	91	70
Gramoxone ⁴ + Chateau SW + Prowl H ₂ O + Ad Wet 90CA	0.5 + 0.125 + 2.0 + 0.25% V/V	12/30/08	-	90	0	100	100	93	93	95	90	81	81	50
Gramoxone ⁴ + Chateau SW + Ad wet 90CA	0.5 + 0.125 + 0.25% V/V	12/30/08	-	90	0	100	100	83	50	95	90	83	83	50
Check	-	-	0	0	0	0	0	0	0	0	0	0	0	0

¹0 = No weed control or crop injury; 100 = Complete weed control; crop dead

²Data taken on: 11/12/08, 1/16/09, 2/12/09 and etc.

³Herbicide applied preemergence to the above weed species

⁴Gramoxone Inteon 2AS formulation

Table 2 – Treatment List and Weed Control in Established Alfalfa

Treatment	Rate lb ai/A	Application Date	% - Weed Control ¹										
			Prostrate Knotweed			Common Groundsel		Annual Henbit		Annual Shepherd's Sowthistle		Shepherd's Purse	
			2/25 ²	3/9	5/15	1/16	3/9	1/16	3/9	1/16	3/9	1/16	3/9
Chateau SW ³ + Ad Wet 90CA	0.125 + 0.25% V/V	10/29/08	92	77	43	100	90	100	85	100	93	100	100
Velpar L + Chateau SW + Ad Wet 90CA	0.25 + 0.125 + 0.25% V/V	12/30/08	96	96	0	95	99	100	100	70	99	85	100
Gramoxone ⁴ + Chateau SW + Prowl H ₂ O + Ad Wet 90CA	0.5 + 0.125 + 2.0 + 0.25% V/V	12/30/08	100	100	100	95	86	100	100	95	97	95	100
Gramoxone ⁴ + Chateau SW + Ad wet 90CA	0.5 + 0.125 + 0.25% V/V	12/30/08	77	77	0	90	87	100	100	95	96	100	100
Check	-	-	0	0	0	0	0	0	0	0	0	0	0

¹0 = No weed control; 100 = Complete weed control

²Data taken on 1/16, 2/25, 3/9 and 5/15/09

³Herbicide applied preemergence to the above weed species

⁴Gramoxone Inteon 2AS formulation

Trial 7 – **Dodder Control in Established Alfalfa**. Mick Canevari, Don Colbert, Scott Whiteley and Randall Wittie.

OBJECTIVE: Evaluate postemergence applications for controlling attached dodder in established alfalfa.

MATERIAL & METHODS: Trial was established after the first cutting on June 24, 2009 in an established alfalfa field located near Tracy, CA. Plots were 20 by 26 ft arranged in randomized complete block design with three replications. Applications were made with a CO₂ backpack sprayer, 40 psi in 40.5 gpa of water. First cutting was made on June 17, 2009. Immediately prior to the herbicide applications grower mowed the trial area. Growth stages prior to application were: Alfalfa = 2-5 inch height and dodder (*Cuscuta sp*) = attached and early flowering.

RESULTS & DISCUSSIONS:

Alfalfa Injury

As expected, all herbicide treatments showed some early injury with complete recovery 33 days after application.

Dodder Control

Chateau 0.125 lb ai/A tank mixed with the adjutants No Foam A or No foam A + UN32: Both treatments gave around 60% control 6 days after treatment (DAT) then fell off to 0%-13% on the 54 day rating.

Chateau 0.125 lb ai/A + UN32 +Silwet L-77 + Hasten: It gave 88%, 71% and 47% dodder control 6 DAT, 33 DAT and 54 DAT, respectively.

Raptor 0.047 lb ai/A + Hasten + UN32 and Scythe 7.0% V/V + Hasten + UN32: Both treatments gave poor control of dodder.

Raptor 0.047 lb ai/A + Chateau 0.125 lb ai/A + Hasten: 92% dodder control 6 DAT, 81% 33 DAT and 63% 54 DAT.

Roundup 0.5 lb ai/A + 0.125 lb ai/A: 6 DAT 61% dodder control, 60% 33 DAT and 43% 54 DAT.

Scythe 7.0% V/V + Chateau 0.125 lb ai/A: 93% dodder control 6 DAT, 73% control 33 DAT and 50% control 54 DAT.

Table – Treatment List, Alfalfa Injury and Dodder Control in Established Alfalfa

Treatment	Rate lb ai/A	Application Date	% - Alfalfa Injury ¹			% - Dodder Control ¹			
			Necrosis		Stunting 33 DAT	6 DAT	33 DAT	54DAT	76 DAT
			6 DAT ²	33DAT					
Chateau SW + No Foam A	0.125 + 0.25% V/V	6/24/09	68	0	0	65	37	13	0
Chateau SW + No Foam A + UN32	0.125 + 0.25% V/V + 1.0% V/V	6/24/09	68	0	0	62	7	0	0
Chateau SW + UN32 + Silwet L-77 + Hasten	0.125 + 1.0% V/V + 0.125 % V/V + 1.0% V/V	6/24/09	87	0	0	88	71	47	20
Raptor + Hasten + UN32	0.047 + 1.0% V/V + 1.0% V/V	6/24/09	0	0	0	40	30	13	3
Raptor + Chateau SW + Hasten	0.047 + 0.125 + 1.0% V/V	6/24/09	83	0	0	92	81	63	15
Roundup SL ³ + Chateau SW	0.5 + 0.125	6/24/09	28	0	0	61	60	43	17
Scythe EC+ Hasten + UN32	7.0% V/V + 1.0% V/V + 1.0% V/V	6/24/09	48	0	0	48	7	0	0
Scythe EC + Chateau SW	7.0% V/V + 0.125	6/24/09	85	0	0	93	73	50	0
Check	-	-	0	0	0	0	0	0	0

¹0 = No dodder control or crop injury; 100 = Complete dodder control; crop dead

²Data taken days after treatment (DAT)

³Roundup Weathermax formulation

Trial 8 – Yellow Foxtail Control Observation Trial in Established Alfalfa. Mick Canevari, Don Colbert, Scott Whiteley and Randall Wittie.

OBJECTIVE: Evaluate winter herbicide preemergence applications for controlling yellow foxtail in established alfalfa.

MATERIALS & METHODS: Trial was established on December 9, 2008 in an established alfalfa field located near Stockton, CA. on a peat soil containing 6% organic matter. Several herbicide treatments were also applied after the first cutting on April 13, 2009. Plots were 10 by 25 ft strips arranged in a completely random design. Applications were made with a CO₂ backpack sprayer, 35 psi in 20.4 gpa of water. Growth stages prior to 12/9/08 applications were: Alfalfa = 8 to 12 inch height, green foliage and Yellow foxtail (*Setaria glauca*) = preemergence. Growth stages prior to 4/13/09 applications were: Alfalfa = 4 to 9 inch height and yellow foxtail = cotyledon to 4 leaf, 0.25 to 2.5 inch height.

RAINFALL DAT: Weather Station: STOCKTON.C (NCDC#8560, Stockton Fire Station #4)
PRECIPITATION AMOUNT (INCHES) * Application Dates: 12/09/08 & 4/13/09

<u>12/09/08 Application</u>		<u>4/13/09 Application</u>	
<u>Date</u>	<u>Inches</u>	<u>Date</u>	<u>Inches</u>
12/12/08	0.01	5/1/09	0.36
12/14	0.31	5/2	0.06
12/15	0.10	5/3	0.22
12/16	0.18	5/5	0.07
12/19-12/31/08	0.68	June Total	0.05
January 09 Total	1.61		
February Total	4.16		
March Total	1.25		
April Total	0.81		
May Total	0.71		

RESULTS & DISCUSSIONS:

Alfalfa Injury

As expected, all treatments showed some moderate to severe necrosis (55%-97%) early with complete recovery by the February 19th rating date. Gramoxone 0.5 lb ai/A tank mixed with Prowl H₂O at 3.0 and 4.0 lb ai/A gave some 20% stunting early with recovery prior to cutting. On the February 19th rating date the tank mixing of Gramoxone with Sandea reduced alfalfa stunting substantially compared to Sandea applied alone at 0.047 lb ai/A. This has been observed in other trials. Overall, all treatments showed good alfalfa tolerance.

Yellow Foxtail Control

On the July 2nd rating date all herbicide treatments tank mixed with Prowl H₂O gave 68%-90% foxtail control. Sandea 0.047 lb ai/A applied alone gave 88% foxtail control. Sandea 0.031 lb ai/A and 0.047 lb ai/A tank mixed with Gramoxone 0.5 lb ai/A gave 48%-60% foxtail control on July 2nd.

Table – Alfalfa Injury and Yellow Foxtail Control in Established Alfalfa

Treatment ²	Rate lb ai/A	Application Date	% - Alfalfa Injury ¹						% Yellow foxtail control ¹			
			Necrosis			Chlorosis		Stunting	4/14	6/12	7/2	
			1/7 ³	2/19	4/21	4/21	2/19	3/30	4/21			
Gramoxone ⁴	0.5	12/9/08	92	0			0	0	0	30	60	50
Gramoxone + Prowl H ₂ O	0.5 + 1.0	12/9/08	92	0			0	0	0	82	75	68
Gramoxone + Prowl H ₂ O	0.5 + 2.0	12/9/08	93	0			0	0	0	97	90	90
Gramoxone + Prowl H ₂ O	0.5 + 3.0	12/9/08	95	0			20	7	0	94	75	70
Gramoxone + Prowl H ₂ O	0.5 + 4.0	12/9/08	95	0			20	0	0	97	84	70
Gramoxone + Prowl H ₂ O + Prowl H ₂ O	0.5 + 2.0 2.0	12/9/08 4/13/09	95	0	7	0	0	0	0	84	83	80
Gramoxone + Velpar L	0.5 + 0.5	12/9/08	94	0			7	0	0	0	30	65
Gramoxone + Treflan TR10 ⁵	0.5 + 2.0	12/9/08	75	0			7	0	0	97	40	10
Velpar L + Prowl H ₂ O	0.5 + 2.0	12/9/08	91	7			0	0	0	99	70	70
Velpar L	0.5	12/9/08	52	0			0	0	0	0	15	0
Gramoxone + Chateau SW	0.5 + 0.125	12/9/08	55	0			0	0	0	43	50	48
Gramoxone + Chateau SW + Chateau SW	0.5 + 0.125 0.125	12/9/08 4/13/09	97	0	10	0	10	5	0	10	65	60
Chateau SW + Prowl H ₂ O	0.125 + 2.0	12/9/08	97	0			13	6	0	77	40	35
Check	-	12/9/08	0	0	0	0	0	0	0	0	0	0
Sandea WG	0.047	12/9/08	13	0			50	5	0	52	87	88
Gramoxone + Sandea WG	0.5 + 0.031	12/9/08	94	0			3	0	0	82	38	48
Gramoxone + Sandea WG	0.5 + 0.047	12/9/08	97	0			7	0	0	83	68	60
Gramoxone + Velpar L + Prowl H ₂ O	0.5 + 0.5 + 2.0	12/9/08	95	0			0	0	0	97	70	70

¹0 = No crop injury or weed control; 100 = Crop dead, complete weed control

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

³Data taken on 1/7, 2/19/09 and etc.

⁴Gramoxone Inteon 2AS formulation used in this trial

⁵Treflan (TR10) applied with a fertilizer spreader after the Gramoxone application

Trial 9 - Alfalfa Stem Nematode Control in Established Alfalfa Mick Canevari, Randall Wittie, Don Colbert, Scott Whiteley

OBJECTIVE: Evaluate Movento for stem nematode control in established alfalfa.

MATERIALS AND METHODS: Movento was applied to established alfalfa near Lodi, San Joaquin County infested with stem nematode (*Ditylenchus dipsaci*) on February 18, 2009 and on March 18, 2009 to separate plots. (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 CO₂ backpack sprayer at 32 psi 20 GPA water using 8002VS nozzles. Alfalfa stage for the February 18 application was 60% no re-growth, 20% 1" re-growth and 20% 2-4" re-growth. The alfalfa stage for the March 18 application was 60% no re-growth, 20% 1" re-growth and 20% 3" re-growth.

Table 1 – Treatment List

Treatment	Formulation	Rate Lb Ai/A	Rate Fl Oz/A	Application Date
1. Movento	2 SC	0.08	5.0	2-18-09
2. Movento	2 SC	0.08	5.0	3-18-09
3. Untreated Check				

RESULTS AND DISCUSSION: A general phytotoxicity rating was made 7 days after the first application. Results indicate no injury from the Movento application made on February 18. Alfalfa remained semi-dormant and there was no indication that the alfalfa was any different from the untreated.

A second phytotoxicity rating was made 70 days after the first application and 42 days after the second application. Results from this rating indicated that Movento was still safe to alfalfa. Observations made at this evaluation indicated Movento did not control the stem nematode because there was no growth in the treated plots as compared to the untreated plot.

Movento needs to go on the alfalfa with enough foliage so the Movento has enough time to move in the alfalfa stems systemically where the nematodes are feeding.

Trial 10 - Alfalfa Weevil Control in Established Alfalfa Mick Canevari, Randall Wittie, Don Colbert, Scott Whiteley

OBJECTIVE: Evaluate new insecticides with fewer impacts on water quality for alfalfa weevil (*Hyperia postica*) control in established alfalfa.

MATERIALS AND METHODS: Experimental and commercial insecticides were applied to an increasing population of alfalfa weevil and aphids on March 12, 2009 in an established Roundup Ready alfalfa field near Thornton, 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 CO₂ backpack sprayer at 32 psi 20 gpa water using 8002VS nozzles. Alfalfa was 4-8 inch height. Temperature at the beginning of application at 7:30 am was 35.8°F and was 42.7°F when finished spraying at 8:40 am. There was a light frost on the alfalfa during the time of application. Alfalfa weevil (AW) pre-counts indicated small to large larvae averaging 2/180° sweep with a standard insect net. Post treatment counts were made by dividing the plots into segments so a new area was swept on each evaluation 5, 12 and 19 days after treatment (DAT). Five 180° sweeps were made per segment/evaluation and emptied into a yellow tray for counting on site. Data recorded as number per sweep.

Table1 - Treatment list

Treatment	Formulation	Rate Lb Ai/A	Rate Fl Oz/A
1.DPX HGW86	10% SE	0.09	13.5
2.DPX HGW86 + Hasten	10% SE 100% EC	0.09 0.5% V/V	13.5
3.Steward	1.25 SC	0.07	6.7
4.Warrior	1.0 EC	0.03	3.84
5. Voliam Express	1.25 EC	0.06	6.0
6.Lorsban	4.0 EC	1.0	32.0
7.Lorsban Advanced	0.9 E	0.9	32.0
8.Cobalt	2.545 EC	0.5	26.0
9.Untreated Check			

RESULTS AND DISCUSSION: Sweep count data collected on AW and aphids at 5, 12 and 19 DAT. Temperatures for the site between March 12 and March 31:

CIMIS Station: Lodi_West.A

Date	MAX	MIN
3/12	67	34
3/13	68	40
3/14	59	38
3/15	64	47
3/16	67	51
3/17	68	46
3/18	73	44
3/19	76	47
3/20	73	47
3/21	60	43
3/22	59	38
3/23	61	35
3/24	71	39
3/25	71	39
3/26	75	46

3/27	74	44
3/28	78	47
3/29	65	48
3/30	68	44
3/31	72	39

Five Day Counts The untreated control (UTC) averaged 5.2 AW/sweep. Significantly the best treatments at this count were Warrior, Voliam Express, Lorsban and Cobalt. These treatments had 0.7, 0.6, 1.4 and 0.5 AW/sweep respectively. Voliam Express and Cobalt contain pyrethroids. (Table 2)

Twelve Day Counts UTC AW population increased to 17.9/sweep. Excellent AW control was the result of Warrior, Voliam Express and Cobalt. DPX HGW86, Steward, Lorsban and Lorsban Advanced also gave significant control of the AW but significantly less than Warrior, Voliam Express and Cobalt. (Table 2)

Nineteen Day Counts UTC counts increased to 30.7 AW/sweep. Warrior, Voliam Express and Cobalt were significantly the best treatments while DPX HGW86, Steward, Lorsban and Lorsban Advanced were significantly better than the check but significantly less than Warrior, Voliam Express and Cobalt. (Table 2)

Phytotoxicity No treatment resulted in any foliar injury. However, there was some plant injury resulting from the applicator walking on the alfalfa when covered with frost. The alfalfa had grown out of this by the 19 day count.

Results from this trial indicate that products Warrior, Voliam Express, and Cobalt performed equally well. The Lorsban, Lorsban Advanced, Steward, DPX HGW86 did not perform as well as the pyrethroids. Also, the pyrethroid materials seemed to perform better under cooler temperatures. (Figure 1)

Table2 - Alfalfa weevil control in established alfalfa

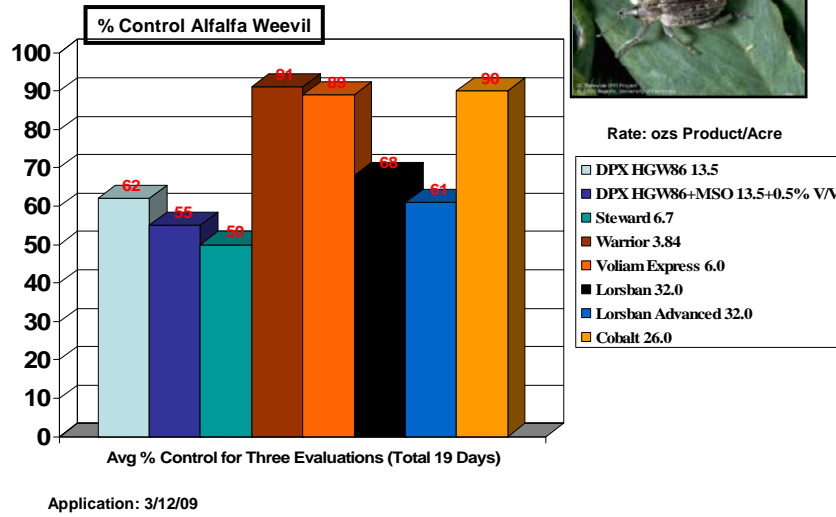
Treatment	Fl Oz/A	----- Control Days After Treatment -----					
		AW/Swp ¹	%C ²	AW/Swp	%C	AW/Swp	%C
		5 DAT	12 DAT	19 DAT			
1.DPX HGW86	13.5	1.6 cd	64	4.8 b	73	16.0 b	48
2.DPX HGW86 + MSO 0.5% V/V	13.5	3.1 bc	40	5.3 b	70	14.2 bc	54
3.Steward	6.7	3.5 b	33	5.9 b	67	15.4 bc	50
4.Warrior	3.84	0.7 d	87	0.5 c	97	3.5 d	89
5.Voliam Express	6.0	0.6 d	88	1.1 c	94	4.8 d	84
6.Lorsban	32.0	1.4 d	73	5.5 b	69	11.6 c	62
7.Lorsban Advanced	32.0	2.2 bcd	58	6.0 b	66	12.5 ab	59
8.Cobalt	26.0	0.5 d	90	0.7 c	96	4.9 d	84
9. Untreated Check		5.2 a		17.9 a		30.7 a	
LSD(P=.05)		1.65		1.85		4.17	
CV		54.56		24.07		22.67	

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

² %C = % Control of the UTC

Figure 1

Alfalfa Weevil Control in Established Alfalfa Thornton 2009



Trial 11 - Alfalfa Lepidoptera Worm Complex Control in Established Alfalfa Mick Canevari, Randall Wittie, Don Colbert, Scott Whiteley

OBJECTIVE: Evaluate new insecticides with fewer impacts on water quality for beet armyworm (*Spodoptera exigua*), western yellowstriped armyworm (*Spodoptera praefica*) and alfalfa caterpillar (*Colias eurytheme*) control in established alfalfa.

MATERIALS AND METHODS: Experimental and commercial insecticides were applied to a moderate population of beet armyworm (BAW), western yellowstriped armyworm (WYSAW) and the alfalfa caterpillar (AC) on August 18, 2009 in an established alfalfa field near Tracy, San Joaquin County, (Table 1). Plots were 10 ft by 30 ft arranged in a randomized complete block design with four replicates. Treatments were applied broadcast foliar with a CO₂ backpack sprayer at 32 psi 20 gpa water using 8002VS nozzles. Alfalfa was 8-12 inch height. Larva pre-counts were as follows: BAW = 2.2/sweep, WYSAW = 0.53/sweep and AC = 1.23/sweep. Post treatment evaluation counts were made by dividing the plots into segments so a new area was swept on each evaluation 3, 7 and 10 days after treatment (DAT). Five 180° sweeps were made per segment/evaluation and emptied into a yellow tray for counting on site. Data recorded as number per sweep.

Table1 - Treatment list

Treatment	Formulation	Rate Lb Ai/A	Rate Fl Oz/A
1.Voliam Express	15% ZC	0.05	5.0
2.Voliam Express	15% ZC	0.07	7.0
3.Voliam Express	15% ZC	0.09	8.9
4.Warrior II	25% CS	0.02	1.26
5.Warrior II	25% CS	0.03	1.92
6.Warrior	1 CS	0.03	3.84
7.Steward	1.25 SC	0.1	10.0
8.Coragen	1.67 SC	0.14	10.7
9.Lorsban Advanced + Latron B-1956	3.755 E + 100% EC	0.9	32.0 + 0.125% V/V
10.Belt + No Foam A	39% SC	0.05	2.0 + 0.25% V/V
11.Belt + No Foam A	39% SC	0.1	4.0 + 0.25% V/V
12.Untreated Control			
13.Intrepid + Latron B-1956	2.0 F	0.12	8.0 + 0.125% V/V
14.Radiant + Latron B-1956	12% SC	0.04	5.0 + 0.125% V/V
15.DPX HGW86	10% SE	0.09	13.5
16.DPX HGW86 + MSO	10% SE	0.09	13.5 + 0.5% V/V

RESULTS AND DISCUSSION:

Voliam Express: Good control of the BAW at the .07 (82%) and .09 (81%) fl oz rates. WYSAW control (96, 100, 98%) and AC control (100, 97, 100 %) was excellent at all three rates.

Warrior II: BAW control unacceptable (21 and 41%) at both rates. However, there was excellent control of the WYSAW (91 and 100%) and AC (97 and 100%) at both rates.

Warrior: Gave unacceptable control of the BAW (5%) and less than Warrior II while providing excellent control of the WYSAW (99%) and AC (97%).

Steward: Acceptable control of the BAW (90%) did not occur until the 7 DAT evaluations. Excellent control of the WYSAW (99%) and AC (97%) occurred up to 10 days after treatment.

Coragen: Provided excellent control of all three lepidopteron species (92, 99,100%) for up to 10 days after treatment.

Lorsban Advanced: Results were 100% control of all three species for the 3,7,10 days after treatment.

Belt: Both rates provided 100% control of all three species for the 3,7,10 days after treatment.

Intrepid: Gave excellent control of the BAW (90%) and AC (97%) but unacceptable control of the WYSAW (73%).

Radiant: No control of the BAW at the 3 DAT evaluations but control was excellent (100 and 89%) at the 7 and 10 DAT evaluations. Control was unacceptable for the WYSAW (52%) but control was excellent for the AC (100%).

DPX HGW86: Control was excellent for the BAW (100%), WYSAW (99%) and AC (100%) up to the 10 DAT evaluations with and with out MSO.

Table2 -Lepidoptera larva control in established alfalfa

Treatment	LB AI/A	<-----% Control Days after Treatment ----->											
		<----- BAW* ----->				<----- WYSAW** ----->				<----- AC*** ----->			
		3	7	10	AVG	3	7	10	AVG	3	7	10	AVG
1.Voliam Express	0.05	82	80	44	67	100	93	96	96	100	100	100	100
2.Voliam Express	0.07	100	80	67	82	100	100	100	100	91	100	100	97
3.Voliam Express	0.09	93	60	89	81	100	98	96	98	100	100	100	100
4.Warrior II	0.02	29	0	33	21	100	98	96	98	91	97	100	97
5.Warrior II	0.03	68	0	56	41	98	100	96	98	100	100	100	100
6.Warrior	0.03	14	0	0	5	100	98	100	99	91	100	100	97
7.Steward	0.1	0	80	100	60	100	100	96	99	91	100	100	97
8.Coragen	0.14	96	80	100	92	100	100	96	99	100	100	100	100
9.Lorsban Advanced	0.9	100	100	100	100	100	100	100	100	100	100	100	100
10.Belt	0.05	100	100	100	100	98	100	100	99	100	100	100	100
11.Belt	0.1	100	100	100	100	100	100	100	100	100	100	100	100
12.UTC		0	0	0	0	0	0	0	0	0	0	0	0
13.Intrepid	0.12	71	100	100	90	87	40	92	73	91	100	100	97
14.Radiant	0.04	0	100	89	63	67	60	29	52	100	100	100	100
15.DPX HGW86	0.09	100	100	100	100	100	93	100	98	100	100	100	100
16.DPX HGW86+MSO	0.09	93	100	100	100	100	100	100	100	100	100	100	100
LSD (P=.05)		3.36	0.74	0.58		2.45	1.28	0.56		0.28	0.07	0.04	

* BAW = Beet Armyworm

** WYSAW = Western Yellowstriped Armyworm

*** AC = Alfalfa Caterpillar

Trial 12 - **Alfalfa Lepidoptera Worm Complex Control in Established Alfalfa** Mick Canevari, Randall Wittie, Don Colbert, Scott Whiteley

OBJECTIVE: Evaluate new insecticides with fewer impacts on water quality for beet armyworm (*Spodoptera exigua*) control in established alfalfa.

MATERIALS AND METHODS: Experimental and commercial insecticides were applied to a moderate population of beet armyworm (BAW) on September 11, 2009 in an established alfalfa field near Tracy, San Joaquin County, (Table 1). Plots were 10 ft by 30 ft arranged in a randomized complete block design with four replicates. Treatments were applied broadcast foliar with a CO₂ backpack sprayer at 32 psi 20 gpa water using 8002VS nozzles. Alfalfa was 14-16 inch height. Larva pre-counts were as follows: BAW = 2.7/sweep. Post treatment evaluation counts were made by dividing the plots into segments so a new area was swept on each evaluation 3, 6 and 11 days after treatment (DAT). Five 180° sweeps were made per segment/evaluation and emptied into a yellow tray for counting on site. Data recorded as number per sweep.

Table1 - Treatment list

Treatment	Formulation	Rate Lb Ai/A	Rate Fl Oz/A
1.Voliam Express	15% ZC	0.09	8.9
2.Warrior II	25% CS	0.03	1.92
3.Steward	1.25 SC	0.1	10.0
4.Coragen	1.67 SC	0.07	5.0
5.Belt + No Foam A	39% SC	0.1	4.0 + 0.25% V/V
6.Intrepid + Latron B-1956	2.0 F	0.12	8.0 + 0.125% V/V
7.Untreated Check			

RESULTS AND DISCUSSION:

Voliam Express: Good control of the BAW.

Warrior II: Very poor control of the BAW (Avg % control 3).

Steward: Excellent control for 11 days after treatment.

Coragen: Excellent control early (93%) but residual control at 11 DAT was 58%.

Belt: Excellent control of the BAW for 11 DAT.

Intrepid: Gave excellent control of the BAW (97%) for 11 DAT.

Table 2 – Control of the beet armyworm with new insecticide chemistries.

Treatment	FIOz/A	3 DAT ¹		6 DAT		11 DAT	
		Larva/Sweep	%C ²	Larva/Sweep	%C	Larva/Sweep	%C
1.Voliam Express	8.9	0.7 b	87	0.8 b	82	1.4 bc	26
2.Warrior II	1.92	4.3 a	19	4.3 a	2	2.9 a	0
3.Steward	10.0	0.2 b	96	0.3 b	93	0.4 c	79
4.Coragen	5.0	0.3 b	94	0.3 b	93	0.8 bc	58
5.Belt + No Foam A	4.0 + 0.25% V/V	0.1 b	98	0.1 b	98	0.2 c	89
6.Intrepid + Latron B-1956	8.0 + 0.125% V/V	0.1 b	98	0.1 b	98	0.1 c	95
7.Untreated Check		5.3 a		4.4 a		1.9 ab	
LSD (P=.05)		1.47		1.56		1.43	

¹ DAT = Days After Treatment

² %C = % Control based on the Untreated Check

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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