Imperial County Agricultural Briefs

Features From your Farm Advisors

June, 2008

Lygus Bug Management for Alfalfa Seed Production

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Lygus bugs are the most important insect pests affecting production of alfalfa seed. It is vitally important to properly time insecticide treatment applications. Timing of insecticides applications should be based on realistic treatment levels. Proper timing of insecticide applications helps to minimize pest control costs while successfully controlling lygus bugs. To control lygus bug we must understand the biology of this pest.

During the summer, it takes about 28 days for lygus bugs to complete their lifecycle. Insecticide applications must be timed to coincide with egg hatch and stage of development to achieve maximum lygus bug control. Lygus bugs are most easily controlled as nymphs up to the third instar. Older nymphs are more difficult to control, especially fifth instar nymphs. It is not uncommon to find fourth and fifth instar nymphs and adults in alfalfa seed production fields after an insecticide treatment. Adults are strong fliers and will often be repelled from seed production fields following an insecticide application, but adults can quickly return when the repellency has subsided.

Withhold insecticide application when newly hatched first instar nymphs are observed in the field to allow all eggs to hatch unless an insect growth regulator such as Novaluron (Rimon®) is to be applied. Percentages of control are improved when all lygus bug eggs have hatched and some nymphs have developed to the third instar. Lygus bug nymphs hatching a few days after an insecticide application often survive and an additional insecticide treatment may be necessary.

The first lygus bug insecticide treatment should be applied when a population of 4 to 6 bugs per sweep is reached during the period of early bloom when many buds are vulnerable to attack. During full bloom and seed set, treatment is suggested at 8 to 10 bugs per sweep. Later in the season, when the crop begins to mature, the suggested treatment level is 10 to 12 bugs per sweep. These guidelines are suggested action levels and are not necessarily fixed, but can vary with field condition.

Lygus bugs levels of 8 to 10 bugs per sweep during bloom and seed set usually do not adversely affect seed yield or quality and can be tolerated without economic loss. Fewer insecticide applications and less frequent disturbance to pollinator activity can be achieved by extending treatment intervals following the suggested action thresholds.

IRRIGATION SCHEDULING- SURFACE IRRIGATION SYSTEMS

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There are several methods to determine when to irrigate and how much water you need to apply. Irrigation scheduling based on CIMIS (California Irrigation Management Information System) is commonly used to predict the consumptive water use for most crops. Reference Evapotranspiration (real time ET_o or normal ET_o) and crop coefficients (K_c) are needed for irrigation scheduling. The consumptive water use for a particular crop can be estimated from:

$$ET_c=K_c*ET_o$$

To determine amount of water needed for irrigation, you need to know the average reference Evapotranspiration on a daily basis since last irrigation and the average crop coefficient during the same period (available online from our website http://ceimperial.ucdavis.edu, select Irrigation and Water Quality program then click on the link for CIMIS- Biometeorology). The amount of water needed for irrigation can be calculated from the following equation:

$$O= C*ET_c*N*A/AE$$

where: O= Amount of water needed for irrigation in acre-feet (ac-ft)

C= Conversion factor = 8.333

ET_c= Daily crop use in inches

N = Number of days since last irrigation

A= Net area of the field in acres

AE= Application efficiency (65-90%)

The application efficiency (AE) of surface irrigation system can be estimated from the average depth of water stored in the root zone and the average depths of runoff and deep percolation. However, AE for heavy clay soils in Imperial can be estimated from runoff rate (assuming very little deep percolation during the irrigation event). For example, if the runoff rate is 10% of applied water, AE is 90% (AE+ runoff rate+ Deep percolation rate =100%).

Example:

ETc: Average daily crop water use 0.30 inches/day

N: 14 days since last irrigation (number of days between irrigation events)

A: net area of the field 72 acres

AE: 90% (assuming an average of 10% runoff rate for this specific field)

The amount of water needed for irrigation can be estimated based on the above figures:

O= 8.333*0.3*14*72/90

O= 28 ac-ft.

This amount of water could be delivered to the field in 12 hr order (1 cfs is approximately 1 ac-ft/12 hrs) or in 24 hrs (1 cfs is approximately 2 ac-ft/24 hrs).

Order rate in cfs = order rate in ac-ft/2 (for 24-hr runs)

Order rate in cfs= order rate in ac-ft (for 12-hr runs)

We have a limited number of IRRIGATION SLIDE

CHARTS that could be used to estimate the amount of water needed for irrigation or to figure the time of application or average depth of irrigation for surface irrigation systems. The slide charts are available in English and Spanish and can be obtained from the UCCE or USBR, please contact Khaled Bali or Mark Niblack if you are interested in obtaining a slide chart.

Conversion factors:
1 acre = 43560 ft^2
1 ft^3 = 7.48 gallons
1 gallon = 3.785 liters
1 cfs = 449 gpm
24 Hour-Run: 1 cfs ::: 2 Ac-ft per 24 hr.
12 Hour-Run: 1 cfs ::: 1 Ac-ft per 12 hr.

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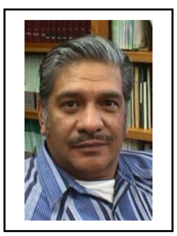
Bailing Recommendations



Juan N. Guerrero
Livestock Advisor

From April through July, or about ⅓ of the year, 40 to 50% of the annual alfalfa hay tonnage is baled in the desert southwest. During this extremely busy time of year, it is important to remember the principles of good hay making. If then, during this relatively short time period, most of the year's hay profit will be made, it is of vital importance that both hay yields and quality be maximized.

1. Time of Day – Theoretically, afternoon swathing should yield the highest quality hay. Numerous scientific manuscripts have demonstrated that afternoon swathed hay crops are higher in quality than those same crops swathed before noon. During the day, plant carbohydrates accumulate in the plant and these same carbohydrates are respired at night. Swathing in the afternoon will maximize soluble carbohydrates in the plant, decrease the alfalfa Neutral Detergent Fiber (NDF)% (very good), and increase the hay quality test. However, during this very busy time of year it is often difficult to only swath in the afternoon. Changing swathing schedules from 11AM to 7PM, rather than initiating the work day at 6 AM, might do the trick, if feasible.

2. Cut at 10% Flower – Cutting at about 10% flower is a good compromise between hay yield and hay quality. Cutting at the bud stage will increase hay quality, and hopefully a greater hay price, but will decrease yield. Cutting at >25% flower will increase hay yield, but hay quality will de-crease. At the current time given the slight price differential between Supreme and Premium quality hay, it probably better to increase hay yields and attempt to have Premium quality hay rather than cutting early and trying to obtain Supreme quality hay.

3. Wide Swaths – Wide swaths promote faster drying rates.

4. Raking – Raking at 40 to 50% hay moisture is recommended. Raking promotes drying rate. Raking at 50% moisture will result in only a 3% loss in dry matter and only a 5% loss in leaves. Raking at 20 to 25% moisture can be tragic. Raking at 20% moisture will result in dry matter losses of about 12% and leaf loss of about 21%! During the months of April through September, afternoon raking should be avoided.

5. Bale Moisture – As the year progresses, the baling window in the day decreases. Sometimes during June and July, there is only enough atmospheric moisture that hay baling is only possible for several hours in the early morning. Bale moisture monitoring meters are available that read bale moisture in the baling chamber of the baler. Theoretically, alfalfa hay should be baled at 14 to 18% moisture. Baling at higher than 20% moisture might result in moldy bales. Baling at lower than 12% moisture results in leaf loss, lower quality hay, and hay that becomes very brittle. Baling hay at the appropriate moisture (14 to 18%) with plenty of leaves means little if it stored road-side for several months. Untarped hay over four months can shrink down to 5% moisture by the end of September. Tarping hay during summer roadside storage will retard hay shrink, enough to pay for the tarping bill.

Current hay prices are relatively high, so maintaining and protecting hay quality is cost effective. However, increased fuel and fertilizer prices have increased production costs, even more reason to sell the highest quality hay possible.

Testing Use of Dazomet and/or Solarization for Control of Soilborne Pests of Melon in the Low Desert

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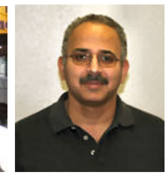

Tom Turini Devon Rodriguez Dr. Rick Bottoms Khaled M. Bali
James Stapleton photo unavailable

SUMMARY: The low desert vegetable production areas of California have seen a recent increase in the use of solarization, which is the practice of covering moist soil with plastic to achieve temperatures lethal to soilborne pests, and trigger other, naturally-occurring biocidal effects. This technique is effective against many pests, but is currently used primarily for weed control in desert spring mix crops. To evaluate the potential benefits of solarization, with or without a chemical soil pesticide for melon production, a trial was conducted at University of California Desert Research and Extension Center in 2006-07. The five treatments compared were: solarization (2 August to 29 September 2006), dazomet (Basamid® G), a granular methyl isothiocyanate-generating material at 530 and 265 lbs/acre covered with solarization film, dazomet at 530 lbs/acre without film cover, and an untreated control. On 26 March 2007, ‘Gold Rush’ cv. cantaloupe was direct seeded on the undisturbed beds and irrigated with buried drip. Weed densities, plant vigor, fruit yield and quality parameters, and root disease symptom severity were recorded. All treatments reduced cheeseweed and

purslane densities, as compared to the untreated control. Vegetative runner lengths of plants were greater in solarized treatments. However, few differences in yield, ^{o}brix, fruit size or root symptom severity were observed.

INTRODUCTION

Solarization is the use of plastic films to cover moist soil during the summer to increase soil temperatures to levels that will kill soil-borne pests, or render them susceptible to additional, naturally-occurring, biological or chemical control effects. In the US, this practice has been used in small-scale organic production for years, but more recently, solarization has been used for weed control in large-scale organic and conventional spring mix crops, destined for bagged salad markets, in the Imperial and Yuma Valleys of California and Arizona. In spring mix cultivation, leafy vegetables are grown on wide beds and repeatedly mowed for harvest. Weed management is critical, and ineffective control necessitates costly hand-weeding of bed tops.

Solarization is also effective against nematodes and fungal pathogens, but there are some limitations. The effect of solarization on soil temperature is greatest near the surface; therefore, pests that can cause damage from deeper in the soil profile may withstand the use of this technique. In addition, some pest structures, such as the ascospores of the soil-borne fungus causing melon vine decline, *Monosporascus cannonballus*, are tolerant of solarization. However, when used in combination with biological or chemical agents, activity of solarization may be increased against heat-resistant propagules. In the desert growing areas of California and Arizona, soil inoculum levels of this pathogen are currently reduced using a high rate of chloropicrin, which is an expensive and very toxic material. The recent increase in use of solarization in conventional spring mix fields and the potential benefit to melon production, which could be rotated with spring mix, inspired the following field study.

Solarization and the methyl isothiocyanate (MIT)-generating, granular chemical agent dazomet (Basamid® G) were tested, alone and in combination, for soil disinfestation in desert melon production. As MIT is a general biocide, reductions of all soilborne pest organisms might be expected.

MATERIALS AND METHODS

A field study was conducted at the University of California Desert Research and Extension Center (DREC) in Holtville to assess the effect of solarization and dazomet on weeds, disease, and cantaloupe plant growth parameters and yield. Treatments were as follow:

(a) dazomet 530 lbs/acre, no solarization
(b) dazomet 530 lbs/acre + solarization
(c) dazomet 265 lbs/acre + solarization
(d) no chemical, solarization
(e) no treatment.(control)

Sixty-inch wide beds with 20-inch wide furrows were shaped in an area of Meloland clay loam soil known to be heavily infested with *M. cannonballus*, as well as with a seedbank containing several summer weed pests. Drip irrigation tape was buried at depth of 10 inches. On 28 July 2006, a tractor-mounted drop spreader was used to apply the dazomet, which was mechanically incorporated into the top 6-8 inches of soil. On 31 July, two additional lines of drip tape were placed on the soil surface 20 inches from the edges on one half (100 feet) of the length of each bed. All dazomet/solarization treatments were applied over entire 200 foot bed lengths. On 2 Aug, beds to be solarized were covered with 1.25 mil, UV-stablilized film designed for solarization. The sides of the plastic were covered with soil to avoid loss of coverage due to high winds. On 2-3 Aug, the field was drip irrigated for 48 hours, for an estimated total of 3.1 inches of water through buried drip and an additional 6.2 inches through the surface drip. Four-channel Hobo® H8 Outdoor/Industrial data loggers fitted with external thermistor probes (Onset Computer Corporation, Bourne, MA) recorded soil temperatures at the center of beds covered with plastic, and in non-covered beds, at depths of 3, 6, 9 and 12 inches. Approximate soil moisture values at 4 and 8 inch depths were monitored 10 inches from the edge of the beds of one solarized and one untreated control treatment for both irrigation configurations with Watermark 900M (Irrometer Inc., Riverside, CA) sensors. The solarization film was removed on 29 Sep.

Plots were fallowed over the winter months and were not worked after the treatments were terminated the previous fall. On 26 Mar 2007, 'Gold Rush' (Harris Moran) cantaloupe seed was sown into the beds and irrigated. All irrigations were made through the buried drip tape. Imidacloprid (Admire) insecticide was drip-applied on 13 Apr to control aphids and whiteflies. The crop was tended according to standard practices.

The solarization and/or dazomet treatment effects were assessed by evaluating emergent weed populations, plant vigor, yield components, and root rot. Weeds were identified and counted on 25 feet of bed per plot on 23 Apr 2007. Plant vigor was evaluated by measuring 3 runners per plot on 3 different plants on 11 and 30 May, and on 7 Jun. Fruit were harvested from 25 feet of each plot on 27 Jun, and 2 and 6 Jul. The number of marketable fruit per plot were determined with respect to standard size categories (9, 12 15, 18 or 23 fruit per carton), and number of sunburned fruit was recorded.

Five fruit per plot were tested for soluble solids at each harvest date. Disease indices and pathogen signs were obtained by visual and microscopic examination of root systems.

The 100 foot-long area with sub-surface drip and the 100 foot-long area with both sub-surface and surface drip irrigation were evaluated and analyzed as two different trials, although the treatments within each were identical. The experimental design was a randomized complete block with four replications. Analysis of Variance was performed and Least Significant Difference [LSD (P=0.05)] is presented.

For confirmatory purposes, a sample of approximately 12 lbs of soil was taken on 20 Sep 2006 from the upper twelve inches at the center of each plot in the area irrigated with sub-surface drip only on 2-3 Aug 2006. The soil was put in 12" diameter pots washed with 10% household bleach, covered with plastic and held in a covered, paved storage area until April 2007. On 13 Apr, 1.5 oz. of 11-52-00 fertilizer was incorporated into the soil of each pot, three 'Gold Rush' variety seed were placed at the center of each pot, drip irrigation tubing was placed in each pot, and they were irrigated. Seedling plants were thinned to 1 per pot. Weed counts and cantaloupe plant growth measurements were made on 29 May, and roots were evaluated for root symptoms and pathogen signs on 6 Jun.

RESULTS AND DISCUSSION

Temperatures under solarization film averaged 100.4° F at a depth of 3 in and 97.2° F at a depth of 12 in, and average temperatures in non-covered beds averaged 93.0°F at 3 in and 92.5 ° F at 12 in from 11 Aug to 29 Sep 2006 (Figs. 1 and 2). The soil was saturated for a minimum of 3 days following the irrigation beginning 2 Aug (data not shown).

Weed densities were reduced by both solarization and dazomet treatments, as compared to the untreated controls P=0.05 (Table 1). Common purselane (*Portulaca oleracea*) counts were lower in all treatments than in the untreated control and cheeseweed (*Malva parviflora*) densities were lower for all treatments than in the untreated control where the 2-3 Aug 2006 irrigation was made with surface and sub-surface drip P=0.05 (Table 1). However, in the portion of the field in which the 2-3 Aug irrigation was made with sub-surface drip only, dazomet alone did not reduce cheeseweed counts P=0.05 (Table 1).

Differences in plant vigor were present among treatments regardless of the irrigation configuration at the time of the solarization initiation in 2006. Runner lengths were greater in solarized treatments than in the untreated control throughout the season P=0.05 (Table 2). However, in spite of the differences in plant vigor, significant differences in cantaloupe fruit yield were found only in one size category (12 fruit per carton) with sub-surface drip irrigation only, and the total yield values were not statistically separable. Similarly, no differences in sunburn or °Brix among treatments were found (P=0.05) (Tables 3 and 4). Substantial root rot and perithecia of *M. cannonballus* were present in all treatments (Table 5).

Results from the potted soil trial were consistent with those from the field. Common purslane weed densities were lower in soil from solarized treatments than in the untreated control, and plant runner lengths were longer P=0.05 (Table 6). The percentage of roots with root rot symptoms was not different among treatments P=0.05 (Table 6), and perithecia of *M. cannonballus* were observed on roots of all treatments.

As shown by the 30-year average, maximum air temperature maps (Stapleton, 2008), these trials were conducted later than the optimal July period for solarization in the Imperial Valley. Nevertheless, results confirmed the obvious benefits of the soil treatments in controlling common purslane and cheeseweed on cantaloupe beds. Also, consistent increases in plant vegetative runner length were associated with solarization. However, results with cantaloupe yields, sunburn incidence, and soluble solids were not consistent or not significant. Neither dazomet nor solarization, alone or combined, can be presently indicated as control measures for *M. cannonballus*.

REFERENCES

Stapleton, J.J. 2008. Soil solarization informational website: <http://www.solar.uckac.edu>

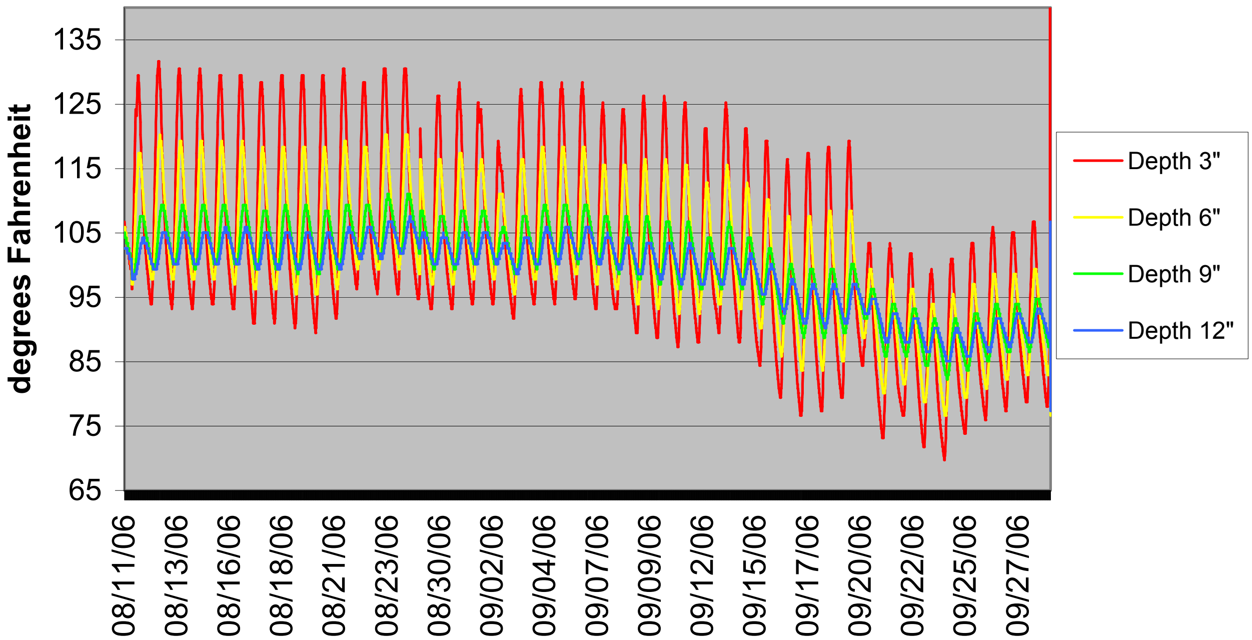

Fig. 1. Soil temperatures at center of 60” bed top covered with 1.25 mil solarization film at University of California Desert Research Extension Center.

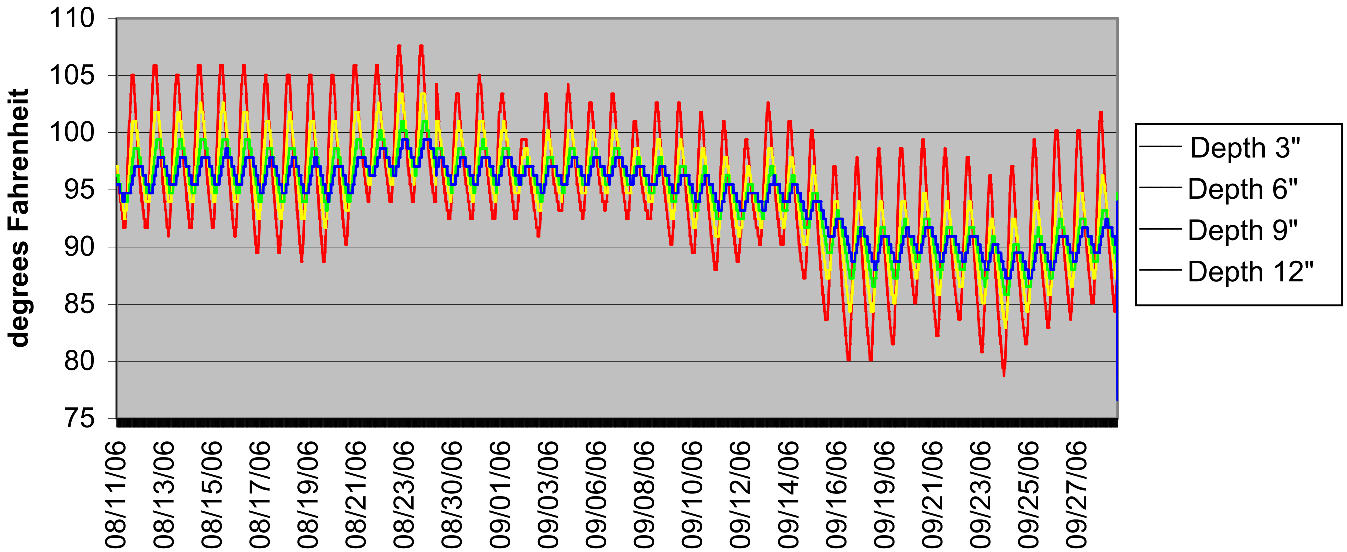

Fig. 2. Soil temperatures at center of 60” bed top of the non-covered bed at University of California Desert Research Extension Center.

Table 1. Effect of Basamid/solarization treatments made in 2006 on weed densities in cantaloupes (seeded and irrigated 26 Mar 2007) on 23 Apr 2007.

Treatment[z]	Irrigation method at initiation of trial (2-3 Aug 2006)			
	Sub-surface drip only		Surface and sub-surface drip	
	Common Purslane[y]	Cheeseweed	Common Purslane	Cheeseweed
Basamid G 530 lbs	17.5	23.0	13.8	8.0
Basamid G 530 lbs + solarization	0.0	4.0	0.0	7.3
Basamid G 265 lbs + solarization	0.0	5.5	0.3	9.0
Solarization	0.0	4.8	0.3	19.5
Untreated	155.3	20.8	62.0	73.8
LSD (P=0.05)[x]	86.6	18.0	32.9	43.8
CV	162.7	100.7	140.2	121.1

[z] On 28 Aug 2006, A tractor mounted drop spreader was used to apply Basamid and the material was mechanically incorporated into the top 6-8 in of soil. On 1 Aug, beds receiving the solarization treatment were covered 1.25 mil solarization film.

[y] On 23 Apr 2007, weeds were identified and counted in 25 ft per plot.

[x] Means separated by a value equal to or greater than the LSD (least significant difference) are significantly different at a probability of 5%.

Table 2. Effect of Basamid/solarization treatments made in 2006 on vigor of cantaloupes seeded and irrigated 26 Mar 2007.

Treatment[z]	Runner length (in)[y]					
	Irrigation method at initiation of trial (2-3 Aug 2006)					
	Sub-surface drip only			Surface and sub-surface drip		
	11 May, 2007	30 May, 2007	7 July. 2007	11 May, 2007	30 May, 2007	7 July. 2007
Basamid G 530 lbs	8.0	38.2	48.9	6.8	38.7	52.2
Basamid G 530 lbs + solarization	17.0	47.5	62.8	15.5	51.6	62.3
Basamid G 265 lbs + solarization	17.8	48.0	63.0	14.5	48.8	63.3
Solarization	14.8	42.2	59.8	13.0	49.2	56.5
Untreated	6.0	36.3	41.0	5.3	26.1	46.3
LSD (P=0.05)[x]	4.3	9.5	8.3	4.2	8.6	9.4
CV	21.9	14.6	9.7	24.8	13.1	10.9

[z] On 28 Aug 2006, A tractor mounted drop spreader was used to apply Basamid and the material was mechanically incorporated into the top 6-8 in of soil. On 1 Aug, beds receiving the solarization treatment were covered 1.25 mil solarization film.

[y] Average runner length as determined by measuring 3 runners from 3 different plants per plot. Averages are resented in inches.

[x] Means separated by a value equal to or greater than the LSD (least significant difference) are significantly different at a probability of 5%.

Table 3. Effect of Basamid/solarization treatments on yield of cantaloupes: Irrigated with sub-surface drip throughout the trial.

Treatment[z]	Cartons marketable fruit/acre[y]						Sunburn fruit per acre[x]	Brix[w]
	9	12	15	18	23	total		
Basamid G 530 lbs	362.8	308.8	162.0	65.3	14.8	909.6	6008.3	9.5
Basamid G 530 lbs + solarization	435.4	289.5	130.6	50.8	0	906.3	4179.7	9.3
Basamid G 265 lbs + solarization	643.3	333.1	156.7	55.1	0	1192.2	4049.1	9.1
Solarization	516.7	489.8	226.4	58.1	3.4	1294.3	4114.4	9.0
Untreated	333.8	148.0	57.5	33.4	3.4	576.1	2481.7	9.1
LSD (P=0.05)[v]	NS[u]	246.0	NS	NS	NS	NS	NS	NS
CV	57.6	51.2	101.7	101.7	179.5	48.8	55.7	7.2

[z] On 28 Aug 2006, A tractor mounted drop spreader was used to apply Basamid and the material was mechanically incorporated into the top 6-8 in of soil. On 1 Aug, beds receiving the solarization treatment were covered 1.25 mil solarization film.

[y] At full slip, fruit were harvested from 25 ft of each plot area on 27 Jun, 2 and 6 Jul. Number of marketable fruit per plot were placed in size categories (9, 12 15, 18 and 23 based on number of fruit per 45 lb carton).

[x] Number of sunburned fruit were recorded.

[w] At each harvest, a representative sample of 5 cosmetically acceptable fruit per plot were tested for soluble solids with a hand-held refractometer.

[v] Means separated by a value equal to or greater than the LSD (least significant difference) are significantly different at a probability of 5%.

[u] No significant difference between means in the column.

Table 4. Effect of Basamid/solarization treatments on yield of cantaloupes: Irrigated with surface and sub-surface drip immediately after application of solarization film and Basamid.

Treatment[z]	Cartons marketable fruit/acre[y]						Sunburn fruit per acre[x]	Brix[w]
	9	12	15	18	23	total		
Basamid G 530 lbs	616.8	239.5	182.9	36.8	0.0	1075.4	4114.4	6.1
Basamid G 530 lbs + solarization	333.8	255.8	100.1	50.8	11.4	751.9	4702.1	9.1
Basamid G 265 lbs + solarization	442.6	201.4	95.8	14.5	2.8	757.1	2220.4	9.0
Solarization	348.3	179.6	139.3	25.4	5.6	698.3	3853.1	8.5
Untreated	522.5	315.7	152.4	43.5	0.0	1034.0	4571.5	6.1
LSD (P=0.05)[v]	NS[u]	NS	NS	NS	NS	NS	NS	NS
CV	85.5	69.1	96.4	94.7	76.3	76.3	69.94	29.0

[z] On 28 Aug 2006, A tractor mounted drop spreader was used to apply Basamid and the material was mechanically incorporated into the top 6-8 in of soil. On 1 Aug, beds receiving the solarization treatment were covered 1.25 mil solarization film.

[y] At full slip, fruit were harvested from 25 ft of each plot area on 27 Jun, 2 and 6 Jul. Number of marketable fruit per plot were placed in size categories (9, 12 15, 18 and 23 based on number of fruit per 45 lb carton).

[x] Number of sunburned fruit were recorded.

[w] At each harvest, a representative sample of 5 cosmetically acceptable fruit per plot were tested for soluble solids with a hand-held refractometer.

[v] Means separated by a value equal to or greater than the LSD (least significant difference) are significantly different at a probability of 5%.

[u] No significant difference between means in the column.

Table 5. Effect of Basamid/solarization treatments made in 2006 on roots three days after the last harvest.

Treatment[z]	Root symptoms/signs on roots[y]			
	Irrigation method at initiation of trial (2-3 Aug 2006)			
	Sub-surface drip only		Surface and sub-surface drip	
	Rot (%)	No. roots w/ perithecia	Rot (%)	No. roots w/ perithecia
Basamid G 530 lbs	7.35	3.1	5.40	4.7
Basamid G 530 lbs + solarization	6.13	10.9	4.48	10.4
Basamid G 265 lbs + solarization	7.28	5.8	3.20	3.1
Solarization	8.28	3.2	3.20	8.0
Untreated	6.17	4.7	4.15	3.2
LSD (P=0.05)[x]	2.52	5.1	2.67	4.7
CV	23.0	58.9	36.3	51.6

[z] On 28 Aug 2006, A tractor mounted drop spreader was used to apply Basamid and the material was mechanically incorporated into the top 6-8 in of soil. On 1 Aug, beds receiving the solarization treatment were covered 1.25 mil solarization film.

[y] On 9 July, 20 roots per plot were undercut and removed by hand. Percentage of the root with brown discoloration or rot was estimated and the number of roots with *M. cannonballus* perithecia were recorded.

[x] Means separated by a value equal to or greater than the LSD (least significant difference) are significantly different at a probability of 5%.

Table 6. Weed counts, cantaloupe plant vigor and root rot severity in soil taken from Basamid/ solarization treated areas and placed in pots.

Treatment[z]	Common purslane/pot on 29 May	Plant/runner length (in) 29 May	Root rot (%) 6 Jun
Basamid G 530 lbs	5.5	7.2	20.0
Basamid G 530 lbs + solarization	2.0	17.3	75.0
Basamid G 265 lbs + solarization	2.0	14.3	72.5
Solarization	2.8	12.4	57.7
Untreated	9.8	5.0	40.0
LSD (P=0.05)[y]	6.3	3.9	NS[x]
CV	92.9	21.7	89.9

[z] On 28 Aug 2006, A tractor mounted drop spreader was used to apply Basamid and the material was mechanically incorporated into the top 6-8 in of soil. On 1 Aug, beds receiving the solarization treatment were covered 1.25 mil solarization film. Twelve lbs soil was sampled from each plot and placed in pots on 20 Sep 2006. On 13 Apr 2007, 'Gold Rush' variety cantaloupe seed was planted and irrigated.

[y] Means separated by a value equal to or greater than the LSD (least significant difference) are significantly different at a probability of 5%.

[x] No significant difference between means in the column.

CIMIS REPORT

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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 May 1 to July 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 o 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	June		July		August	
	1-15	16-30	1-15	16-31	1-15	16-31
Calipatria	0.39	0.40	0.39	0.38	0.35	0.32
El Centro (Seeley)	0.36	0.38	0.38	0.37	0.32	0.29
Holtville (Meloland)	0.38	0.39	0.39	0.38	0.34	0.31

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