Imperial County Agricultural Briefs

Features From your Farm Advisors

September, 2010

FLEA BEETLE & WHITEFLY INSECTICIDE EFFICACY IN LETTUCE, 2009.

Eric T. Natwick

The objective of the study was to evaluate the efficacy of various neonicotinoid insecticides for control of early season insect pests on iceberg head lettuce under desert growing conditions. Head lettuce (MOHAWK M.I.) was direct seeded on 10 Sep 2009 at the University of California Desert Research and Extension Center, El Centro, CA into double row beds on 40 inch centers. Stand establishment was achieved using overhead sprinkler irrigation, and irrigated with furrow irrigation thereafter. Plots were four beds 13.3 ft wide by 50 ft long and bordered by one untreated bed. Five replications of each treatment were arranged in a RCB design. Insecticidal compounds, formulations and application rates along with treatment dates are provided in Table 1. The in-furrow at-planting application of Venom 20 SG was injected 2 inches below the seed on 3 Nov 2008. Durivo was applied as a band-drench at the base of lettuce plants on 13 Jan 2009. All other insecticide treatments were foliar sprays applied with a Lee Spider Spray TracTractor 4-row sprayer with three TJ-60 11003VS nozzles per row that delivered a broadcast application at 36 psi and 57 gpa on the dates indicated in Table 1. Dyne-Amic @ 0.25% vol/vol was added to each foliar spray mixture. Numbers of Sweetpotato whitefly (SWF), *Bemisia tabaci* (Gennadius) – biotype B from 10 plants per plot in each replicate were recorded on each sample date as indicated in Table 2. Palestriped Flea Beetle (PSFB) *Systena blanda* Melsheimer damaging ratings for adult feeding were evaluated from 10 plants per plot in each replicate were recorded on each sample date as indicated in Table 3. Data were analyzed using ANOVA. Differences among means on each sampling date and in each experiment were determined using Least Significant Difference Test (*P*=0.05).

SWF population levels were high during this trial. All of the insecticide treatments significantly (*P*=0.05) reduced numbers of SWF adults compared to the untreated control on the 6 Oct and 16 Oct sampling dates but not on the 28 Sep sampling date (Table 2). All of the insecticide treatments except Clutch 2.13 SC @ 10 oz/acre and Assail 30 SG @ 4.0 oz/acre had significantly fewer SWF eggs compared to the check on 28 Sep and 6 Oct; however, none of the insecticide treatments has significantly fewer SWF eggs compared to the check on 16 Oct (Table 2). All of the insecticide treatments except Assail 30 SG @ 4.0 oz/acre had significantly fewer SWF nymphs compared to the check on 28 Sep and all insecticide treatment had significantly fewer SWF nymphs than the check on 6 Oct. None of the insecticide treatments had significantly fewer SWF nymphs than the check on 16 Oct, but the SWF population was very low on the leaves sampled during the 16 Oct sampling date. The only the Provado 1.6 insecticide treatments @ 3.8 oz/acre did not have a significantly lower PSFB damaging rating compared the check on 12 Oct (Table 3). All of the insecticide treatments had significantly lower PSFB damaging ratings compared to the check on 21 Oct. All of the insecticide treatments except Provado 1.6 @ 3.8 oz/acre had significantly fewer PSFB adults compared to the check on 21 Oct. No phytotoxicity symptoms were observed following any of the insecticide treatments.

Table 1.

Insecticide treatment list

Treatment	Oz/acre	Application method	Treatment date
Untreated Check	--------	No application	--------------------
Vemon	5.0	In-furrow	10 Sep
Clutch 2.13 SC	10.0	In-furrow	10 Sep
Clutch 2.13 SC	12.0	In-furrow	10 Sep
AdmirePro	10.0	In-furrow	9 Sep
Assail 30 SG	4.0	Foliar spray	29 Sep
Provado 1.6	3.8	Foliar spray	29 Sep

Table 2.

Whitefly Adults per leaf, whitefly eggs and nymphs per cm^2

Treatments as oz/acre		Adults			Eggs			Nymphs		
Check	----	8.68	5.74 a	2.68 a	61.75 a	27.14 a	0.29	11.28 a	46.39 a	0.00 b
Vemon	5	15.32	1.80 c	0.48 b	29.66 d	13.33 c	0.41	2.23 c	16.55 bc	0.07 b
Clutch 2.13 SC	10	10.38	1.82 c	0.48 b	48.79 ab	21.55 ab	0.22	4.21 bc	19.35 b	0.07 b
Clutch 2.13 SC	12	11.66	3.30 b	0.64 b	41.01 bcd	12.65 cd	0.56	4.93 bc	14.74 bc	0.17 ab
AdmirePro	10	13.34	2.06 bc	0.36 b	31.99 cd	6.27 d	0.29	2.05 c	12.69 bc	0.32 a
Assail 30 SG	4	12.22	2.12 bc	0.84 b	51.02 ab	20.99 ab	0.34	7.50 ab	8.24 c	0.02 b
Provado 1.6	3.8	9.80	2.36 bc	0.68 b	44.73 bc	15.89 bc	0.19	9.87 a	12.04 bc	0.07 b

Means within columns followed by the same letter are not significantly different, ANOVA; LSD ($P<0.05$).

Table 3.

PSFB Damage Ratings and PSFB Adults per ten plants

Treatment	Oz/acre	FB damage		Flea beetle adults
		12 Oct	21 Oct	21 Oct
Check	------	0.80 a	2.00 a	2.20 a
Vemon	5.0	0.44 cd	0.60 bc	0.40 b
Clutch 2.13 SC	10.0	0.38 cd	0.40 bc	0.60 b
Clutch 2.13 SC	12.0	0.22 d	1.00 b	0.60 b
AdmirePro	10.0	0.52 bc	0.60 bc	0.00 b
Assail 30 SG	4.0	0.48 bc	0.20 c	0.20 b
Provado 1.6	3.8	0.70 ab	1.00 b	1.20 ab

Flea beetle damage rating:

0 = no damage
1 = 1 – 20% damage
2 = 21 – 40% damage
3 = 41 – 60 % damage
4 = 61 – 80 % damage
5 = 81 – 100% damage

Means within columns followed by the same letter are not significantly different, ANOVA; LSD (P<0.05).

Photo courtesy of: UC IPM

IT'S TIME TO CHECK YOUR SPRINKLER SYSTEM

Khaled M. Bali

Fall is a great time to check your sprinkler irrigation system to insure maximum efficiency and to conserve water. Sprinkle irrigation is mainly used for seed germination and for irrigating vegetable crops in the Imperial Valley. Hand-move systems are commonly used in the Imperial Valley and throughout California. Sprinkle irrigation was mainly used in the Valley for seed germination, however, in the last few years, more growers have been using sprinkler irrigation to germinate and grow vegetable crops in the Valley. Sprinkle irrigation is suitable for most vegetable crops in the Valley.

One of the advantages of sprinkler irrigation over surface irrigation is the ability to apply water uniformly at low rates. Application rates for commercial crops vary from 0.10 to 0.30 in/hr. The application rate depends on nozzle size, sprinkler spacing, and operating pressure. Frequent irrigations of low application rates are needed on light or sandy soils. The application rate should not exceed the basic intake or infiltration rate on heavy soils to prevent surface runoff. Table 1 can be used for maximum application rate values for hand-move systems. The application rate of the system should not exceed the values presented in Table 1 to prevent runoff. Reducing or eliminating surface runoff increases the efficiency of the system (water and energy savings). In general, soil infiltration rates decreases after the initial irrigation. If water is filling up your runoff ditch and you have runoff in your drop box, it is time to turn the system off.

The amount of water applied with a sprinkler system depends on the application rate and on the length of irrigation event. The application rate needs to be determined first before any irrigation-scheduling question can be answered. Application rate can be simply determined using the catch can method or a simple procedure in which you run your system for a specific period of time (15 to 60 minutes), determined the amount of water that has been used (using a flow meter) and then calculate the application rate. The application rate (AR) can be calculated from

AR= 720 V/(T A)

Where AR is the application rate (inches per hour), V is the volume of water applied (acre-feet), T is the time of application (minutes), and A is the area of application (acres).

Example: What is the application rate of a sprinkler system where 0.5 ac-ft of water was applied over 40 acres in 60 minutes.

V= 5 ac-ft
T= 60 min.
A= 40 ac.

AR= 720 x 0.5/(60 x 40)
AR= 0.15 in/hr

If you need to apply 0.75 inches of water to meet the crop water demands over a specific period of time, then you need to run the system for 5 hours (0.75 inches/ 0.15 inches per hour). Irrigation time should be adjusted to account for irrigation efficiency/uniformity. Note that if you change the spacing between sprinklers and/or laterals, the application rate needs to be adjusted to account for the new configuration.

To prevent leaching of nutrients, apply no more than 1 to 1.2 inches per application, if you exceed 1" per application, you maybe leaching nutrients out of the root zone. If you are applying fertilizers with the irrigation system, apply the fertilizer toward the end of the run time to prevent leaching of nutrients. For example if you are planning to irrigate for 6 hours and apply fertilizers, run the system for 3 hours then inject the fertilizer toward the end of the run (for 2 hours), then use the last hour to flush the fertilizer from the system.

Sprinkler Irrigation check list:

- Flow meter- to estimate the average depth of application and total applied water over the season
- Pressure gage: to monitor pressure and maintain the system pressurized within the range recommended by the manufacturer of the system. Low pressure results in poor distribution uniformity and under irrigation. High pressure results in over irrigation and wastes water and energy.
- Match application rate with crop water use or CIMIS (California Irrigation Management System) reference evapotranspiration (ETo) during early crop stages.

Table 1. Maximum application rates for sprinklers (Slope less than 5%)

Soil Texture	Maximum Application Rate (in/hr)
Sandy soils	1.50
Sandy loam soils	0.75
Silty loam soils	0.50
Clay and clay loam soils	0.15

2009 BROCCOLI INSECTICIDE EFFICACY TRIAL

Eric T. Natwick

The objective of the study was to evaluate the efficacy of insecticides for control of various insect pests on broccoli under desert growing conditions. Broccoli (Coronado Crown) was direct seeded on 11 Sep 2009 at the University of California Desert Research and Extension Center, El Centro, CA into double row beds on 40 inch centers. Stand establishment was achieved using overhead sprinkler irrigation, and irrigated with furrow irrigation thereafter. Plots were four beds 13.3 ft wide by 50 ft long and bordered by one untreated bed. Four replications of each treatment were arranged in a RCB design. Insecticidal compounds, formulations and application rates along with treatment dates are provided the tables. The in-furrow at-planting application of Admire Pro was injected 2 inches below the seed in 15 gpa H_2O on 9 Sep 2009. All other insecticide treatments were foliar sprays applied with a Lee Spider Spray TracTractor 4-row sprayer with three TJ-60 11003VS nozzles per row that delivered a directed spray application at 35 psi and 72.5 gpa on the dates indicated in Table 1. The buffer in agent, Helena Buffer PS, (Helena Chemical Co.), was added to the tank mixture of Ecozin Plus to establish a 5.5 pH. An adjuvant, TN MSO D17FC0684 (DuPont) was added at 0.25% to each foliar spray mixture. Numbers of Sweetpotato whitefly (SWF), *Bemisia tabaci* (Gennadius) – biotype B, Bagrada bug (BB), *Bagrada hilaris*, Beet armyworm (BAW), *Spodoptera exigua* (Hübner), Cabbage looper (CL), *Trichoplusia ni* (Hübner), and Diamondback moth (DBM), *Plutella xylostella* from 10 plants per plot in each replicate were recorded on sampling dates as indicated in the tables. Data were analyzed using ANOVA. Differences among means on each sampling date and in each experiment were determined using Least Significant Difference Test (P=0.05). Log_{10} (X+1) transformations were used, as needed, with back-transformed means presented in tables.

SWF population levels were low to moderate during this trial. None of the treatments had significantly (P=0.05) fewer SPW adults than the check until 16 Oct when all insecticide treatments had fewer adults compared to the check (Table 2). Prior to foliar spray applications on 29 Sep, there were no differences among the means for SPW eggs with the exception of the Admire treated plots, injected just prior to planting on 9 Sep; the Admire treatments means were significantly lower than the check mean (Table 3). There were no differences among the treatment means for SPW eggs on 6 Oct or 16 Oct. None of the insecticide treatments significantly reduced numbers of SPW nymphs compared to the untreated check on any of the sampling dates from (Table 4).

All of the insecticide treatments had significantly (P=0.05) fewer Bagrada bugs compared to the check on 3 Nov and 12 Nov with the exception of NAI 2302 15EC at 21.0 fl oz/acre on 3 Nov (Table 5); there were no differences among the treatment means on all other sampling dates.

There were few worm pests for the duration of the experiment (Tables 6, 7 and 8). There were too few BAW to a meaningful evaluation even though the check had significantly (P=0.05) fewer larvae than any of the insecticide treated plots on 1 Dec (Table 6). All of the insecticide treatments had significantly fewer CL larvae compared to the check on the sampling dates 21 Oct, 27 Oct and 3 Nov – 1 Dec with the exception of Voliam Xpress alternating with Orthene 97 on 21 Oct (Table 7). The DBM population levels were very low and there were no significant differences among the means except on 21 Oct when all insecticide treatments had fewer DBM larvae compared to the check (Table 8).

Only Voliam Flexi 40 WG alternating with Movento, Voliam Xpress alternating with Orthene 97 and Admire Pro followed by Hero had significantly (*P*=0.05) more market quality broccoli heads compared to the check (Table 9). The insecticide treatments of Voliam Flexi 40 WG alternating with Movento, Voliam Xpress alternating with Orthene 97, Admire Pro followed by Radiant and Admire Pro followed by Hero all had means for kg of market broccoli heads that were greater than the check. All insecticide treatments had significantly fewer damaged broccoli heads than the check and significantly higher percentages of market quality broccoli heads compared to the check. No phytotoxicity symptoms were observed following any of the insecticide treatments.

Table 1.

Insecticide treatment list

Treatment	oz/acre	Application method	Application date
Voliam Flexi 40 WG alt/w Movento	7.0 alt/w 4.0	Foliar spray Foliar spray	29 Sep, 30 Oct 15 Oct, 4 Nov
Voliam Xpress alt/w Orthene 97	9.0 alt/w 12.0	Foliar spray Foliar spray	29 Sep, 16 Nov 30 Oct
NAI 2302 15EC	21.0	Foliar spray	29 Sep, 30 Oct, 4, 16 Nov
NAI 2302 15EC + Brigade 2E	21.0 + 4.0	Foliar spray	29 Sep, 30 Oct
Vetica	13.0	Foliar spray	29 Sep, 15 Oct, 4 Nov
Admire Pro f/b Radiant	10.5 f/b 5.0	In-furrow Foliar spray	9 Sep 29 Sep, 15, 30 Oct
Admire Pro f/b Hero	10.5 f/b 10.3	In-furrow Foliar spray	9 Sep 29 Sep, 16 Nov

Table 2.

Treatment	oz/acre	SWF adults per leaf		
		29 Sep	6 Oct	16 Oct
Voliam Flexi alt/w Movento	7.0 alt/w 4.0	7.00 b	21.05 a	35.90 bc
Voliam Xpress alt/w Orthene 97	9.0 alt/w 12.0	6.70 bc	14.98 b	24.75 bcd
NAI 2302 15EC	21.0	7.28 b	9.45 bc	11.45 d
NAI 2302 15EC + Brigade 2E	21.0 + 4.0	3.38 c	13.15 b	41.10 b
Vetica	13.0	7.25 b	12.35 b	18.45 cd
Admire Pro f/b Radiant	10.5 f/b 5.0	12.40 a	5.30 c	11.20 d
Admire Pro f/b Hero	10.5 f/b 10.3	4.95 bc	4.75 c	8.40 d
Check	----------	6.50 bc	10.33 bc	85.30 a

Means within columns followed by the same letter are not significantly different, ANOVA; LSD ($P<0.05$).

Table 3.

Treatment	oz/acre	SWF eggs per cm^2		
		29 Sep	6 Oct	16 Oct
Voliam Flexi alt/w Movento	7.0 alt/w 4.0	79.02 a	58.30	29.88
Voliam Xpress alt/w Orthene 97	9.0 alt/w 12.0	73.71 ab	63.70	27.91
NAI 2302 15EC	21.0	60.06 abc	64.38	36.12
NAI 2302 15EC + Brigade 2E	21.0 + 4.0	65.93 abc	42.29	40.12
Vetica	13.0	63.47 abc	22.97	21.27
Admire Pro f/b Radiant	10.5 f/b 5.0	50.26 bc	38.76	6.09
Admire Pro f/b Hero	10.5 f/b 10.3	45.55 c	28.39	13.36
Check	----------	72.86 ab	47.68	53.33

Means within columns followed by the same letter are not significantly different, ANOVA; LSD (*P*<0.05).
Table 4.

Treatment	oz/acre	29 Sep	SWF nymphs per cm^2	
			6 Oct	16 Oct
Voliam Flexi alt/w Movento	7.0 alt/w 4.0	4.49	3.74	10.52
Voliam Xpress alt/w Orthene 97	9.0 alt/w 12.0	4.99	3.33	6.88
NAI 2302 15EC	21.0	1.39	2.36	13.33
NAI 2302 15EC + Brigade 2E	21.0 + 4.0	4.14	1.89	6.97
Vetica	13.0	2.74	1.83	3.27
Admire Pro f/b Radiant	10.5 f/b 5.0	3.26	2.53	1.46
Admire Pro f/b Hero	10.5 f/b 10.3	2.21	1.03	5.21
Check	----------	4.88	2.94	5.88

Means within columns followed by the same letter are not significantly different, ANOVA; LSD (*P*<0.05).

Table 5.

Treatment	oz/acre	6 Oct	Bagrada bugs per plant				
			21 Oct	27 Oct	3 Nov	12 Nov	19 Nov
Voliam Flexi alt/w Movento	7.0 alt/w 4.0	0.00	0.00	1.25	1.50 b	0.00 b	1.50
Voliam Xpress alt/w Orthene 97	9.0 alt/w 12.0	0.00	0.25	2.50	0.25 b	1.00 b	0.00
NAI 2302 15EC	21.0	0.00	0.00	0.75	2.25 ab	0.50 b	3.50
NAI 2302 15EC + Brigade 2E	21.0 + 4.0	0.00	0.00	1.50	0.00 b	0.75 b	0.50
Vetica	13.0	0.00	0.00	0.50	0.50 b	0.25 b	1.00
Admire Pro f/b Radiant	10.5 f/b 5.0	0.25	0.00	3.00	0.00 b	0.25 b	0.50
Admire Pro f/b Hero	10.5 f/b 10.3	0.00	0.00	1.00	0.00 b	0.00 b	0.00
Check	----------	0.00	0.00	1.25	4.50 a	3.50 a	4.00

Means within columns followed by the same letter are not significantly different, ANOVA; LSD (*P*<0.05

Table 6.

Treatment	oz/acre	BAW per 10 plants								
		29 Sep	6 Oct	14 Oct	21 Oct	27 Oct	3 Nov	12 Nov	19 Nov	1 Dec
Voliam Flexi alt/w Movento	7.0 alt/w 4.0	0.00	0.50	0.00	0.00	0.00	0.75	0.00	0.00	0.00 b
Voliam Xpress alt/w Orthene 97	9.0 alt/w 12.0	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00 b
NAI 2302 15EC	21.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 b
NAI 2302 15EC + Brigade 2E	21.0 + 4.0	0.00	0.25	0.00	0.00	0.00	0.25	0.00	0.00	0.00 b
Vetica	13.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 b
Admire Pro f/b Radiant	10.5 f/b 5.0	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00 b
Admire Pro f/b Hero	10.5 f/b 10.3	0.00	0.00	0.00	0.00	0.00	0.25	0.50	0.00	0.00 b
Check	----------	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.75 a

Means within columns followed by the same letter are not significantly different, ANOVA; LSD (P<0.05).

Table 7.

Treatment	oz/acre	CL per 10 plants								
		29 Sep	6 Oct	14 Oct	21 Oct	27 Oct	3 Nov	12 Nov	19 Nov	1 Dec
Voliam Flexi Movento	7.0 4.0	0.00	0.00	0.50 b	1.00 cd	1.00	0.50 bcd	0.00 c	0.00 b	0.50 b
Voliam Xpress Orthene 97	9.0 12.0	0.00	0.00	0.00 b	2.50 ab	1.00	0.25 cd	0.25 c	0.00 b	0.50 b
NAI 2302 15EC	21.0	0.00	0.00	0.25 b	0.50 cd	0.75	1.00 bc	0.75 b	0.00 b	0.50 b
NAI 2302 15EC + Brigade 2E	21.0 + 4.0	0.00	0.00	0.00 b	1.50 bc	0.25	0.00 d	0.00 c	0.00 b	0.50 b
Vetica	13.0	0.00	0.00	1.75 a	0.50 cd	0.25	1.25 b	0.00 c	0.00 b	0.75 b
Admire Pro Radiant	10.5 5.0	0.00	0.00	0.50 b	0.00 d	2.50	0.00 d	0.00 c	0.00 b	0.50 b
Admire Pro Hero	10.5 10.3	0.00	0.00	0.00 b	0.00 d	0.25	0.00 d	0.00 c	0.00 b	0.00 b
Check	---------	0.00	0.00	0.50 b	3.25 a	2.00	2.75 a	1.25 a	0.75 a	2.75 a

Means within columns followed by the same letter are not significantly different, ANOVA; LSD (P<0.05).

Table 8.

Treatment	oz/acre	DBM larvae per 10 plants								
		29 Sep	6 Oct	14 Oct	21 Oct	27 Oct	3 Nov	12 Nov	19 Nov	1 Dec
Voliam Flexi alt/w Movento	7.0 alt/w 4.0	0.00	0.00	0.25	0.00 b	0.50	0.00	0.00	0.00	0.00
Voliam Xpress alt/w Orthene 97	9.0 alt/w 12.0	0.25	0.00	0.00	0.25 b	0.50	0.00	0.00	0.00	0.00
NAI 2302 15EC	21.0	0.00	0.00	0.25	0.25 b	0.00	0.00	0.00	0.00	0.00
NAI 2302 15EC + Brigade 2E	21.0 + 4.0	0.00	0.50	0.00	0.00 b	0.25	0.00	0.00	0.00	0.25
Vetica	13.0	0.00	0.00	0.25	0.00 b	0.00	0.00	0.00	0.00	0.00
Admire Pro f/b Radiant	10.5 f/b 5.0	0.00	0.00	0.25	0.75 b	0.25	0.00	0.00	0.00	0.00
Admire Pro f/b Hero	10.5 f/b 10.3	0.00	0.00	0.00	0.25 b	0.00	0.00	0.00	0.00	0.00
Check	----------	0.00	0.50	0.50	1.75 a	0.25	0.00	0.50	0.00	0.25

Means within columns followed by the same letter are not significantly different, ANOVA; LSD ($P<0.05$).

Table 9.

Treatment	oz/acre	Numbers of damaged broccoli heads, market heads and kg of market heads per 0.001 acre and percentages of market heads			
		Damaged heads	Market heads	Kg market heads	% Market heads
Voliam Flexi alt/w Movento	7.0 alt/w 4.0	1.00 b	14.00 ab	4.37 ab	93.93 a
Voliam Xpress alt/w Orthene 97	9.0 alt/w 12.0	0.50 b	13.00 ab	4.53 ab	95.45 a
NAI 2302 15EC	21.0	0.25 b	10.75 bc	3.58 bc	98.61 a
NAI 2302 15EC + Brigade 2E	21.0 + 4.0	0.50 b	11.25 abc	3.43 bc	95.94 a
Vetica	13.0	2.25 b	11.75 abc	3.35 bc	85.39 a
Admire Pro f/b Radiant	10.5 f/b 5.0	2.50 b	11.75 abc	4.48 ab	82.28 a
Admire Pro f/b Hero	10.5 f/b 10.3	1.75 b	17.00 a	6.02 a	88.54 a
Check	----------	7.00 a	6.50 c	1.63 c	43.78 b

Means within columns followed by the same letter are not significantly different, ANOVA; LSD ($P<0.05$).

Effect of Insecticides on the Mid-Season Severity of Iris Yellow Spot in Onions

Donna Henderson and Eric Natwick

Iris Yellow Spot Virus (IYSV) is a viral disease of bulb and seed onion crops that is transmitted by onion thrips, *Thrips tabaci*. IYSV is characterized as genus tospovirus, virus family *Bunyaviridae.* The virus infects most *Allium* species and also is known to infect some ornamentals (iris, lisianthus) and some weeds (jimsonweed, tobacco, redroot pigweed) (UC-IPM). California produces approximately 36,000 acres of onions with a total value of $144 million, making it the top onion producing state in the U.S.

Symptoms of IYSV on an onion plant.
www.ipmimages.org

The symptoms of IYSV are yellow/straw colored diamond shaped or circular lesions on the onion scape or leaves of the onion plant. Chlorotic lesions may coalesce into large chlorotic streaks capable of causing lodging of the onion plant. Infection can reduce plant size and vigor of the onion plant. Infection by IYSV can potentially cause total field loss, but in the Imperial Valley there has not been any total field loss reported (Plant Health Progress, 2007). Stressed onion plants are more susceptible to IYSV than otherwise healthy plants.

IYSV is transmitted by onion thrips throughout the growing season, and weeds or volunteer onions may be a host reservoir for maintaining IYSV between cropping seasons. IYSV infection may be highest on the border of crops. The virus disease is common in the Imperial Valley, but still occurs erratically. Management of the virus includes onion thrips control. This study investigated the role of insecticide use in reducing or eliminating mid-season IYSV incidence. Anecdotal observations of fields with early infections have resulted in severe yield loss, especially in seed crop production. Early infection by IYSV causes coalescence of the necrotic lesions on leaves and stems, leading to plant lodging and/or reduced leaf area for photosynthesis later in the season.

Methods Dehydrator onions variety White Creole were planted at UC DREC Holtville, CA on 19 October and replanted 10 December 2009 due to insufficient plant stand. The plant stand was established via sprinkler irrigation and furrow irrigation was used thereafter. The experimental design was a randomized complete block with 4 replicates, each replicate was 50 ft X 6.67 ft; 2 beds/plot on 40" centers. Nine insecticide regimes were applied (Table 1), and an untreated control. Insecticides were applied according to treatment regimes on 18 February, 25 February, 4 March, 11 March, 18 March, 25 March, 1 April, 8 April, and 15 April. Insecticides were applied on the foliage with a Lee Spider Spray TracTractor 4-row sprayer with 3 TJ-60 11003VS nozzles/bed**.** The applications were sprayed at PSI 30, using 57.22 gallons water/acre.

Table 1. Onion Insecticide Efficacy Trial, Thrips, Holtville, California, 2009/10.

Treatments	Oz/acre	Application Dates
1.Untreated	--------	---------------
2. Vydate 2 L f/b Radiant SC + Aza-Direct f/b Mustang Max f/b Lannate LV	48.0 f/b 8.0 + 32 f/b 4.0 f/b 48.0	18 Feb, 18 Mar, 15 Apr 25 Feb, 25 Mar 4 Mar, 1 Apr 11 Mar, 8 Apr
3. HGW86 10 OD f/b Lannate LV f/b Radiant	13.5 f/b 48.0 f/b 8.0	18 Feb, 11 Mar, 1 Apr 25 Feb, 18 Mar, 8 Apr 4, 25 Mar, 15 Apr
4. HGW86 10 OD f/b Lannate LV f/b Radiant	20.5 f/b 48.0 f/b 8.0	18 Feb, 11 Mar, 1 Apr 25 Feb, 18 Mar, 8 Apr 4, 25 Mar, 15 Apr
5. Agri-Mek f/b Warrior II f/b Radiant SC f/b Movento	16.0 f/b 1.92 f/b 8.0 f/b 5.0	18 Feb, 18 Mar, 15 Apr 25 Feb, 25 Mar 4 Mar, 1 Apr 11 Mar, 8 Apr
6. Entrust f/b Aza-Direct f/b Bugoil	2.0 f/b 48.0 f/b 1% v/v	18 Feb, 11 Mar, 1 Apr 25 Feb, 18 Mar, 8 Apr 4, 25 Mar, 15 Apr
7. Bridadier f/b Beleaf 50 WG f/b GWN 2119	5.5 f/b 2.8 f/b 3.0	18 Feb, 4, 25 Mar, 15 Apr 25 Feb, 18 Mar, 8 Apr 11 Mar, 1 Apr
8. Radiant SC	8.0	18 Feb, 4, 18 Mar, 1, 15 Apr
9. Movento	5.0	18 Feb, 4, 18 Mar, 1, 15 Apr
10. Radiant SC alt/w Movento	8.0 alt/w 5.0	18 Feb, 4, 18 Mar 1, 15 Apr 25 Feb, 11, 25 Mar, 8 Apr

Dyne-Amic @ 0.25% v/v was added to all foliar sprays except Bugoil.

Data The number of thrips larvae per five onion plants, adult thrips per five onion plants, all thrips per five onion plants were counted prior to each application of insecticide. IYSV severity data of ten random plants per replication were evaluated on 24 March on a visual scale of 0-5 indicating the percent of leaves covered with lesions: 0 = 0 lesions, 1 = 1-25 percent of leaf covered with lesions, 2 = 26-50 percent, 3 = 51-75 percent, 4 = 76-99 percent, 5 = 100 percent leaf area. IYSV infection was confirmed with ELISA (Agdia, Inc.) at harvest on 20 May, 2010.

Results

The IYSV infection corresponded in significance to the levels of thrips adult and larvae populations sampled on 10 March, 17 March, and 24 March. The untreated control had significantly higher IYSV severity and higher populations of thrips adults and larvae in comparison with all insecticide regime treatments.

Table 2. Severity of Iris Yellow Spot Virus in Comparison to Populations of Thrips (*Thrips tabaci* and *Frankinella occidentalis)* under different Insecticide regimes.

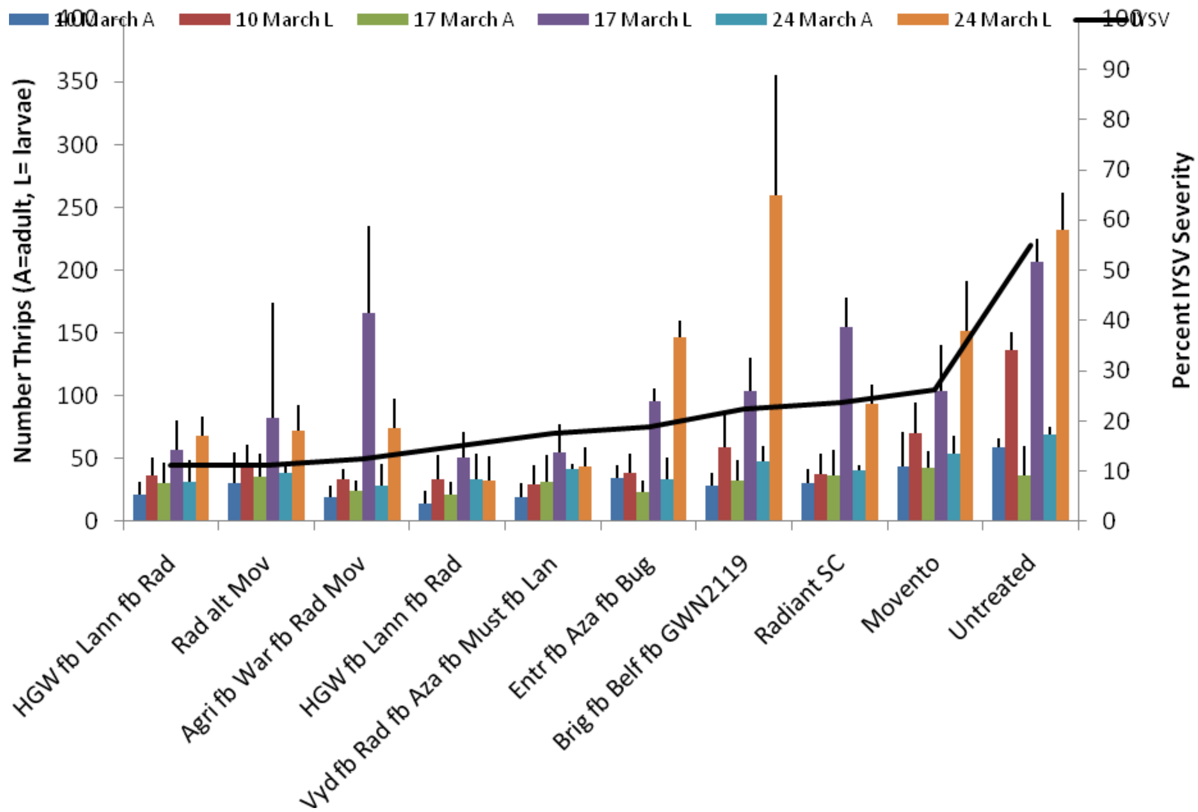
Treatment	oz/acre	Larvae / Adults	3 Mar	10 Mar	17 Mar[z]	24 Mar[z]	24 Mar IYSV Severity
Untreated	--------	Larvae	134.75 a	136.25 a	207.00 a	232.25 ab	0.55a
		Adults	62.75 a	58.75 a	37.00	69.50 a	
Vydate 2 L f/b Radiant SC + Aza-Direct f/b Mustang Max f/b Lannate LV	48.0 f/b 8.0 f/b 32 f/b 4.0 f/b 48.0	Larvae	41.75 c	29.00 c	54.50 d	43.75 ef	0.175b
		Adults	20.75 d	19.50 de	32	41.50 bcd	
HGW86 10 OD f/b Lannate LV f/b Radiant	13.5 f/b 48.0 f/b 8.0	Larvae	43.25 c	37.00 bc	57.25 d	67.75 de	0.1125b
		Adults	38.50 bc	21.00 cde	30.75	32.00 cd	
HGW86 10 OD f/b Lannate LV f/b Radiant	20.5 f/b 48.0 f/b 8.0	Larvae	40.50 c	33.50 c	51.00	33.00 f	0.15b
		Adults	39.50 bc	14.00	21.25	33.50d	
Agri-Mek f/b Warrior II f/b Radiant SC f/b Movento	16.0 f/b 1.92 f/b 8.0 f/b 5.0	Larvae	63.00 c	33.75 c	165.50 ab	74.25 d	0.125b
		Adults	37.00 c	19.00 de	24	28.00 d	
Entrust f/b Aza-Direct f/b Bugoil	2.0 alt/w 48.0 1% v/v	Larvae	57.00 c	39.00 bc	95.75 cd	147.00 bc	0.1875b
		Adults	35.25 cd	34.50 abc	23.75	33.75 cd	
Brigadier f/b Beleaf 50 WG f/b GWN 2119	5.5 f/b 2.8 f/b 3.0	Larvae	63.25 c	58.50 bc	103.75bc	259.50 a	0.225b
		Adults	35.25 cd	28.75 bcd	32.75	48.00abc	
Radiant SC	8	Larvae	56.25 c	37.75 bc	154.75 abc	93.50 cd	0.2375b
		Adults	30.50 cd	30.75 bcd	36.25	40.50bcd	
Movento	5	Larvae	104.00 b	69.75 b	104.00 bc	151.50 abc	0.2625b
		Adults	52.25 ab	43.25ab	42.5	53.50 ab	
Radiant SC alt/w Movento	8.0 alt/w 5.0	Larvae	56.50 c	44.50 bc	82.25 cd	72.50 de	0.1125b
		Adults	38.00 bc	30.00 bcd	36	38.50 bcd	
LSD value, *P*=0.05, Larvae			29.22	33.94	0.25	0.23	0.2024
LSD value, *P*=0.05, Adults			14.99	0.22	NS	0.19	

Means followed by the same letter are not significantly different.
[z] Log transformed data used for analysis; actual means are presented.

The data indicate that as populations of thrips increase, IYSV severity also increases

(Figure 1). All insecticide regimes were significantly able to reduce IYSV severity in comparison with the control mid-way through the season (24 March). The insecticide regime that resulted in the lowest IYSV severity was Vydate 2 L f/b Radiant SC + Aza-Direct f/b Mustang Max f/b Lannate LV and Radiant SC alt/w Movento, although all were able to significantly reduce severity.

Figure 1. Effect of Insecticide Regime on Thrips Populations and Iris Yellow Spot Virus Severity



This research indicates that some measure of IYSV control early in the season can be accomplished with an insecticide regime. All insecticide regimes were able to significantly reduce IYSV infection and thrips populations in comparison to no insecticides at all. These findings indicate that a consistent and adequate insecticide regime is capable of reducing the IYSV severity by 31% in the mid-season. Reducing thrips populations and subsequently IYSV severity into the mid-season may be an effective management approach in order to mitigate severe yield loss. However, in this study the yield data was not gathered but will obtained in subsequent experiments.

U.S. Department of Agriculture (USDA)
USDA #M1911 - Earthquake

Declaration Information — The following table illustrates the declaration information.

Eligible Primary County(s):	Imperial
Eligible Contiguous County(s):	Riverside, San Diego
Event:	May 7, 2010, Major Disaster Declaration (DR-1911-CA) as a result of the earthquake beginning April 4, 2010, and continuing
Assistance made available by designation:	• Emergency farm loans for actual losses as a direct result of the disaster • Up to a maximum of $500,000 • Interest rate 3.75 percent
Application deadline:	**January 7, 2011**
Who may apply:	Farmers and ranchers who conduct family-sized farming operations
How to apply:	• Contact local Farm Service Agency (FSA) office listed in the local telephone directory under U.S. Government, Agriculture •Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD)
USDA website for additional information:	www.fsa.usda.gov/pas/disaster/assistance1.htm

CIMIS REPORT AND UC DROUGHT MANAGEMENT PUBLICATIONS

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 September 1 to November 30 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 (http://wwwcimis.water.ca.gov/cimis/welcome.jsp).

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

Station	September		October		November	
	1-15	16-30	1-15	15-31	1-15	16-30
Calipatria	0.30	0.27	0.23	0.19	0.14	0.10
El Centro (Seeley)	0.29	0.26	0.23	0.17	0.13	0.09
Holtville (Meloland)	0.30	0.27	0.22	0.18	0.13	0.10

* Irrigation Management Unit, Imperial Irrigation District.

Link to UC Drought Management Publications

http://ucmanagedrought.ucdavis.edu/

Heat and Farm Safety Bilingual Information

Khaled M. Bali

The University of California Communication Services News & Information Outreach program published a bilingual brochure on information that helps you stay safe in the farm.

For information about heat and farm safety in English and Spanish, please visit the AsisTel website:
AsisTel is a bilingual toll-free information line, available nationwide. 1-800-514-4494.
www.asistel.org.

AsisTel de la UC: 1-800-514-4494
Servicio de Información en Español: http://espanol.ucanr.org