Imperial County Agricultural Briefs

Feature

From your Farm Advisors

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GM Alfalfa

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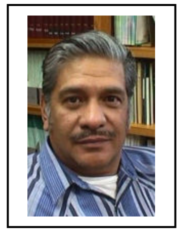

Well, it's about that time of year that alfalfa growers have to give some time regarding what variety to plant next October. This year a new option will be available, with many restrictions, RoundUp Ready® (RR) alfalfa.

Will RR alfalfa be safe for dairy cattle? On July 12, 2006, in Minneapolis at the annual meetings of the American Society of Dairy/Animal Science a poster was presented regarding the effects of RR alfalfa on milk production. Researchers of the University of Wisconsin, Combs and Hartnell (2006), fed RR alfalfa hay and a reference hay (no genetically modified, GM, plants) to dairy cows. There were no differences (P > 0.05) in milk production, milk composition, feed intake and feed efficiency for lactating dairy cattle when fed RR or reference alfalfa.

When livestock are fed GM crops, will the GM genes be present in meat or milk? Table 1 demonstrates that in no instance have GM genes ever been detected in meat or milk. The meat and milk from livestock that have been fed GM crops are safe for humans.

The main problem with growing RR alfalfa is that while some may embrace this new technology, others will be vehemently opposed. Locally, alfalfa seed is pollinated by honey bees, *Apis mellifera* (AP). What are the chances of a grower that decides to plant RR alfalfa to contaminate the non RR crop of a neighbor? There is a 1.5% possibility at 900 ft of AP spreading RR genes to non RR alfalfa, and <0.03% chance of gene flow at 2500 ft (Teuber et al.; 2004). The reason that these probabilities are so small is that many simultaneous events have to occur between the RR field and the non-RR field; both fields have to be in flower, AP must be in both fields, pollen from the RR plant must fertilize the ovules of non-RR plants, the fertilized plants must mature, the fertilized seeds must fall to the ground AND germinate, and there must be sufficient contaminated plants to contribute to hay dry matter (Putnam, 2006). Alfalfa allelopathy also will contribute to contaminated non-RR seeds not germinating. Even at a high probability, there will be less than a 0.01 % chance that a non-RR field will have gene flow from an RR field; however, 0.01 is not zero.

For those that do decide to plant RR alfalfa, the control of feral or wild alfalfa plants at the periphery of the field will be extremely important. For those that want to guarantee that they have RR alfalfa, there are test kits that can detect RR genes in hay at a 5% level.

There will be numerous restrictions for those who wish to plant RR alfalfa. The grower MUST sign a contract with the seed purveyor. The grower must contractually agree not to make seed from the RR alfalfa crop, to provide GPS coordinates where the RR alfalfa will be planted, to isolate the field from nearby non-RR alfalfa, and the grower must be able to account for all the seed provided by the purveyor. There will be about a two week waiting period for contract approval and seed delivery. For those wishing to plant RR alfalfa, you may call Imperial Valley Milling (Ray Johnson) at 356-2914 or America's Alfalfa (Joe Machado) at 209-602-1230 (I am only aware of these two locally, there might be more).

Source: Combs, D. K. and G. F. Hartnell. 2006. Effects of feeding RoundUp Ready ® alfalfa on intake and milk production of diary cows. J. Anim. Sci. Suppl. 1 89:374.

Teuber, L., A. Van Deynze, S. Mueller, M. McCaslin, S. Fitzpatrick, and G. Rogan. 2004. Gene flow in alfalfa under honey bee (*Apis mellifera*) pollination. Proc. 39th North Am. Alfalfa Improv. Conf. July 18-21, Quebec City, Canada. http://www.naaic.org/Publications/pub-list.html.

Putnam, D. H. 2006. Methods to enable coexistence of diverse production systems involving genetically engineered alfalfa. Univ. Calif. Publ. 8193.

Table 1. Incidence of genes from genetically modified plants consumed by livestock in meat and milk.

Genetically Mod. Crop	food incidence of introduced genes %positive		number of samples	Source
Corn	milk	0	147	Faust, M. 2000. Proc. ASAS.
Corn silage	milk	0	12	Phillips, R. 2001. J. An. Sci. 79:225.
Soybeans	milk	0	10	Phillips, R. 2002. L. Prd. Sci. 74:269.
Cotton seed	milk	0	10	Jennings, R. 2003. IDF.Bul. 383.
Soybean	pork	0	50	Jennings, R. 2003. J. An. Sci. 81:1447.

Source: Cullor, J. S. and P. Rossitto. 2004. Can genetically enhanced traits be detected in milk or meat. Proc. Nat. Alfalfa Symposium, Dec. 13-15. San Diego. Univ. Calif. Coop. Ext.

Evaluation of Insecticides for Whitefly Control in Broccoli

Eric T. Natwick

A field trial was conducted at the University of California Desert Research and Extension Center near Holtville, CA, to look at insecticide applications for efficacy against silverleaf whitefly on broccoli, variety General, planted September 17, 2005. The experimental design was a randomized complete block with four replicates. Plots measured 50 ft by 13.33 ft; 4 beds per plot no 40" centers. Insecticide treatments are listed in Table 1. Admire and Admire Pro were injected at the rates listed in Table 1 two inches below the seed line on September 14. Oberon 2 SC was applied as a foliar spray at 60.9 gpa at 40 psi using a Spider Trac Sprayer with three TJ-60 11003VS nozzles per bed on October 11. Evaluations were made by counting the numbers of whitefly adults on basal leaves of ten plants in each plot on dates listed in Tables 1. Whitefly eggs and nymphs within 1.65 cm^2 leaf disks from ten basal leaves from each plot and counted using a binocular microscope on date listed in Tables 2 and 3.

All insecticide treatments had significantly fewer silverleaf whitefly adults compared to the untreated control during November and for the seasonal means (ANOVA, $P < 0.05$) (Table 1). Plants treated with Admire Pro at 7 fluid ounces per acre had significantly fewer whitefly adults than plants treated with Admire 2F at 10 fluid ounces per acre followed by a foliar spray of Oberon 2 SC at 7 fluid ounces per acre.

All insecticide treatments had significantly fewer eggs and nymphs than the untreated control for seasonal means and on all sampling dates except October 4 (ANOVA, $P < 0.05$) (Tables 2 & 3).

All insecticide treatments had significantly more marketable heads per 0.001 acre and cartons per acre than the untreated control (ANOVA, $P < 0.05$) (Table 4). Admire 2F followed by Oberon 2SC had significantly more marketable heads per 0.001 acre than either Admire 2F alone or Admire Pro.

Table 1. Adult Whitefly per Leaf Following Various Insecticide Treatments In Broccoli, Holtville, CA, 2005.

Treatment	oz/acre	4 Oct	20 Oct	1 Nov	8 Nov	16 Nov	1 Dec	SM[z]
Untreated	------	22.14 a	3.48 a	98.52 a	34.66 a	31.78 a	15.22 a	34.30 a
Admire 2F	16	22.86 a	4.22 a	30.48 b	24.66 b	21.22 b	13.96 a	19.57 bc
Admire Pro	7	20.58 a	3.28 a	29.78 b	22.06 b	15.88 b	14.26 a	17.64 c
Admire 2 F f/b Oberon 2 SC	10 7	21.36 a	5.24 a	39.04 b	27.42 b	17.62 b	12.26 a	20.49 b

Mean separations within columns by $LSD_{0.05.}$ [y] Log transformed data used for analysis; reverse transformed means reported. [z] Seasonal means.

Table 2. Whitefly Eggs per cm^2 of Broccoli Leaf Following Various Insecticide Treatments. Holtville, CA, 2005.

Treatment	oz/acre	4 Oct	20 Oct	1 Nov	8 Nov	16 Nov	1 Dec	SM[z]
Untreated	------	133.7 a	51.5 a	10.7 a	29.1 a	21.6 a	7.4 a	42.6 a
Admire 2F	16	108.0 a	6.7 b	3.8 b	6.2 b	3.4 c	3.3 b	22.0 b
Admire Pro	7	103.2 a	10.9 b	2.6 b	4.8 b	2.0 c	3.5 b	21.2 b
Admire 2 F f/b Oberon 2 SC	10 7	112.0 a	7.3 b	4.1 b	5.6 b	7.0 b	2.6 b	23.1 b

Mean separations within columns by $LSD_{0.05.}$ [y] Log transformed data used for analysis; reverse transformed means reported. [z] Seasonal means.

Table 3. Whitefly Nymphs per cm^2 of Brocolli Leaf Following Various Insecticide Treatments. Holtville, CA, 2005.

Treatment	oz/acre	4 Oct	20 Oct	1 Nov	8 Nov	16 Nov	1 Dec	SM[z]
Untreated	------	2.5 a	75.1 a	30.4 a	70.7 a	44.5 a	29.0 a	42.5 a
Admire 2F	16	2.2 a	13.1 c	5.9 bc	14.4 b	11.3 bc	11.4 b	9.7 b
Admire Pro	7	1.5 a	13.7 c	4.3 c	14.1 b	7.5 c	10.4 b	8.7 b
Admire 2F f/b Oberon 2 SC	10 7	2.1 a	18.2 b	7.5 b	12.9 b	14.6 b	10.4 b	11.1 b

Mean separations within columns by $LSD_{0.05.}$ [z] Seasonal means.

Table 4. Number of Market Heads, Pounds of Market Heads, Number of Whitefly Damaged Heads, and Percentages of Market Heads per 0.001 Acre, and Cartons per Acre. Holtville, California, 2005.

Treatment	oz/acre	No. Market Heads	Lb Market Heads	Damaged Heads	% Market Heads	Cartons
Untreated	------	10.80 c	3.90 b	7.20 a	60.44 b	149.92 b
Admire 2F	16	16.40 b	10.12 a	4.60 a	78.32 a	389.14 a
Admire Pro	7	15.20 b	10.60 a	4.60 a	78.11 a	407.52 a
Admire 2 F f/b Oberon 2 SC	10 7	18.80 a	12.35 a	3.80 a	83.57 a	474.90 a

Mean separations within columns by $LSD_{0.05.}$

Lettuce N Fertilization

Rick Bottoms, Ph.D.

The level of nitrogen fertility probably more than any other plant nutrient influences growth and yield of lettuce, especially in desert soils. Lettuce produced on low desert soils requires from 150 to 300 pounds (lbs) of nitrogen (N) to the acre for optimal yields. The actual rate will vary depending upon residual soil N, soil texture, irrigation and rainfall. Split applications of N are usually more efficient than a single pre-plant application because N in the soil is subject to leaching, denitrification (gaseous loss to the atmosphere), and other mechanisms of loss during the growing season. Generally, N is side-dress applied just after thinning and during later growth stages. Early, warm-season lettuce requires less N than a crop grown in early winter. About 150 lbs of N per acre (168 kg/ha) is used for early season production, while 200-250 lbs per acre (224-280 kg/ha) is used during cooler weather production.

Lettuce is very sensitive to overdoses of ammoniacal fertilizers (especially on light or sandy soils). Seedling injury will be expressed by root burn, yellowing of the leaves, and even dead plants. Fertilizer injury later in the season is expressed by wilting of the outer leaves and a rusty reddish discoloration in the middle of the plant root.

Nitrogen applications are usually applied by side-dress or water-run and usually start after thinning and cultivation. Typically following thinning, lettuce will be cultivated and side-dressed with N. The amount and frequency of N application can be adjusted based upon a pre-side-dress soil nitrate-N test or a plant midrib tissue test. Lettuce grown in soils with a nitrate-N concentration of 20 ppm or greater (>20 mg.kg-1) in the top 12 inches (30 cm) will generally not respond to additional N fertilizer. Midrib samples are also useful during the second half of the growing season (after the 8 to 10-leaf stage). Generally, lettuce is not considered deficient in N if midribs nitrate-N concentrations exceed 8000 ppm (8000 mg.kg-1). A second series of cultivation and side-dressing is usually conducted approximately 14 days following the first such operation, usually near early head formation. Additional side-dress applications of N may be applied if adverse growing conditions are encountered.

Trials conducted by Hartz (2002) in 15 commercial fields in the central coast region of California to evaluate the use of pre-side-dress soil nitrate testing (PSNT) to determine side-dress N requirements for production of iceberg and romaine lettuce side-dress N application was based on pre-side-dress soil Nitrate (NO3-N) concentration. Prior to each side-dress N application scheduled composite soil sample (top 12 inches) were collected and analyzed for NO3-N. No fertilizer was applied in the PSNT plot at that side-dressing if NO3-N was greater then 20 ppm (>20 mg.kg-1); if NO3-N was lower than that threshold, only enough N was applied to increase soil available N to 20 ppm (~20 mg.kg-1). The productivity and N status of PSNT plots were compared to adjacent plots receiving the growers' standard N fertilization. Cooperating growers applied a seasonal average of 229 lbs/acre (257 kg.ha-1) N, including one to three side-dressings containing 173 lbs/acre (194 kg.ha-1) N. Side-dressing based on PSNT decreased total seasonal and side-dress N application by an average of 43% and 57%, respectively. The majority of the N savings achieved with PSNT occurred at the first side-dressing. There was no significant difference between PSNT and grower N management across fields in lettuce yield or post-harvest quality, and only small differences in crop N uptake.

Recent Arizona research indicates that the use of controlled release fertilizers may represent a viable alternative to split application of conventional soluble N sources. There is considerable variation in N release rates and costs of controlled release N fertilizers, and individual products should be closely evaluated before they are utilized.

References:

Hartz, T. HortScience-. 2002; 37(7): 1061-1064
Jackson, L. *et al*. Leaf Lettuce Production in Ca. UC Pub. 7216: 3
Kerns, D. *et al*. Head Lettuce Production in Arizona. AZ Pub. 1099. 8-9
Meister, H. *et al*. 2004, Vegetable Crop Guidelines; UC Pub. 3073: 65

Results of Imperial County Lettuce Drop Fungicide Timing Comparisons

Thomas Turini, Ronald Cardoza and Barry Pryor

In low desert lettuce production areas, drop, which is caused by *Sclerotinia sclerotiorum* and *S. minor,* is common in fields in which lettuce is grown annually. In fields with a lettuce drop history, preventative fungicide applications are used for control. Common commercial practice is to treat within 3 days following thinning and a second application 2- to 4 weeks later, at the rosette stage of plant development. However, there have been conditions under which this treatment schedule did not provide commercially acceptable levels of control.

During the 2004-05 and 05-06 lettuce seasons, experiments were conducted at University of California Desert Research and Extension Center in Holtville to compare application timings for control of lettuce drop. The soil is a Imperial-Glenbar silty clay loam and the beds were 40" center-to-center. On 9 Nov 04 and 16 Nov 05, *S. sclerotiorum* sclerotia were placed on the soil surface (9 sclerotia/ft^2), iceberg lettuce cv. 'Winterhaven' seed was sown and the field was sprinkler irrigated. On 18 Nov 04 and 12 Dec 05, the sprinklers were removed and the lettuce was furrow irrigated.

Registered fungicides were applied according to commercial practice. This was compared to treatments with an application made while the plants had 1 to 2 true leaves, which was 1 to 2 days before the first furrow irrigation. A complete list of the stage of crop development at and dates of the applications are listed in Table 1.

During the 2004-2005 season, Rovral 4F was applied at 2.0 pts per acre in 50 gallons water per acre at 30 psi. A CO_2-pressurized backpack sprayer with a spray boom equipped with four 8004VS Teejet nozzles per seed line directed at base of the plants was used for all applications. In the 05-06 study, Endura 11.0 oz per acre and Rovral 4F, as in the 04-05 study, were each applied at the timings listed (Table 1).
The experimental design of both studies was a randomized complete block with 3

replications. Each plot was 25 ft long by 2 beds wide in 04-05 and 1 bed wide in 05-06. Plots were inspected at 7 to 16 day intervals. At each evaluation, the number of plants with characteristic wilting and sclerotia were recorded. Analysis of Variance was performed and Least Significant Difference (LSD: P=0.05) is reported. Orthogonal Contrast was used to compare the activity of the fungicides in the 05-06 study regardless of timing.

Under the conditions present in the 04-05 study, the Rovral 4F provided the best control of drop when applied at 1st true leaf stage of development (A) and post-thinning (B) although the performance was not statistically different than when applied only at A or B or at the rosette stage of development (C), P=0.05 (Table 2). Similarly, in the 05-06 study, Rovral 4F A+B had the numerically lowest incidence of drop (Table 3). However, disease incidence was statistically similar to Rovral 4F B+C, Rovral 4F A, Endura A+B and Rovral 4F B P=0.05. When all data was grouped by fungicide, Rovral 4F-treated lettuce had lower drop incidence (8.1% drop) than that treated with Endura (12.1% drop) as compared statistically through Orthogonal Contrasts, P=0.021.

Table 1. Stage of crop development at and dates of applications for control of lettuce drop caused by *Sclerotinia sclerotiorum* at the University of California Desert Research and Extension Center.

Stage of crop development	**2004-2005**	**2005-2006**
A. 1 to 2 true leaves	19 Nov	12 Dec
B. 5-7 true leaves (day after thinning)	17 Dec	5 Jan
C. Rosette stage of development	-------------------	2 Feb
A+B	-------------------	12 Dec + 5 Jan
B+C	17 Dec + 1 Jan	5 Jan + 2 Feb
A+C	19 Nov + 1 Jan	12 Dec + 2 Feb

Table 2. Effect of Rovral 4F 2.0 pts/A application timing on drop incidence on iceberg lettuce at UC Desert Research Extension Center, 2004-2005.

Application timing[z]	Plants with drop (%)[y]					
	16 Dec 04	1 Jan 05	14 Jan 05	25 Jan 05	3 Feb 05	14 Feb
19 Nov and 17 Dec	0.0	2.0	3.0	6.0	7.3	9.3
19 Nov	1.3	1.7	2.7	8.0	13.7	17.7
17 Dec and 1 Jan	2.3	5.7	10.0	11.3	16.3	16.3
17 Dec	2.7	8.0	11.7	20.7	24.0	27.3
Untreated	2.7	8.0	16.0	32.7	40.0	41.3
LSD (P=0.05)	2.25	3.45	3.84	6.69	10.94	12.20

[z] Rovral 4F was applied in 50 gallons water per acre with a CO_2-pressurized backpack sprayer at 30 psi.
[y] One hundred plants per plot were evaluated for obvious symptoms of drop and *S. sclerotiorum* sclerotia.

Table 3. Effect of application of Rovral 4F 2.0 pts/A and Endura 11.0 oz/A on drop incidence on iceberg lettuce at UC Desert Research Extension Center, 2005-2006.

Fungicide and application timing [z]	Plants with drop (%)[y]					
	24 Jan 06	1 Feb 06	16 Feb 06	24 Feb 06	8 Mar 06	15 Mar 06
Rovral 4F: 12 Dec and 5 Jan	0.0	0.0	0.6	0.6	2.0	2.0
Rovral 4F: 5 Jan and 2 Feb	0.7	2.6	2.6	2.0	4.0	4.7
Rovral 4F: 12 Dec and 2 Feb	0.0	0.0	0.6	0.6	5.3	5.3
Rovral 4F:12 Dec	0.0	1.3	1.3	1.3	5.3	8.0
Endura: 12 Dec and 5 Jan	0.0	0.0	1.3	1.3	5.3	8.0
Rovral 4F: 5 Jan	0.7	2.0	2.6	3.3	6.3	8.7
Endura: 5 Jan and 2 Feb	2.0	3.3	5.3	6.0	9.3	10.7
Endura: 12 Dec	0.0	2.6	4.0	4.6	9.3	11.3
Endura: l5 Jan	0.0	4.0	4.6	5.3	10.0	11.3
Endura: 2 Feb	0.7	2.3	4.6	4.6	12.0	15.3
Endura: 12 Dec and 2 Feb	0.6	5.3	6.6	6.6	13.3	15.7
Rovral 4F: 2 Feb	2.0	7.3	8.0	8.0	18.0	20.0
Untreated	0.6	5.3	8.0	9.3	19.3	25.3
LSD (P=0.05)	0.94	4.32	4.66	5.00	6.28	7.91

[z] Rovral 4F was applied in 50 gallons water per acre with a CO_2-pressurized backpack sprayer at 30 psi.
[y] Fifty plants per plot were evaluated for obvious symptoms of drop and *S. sclerotiorum* sclerotia.

Evaluation of Insecticides for Worm Control in Lettuce

Eric T. Natwick

A field trial was conducted at the University of California Desert Research and Extension Center near Holtville, CA, to look at various insecticides for efficacy against worm pests on head lettuce, variety Lighthouse, planted September 18, 2005. The experimental design was a randomized complete block with four replicates. Plots measured 50 ft by 13.33 ft; 4 beds per plot no 40" centers. Insecticide treatments are listed in Table 1. Foliar spray treatments were applied at 60.9 gpa at 40 psi using a Spider Trac Sprayer with three TJ-60 11003VS nozzles per bed on October 11 and November 15. Evaluations were made by counting the numbers of beet armyworm larvae and cabbage looper larvae on twenty plants in each plot on dates listed in Tables 1 and 2. Several insecticides under development were compared to industry standards including BAS 32001 240 SC (metaflumizone) under development by BASF Corp., GF-1587 120 SC, a spinosyn insecticide under development by Dow AgroSciences, and E2Y45 SC (rynaxypyr) an enantiomer of indoxicarb.

All insecticide treatments had significantly fewer beet armyworm larvae compared to the untreated control on October 26, November 30, December 6 and for the post treatment means (ANOVA, $P < 0.05$) (Table 1). Success had the lowest post treatment mean (0.19) which was significantly lower than all of the BAS 32001 240 SC (metaflumizone) treatments and the Avaunt 30 WG treatment. Cabbage looper numbers were very low and there were not significant differences among the treatments except on November 30 and for the post treatment means when all insecticide treatments were significantly lower than the untreated control (Table 2).

Success had the greatest number of market lettuce heads per 0.001 acre (22) which was significantly greater than the untreated control (14.75), GF-1587 120 SC @ 6.91 ounces (14.75), BAS 32001 240 SC @ 9.14 ounces (17.5), E2Y45 SC @ 1.69, 3.37 and 5.06 ounces, respectively (16.5, 17.75 and 18.25, respectively), Intrepid 2 SC (17.5), Avaunt 30 WG (17.5)and Proclaim 5SG (18.0) (Table 3). Success also had the greatest number of cartons per acre (916.5) which was significantly greater than the untreated control (614.5). There were no differences among the treatments for numbers of worm damaged heads nor percentages of marketable heads.

Table 1. Beet Armyworm Larvae per Twenty Lettuce Plant. Holtville, CA, 2005.

Treatment	oz/acre	7 Oct	26 Oct	8 Nov[x]	30 Nov	6 Dec	PTM[z]
Untreated	--------	3.00 a	6.50 a	5.00 a	4.75 a	2.00 a	4.56 a
*BAS 32001 240 SC	9.14	2.50 a	2.50 b	2.50 a	0.25 cd	0.75 b	1.50 bc
BAS 32001 240 SC	13.7	1.50 a	2.50 b	3.25 a	0.00 d	0.05 bc	1.50 bc
BAS 32001 240 SC	16.0	2.50 a	2.50 b	3.00 a	1.25 bc	0.25 bc	1.69 b
*GF-1587 120 SC	2.05	4.00 a	1.25 bc	3.00 a	2.25 b	0.25 bc	1.69 b
GF-1587 120 SC	2.94	2.75 a	0.50 bc	2.50 a	1.00 bc	0.00 c	1.00 bcde
GF-1587 120 SC	4.99	4.00 a	0.50 bc	2.75 a	1.00 bc	0.25 bc	1.13 bcd
GF-1587 120 SC	6.91	3.00 a	0.00 c	1.75 a	0.00 d	0.00 c	0.44 de
*E2Y45 SC	1.69	2.75 a	1.00 bc	1.25 a	0.25 cd	0.25 bc	0.69 cde
E2Y45 SC	3.37	2.75 a	0.00 c	3.00 a	0.75 bcd	0.00 c	0.94 bcde
E2Y45 SC	5.06	1.00 a	0.00 c	3.25 a	0.00 d	0.25 bc	0.88 bcde
E2Y45 SC	6.74	2.75 a	2.00 bc	1.75 a	0.25 cd	0.00 c	1.00 bcde
Success 2 SC	5.7	3.50 a	0.00 c	0.75 a	0.00 d	0.00 c	0.19 e
Intrepid 2 SC	8.0	2.50 a	0.00 c	2.00 a	1.00 bc	0.25 bc	0.81 bcde
Avaunt 30 WG	3.47	1.00 a	1.50 bc	2.75 a	0.25 cd	0.25 bc	1.19 bcd
Proclaim 5 SG	3.2	3.50 a	0.75 bc	2.00 a	0.25 cd	0.50 bc	0.89 bcde

* Not registered for use on cotton at the time of publications. Mean separations within columns by LSD (P# 0.05). [x] Log transformed data used for analysis and actual means reported. [z] PTM = Post treatment mean.

Table 2. Cabbage Looper Larvae per Twenty Lettuce Plant. Holtville, CA 2005.

Treatment	oz/acre	7 Oct	26 Oct	8 Nov	30 Nov	6 Dec	PTM[z]
Untreated	--------	0.75 a	0.00 a	2.50 a	1.00 a	0.75 a	1.06a
*BAS 32001 240 SC	9.14	0.00 a	0.75 a	0.75 a	0.00 b	0.25 a	0.44 b
BAS 32001 240 SC	13.7	0.25 a	0.00 a	0.50 a	0.00 b	0.00 a	0.13 b
BAS 32001 240 SC	16.0	0.00 a	0.00 a	0.75 a	0.00 b	0.00 a	0.19 b
*GF-1587 120 SC	2.05	0.25 a	0.00 a	0.50 a	0.00 b	0.00 a	0.13 b
GF-1587 120 SC	2.94	0.25 a	0.00 a	0.50 a	0.00 b	0.00 a	0.13 b
GF-1587 120 SC	4.99	0.00 a	0.00 a	0.50 a	0.00 b	0.50 a	0.25 b
GF-1587 120 SC	6.91	0.50 a	0.00 a	0.75 a	0.00 b	0.25 a	0.25 b
*E2Y45 SC	1.69	0.00 a	0.00 a	0.25 a	0.00 b	0.50 a	0.19 b
E2Y45 SC	3.37	0.00 a	0.00 a	0.00 a	0.00 b	1.00 a	0.25 b
E2Y45 SC	5.06	0.00 a	0.00 a	0.25 a	0.00 b	0.25 a	0.13 b
E2Y45 SC	6.74	0.00 a	0.00 a	1.00 a	0.00 b	0.00 a	0.25 b
Success 2 SC	5.7	0.00 a	0.00 a	0.75 a	0.00 b	0.00 a	0.19 a
Intrepid 2 SC	8.0	0.50 a	0.00 a	1.25 a	0.00 b	0.25 a	0.38 b
Avaunt 30 WG	3.47	0.25 a	0.00 a	0.50 a	0.00 b	0.00 a	0.13 b
Proclaim 5 SG	3.2	0.00 a	0.25 a	0.25 a	0.00 b	0.00 a	0.13 b

* Not registered for use on cotton at the time of publications. Mean separations within columns by LSD (*P*# 0.05). [z] PTM = Post treatment mean.

Table 3. Numbers of Marketable and Worm Damaged Heads 0.001 Acre, Carton per Acre, and Percentages of Marketable Heads, in Lettuce. Holtville, CA 2005.

Treatment	oz/acre	Marketable Heads	Damaged Heads	Cartons	% Marketable Heads[z]
Untreated	---------	14.75 d	6.75 a	614.5 d	68.73 a
*BAS 32001 240 SC	9.14	17.50 bcd	5.50 a	729.1 bcd	76.63 a
BAS 32001 240 SC	13.7	19.25 abc	5.50 a	802.0 abc	77.73 a
BAS 32001 240 SC	16.0	18.50 abc	5.50 a	770.7 abc	76.88 a
*GF-1587 120 SC	2.05	19.25 abc	4.25 a	802.0 abc	81.67 a
GF-1587 120 SC	2.94	20.25 ab	5.75 a	843.6 ab	77.78 a
GF-1587 120 SC	4.99	19.25 abc	5.00 a	802.0 abc	79.34 a
GF-1587 120 SC	6.91	14.75 d	6.75 a	614.5 d	68.69 a
*E2Y45 SC	1.69	16.50 cd	4.75 a	687.4 cd	76.30 a
E2Y45 SC	3.37	17.75 bcd	4.75 a	739.5 bcd	79.53 a
E2Y45 SC	5.06	18.25 bcd	5.25 a	760.3 bcd	76.62 a
E2Y45 SC	6.74	20.25 ab	4.75 a	843.6 ab	80.69 a
Success 2 SC	5.7	22.00 a	4.50 a	916.5 a	83.26 a
Intrepid 2 SC	8.0	17.50 bcd	4.50 a	729.1 bcd	79.78 a
Avaunt 30 WG	3.47	17.50 bcd	5.50 a	729.1 bcd	75.45 a
Proclaim 5 SG	3.2	18.00 bcd	4.50 a	749.9 bcd	80.04 a

* Not registered for use on cotton at the time of publications. Means within columns followed by the same letter are not significantly different by ANOVA and LSD (P# 0.05).

CIMIS REPORT

Khaled Bali and Steve Burch*

California Irrigation Management Information System (CIMIS) is a statewide network operated by California Department of Water Resources. Estimates of the daily reference evapotranspiration (ET_o) for the period of June 1 to August 31 for three locations in the Imperial County are presented in Table 1. ET of a particular crop can be estimated by multiplying ET_o by crop coefficients. For more information about ET and crop coefficients, contact the UC Imperial County Cooperative Extension Office (352-9474) or the IID, Irrigation Management Unit (339-9082).

Please feel free to call us if you need additional weather information, or check the latest weather data on the worldwide web (visit http://tmdl.ucdavis.edu and click on the CIMIS link).

Table 1.Estimates of daily Evapotranspiration (ET_o) in inches per day

Station	July		August		September	
	1-15	16-31	1-15	15-31	1-15	16-30
Calipatria	0.39	0.38	0.35	0.32	0.30	0.27
El Centro (Seeley)	0.38	0.37	0.32	0.29	0.29	0.26
Holtville (Meloland)	0.39	0.38	0.34	0.31	0.30	0.27

* Irrigation Management Unit, Imperial Irrigation District.