DRY BEAN RESEARCH

INSECT, WEED CONTROL, VARIETY TRIALS 2007

SAN JOAQUIN COUNTY

Cooperative Extension University of California
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2007 DRY BEAN

RESEARCH PROGRESS REPORT

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San Joaquin County

ACKNOWLEDGEMENTS

The 2007 dry bean research program for San Joaquin County was conducted on Baby Limas, Fava, Lupines, Garbanzo, and Dark Red Kidney beans. Research was conducted on variety evaluations, weeds, lygus and spider mites. The cooperation and management assistance of Larry Celle, Bill Machado, Gary Merwin, Richard Rodriguez, Myron Yamasakie, Steve Temple and UC Davis staff are greatly appreciated. Many thanks are extended to them for their assistance, interest and patience.

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Caution

This report is a summary of dry bean insect control; weed control and variety studies conducted in San Joaquin County. **It should not in any way be interpreted as a recommendation of the University of California but rather a guide as to the progress in finding solutions to problems.**

Insecticide and herbicide 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.

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

Trade Name	Common Name	Company
Insecticides		
Acramite	bifenazate	Crompton Uniroyal
Agri-Mek	abamectin	Syngenta
GWN-1708	----------	Gowan
Steward	indoxacarb	DuPont
Comite	propargite	Crompton Uniroyal
Oberon	spiromesifen	Bayer
Onager	hexythiazox	Gowan
Warrior	lambda-cyhalothrin	Syngenta
Herbicides		
Basagran	bentazon	BASF
Caparol	prometryn	Syngenta
Chateau	flumioxazin	Valent
FirstRate	cloransulam	Dow
Goal Tender	oxyfluorfen	Dow
Matrix	rimsulfuron	Dupont
Prowl	pendimethalin	BASF
Python	flumetsulam	Dow
Raptor	imazamox	BASF
Sencor	metribuzin	Bayer
Spartan	sulfentrazone	FMC

Trial I. PPI, Pre-emergent and Post Emergent Herbicides for Weed Control in Bush Baby Lima Beans. Mick Canevari, Don Colbert, Scott Whiteley and Randall Wittie

OBJECTIVE: Evaluate several PPI, pre and post emergent herbicides for weed control and crop tolerance in bush baby lima beans.

MATERIALS AND METHODS: The following herbicides were applied June 12, 2007 PPI to bush baby lima beans var. "Luna" planted June 14, 2007 on the Bill Machado farm located near Linden, CA: (1) Chateau 51WG 0.047 lb ai/A + Dual II Magnum 7.64 EC 1.0 lb ai/A, (5) FirstRate 84 WG 0.04 lb ai/A and (6) Python 80 WG 0.05 lb ai/A. The following treatment was applied pre-emergent on June 19, 2007: (2) Chateau 51 WG 0.094 lb ai/A + Dual II Magnum 7.64 EC 1.0 lb ai/A. The following treatments were applied post emergence (pre-bloom) on August 8, 2007: (3) FirstRate 84 WG 0.008 lb ai/A and (4) FirstRate 84 WG 0.016 lb ai/A. No Foam A at 0.25% V/V was added to the post emergent treatments. Plots were 5 ft x 25 ft and replicated four times. Treatments were applied with a CO_2 backpack sprayer at 35 psi in 20 gpa water. Crop tolerance and weed control evaluations were made at various intervals after treatments.

RESULTS AND DISCUSSIONS:

PPI Treatment Results: Chateau + Dual II Magnum were safe to baby Lima beans as a PPI treatment. Slight stunting of the beans occurred at 36 days after treatment but beans had grown out of this by the 84 day rating. Chateau + Dual II Magnum did not provide adequate control of wild radish. FirstRate and Python were safe to the baby Lima beans and also provided commercially acceptable control of wild radish. Control for both materials was 84 and 82 % respectively. (Table I)

Preemergence Treatment Results: Chateau + Dual II Magnum resulted in slight stunting (3%) 29 DAT. No stunting was observed at the 84 DAT rating. No other visible effects on the beans were observed with this treatment. Wild radish control was only 50% at 36 DAT. The bean field was cultivated by the Grower after this rating. (Table II)

Post Emergence Treatment Results: FirstRate at 0.008 and 0.016 lb applied pre-bloom to beans resulted in no visible signs of chlorosis, necrosis or stunting at 7 and 27 DAT. No wild radish was observed in the test area after the field was cultivated. Therefore, no rating was taken for wild radish control from the post emergence application. (Table III)

Table I. Phytotoxicity[1] & Weed Control[2] Days After Treatment

PPI Treatments Rate = lb ai/A.		PhyGen[3] 20	PhyGen 43	PhyStu[4] 36 84	PhyChlo[5] 84	PhyNec[6] 84		Radish Control 36
Chateau 0.047 lb + Dual II Mag 1.0 lb		0	0	2 0	0	0		4
FirstRate 0.04 lb		0	0	1.3 0	0	0		84
Python 0.05 lb		0	0	0 0	0	0		82

Table II. Phytotoxicity & Weed Control Days After Treatment

Preemergence TRT Rate = lb ai/A.		PhyGen 13	PhyGen 36	PhyStu 29 84	PhyChl 84	PhyNec 84		Radish Control 36
Chateau 0.094 lb + Dual II Mag 1.0 lb		0	0	2.8 0	0	0		50

Table III. Phytotoxicity Days After Treatment

PostEmergence TRTS Rate = lb ai/A.		PhyChl 7 27	PhyNec 27	PhyStu 27
FirstRate 0.008 lb		0 0	0	0
FirstRate 0.016 lb		0 0	0	0

[1] Phytotoxicity = 0 None, 100 % Plant dead.
[2] Weed Control = 0 No Control, 100 % Complete Control
[3] PhyGen = General Phytotoxicity of the Entire Plant
[4] PhyStu = Phytotoxicity Stunting of the Plants
[5] PhyChl = Phytotoxicity Chlorosis of the Leaves
[6] PhyNec = Phytotoxicity Necrosis of the Leaves

Trial II. <u>Pre-emergent and Post Emergent Herbicides for Weed Control in Garbanzos.</u> Mick Canevari, Don Colbert, Scott Whiteley and Randall Wittie

OBJECTIVE: Evaluate several pre-emergent and post emergent herbicides for weed control in garbanzos in San Joaquin County.

MATERIALS AND METHODS: The following herbicides were applied pre-emergent on Nov. 30, 2006 to garbanzo beans planted Nov. 23, 2006 on the UC Davis Agronomy Farm: (1) Prowl 3.8 CS 1.5 lbai/A + Sencor 75 DF 0.25 lbai/A, (2) Prowl 3.8 CS 1.5 lbai/A + Goal Tender 4 F 0.25 lbai/A, (3) Prowl 3.8 CS 1.5 lbai/A + Sencor 75DF 0.125 lbai/A + Goal Tender 4 F 0.125 lbai/A, (4) Untreated Control. The following herbicides were applied post emergent on April 18, 2007 to the garbanzos planted Nov. 23, 2006 on the UC Davis Agronomy Farm: (5) Python 80 WG 0.025 lbai/A, (6) Python 80 WG 0.05 lbai/A, (7) FirstRate 84 WG 0.008 lbai/A, (8) Raptor 1 SL 0.047 lbai/A. No Foam A at 0.25% V/V included with the post treatments. Plots were 5 ft x 25 ft and replicated three times. Treatments were applied with a CO_2 backpack sprayer at 35 psi in 20 gpa water. Crop tolerance evaluations were made at 19, 40, 70 and 91 days after the pre-emergent application. Crop tolerance evaluations were made at 7, 21 and 35 days after the post application. Yield data taken July 3, 2007.

RESULTS AND DISCUSSION:

<u>Preemergent Treatments</u> Prowl + Sencor at 1.5 + 0.25 lb ai did not impact the garbanzo stand nor was it injurious to the garbanzo plants. However, Prowl + Goal Tender at 1.5 + 0.25 lb ai resulted in unacceptable phytotoxicity at 40 DAT but had grown out of most of the injury by the 70 and 91 DAT evaluation. Stand was not impacted by the Prowl + Goal Tender treatment. Unacceptable necrosis resulted from Prowl + Sencor + Goal Tender at 1.5 + 0.125 + 0.125 lb ai at 40 DAT. Plants had grown out of the injury as well as some slight stunting by the 70 and 91 DAT evaluations. Slight stand reduction was noted with the Prowl + Sencor + Goal Tender treatment. (Table I)

<u>Post emergent Treatments</u> A crop tolerance rating 7 DAT indicated Python at 0.025 and 0.05 lb ai, FirstRate at 0.008 lb ai and Raptor at 0.047 lb ai resulted in some chlorosis but was commercially acceptable while Raptor had significantly more than Python or FirstRate. Firstrate and Raptor had significantly more necrosis than Python. No treatment resulted in plant stunting at 7 DAT. At 21 DAT, Raptor had commercially unacceptable chlorosis and all treatments were showing some necrosis as well as slight stunting. Raptor was the only treatment resulting in unacceptable injury at 35 DAT. The best yield was from the FirstRate treatment but even this was significantly less than the Untreated Check. Yields were severely impacted by Python at 0.025 and 0.05 lb ai, FirstRate at 0.008 lb ai and Raptor at 0.047 lb ai. The Untreated Check had significantly higher yields than all 4 treatments. Python had smaller seed than FirstRate or Raptor or the Untreated Check. Firstrate and Raptor had seed slightly smaller than the Untreated Check. (Table II)

Table I. Effect of preemergent herbicides for crop tolerance on garbanzos.

Treatment	Rate lbai/A	Stand[2]	---Phytotoxicity (DAT)[1] --- Nec 40	Stunt 40	Nec 70	Stunt 70	Stunt 91	Yield lb/Acre	Seed Per OZ
Prowl 3.8CS Sencor 75DF	1.5 0.25	24a	0b	2c	0b	0b	0b	1208ab	76bc
Prowl 3.8CS Goal Tender 4F	1.5 0.25	22a	37a	57a	8a	6a	7a	1394a	73c
Prowl 3.8CS Sencor 75DF Goal Tender 4F	1.5 0.125 0.125	13a	33a	18b	0b	0b	0b	1220ab	74c
Untreated Check		27a	0b	0c	0b	0b	0b	1022ab	66c
LSD (P=.05)		14	5.52	9.42	2.88	1.53	2.88	516.29	11.2

[1]DAT = Days After Treatment, Phytotoxicity 0 = no injury, 100 = plant dead

[2] Stand = Average number plants per 2 rows by 25ft.

Table II Effect of post emergent herbicides for crop tolerance in garbanzos.

Treatment	Rate lbai/A	Phytotoxicity[1] CHL	NEC	STU	Yield lbs/Acre	Seed Per OZ
Python 80WG	0.025	10	14	5	267c	101a
Python 80WG	0.05	8	10	5	290c	86b
FirstRate 84WG	0.008	9	19	7	836b	76bc
Raptor 1SL	0.047	26	25	8	109c	73c
Untreated Check		0	0	0	1278ab	67c
LSD (P=.05)					516.29	11.2

[1] Phytotoxicity (Avg 3 Ratings 7, 21 and 35 DAT) = 0 none, 100 plant dead. CHL = Chlorosis, NEC = Necrosis, STU = Stunting

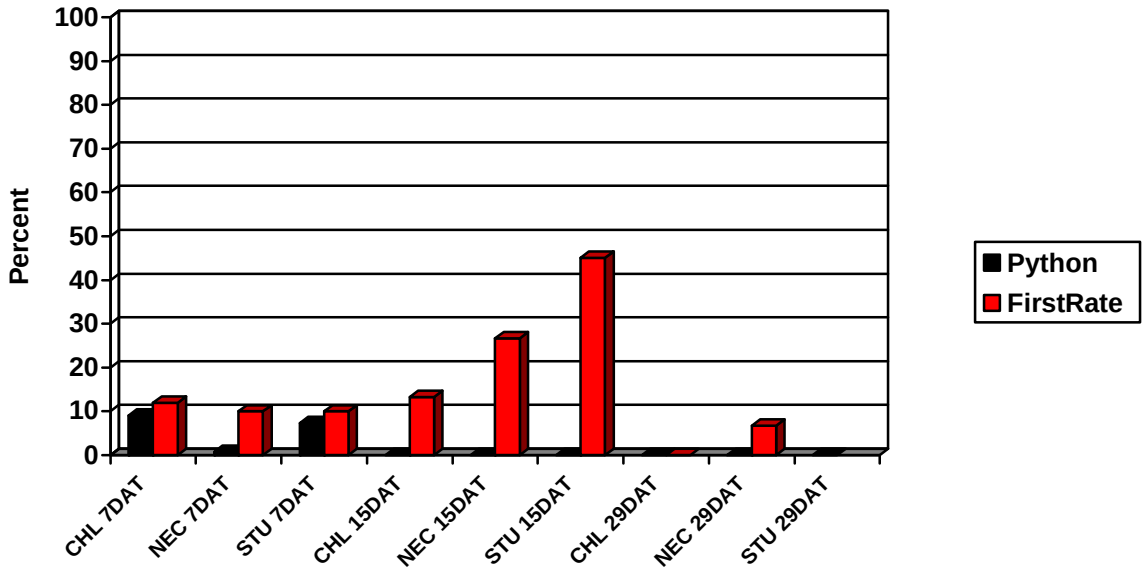
Trial III. **Post Emergent Herbicides for Weed Control in Garbanzos.** Mick Canevari, Don Colbert, Scott Whiteley and Randall Wittie

OBJECTIVE: Evaluate two new post emergent herbicides for weed control and crop tolerance in garbanzos.

MATERIALS AND METHODS: The following herbicides were applied May 1, 2007 post emergent to garbanzos planted on the Richard Rodriguez farm on Hwy 88 east of Stockton: (1) Python 80WG 0.05 lbai/A, (2) FirstRate 84WG 0.024 lbai/A, (3) Untreated Check. No Foam A (NIS) at 0.25% V/V was added to both herbicides. Plots were 5 ft x 10 ft and replicated 3 times. Treatments were applied with a CO_2 backpack sprayer at 35 psi in 20 gpa water. Garbanzos were 8" in diameter and 9" ht. when sprayed. Crop tolerance evaluations were made 7, 15 and 29 days after treatment (DAT). Plots were harvested August 8, 99 DAT.

RESULTS AND DISCUSSIONS: The 7 DAT rating indicated FirstRate to be slightly more injurious to the garbanzos than Python. There was slightly more chlorosis, necrosis and stunting with FirstRate than Python. Necrosis was significantly more with FirstRate than Python. FirstRate had significantly more injury in the form of chlorosis, necrosis and stunting than Python at 15 DAT. By 29 DAT FirstRate had grown out of some of the injury but still was showing about 18% stunting while Python showed no visible signs of injury in any form. (Figure I)

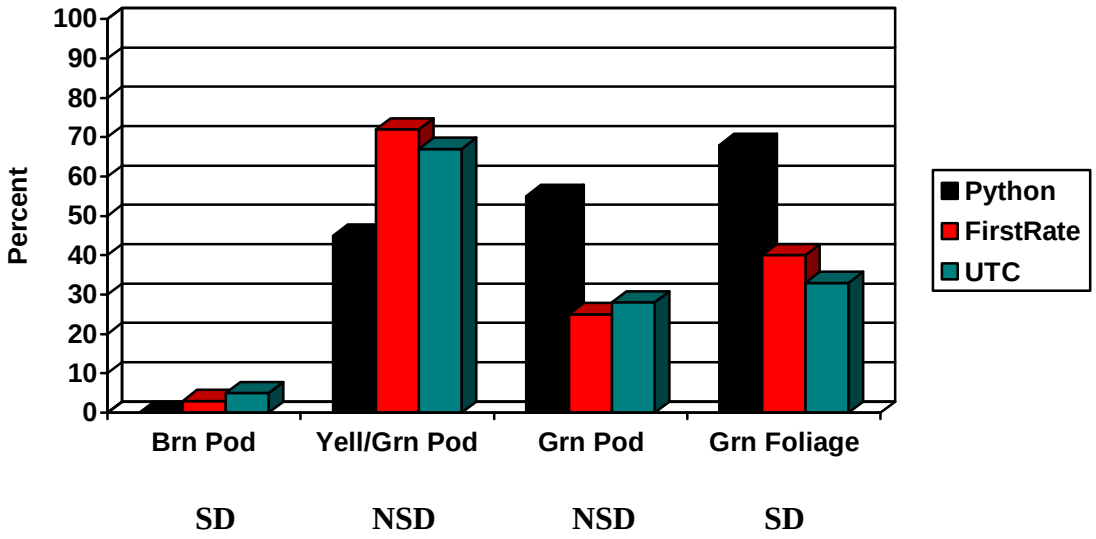
Figure I. Crop tolerance of Python and FirstRate on garbanzos.



CHL = Chlorosis, NEC = Necrosis, STU = Stunting

At 50 DAT, a rating was made on maturity which included pod color as well as foliage color. Pod color was rated as brown, yellow/green or green. Foliage was rated as percent of total foliage that was still green. The rating indicated that even though Python had less visible phytotoxicity symptoms than FirstRate the treatment delayed maturity. Python had 68% green foliage which was significantly more than FirstRate at 40% green foliage. There were less green pods and more yellow/green and brown pods in the FirstRate treatment than the Python treatment. (Figure II)

Figure II. Post emergent herbicide effects on crop maturity.



Yield was not impacted by Python or FirstRate. Python averaged 1335.8 lb/A., FirstRate averaged 1393.9 lb/A and the untreated check averaged 1335.8 lb/A. Also, there was no significant difference between the three treatments for seed size as measured by counting the seed per oz. Python had 83.7 seed/oz, FirstRate had 76.7 seed/oz and the untreated had 81.7 seed/oz.

Trial IV. <u>Pre-emergent Herbicides for Weed Control in Fava Beans.</u> Mick Canevari, Don Colbert, Scott Whiteley and Randall Wittie

OBJECTIVE: Evaluate several pre-emergent herbicides for weed control in fava beans in San Joaquin County.

MATERIALS AND METHODS: The following herbicides were applied pre-emergent to fava beans planted November 13, 2006 on the Larry Celle farm located at Jack Tone and Fanning Road east of Stockton: (1) Untreated Check, (2) Prowl H20 1.5 lbai/A, (3) Sencor 75DF 0.38 lbai/A, (4) Matrix 25 SG 0.047 lbai/A, (5) Caparol 4L 2.0 lbai/A, (6) Spartan 75DF 0.25 lbai/A, (7) Dual II Magnum 2.5 lbai/A, (8) Sencor 75DF + Prowl H20 0.25 + 1.0 lbai/A, (9) Sencor 75DF + Matrix 25SG 0.25 + 0.047 lbai/A, (10) Sencor 75DF + Dual II Magnum + Prowl H20 0.25 + 2.0 + 1.0 lbai/A, (11) Matrix 25SG + Prowl H20 1.0 lbai/A. Plots were 10 ft x 10 ft and replicated two times. Treatments were applied with a CO_2 backpack sprayer at 35 psi in 20 gpa water. Crop tolerance and weed control evaluations were made at 24, 49, 79, 107 and 147 days after treatment.

RESULTS AND DISCUSSIONS: Stand counts were made at 24 and 49 days after application by counting all emerged plants per plot. There were no significant differences between treatments at both timings. However, Matrix alone and Matrix + Prowl H20 had fewer plants per plot than the rest of the treatments. (Table I)

Prowl H20, Dual II Magnum and Sencor + Dual II Magnum + Prowl H20 had unacceptable foliar injury which was in the form of necrotic spots on the leaves as well as black lesions on the undersides of the leaves at the 49 day evaluation. (Table II) Excellent control of chickweed and annual bluegrass was obtained with all treatments. Excellent wild radish control was obtained with Prowl H20, Sencor, Sencor + Prowl, Sencor + Matrix, Sencor + Dual II Magnum + Prowl and Matrix + Prowl H20. (Table III)

Prowl H20, Sencor + Matrix and Matrix + Prowl H20 had unacceptable foliar injury at 79 DAT. All treatments were providing excellent control of chickweed and annual bluegrass. Excellent control of wild radish was provided by Prowl H20, Matrix, Spartan, Sencor + Prowl H20, Sencor + Matrix, Sencor + Dual II Magnum + Prowl H20 and Matrix + Prowl H20. (Table III)

A rating made 147 days after treatment indicated treatments with Matrix provided unacceptable injury to the beans. Matrix treatments reduced the stand as well as stunting the plants that remained.

Table I. <u>Fava bean stand counts following pre-emergent herbicide application.</u>

Treatment Rate lb ai/A.	Stand[1] 24 DAT[2]	Stand[1] 49 DAT
1. Untreated Check	12.0 a	18.0 a
2. Prowl 1.5	16.5 a	24.5 a
3. Sencor 0.38	13.5 a	18.0 a
4. Matrix 0.047	7.5 a	13.5 a
5. Caparol 2.0	14.5 a	18.0 a
6. Spartan 0.25	14.0 a	16.5 a
7. Dual II Mag 2.5	17.5 a	23.5 a
8. Sencor 0.25 Prowl 1.0	15.5 a	21.5 a
9. Sencor 0.25 Matrix 0.047	17.0 a	21.5 a
10. Sencor 0.25 Dual II M 2.0 Prowl 1.0	20.0 a	25.0 a
11. Matrix 0.047 Prowl 1.0	9.0 a	15.0 a
LSD (P=.05)	10.23	11.04
CV	32.17	19.21

1 Stand = Plants per 30 row Ft 2 DAT = Days After Treatment

Table II. Effect of pre-emergent herbicides for crop tolerance in fava beans.

	----------Phytoxicity[1]----------			
Treatment Rate lb ai/A.	49 DAT	79 DAT	107 DAT	147 DAT
1. Untreated Check	0 c	0 c	0 b	0 b
2. Prowl 1.5	30 a	33 ab	0 b	0 b
3. Sencor 0.38	0 c	8 c	0 b	0 b
4. Matrix 0.047	0 c	0 c	55 a	70 a
5. Caparol 2.0	0 c	0 c	0 b	0 b
6. Spartan 0.25	0 c	0 c	0 b	0 b
7. Dual II Mag 2.5	30 a	0 c	0 b	0 b
8. Sencor 0.25 Prowl 1.0	15 b	3 c	0 b	0 b
9. Sencor 0.25 Matrix 0.047	10 bc	38 a	45 a	75 a
10. Sencor 0.25 Dual II M 2.0 Prowl 1.0	30 a	28 b	3 b	0 b
11. Matrix 0.047 Prowl 1.0	0 c	35 ab	45 a	75 a
LSD (P=.05)	11.04	9.5	15.28	11.83

[1]Phytotoxicity = 0 none, 100 plant dead

Table III. Effect of pre-emergent herbicides for weed control in fava beans.

	WEED CONTROL[1]					
	Days After Treatment					
	Chickweed		Annual Bluegrass		Wild Radish	
Treatment Rate lb ai/A.	49	79	49	79	49	79
1. Untreated Check	0	0	0	0	0	0
2. Prowl 1.5	91	99	85	88	88	93
3. Sencor 0.38	98	100	99	99	100	75
4. Matrix 0.047	95	100	98	100	69	82
5. Caparol 2.0	100	100	97	99	60	32
6. Spartan 0.25	78	72	99	90	61	82
7. Dual II Mag 2.5	81	97	85	100	65	55
8. Sencor 0.25 Prowl 1.0	100	100	99	99	85	95
9. Sencor 0.25 Matrix 0.047	100	100	99	100	96	96
10. Sencor 0.25 Dual II M 2.0 Prowl 1.0	100	100	93	100	98	93
11. Matrix 0.047 Prowl 1.0	99	99	98	100	98	100

[1] Weed Control = 0 No Control; 100 Complete Control

Trial V. <u>Pre-emergent and Post Emergent Herbicides for Weed Control in Lupines.</u>
Mick Canevari, Don Colbert, Scott Whiteley and Randall Wittie

OBJECTIVE: Evaluate several pre-emergent and post emergent herbicides for weed control in lupines in San Joaquin County.

MATERIALS AND METHODS: The following herbicides were applied pre-emergent on Nov. 30, 2006 to lupines planted Nov. 23, 2006 on the UC Davis Agronomy Farm: (1) Prowl 3.8 CS 1.5 lbai/A + Sencor 75 DF 0.25 lbai/A, (2) Prowl 3.8 CS 1.5 lbai/A + Goal Tender 4 F 0.25 lbai/A, (3) Prowl 3.8 CS 1.5 lbai/A + Sencor 75DF 0.125 lbai/A + Goal Tender 4 F 0.125 lbai/A, (4) Untreated Control. The following herbicides were applied post emergent on April 18, 2007 to the garbanzos planted Nov. 23, 2006 on the UC Davis Agronomy Farm: (5) FirstRate 84 WG 0.016 lbai/A, (6) FirstRate 84 WG 0.024 lbai/A, (7) Raptor 1 SL 0.047 lbai/A, (8) Untreated Control. No Foam A at 0.25% V/V included with the post treatments. Plots were 5 ft x 25 ft and replicated three times. Treatments were applied with a CO_2 backpack sprayer at 35 psi in 20 gpa water. Crop tolerance evaluations were made at 19, 40, 70 and 91 days after the pre-emergent application. Crop tolerance and weed control evaluations were made at 7, 21 and 35 days after the post application. Yield data taken July 3, 2007.

RESULTS AND DISCUSSION:

Pre-emergent Treatments A stand count made 19 days after treatment (DAT) indicated no significant injury between the treatments and the untreated check. Prowl + Sencor numerically had fewer plants than the other treatments and the check. Prowl + Sencor + Goal Tender numerically had fewer plants than Prowl + Goal Tender and the untreated check. Prowl + Sencor and Prowl + Goal Tender were completely safe to lupines through 91 DAT. Prowl + Sencor + Goal Tender resulted in slight phytotoxicity and very slight stunting at 70 DAT but had completely grown out of the injury by the 91 DAT evaluations. Prowl + Goal Tender and the untreated check had the highest yields while Prowl + Sencor and Prowl + Sencor + Goal Tender had good yields but were slightly inferior to the untreated check. No significant differences observed for seed size as indicated by the number of seed per ounce for each treatment. (Table I)

Post Emergent Treatments FirstRate at both rates resulted in slight injury at 7 and 21 DAT. Raptor had unacceptable injury in the form of necrosis with some stunting but grew out of it by the 35 day rating. FirstRate at both rates had yields comparable to the untreated check while Raptor had significantly lower yields than both FirstRate and the untreated check. No significant difference between the treatments and the check for seed size as indicated by the number of seed per ounce per treatment. (Table II)

Table I. Effect of pre-emergent herbicides for crop tolerance in lupines.

Treatment	Rate lb ai/A	Stand[1] 19	Phytotoxicity[2] DAT[3] 70	70[4]	Yield lbs/Acre	Seed Per OZ
Prowl 3.8 CS Sencor 75 DF	1.5 0.25	103	0b	0	1464abc	81
Prowl 3.8 CS Goal Tender 4F	1.5 0.25	179	0b	0	1603ab	87
Prowl 3.8 CS Sencor 75 DF Goal Tender 4F	1.5 0.125 0.125	125	10a	5	1499abc	85
Untreated Check		184	0b	0	1615a	86
LSD (P=.05)		NSD	4.99	NSD	400.85	NSD

[1]Stand = number plants per 2 rows by 25ft.
[2]Phytotoxicity = 0 no injury, 100 plants dead
[3]DAT = days after treatment
[4]Stunting

Table II. Effect of post emergent herbicides for crop tolerance in lupines.

Treatment	Rate lb ai/A	Phytotoxicity[1] 35 DAT[2] NEC	STU	Yield lb/A	Seed Per OZ
FirstRate 84WG	0.016	0 b	0 b	1150 c	85 a
FirstRate 84WG	0.024	0 b	0 b	1208 bc	88 a
Raptor 1SL	0.047	33 a	22 a	383 d	95 a
Untreated Check		0 b	0 b	1266 abc	84 a
LSD (P=.05)		4.99	2.88	400.85	NSD

[1] Phytotoxicity = 0 no injury, 100 plant dead
[2] DAT = Days After Treatment

Trial VI. <u>Post Emergent Herbicide Timing for Weed Control in Lupines.</u> Mick Canevari, Don Colbert, Scott Whiteley and Randall Wittie

OBJECTIVE: Evaluate several post emergence herbicides for weed control in lupines.

MATERIALS AND METHODS: The following herbicides were applied early post emergence on Feb. 8, 2007 to lupines planted Nov. 30, 2006 on the Gary Merwin Farm near Clarksburg, CA: (1) Untreated Check, (2) Python 80WG 0.025 lbai/A, (3) Python 80WG 0.05 lbai/A, (4) FirstRate 84WG 0.008 lbai/A, (5) FirstRate 0.016 lbai/A and (6) Raptor 1 SL 0.032 lbai/A + Basagran 4EC 0.1875 lbai/A. The following herbicides were applied late post emergence on March 14, 2007 to the lupines planted Nov. 30, 2006 on the Gary Merwin Farm: (7) FirstRate 84 WG 0.008 lbai/A, (8) FirstRate 84 WG 0.016 lbai/A, (9) FirstRate 84 WG 0.024 lbai/A, (10) Raptor 1 SL 0.047 lbai/A + Basagran 4EC 0.1875 lbai/A, (11) Raptor 1 SL 0.047 lbai/A and (12) Untreated Check. No Foam A at 0.25% V/V included with all treatments. Plots were 10 ft x 20 ft and replicated three times. Treatments were applied with a CO_2 backpack sprayer at 35 psi in 20 gpa water. Stage of lupine at early post was seedling and late post was 1% bloom. Crop tolerance and weed control evaluations were made at 21, 34, and 69 days after the early post application and 7, 35, 48 and 70 days after the late post application.

RESULTS AND DISCUSSION:

<u>Early Post Results:</u> Python at both rates provided excellent control of wild radish but both rates resulted in unacceptable injury to the lupines. At the 69 day evaluation, no live lupine plants were observed in the Python plots. FirstRate at the 0.016 lb rate provided excellent control of the wild radish with very little effect on the lupines. The 0.008 lb rate was very safe to the lupine but radish control was not acceptable. Raptor + Basagran did not provide acceptable control of the radish but was safe to the lupines. (Table I)

<u>Late Post Results:</u> Python was not included in the late post application. A third rate of 0.024 lb ai/A was added to the treatment list for FirstRate. All three rates of FirstRate resulted in some chlorosis and stunting of the lupines but injury was acceptable. The 0.016 and 0.024 lb rates of Firstrate provided excellent control of wild radish. At the 70 day rating both rates were providing 95 to 100% control of radish. Raptor + Basagran and Raptor alone had unacceptable injury of the lupines and less than commercial control of radish. (Table II)

Table I. Effect of early post emergence herbicides on lupines and wild radish.

		-Phytotoxicity[1]--			-Wild Radish-		
		DAT[2]			Control DAT[3]		
Treatment	Rate Lb ai/A	21	34	69	21	34	69
1.Untreated Check		0	0	0	0	0	0
2.Python 80 WG	0.025	54	97	100	83	91	NR[4]
3.Python 80 WG	0.05	59	99	100	83	92	NR
4.Firstrate 84 WG	0.008	0	0	0	37	40	33
5.Firstrate 84 WG	0.016	0	2	15	78	90	93
6.Raptor 1 SL Basagran 4 EC	0.032 0.1875	10	4	1	27	28	67

[1] Phytotoxicity = 0% no injury, 100% plant dead
[2] DAT = Days After Treatment
[3] Wild Radish Control = 0% no control, 100% complete control
[4] Not Rated

Table II. Effect of late post emergence herbicides on lupines and wild radish.

		--Phytotoxicity[1]---				--Wild Radish----			
		DAT[2]				Control DAT[3]			
Treatment	Rate Lb ai/A	7	35	48	70	7	35	48	70
7.Firstrate 84WG	0.008	1	7	3	8	5	43	40	37
8.FirstRate 84WG	0.016	3	7	6	4	9	82	98	91
9.FirstRate 84WG	0.024	7	13	5	5	15	93	100	99
10.Raptor 1SL Basagran 4EC	0.047 0.1875	14	16	28	23	15	68	92	42
11.Raptor 1SL	0.047	3	23	44	21	13	43	77	23
12.Untreated Check		0	0	0	0	0	0	0	0

[1] Phytotoxicity = 0% no injury, 100% plant dead
[2] DAT = Days after Treatment
[3] Wild Radish Control = 0% no control, 100% complete control

Trial VII. **Two-Spot Spider Mite (*Tetranychus urticae*) Control in Dark Red Kidney Beans.** Mick Canevari, Randall Wittie

OBJECTIVE: Evaluate several acaricides for two-spot spider mite (Tetranychus urticae) control and crop safety in dark red kidney beans.

MATERIALS AND METHODS: The following materials were applied on July 13, 2007 to dark red kidney beans planted on the UC Davis Agronomy Farm: (1) Untreated Control, (2) GWN-1708 20FL 0.13 lb ai/A, (3) GWN-1708 20FL 0.209 lb ai/A, (4) Onager 1EC 0.12 lb ai/A, (5) Agri-Mek 0.15EC 0.009 lb ai/A, (6) Comite 6.55EC 2.46 lb ai/A, (7) Oberon 2SC 0.19 lb ai/A, (8) Acramite 4SC 0.75 lb ai/A, (9) Acramite 4SC 0.5 lb ai/A. No Foam A (NIS) at 0.25% V/V was added to treatments 2-7. Silwet L-77 (organo silicone surfactant) at 0.12% V/V was added to treatments 8 and 9. Plots were arranged in a randomized complete block design with four replicates. Plots were 4 rows (10 ft) x 25 ft. Treatments were applied with a CO_2 backpack sprayer at 40 psi in 35 gpa water using drop nozzles and one nozzle over the top. Bean stage at application was pre-bloom and 15 in. ht. Mite counts were made by selecting 10 leaves from the lower portion of the plants between the middle two rows of plots. Samples were bagged and brought to lab for brushing and counting. Pre-treatment counts averaged 3-11 spider mites per leaf. Post treatment counts were made at 4, 11, 18, 25 and 32 days after treatment (DAT).

RESULTS AND DISCUSSION: Two-spot spider mite (TSSM) motiles and eggs, predatory mites (*Galendromus* sp.), thrips (*Scolothrips sexmaculatus*), and the big-eyed bug (*Orius tristicolor*) were counted and recorded as number per leaf.

Four Days after Treatment. There were no significant differences between the untreated and the treatments for TSSM motiles and eggs per leaf. However, all treatments had fewer motiles and eggs per leaf than the untreated. Comite was the only treatment with bean injury which was acceptable. Injury was in the form of slight burning of the newer leaves.

Eleven Days after Treatment. Agri-Mek and Oberon were significantly the best treatments with 0.6 and 0.7 motiles/leaf respectively, compared to the Untreated Control which had 34.4 motiles/leaf. GWN-1708, Onager, Comite and Acramite were also giving acceptable control but were slightly inferior to Agri-Mek and Oberon. Egg deposition was least with Agri-Mek, Comite, Oberon and Acramite.

Eighteen Days after Treatment. Agri-Mek, Onager, Comite and Oberon provided excellent control of TSSM motiles and eggs. Acramite also provided good control but was slightly inferior to the 4 treatments but was superior to GWN-1708.

Twenty-five Days after Treatment. The Untreated Control counts were down due to cooler temperatures the previous days prior to this count. (Figure I) Agri-Mek and Oberon was superior to the remainder of the treatments for TSSM motile as well as egg

control. However, all treatments were providing significant control of the TSSM as compared to the Untreated Control.

Thirty-two Days after Treatment. Onager, Agri-Mek and Oberon are still holding motiles below 1/leaf. Oberon had less than 1.0 egg/leaf. Overall, Onager, Agri-Mek, Oberon, Comite and Acramite at 0.75 lb rate provided season long control of the TSSM in dark red kidney beans. (Table I and II)

Yields. The 2 middle rows of the 4 row plots were cut for yield evaluation. The fourth replicate was not included in the data summary because of poor plant vigor in the plots. Even though the mite count data showed excellent control in all plots of all treatments, yields were lower in the plots of the fourth replicate due to poor plant vigor. Agri-Mek had significantly the best yields as well as good seed size. (Table I)

Table I. Control of two-spot spider mite in dark red kidney bean.

			----------Motiles Per Leaf -- DAT[1] ----------						
Treatment	Lb ai/Acre	Pre-Counts	4	11	18	25	32	Yield Lb/Acre	Seed/ OZ
UTC		2.8 a	5.5a	34.4 a	85.6 a	51.5 a	90.2 a	1847 bc	72 a
GWN-1708	0.13	6.2 a	3.3a	15.6 b	29.9 b	23.0 b	35.8 b	2056abc	69 ab
GWN-1708	0.209	9.3 a	4.5a	7.9 c	16.1 c	8.1 bc	9.3 c	1742 c	72 a
Onager	0.12	7.7 a	3.4a	2.7 cd	0.9 d	1.8 c	0.7 c	1777 c	69 ab
Agri-Mek	0.009	7.4 a	5.1a	0.6 d	0.8 d	0.5 c	0.4 c	2474 a	64 c
Comite	2.46	8.6 a	3.8a	1.9 cd	1.0 d	2.1 c	1.1 c	2312 ab	65 bc
Oberon	0.19	6.8 a	2.2a	0.7 d	1.1 d	0.7 c	0.4 c	2184abc	69 abc
Acramite	0.75	12.2 a	5.1a	2.1 cd	3.0 d	6.4bc	1.6 c	1928 bc	72 a
Acramite	0.5	8.9 a	2.6a	6.2 cd	4.3 cd	6.0 c	5.3 c	2172abc	66 bc
	LSD (P=.05)	9.19	4.18	6.19	13.0	16.84	17.69	466.85	4.37
	CV							13.13	3.68

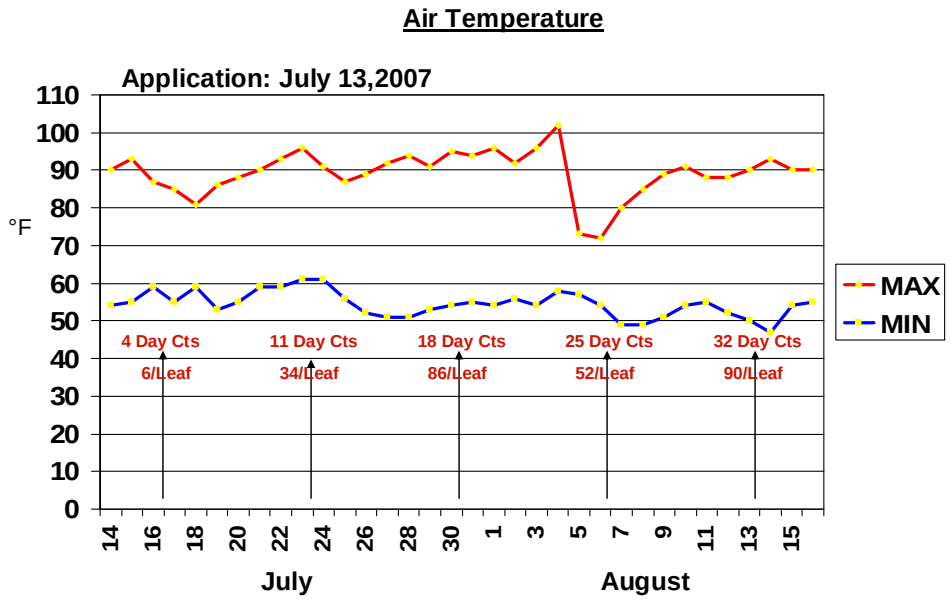
[1]DAT = Days after Treatment

Table II. Effects of acaricides on spider mite egg deposition.

			----------Eggs Per Leaf – DAT[1]----------				
Treatment	Lb ai/Acre	Pre-Counts	4	11	18	25	32
UTC		1.5 a	7.2 a	79.5 a	122.6 a	50.0 a	72.1 a
GWN-1708	0.13	4.8 a	1.8 a	26.6 bc	20.9 b	18.9 b	49.2 b
GWN-1708	0.209	3.6 a	3.7 a	11.1 cd	13.2 b	11.2 b	10.1 c
Onager	0.12	4.0 a	3.4 a	35.2 b	4.7 b	2.8 b	2.3 c
Agri-Mek	0.009	3.0 a	1.9 a	1.9 d	1.9 b	0.3 b	1.1 c
Comite	2.46	3.0 a	2.9 a	1.1 d	0.6 b	0.3 b	1.1 c
Oberon	0.19	3.4 a	1.7 a	2.9 d	0.8 b	0.7 b	0.4 c
Acramite	0.75	3.1 a	3.9 a	1.5 d	0.8 b	7.1 b	0.6 c
Acramite	0.5	4.6 a	3.0 a	3.2 d	3.2 b	7.5 b	2.9 c
	LSD (P=.05)	4.56	4.92	19.95	24.6	28.39	10.52

[1]DAT = Days after Treatment

Figure I DRK Bean Spider Mite Trial UCD 2007



Predator populations never increased in the untreated control to significantly reduce the TSSM population. Thrips were the predominant predator while a few Orius were counted in the treatments and only one or two predatory mites were observed.

Trial VIII **Bush Baby Lima Bean Variety Evaluation.** Mick Canevari, Randall Wittie, Steve Temple

OBJECTIVE: Evaluate two new bush baby lima bean varieties compared to existing commercial variety.

MATERIALS AND METHODS: The following two bush baby lima bean varieties were direct seeded on the Machado Farm near Linden, CA on May 25, 2007: (1)Var. 31, (2) Var. 124. The field variety was "Luna". Varieties were arranged in a randomized complete block design with 4 replicates. Plots were 5 ft X 25 ft with 2 rows per plot. The bean field with the varieties was cut on Sept.26. Plots were thrashed on Oct. 5 using the Belt thrasher from UC Davis.

RESULTS AND DISCUSSION: Several criteria were evaluated for seed quality. These included Lygus damage, skin cracks, worm damage, seed discoloration, seed size, cleanout, and yield. Variety 31 had the least amount of Lygus damage followed by Variety 124 and then Luna. There was no difference between the varieties for cracked skins. Worm damage was 0 for all three varieties. Variety 31 had about 1% more discolored seed than the other two varieties. There was no difference between varieties for number of seed per ounce. All three varieties had excellent cleanout. There was no significant difference between varieties for yield. However, Luna averaged 2.1 – 2.5 CWT more then the two new varieties. (Table I)

Table I. Seed quality and yield of two new bush bean varieties compared to "Luna".

Variety Name	%Lygus Damage	% Skin Cracks	% Worm Damage	% Seed Discoloration	% Cleanout	Yield CWT	Seed PerOZ
1. 31	0.8 a	0.8 a	0 a	2.3 a	2.8 a	29.4 a	69.8 a
2. 124	1.0 a	0.7 a	0 a	1.3 a	3.1 a	29.8 a	70.8 a
3. Luna	2.1 a	0.5 a	0 a	1.2 a	3.8 a	31.9 a	69.5 a
LSD (P=.05)	1.57	0.66	0	1.36	1.93	2.72	2.56
CV	69.76	57.79	0	49.04	34.41	5.19	2.12

Trial IX **Vine Baby Lima Bean Variety Evaluation.** Mick Canevari, Randall Wittie, Steve Temple, Chip Morris

OBJECTIVE: Evaluate a new vine baby lima bean variety compared to an existing commercial variety.

MATERIALS AND METHODS: The following vine baby lima (VBL) bean variety was direct seeded on the Myron Yamasaki Farm near Vernalis, CA on May 25, 2007: (1)Vine Baby Lima UC 279. The field variety was "Mezcla". Variety arranged in a randomized complete block design with 4 replicates. Plots were 5 ft X 25 ft with 2 rows per plot. The bean field with the variety was cut on Oct.28. Plots were thrashed on Nov.7 using the Belt thrasher from UC Davis.

RESULTS AND DISCUSSION: Several criteria were evaluated for seed quality. These included Lygus damage, skin cracks, seed discoloration, seed size, cleanout, and yield. There was no significant difference between UC 279 and Mezcla for lygus damage, yield or green pod seed weights. Green pod seed weights were obtained by collecting the green pods from the thrashed seed and brought to the lab and put in dryer overnight to be dried for thrashing. This evaluation was conducted to determine if the amount of seed recovered from the green pods was significant enough to allow the Grower to leave cut plants in the field long enough to allow the green pods to dry without risk of being damaged by rain storms since this was conducted late in the season. The Mezcla appeared to have more green pods than the UC 279. Therefore, seed recovered from the Mezcla averaged 144.5 lbs/acre while the UC 279 resulted in 86.5 lb/acre. There was no significant difference between the two varieties but results indicate the Mezcla had more green pods than UC 279. UC 279 had significantly more skin cracks. Mezcla had significantly more seed discoloration than UC 279. Cleanout was better with UC 279 than Mezcla. UC 279 had slightly larger seed than Mezcla which was indicated by the number of seed per oz. (Table I)

Table I. Seed quality and yield of a new VBL bean variety compared to "Mezcla".

Variety Name	%Lygus Damage	% Skin Cracks	% Seed Discoloration	% Cleanout	Yield CWT	Green Pod Seed Lb/A	Seed Per OZ
1.VBL UC 279	1.1 a	9.8 a	0.3 b	6.4 b	38.3 a	86.5 a	66.5 b
2. Mezcla	0.8 a	1.9 b	1.5 a	10.5 a	40.8 a	144.5 a	72.5 a
LSD(P=.05	5.36	1.15	3.83	2.88	3.98	78.77	60.48
CV	54.02	29.13	53.6	15.26	4.46	23.28	3.43

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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