2005 DRY BEAN

RESEARCH PROGRESS REPORT

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San Joaquin County

ACKNOWLEDGEMENTS

The 2005 dry bean research program for San Joaquin County was conducted on Baby Limas, Garbanzo, Canario and Kidney beans. Research was conducted on variety evaluations, weeds, lygus and spider mites. The cooperation and management assistance of Skip Foppiano, Keith and Hal Roberston, Richard Rodridguez, Frank Solari , 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, plant growth regulator, 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, herbicide and plant growth regulator 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.** Plant growth regulator rates expressed as **fluid ounces of product per treated acre.**

Trade Name	Common Name	Company
Insecticides		
Acramite	bifenazate	Crompton Uniroyal
Avaunt	indoxacarb	DuPont
Comite	propargite	Crompton Uniroyal
Dimethoate	dimethoate	Drexel
Oberon	spiromesifen	Bayer
Onager	hexythiazox	Gowan
Warrior	lambda-cyhalothrin	Syngenta
Plant Growth Regulators		
HappyGro	kinetin	LT BioSyn,Inc.
Headline	pyraclostrobin	BASF
MaxCel	6-benzyladenine (6BA)	Valent
MegaGro	cytokinin	LT BioSyn,Inc.
PhotoGro	Vit B complex boric acid zinc sulfate	LT BioSyn, Inc.
ReTain	aminoethoxyvinylglycine	Valent
Solubor	boron	
Herbicides		
Chateau	flumioxazin	Valent
Dual II Magnum	s-metolachlor	Syngenta
Matrix	rimsulfuron	DuPont
Outlook	dimethenamide-P	BASF
Prowl	pendimethalin	BASF
Raptor	imazamox	BASF

Trial 1 **Twospotted Spider Mite (*Tetranychus urticae)* Control in Baby Lima Beans.**
Mick Canevari, Randall Wittie & Scott Whiteley.

OBJECTIVE: Evaluate several miticides for the control of the twospotted spider mite (*Tetranychus urticae*) in baby lima bean.

MATERIALS AND METHODS: The following miticides were applied to baby lima beans var. "Luna" planted on the UC Davis Agronomy farm on July 15, 2005: (1) Acramite 75 WG 0.5 lb ai/A, (2) Acramite 75 WG 0.75 lb ai/A, (3) Acramite 4 SC 0.5 lb ai/A, (4) Acramite 4 SC 0.75 lb ai/A, (5) Comite 6.55 EC 2.46 lb ai/A, (6) Oberon 2 SC 0.19 lb ai/A, (7) Onager 1 EC 0.09 lb ai/A, (8) Onager 1 EC 0.13 lb ai/A and (9) Onager 1 EC 0.16 lb ai/A. Silwet L-77 at 0.12 % V/V was added to all treatments. Treatments were arranged in a randomized complete block design with four replicates. Plots were two 30" rows by 30 ft. The treatments were applied with a CO_2 backpack sprayer at 35 psi in 50 gpa of water using drop nozzles on each side of the plant and one nozzle over the top. Bean growth stage: early bloom, 14-18 inch height. Pre-count TSSM averaged 2-4 motiles/leaf, population located on the lower portion of the plant.

RESULTS AND DISCUSSION: Mite counts were taken pre, 6, 13, 21 and 31 days after treatment. Ten trifoliate leaves were selected from the lower portion of ten plants per plot and brought to the lab for counting. Ten single leaves were selected from the ten trifoliate leaves and brushed with a mite brushing machine. Two-spot spider mites (TSSM), predatory mites (*Galendromus* sp.) , thrips (*Scolothrips sexmaculatus*) and big-eyed bugs (*Orius tristicolor*) were counted and numbers recorded as per leaf. Pre-counts were made 1 day prior to application. Counts indicated a light non-uniform population of mites. Mites averaged 0.4 - 6.4 per leaf for the 10 treatments. No predatory mites or big-eyed bugs were observed in the pre-counts. Thrips averaged 3.2 - 7.4 per leaf. Counts made 6 days after application indicated all treatments were providing excellent control of the TSSM. Comite was the poorest with 79% control. Oberon provided 100% control while Onager provided 92, 90 and 97% control respectively. Acramite 4 SC provided 100 and 92 % control respectively while Acramite 75 WG provided 97 and 87% control respectively. No predatory mites were observed in any treatment and big-eyed bugs were noted in the Acramite and Onager treatments. Thrips were < 1 per leaf in all treatments. The check increased from 8 to14 mites per leaf between 6 and 13 days after treatment. All treatments were providing 97 to 100% control 13 DAT with Comite giving 83% control. Twenty-one days after application, Comite gave 79% control while the Acramite formulations provided 87 to 98% control of the TSSM. Oberon provided 97% control and the Onager treatment gave 98-100% TSSM control. In general predator activity was very low. Predatory mites were observed in the Acramite and Onager treatments (No Data). TSSM population (18.4/leaf) leveled off in the untreated plots 31 days after treatment. Comite provided 44% control while Oberon provided 94% control. Acramite 75 WG and 4 SC formulations at the 0.75 lb ai/A rate were still providing 95 and 90% control, respectively. At the 0.5 lb ai/A rate, Acramite 75 WG gave 75% TSSM control while the 4SC formulation resulted in 57% control. Onager treatments 31 DAT provided 75-89% TSSM control. Results indicate Oberon 2 SC at 0.19 lb ai/A provided the best overall control of the two-spotted spider mite in baby lima beans. Both Acramite formulations

(75WG and 4SC) were similar in controlling the TSSM. All three rates of Onager gave comparable control for 31 days (Table 1-a).

Yield data at harvest indicated no significant differences between the check and the treated plots. Treatment yields ranged 3920 - 4189 lbs/A. The untreated plots averaged 4145 lbs/A (Table 1-a).

Table 1-a Control of two-spot spider mite in bush baby lima beans.

			Control – DAT[1]				
Treatment[2]	Lb ai/Acre	Pre-Counts[3]	6	13	21	31	Yield Lb/Acre
Acramite 75WG	0.5	3 a	97	99	87	74	3928 a
Acramite 75WG	0.75	0.4 a	87	97	98	95	3971 a
Acramite 4SC	0.5	3 a	100	100	98	57	4051 a
Acramite 4SC	0.75	2 a	92	100	96	90	3920 a
Comite 6.55EC	2.46	2 a	79	83	79	44	4102 a
Oberon 2SC	0.19	1 a	100	100	97	94	3971 a
Onager 1EC	0.09	6 a	92	99	98	89	3986 a
Onager 1EC	0.13	3 a	90	100	100	83	4058 a
Onager 1EC	0.16	3 a	97	99	98	75	4189 a
Untreated Check		2 a					4145 a
	LSD	2.7					169.5

Means followed by the same letter do not significantly differ (P=.05)

[1] DAT – Days After Treatment

[2] All treatments included Silwet L-77 @ 0.12% V/V

[3] Average motiles per leaf prior to application.

Trial 2 <u>Control of the Western Tarnished Plant Bug with Warrior in California Black-eyes.</u> Mick Canevari, Don Colbert, Randall Wittie & Scott Whiteley.

OBJECTIVE: To evaluate Warrior for the control of the western tarnished plant bug (*Lygus hesperus)* in California blackeyes.

MATERIALS & METHODS: The following insecticides were applied to California Blackeyes on July 22 and August 5, 2005: (1) Untreated, (2) Warrior Zeon 1EC 0.03 lb ai/A at early bloom and pod set, (3) Warrior Zeon 1EC 0.03 lb ai/A, at early bloom and pod set (4) Dimethoate 2.67EC 0.5 lb ai/A at early bloom and pod set. Treatments were arranged in a randomized complete block design with four replicates. Plots were four 30" rows by 30 ft. The treatments were applied with a CO_2 backpack sprayer at 35 psi in 20 gpa of water. Crop growth stage prior to application: (1) July 22 early bloom and (2) August 5 pod set. Lygus counts were 0.75/sweep for the first application and 2/sweep for the second application.

RESULTS & DISCUSSION: Plots were harvested on September 29, 2005. Lygus counts were made on a weekly basis and just prior to treatments being made (Table2-a). During the early part of the growing cycle lygus populations were low and reached threshold levels of 0.5 & 1.0 / sweep on July 17. The first application was made on July 22 and the second application on August 5.

Treatments 2 and 3 were designed to have different timing schedules between bloom and pod fill but due to irrigations and overlapping bloom cycle and pod set, both plots received the same identical treatments.

Yield results were statistically different between warrior, dimethoate and the untreated. Two applications of warrior at bloom and pod set averaged 2632 lbs/A, 352 lbs higher than dimethoate treatments and 541 lbs more than the untreated (Table 2-a).

Seed quality was measured by evaluating 100 seed sample for lygus sting damage from replication III only. Replications I, II & IV were combined prior to seed assessment which made evaluation and statistical analysis for seed damage impossible.
Seed quality was greatly improved with the warrior treatments over dimethoate and the untreated plots. Pyrethroid insecticides have shown an increase in lygus control over the organophosphate insecticides resulting in higher yield and better quality beans.

Table 2-a <u>Yield and seed quality of California blackeyes treated for lygus control</u>.

Treatment	Yield (lb/A)	Lygus Damage Seed (%)
Untreated	2090.9	25.4
Warrior 0.03 lb ai/A	2737.0	3.4
Warrior 0.03 lb ai/A	2526.5	3.6
Dimethoate 0.5 lb ai/A	2279.6	10.7
LSD	249.35	

Trial 3 **Bush Baby Lima Bean -- Lygus Control and Variety Tolerance for Henderson and Luna.** Mick Canevari, Don Colbert, Randall Wittie & Scott Whiteley.

OBJECTIVE: Evaluate western tarnished plant bug (*Lygus hesperus)* control with Warrior on two bush baby lima bean varieties. Henderson and Luna are the industries two bush varieties. Research observations made in 2004 trials indicate an inherent difference of lygus tolerance expressed with Luna.

MATERIALS & METHODS: Two varieties of bush baby lima beans (Henderson and Luna) were planted May 27, 2005 on the UC Davis Agronomy farm arranged in a randomized complete block design. The following treatments were initiated on July 22, 2005: (1) Henderson Untreated Control (UTC), (2) Henderson treated with Warrior 1EC 0.03 lb ai/A at full bloom (**EARLY**), (3) Henderson treated with Warrior 1EC 0.03 lb ai/A at full bloom (**EARLY**) and pod set (**LATE**), (4) Henderson treated with Warrior 1EC 0.03 lb ai/A at pod set (**LATE**), (5) Luna Untreated Control, (6) Luna treated with Warrior 1EC 0.03 lb ai/A at full bloom (**EARLY**), (7) Luna treated with Warrior 1EC 0.03 lb ai/A at full bloom (**EARLY**) and pod set (**LATE**), (8) Luna treated with Warrior 1EC 0.03 lb ai/A at pod set (**LATE**). Plots were four 30" rows by 30 ft. The treatments were applied with a CO_2 backpack sprayer at 35 psi in 20 gpa of water. Lygus counts were 2/sweep on July 22 and 4/sweep on August 5.

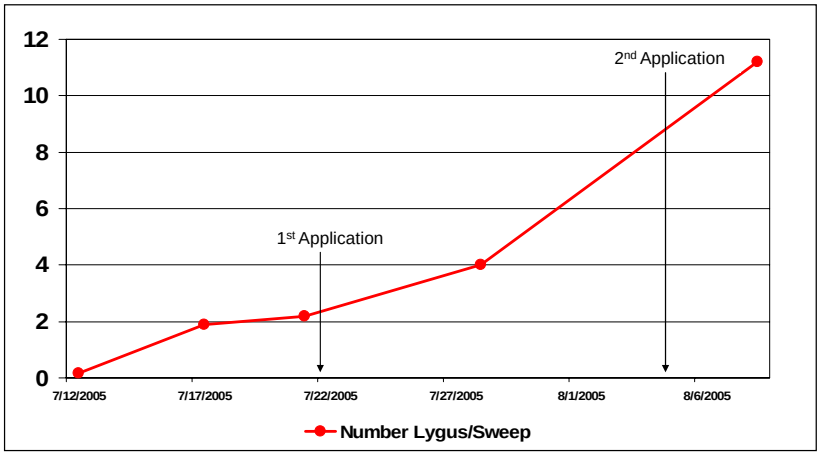
RESULTS & DISCUSSION: Lygus sweep counts were taken from 4 different locations in the test area on a 5 to 11 day interval starting July 12 with 40 sweeps resulting in 0.15 Lygus /sweep. The following lygus counts were from 10 sweeps: July 17 1.9/sweep, July 21 2.2/sweep, July 28 4.0/sweep and August 8 11.2/sweep (Figure 3-a).

Yields (lb/A) were taken on September 29, 2005. Area harvested was two 30" rows by 30 ft. Henderson untreated yields were significantly less than Luna untreated. Henderson treated with Warrior **EARLY** and **LATE** was numerically higher than the untreated but were not significantly different. Luna treated with Warrior **EARLY** and **LATE** was numerically better than the untreated as well as Henderson treated with Warrior (Figure 3-b). Henderson untreated yielded 2374 lbs/A while Luna untreated yields were 2984 lbs/A. Luna out yielded Henderson without any treatments for Lygus (Figure3-c).

Lygus seed damage was greater in the untreated check for both varieties than the Warrior treated plots. The Henderson UTC had 5.3% seed damage while the Luna UTC had 4.8% seed damage. Both varieties treated **EARLY** + **LATE** and plots treated only **LATE** had the least amount of seed damage. The best treatment in the Henderson variety was the **LATE** application of Warrior when there were more pods available for damage resulting in 2.3% seed damage while the **LATE** application on Luna provided 3.1% seed damage. Treatments with both applications, **EARLY** + **LATE,** on Henderson and Luna resulted in 3.1 and 2.9% seed damage, respectively. A single application of Warrior **EARLY** at full bloom resulted in 3.6% seed damage for Henderson and 4.1% seed damage for Luna (Figure 3-d).

Warrior applications to Henderson resulted in a significant yield increase with the **LATE** application more critical in preventing seed damage. There is a slight advantage in applying a **LATE** application of Warrior to Luna for lygus control which is very important for reducing seed damage. Luna yield seems to be less impacted by lygus feeding compared to the Henderson variety.

Figure 3-a Control of Lygus with warrior on Henderson and Luna lima bean.



1St Application = Full Bloom (EARLY)

2nd Application = Pod Fill (LATE)

Figure 3-b Yield of Henderson and Luna lima beans treated with warrior.

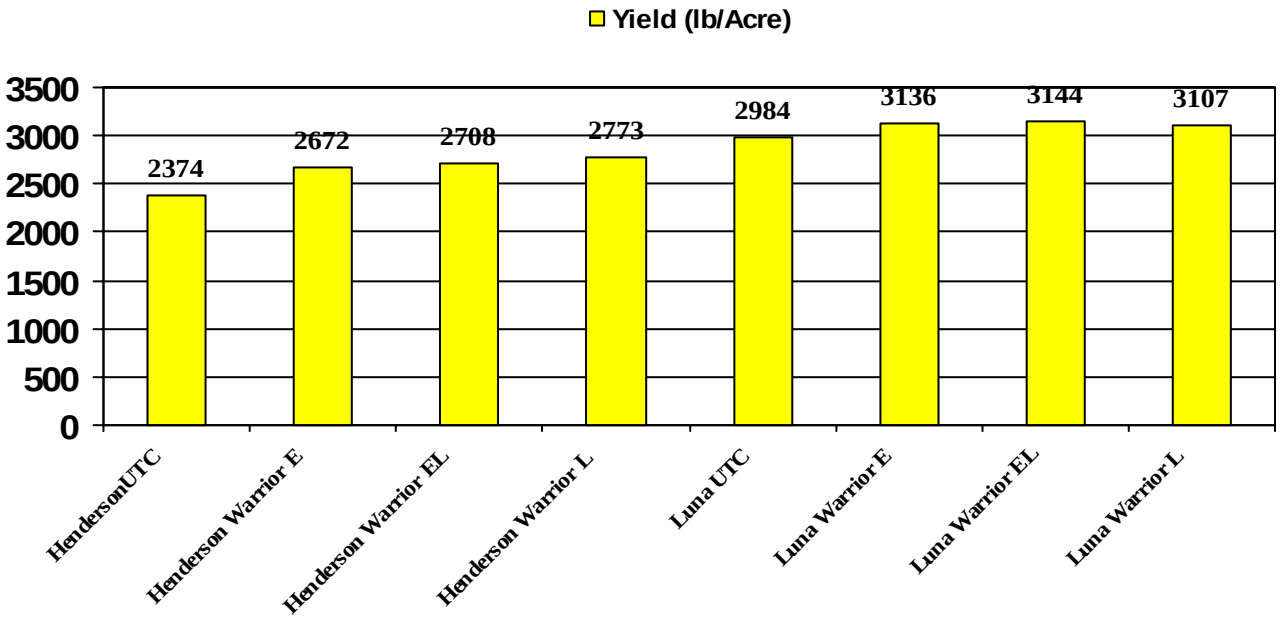


Figure 3-c Yield comparison between untreated Henderson and Luna lima bean.

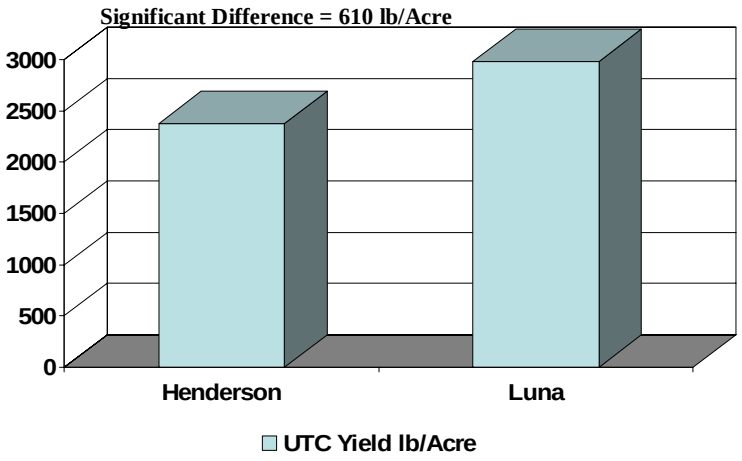
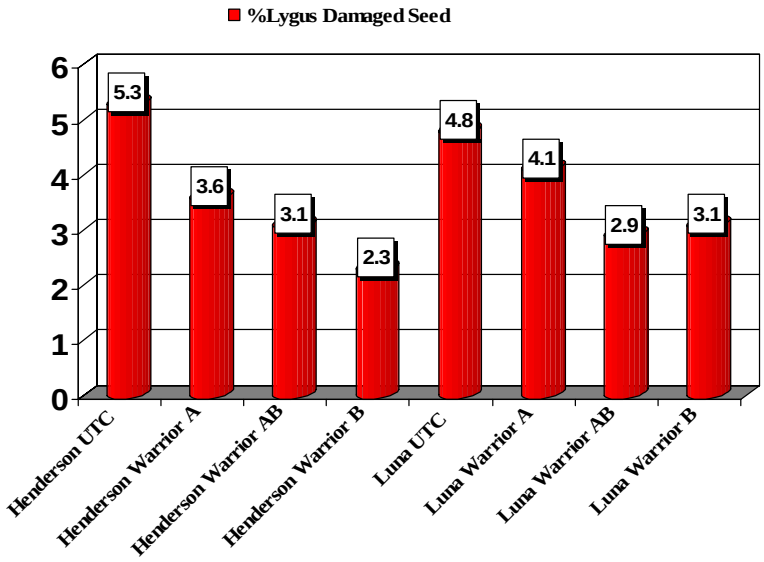


Figure 3-d Lygus damaged seed comparison between treated and untreated Henderson and Luna lima bean.



A = EARLY application of Warrior @ 0.03 lbai/A on 7/22 in 20 gpa of water.
B = LATE application of Warrior @ 0.03 lbai/A on 8/5 in 20 gpa of water.
UTC = Untreated Check.

Trial 4 **Control of Lygus with Avaunt on New Vine Baby Lima Bean Varieties (IPM).**
Mick Canevari, Don Colbert, Randall Wittie & Scott Whiteley.

OBJECTIVE: Evaluate an IPM management program for controlling the western tarnished plant bug (*Lygus hesperus)* on vine baby lima beans. Avaunt (indoxacarb) is a new softer chemistry considered environmentally less problematic than organophosphates and pyrethroids. New lygus tolerant varieties developed were compared with and without lygus control.

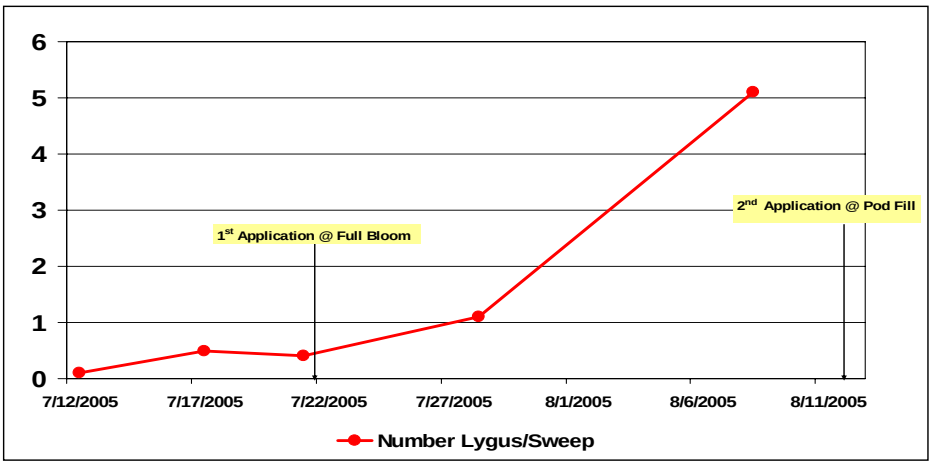
MATERIALS & METHODS: Four new UC vine varieties were evaluated for lygus tolerance. The standard test variety was Mezcala baby lima. The following bean varieties were planted on the UC Davis Agronomy farm on May 27, 2005: (1) 488 (04) 19, (2) 488 (04) 73, (3) 488 (04) 285, (4) 488 (04) 383, (5) 488 (04) 19, (6) 488 (04) 73, (7) 488 (04) 285, (8) 488 (04) 383, (9) Mezcala and (10) Mezcala. Plots 5-8 and 10 were treated with Avaunt 30WG 0.11 lbai/A on July 22nd and August 12th, 2005 for Lygus control. Plots 1-4 and 9 were not treated. Plots were arranged in a randomized complete block design with four replicates. Plots were four 30" rows by 30 ft. Treatments were applied with a CO_2 backpack sprayer at 35 psi in 20 gpa of water. Crop stage at application: July 22, blooming and August 12, pod set. Lygus pre-counts were 2/sweep.

RESULTS AND DISCUSSION: Lygus sweep counts were taken in four different locations in the test plot area beginning on July 12 and ending August 8 (Figure 4-a).

Yields (lb/A) were taken on September 29. Area harvested was two 30" rows by 30 ft. Varieties treated with Avaunt had slightly higher yields than the same varieties receiving no treatment. Cultivar 19, 73, 285 and 383 treated with Avaunt had yield increases above the untreated check of 26%, 34%, 5%, and 10%, respectively. Results indicate cultivar 383 is possibly more tolerant to Lygus feeding because of the lower percentage in increased yield over the untreated. Mezcala treated with Avaunt had a 10% increase in yield over the untreated check (Figure 4-b, 4-c).

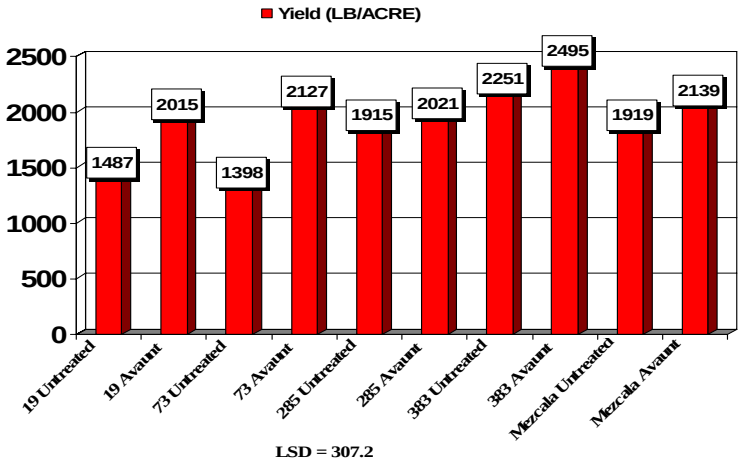
Cultivar 383 had slightly more Lygus seed damage in the treated plots (7.8%) than the untreated (5.7%). The least amount of seed damage (2.2%) occurred in the Avaunt treated cultivar 285 (Figure 4-d). Higher seed damage may be due to late season high populations of lygus before pods were matured.

Figure 4-a Control of Lygus with Avaunt on vine baby lima beans 2005



1St Application July 22 = Blooming
2nd Application August 12 = Pod Fill

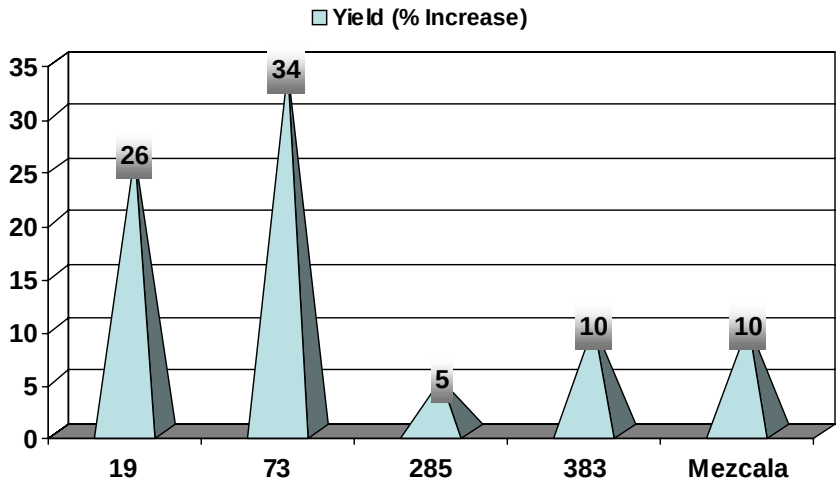
Figure 4-b Yield comparisons between Avaunt treated and untreated vine baby lima bean varieties.



LSD = 307.2

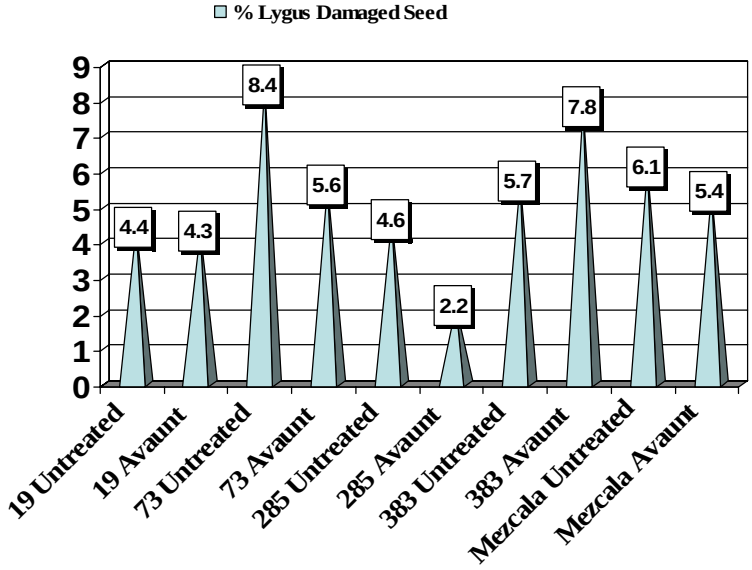
Avaunt 30WG @ 0.11 lbai/A was applied on 7/22and 8/26 in 20 gpa water.
Lygus counts per sweep: 7/12=0.1, 7/17=0.5, 7/21=0.4, 7/28=1.1, 8/8=5.1

Figure 4-c **Percent yield between Avaunt treated and untreated vine baby lima bean varieties.**



Avaunt 30WG @ 0.11 lbai/A was applied on 7/22 and 8/26 in 20 gpa water.

Figure 4-d **Seed damage comparison between treated and untreated vine baby lima bean varieties.**



Avaunt 30WG @ 0.11 lbai/A was applied on 7/22and 8/26 in 20 gpa water.

Trial 5 **Plant Growth Regulator Study in Baby Lima Beans.** Mick Canevari, Randall Wittie, Humphrey Yu.

OBJECTIVE: Evaluate Plant Growth Regulators (PGRs) for their effect on crop yields in bush baby lima beans.

MATERIALS AND METHODS: Various products were selected for this study which included cytokinins, nutrients and fungicides which have demonstrated plant growth regulator activity. Materials applied to the foliage of bush baby lima beans var. "Luna" planted May 27, 2005 on the UC Davis Agronomy farm were: (1) Application A (June 28), MegaGro 85% EC 3.2 fl oz/A, crop stage 2-4 trifoliate leaf; (2) Application B (July 21): Headline 2.09 EC 9.0 fl oz/A, HappyGro 0.5% EC 3.2 fl oz/A, Solubor 5 lb/A and ReTain 15% SP 62.5 ppm product, crop stage bloom and (3) Application C (August 5): PhotoGro 2% EC 3.2 fl oz/A and Maxcel 1.9% SC 50 ppm product, crop stage pod filling. Warrior Zeon 1CS 3.0 fl oz/A was included with all treatments including the untreated check for Lygus control. All recommended cultural practices were used during the trial. An application of phosphorus and nitrogen fertilizer was disked in pre-plant. Trial was cultivated once and furrow irrigated every two weeks. Plots were weed free, very uniform stand and vigor. Treatments were arranged in a randomized complete block design with five replicates. Plots were two 30" rows by 25 ft. PGRs were applied with a CO_2 backpack sprayer at 35 psi in 20 gpa of water. In-season sampling was done by tagging four plants randomly selected per plot. Bean pods greater than 0.5" in length were counted at three timings: 30 and 7 days after applications for A & B; 45, 22 and 7 days after applications A, B, C and 59, 36 and 21 days after applications A, B and C.

RESULTS AND DISCUSSION: Results from the plant pod counts were inconclusive. Pod counts taken on the same plants were quite variable and yields between treatments were not statistically different. There were no significant difference between the treatments and the untreated control for pod numbers per plant. Solubor showed some 28% leaf burn 25 days after application but recovered completely prior to harvest. All other treatments had no visible bean injury (data not shown). The CVs were quite high indicating a wide range of variability (Figure 5-a).

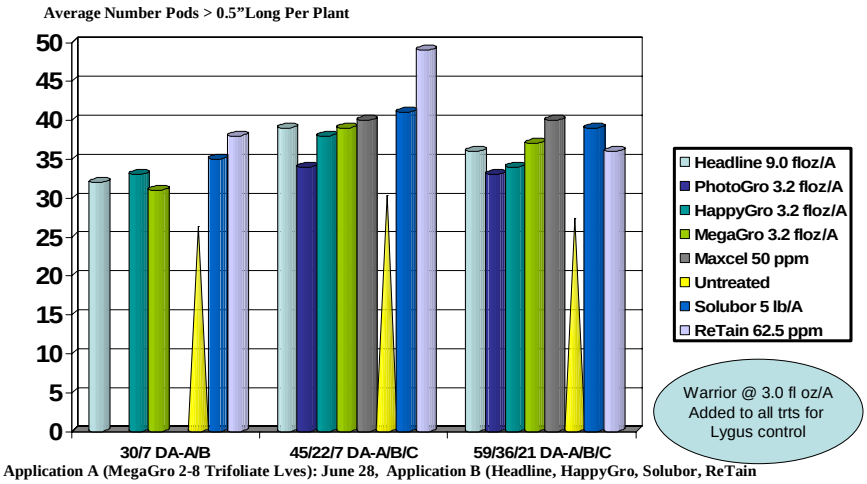
HARVEST AND YIELD:
Plants were cut with a mechanical bean cutter on September 10 and allowed to dry. Harvested samples were weighed and results were recorded as lbs/acre. Results showed no significant difference between PGR treatments and the untreated check (UTC). The UTC averaged 3575.4 lbs/A while Headline @ 9.0 fl oz/A averaged 3638.1 lbs/A, PhotoGro @ 3.2 fl oz/A averaged 3652.1 lbs/A, HappyGro @ 3.2 fl oz/A averaged 3645.1 lbs/A, MegaGro @ 3.2 fl oz/A averaged 3554.5 lbs/A, Maxcel @ 50 ppm averaged 3693.9 lbs/A, Solubor @ 5 lb/A averaged 3610.3 lbs/A and ReTain @ 62.5 ppm averaged 3568.4 lbs/A (Table 5-a).

Seed quality was excellent for all treatments making USDA #1 seed (Figure 5-b).

Table 5-a Yield of lima beans treated with PGRs

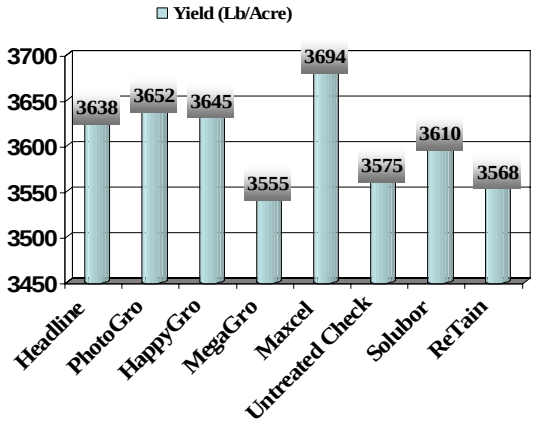
Treatment	Yield lb/A	Weight 100 Seed (Grams)
Headline 9.0 fl oz/A	3638	37.81
PhotoGro 3.2 fl oz/A	3652	36.81
HappyGro 3.2 fl oz/A	3645	37.54
MegaGro 3.2 fl oz/A	3554	37.04
Maxcel 50 ppm product	3694	37.41
Untreated Check	3575	37.58
Solubor 5.0 lb/A	3610	37.02
ReTain 62.5 ppm product	3568	37.07
LSD	175.6	0.895

Figure 5-a **Comparison of pod counts on baby lima beans.**



Application A (MegaGro 2-8 Trifoliate Lves): June 28, Application B (Headline, HappyGro, Solubor, ReTain Bloom Sprays): July 21, Application C (PhtoGro, Maxcel Pod Filling Sprays) Aug 5.
GPA = 20 gal. No significant difference between treatments
DA = Days After.

Figure 5-b **Yield of baby lima beans treated with PGRs.**



Application A (MegaGro 2-8 Trifoliate Lves): June 28, Application B (Headline, HappyGro, Solubor, ReTain Bloom Sprays): July 21, Application C (PhotoGro, Maxcel Pod Filling Sprays): Aug 5.
GPA = 20 gal. Warrior @ 3.0 floz/A added to all treatments for Lygus control.
YIELD: NO SIGNIFICANT DIFFERENCES

Trial 6 **Nightshade Control in Baby Lima Beans.** Mick Canevari, Don Colbert, Randall Wittie, Scott Whiteley.

OBJECTIVE: Evaluate several herbicides for nightshade (*Solanum sarrachoides*) control in bush baby lima beans.

MATERIALS AND METHODS: The following herbicides were applied to bush baby lima beans var. "Luna" planted May 27, 2005 on the Keith and Hal Robertson Farm on Linne Rd east of I-5 near Tracy, CA: (1) Prowl 3.3 CS 1.5 lb ai/A + Dual II Magnum 7.64 EC 1.0 lb ai/A PPI, (2) Prowl 3.3 CS 1.5 lb ai/A + Outlook 6 EC 0.84 lb ai/A PPI, (3) Prowl 3.3 CS 1.5 lb ai/A + Chateau 51WG 0.047 lb ai/A PPI, (4) Chateau 51 WG 0.047 lb ai/A Preemergence, (5) Chateau 51 WG 0.047 lb ai/A + Prowl 3.3 CS 1.5 lb ai/A Preemergence, (6) Chateau 51 WG 0.047 lb ai/A + Dual II Magnum 7.64 EC 1.0 lb ai/A Preemergence, (7) Chateau 51 WG 0.047 lb ai/A Layby, (8) Raptor 1 SL 0.047 lb ai/A Lay-by and (9) DPXF9636 25WG 0.047 lb ai/A Layby. Plots were arranged in a randomized complete block design with four replicates. Plots were four 30" rows by 30 ft. Treatments were applied with a CO^2 backpack sprayer at 35 psi in 20 gpa water. The PPI treatments were incorporated to a depth of 2-3" using a rolling cultivator (Lilliston). Preemergence applications were made after planting and before beans emerged. Layby application crop stage was 2-3 trifoliate leaf, 3" height. Crop stage for the layby application was 2-3 trifoliate leaves and plants were 3" height.

RESULTS AND DISCUSSION: Stand counts, vigor and crop injury ratings were made on June 14, 18 and 14 days after applications A & B. Stand counts showed no significant differences between treatments. All treatments averaged 2-3 plants per row foot. All treatments resulted in good plant vigor. Unacceptable foliar phytotoxicity was observed with the preemergence application of Chateau + Prowl. Phytotoxicity was on the lower leaves in the form of necrotic spots (Table 6-a).

All treatments showed good crop tolerance except for some early injury from the preemergence tank mix applications of Prowl + Chateau (32%) and Dual II Magnum + Chateau (18%). Phytotoxicity occurred on the lower leaves as necrotic spots (Table 6-a). Late observations showed no injury from these tank mixtures. DPXF9636 lay-by showed some early (7%) crop injury but recovered before the August 3 rating date.

The nightshade population was very low, therefore, unable to make conclusive results. However, two ratings were made to count the number of plants per plot. Nightshade averaged less than one plant per plot in the preemergence application of Chateau, Chateau layby, Raptor layby and DPXF9636 layby. The untreated check for preemergence and layby also averaged less than one plant per plot (Table 6-a).

Table 6-a <u>Control of nightshade with PPI, preemergence and layby herbicides in baby lima beans.</u>

				Phytotoxicity[2]			
Treatment	Rate lbai/A.	Stand Count[1]	Vigor	14 June	7 July	3 August	Nightshade[3]
Check		12	100	0	0	0	0
Prowl 3.3 CS Dual II Mag	1..5 PPI 1.0	10	100	0	0	0	0
Prowl 3.3 CS Outlook 6 EC	1.5 PPI 0.84	12	100	0	0	0	0
Prowl 3.3 CS Chateau 51WG	1..5 PPI 0.047	12	100	3	0	0	0
Chateau 51WG	0.047 Pre	11	100	4	0	0	1.33
Chateau 51WG Prowl 3.3 CS	0.047 Pre 1..5	13	100	32	0	0	0
Chateau 51WG Dual II Mag	0.047 Pre 1.0	15	100	18	0	0	0
Chateau 51WG	0.047 Layby	13	100		0	0	1.0
Raptor 1SL	0.047 Layby	13	100		0	0	0.33
Check		11	100	0	0	0	0.67
DPXF9636 25WG	0.047 Layby				7	0	1.0
	LSD	2.1		3.5	1.8		0.9

[1]Stand Counts = Number plants per 3ft row. [2] Phytotoxicity = 0, no injury, 100 plant dead. [3] Nightshade = Plants per plot.

Trial 7 **Garbanzo Variety Trial.** Mick Canevari, Don Colbert, Randall Wittie, Scott Whiteley

OBJECTIVE: Compare several new garbanzo varieties to the standard commercial varieties.

MATERIAL AND METHODS: The following garbanzo varieties were planted December 22, 2004 five miles east of Stockton, CA on a Wyman Clay Loam soil: (1) Dwelley, (2) HS 19, (3) 1869 W, (4) AF 46A, (5) 0147 W, (6) HB 14, (7) 1861 W, (8) AF 54, (9) 1827 W, (10) 1604 W, (11) Sierra, (12) 072C. The previous crop was processing tomatoes. This was an observation strip trial. Three rows of each variety were planted on a 5-ft bed 275 ft in length. Beans were planted into dry soil 2" deep using the grower's air planter. Preemergent herbicides (Goal 0.125 lb ai/A + Sencor 0.125 lb ai/A) were applied December 23, 2004.
Beans were direct harvested on July 18, 2005 using a Kincade grain plot harvester. Three 30-ft subplots were harvested from each strip.

RESULTS AND DISCUSSION: Forty days after planting, stand count and plant height observations were made. The varieties with the best stand and height were HS 19, 1869 W, AF 46A, 1861 W and AF 54. These varieties averaged 4-6 plants/ 3 ft. of row and were at least 0.75" height.

Sixty-five days after planting, 1869 W, AF 46A and 1861 W had the best population and 4-5" height.

At 154 days after the planting evaluation, all the varieties had 70 - 90% green pods while 0147 W and AF54 had the least percentage of flowers, 9 and 5% respectively. Sierra and 1827W had the least amount of chlorosis.

HS 19, AF 46A and AF 54 were 100% dry 175 days after planting. HB 14 was only 10% dry.

AF46A and AF54 yields were significantly higher, 2516.8 and 2332.9 lb/A than any other varieties. The lowest yielding variety was 1869W, 1374.6 lb/A (Table 7-a). 1869 W, 0147 W, 1861 W and AF54 had significantly more seeds per ounce than the other varieties. HB 14, 1827W, Sierra and 072C were not harvested due to poor stand (Table 7-a). The day after planting, high amounts of rainfall occurred resulting in standing water and soil saturation conditions that lasted most of the winter. The four varieties not harvested were severely impacted by these wet conditions. The other varieties were less affected.

Table 7-a **Comparison of several growth characteristics of garbanzo varieties.**

Variety	Stand Ct.[1] 65 DAP[2]	GreenPods % 154 DAP	Flowers % 154 DAP	Chlorosis % 154 DAP	Maturity % 175 DAP	LB/Acre 208DAP	Seed/Oz 208 DAP
Dwelley	13	75	25	20	80	1848.9	52
HS 19	19	90	10	65	100	1548.8	55
1869 W	28	80	10	65	40	1374.6	66
AF 46A	22	70	10	70	100	2516.8	56
0147 W	12	90	9	20	70	1723.0	61
HB 14	3	90	10	20	10	N/A	N/A
1861 W	21	80	20	50	75	1877.9	65
AF 54	14	90	5	55	100	2332.9	62
1827 W	2	70	30	5	40	N/A	N/A
1604 W	9	85	10	25	75	2129.6	47
Sierra	3	90	10	5	65	N/A	N/A
072 C	6	85	15	10	30	N/A	N/A
LSD	3.23					196.62	2.5

[1]Stand Count = Plants per 3 ft. row.

[2]DAP = Days after planting