



Features

From your Farm Advisors

February, 2012

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Insecticide Efficacy Against the Armyworm, *Pseudaletia unipuncta* (Haworth) on Sweet Corn

Eric T. Natwick and Martin I. Lopez



The objective of the study was to evaluate the efficacy of new and a standard insecticide for control of armyworm (AW) on sweet corn under desert growing conditions during the spring season. Sweet corn was direct seeded on 25 Feb 2011 at the University of California Desert Research and Extension Center, Holtville, CA into single row beds on 40 inch centers. Stand establishment and crop maintenance was achieved using furrow irrigation. Plots were 2-beds wide (6.67 ft) by 25 ft long. Five replications of each treatment were arranged in a RCB design. Formulations and rates for each compound are provided in Table 1. The applications were made with a 6-nozzle, 2-bed boom, on a hand held CO₂ propelled sprayer, with 3 Conjet TXVS-4 nozzles per bed spaced 15” apart; outer 2 nozzels on 15” drops facing the plant angled 135° down from vertical delivering 11.2 gpa at 24 psi. On the sampling dates listed (Table 2) a modified Davis scale 0.01-9 was used to rate AW damage as shown below:

0.01 No visible leaf injury.

1. Pin-hole damage on a few leaves.
2. Small amount of shot-hole damage on a few leaves.
3. Shot-hole damage on several leaves.
4. Shot-hole damage and lesions on a few leaves.
5. Lesions on several leaves.
6. Large lesions on several leaves.
7. Large lesions and portions eaten away on a few leaves.
8. Large lesions and portions eaten away on several leaves.
9. Large lesions and portions eaten away on most leaves.

Additionally, AW damaged plants per twenty plants examined were recorded on the dates listed in Table 3. Numbers of AW larvae found per twenty plants examined were recorded for each plot on the dates listed in Table 4. Insecticide treatments were applied as listed in Table 1. An adjuvant, SOLAR, a methylated seed oil with organosilicone at 0.5 % vol/vol was added to each spray mixture. Data sets were analyzed using 2-way ANOVA and means separated by a protected LSD ($P<0.05$).

The AW pressure was normal for the spring sweet corn season. Insecticide treatments were applied after the first AW evaluation 4 May. There were no differences ($P=0.05$) among the treatments during the first three rating dates (Table 2). All of the insecticide treatments had AW damage rating means that were lower than the check on the sampling dates of 17 Sep, 20 Sep, 24 Sep and 27 Sep, except for the treatment of Rimon applied

alone and evaluated on 24 May. There were no differences among the treatments for AW damage rating on 31 May, only Voliam Xpress had an AW rating that was lower than the check on 3 Jun and all insecticide treatments had seasonal averages for AW damage that were lower than the check. There were no differences ($P=0.05$) among the treatments for numbers of AW damaged plants per twenty plants on 4 May and 9 May (Table 3). All insecticide treatments had fewer AW damaged plants compared to the check on sampling dates of 13 May, 17 May, 20 May, 24 May and for the seasonal averages. There were no differences among the treatments for numbers of AW damaged plants per twenty plants on 27 May, 31 May and 3 Jun. There were no differences ($P=0.05$) among the treatments for numbers of AW larvae per twenty plants on any of the sampling dates except 13 May when all insecticide treatments had fewer ($P=0.05$) AW larvae than the check (Table 4). The seasonal average for numbers of AW larvae per twenty plants for each of the insecticide treatments was lower than the mean for the check. No symptoms of phytotoxicity were detected following any of the insecticide applications.

Table 1.

2009 Fall Sweet Corn Treatment List		
Treatment	Ounces/acre	Application Dates
Check	-----	-----
Rimon	12.0	5, 19, 27 May
Rimon 0.83 EC ^z f/b	12.0 f/b	5, 27 May
Avaunt	3.5	19 May
Voliam Xpress	9.0	5, 19, 27 May

^z Rimon 0.83 EC is labeled for use on sweet corn under EPA Reg. No. 66222-35-400; EPA Est. No. 014/093011; CA label for this use was pending at time of publication.

Table 2.

Treatment	Oz/acre	AW Rating									
		4 May	9 May	13 May	17 May	20 May	24 May	27 May	31 May	3 Jun	PTA
Check	-----	1.00	2.40	3.20	2.80 a	1.80 a	2.60 a	1.20 a	0.60	1.00 a	1.95 a
Rimon 0.83 EC ^z	12.0	1.40	1.00	1.80	1.20 b	0.60 b	1.80 a	0.21 b	0.01	0.41 ab	0.88 b
Rimon f/b Avaunt	12.0 f/b 3.5	1.20	1.20	1.40	1.60 b	0.41 b	0.61 b	0.41 b	0.21	0.61 ab	0.80 b
Voliam Xpress	9.0	2.00	1.40	2.00	0.80 b	0.41 b	0.21 b	0.41 b	0.21	0.01 b	0.68 b

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

^z Rimon 0.83 EC is labeled for use on sweet corn under EPA Reg. No. 66222-35-400; EPA Est. No. 014/093011; CA label for this use was pending at time of publication.

Table 3.

Treatment	Oz/acre	Numbers of AW Damaged Plants per Twenty Plants									
		4 May	9 May	13 May	17 May	20 May	24 May	27 May	31 May	3 Jun	PTA
Check	-----	2.00	3.80	3.60 a	4.80 a	2.20 a	2.60 a	1.20	0.80	1.20	2.53 a
Rimon 0.83 EC ^z	12.0	1.60	2.00	2.00 b	1.80 bc	0.40 b	1.40 b	0.20	0.00	0.40	1.03 b
Rimon f/b Avaunt	12.0 f/b 3.5	2.40	2.00	1.40 b	2.40 b	0.60 b	0.80 bc	0.60	0.40	1.00	1.15 b
Voliam Xpress	9.0	2.40	2.40	1.80 b	1.00 c	0.40 b	0.20 c	0.40	0.20	0.00	0.80 b

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

^z Rimon 0.83 EC is labeled for use on sweet corn under EPA Reg. No. 66222-35-400; EPA Est. No. 014/093011; CA label for this use was pending at time of publication.

Table 4.

Treatment	Oz/acre	Numbers of AW Larvae Plants per Twenty Plants									
		4 May	9 May	13 May	17 May	20 May	24 May	27 May	31 May	3 Jun	PTA
Check	-----	1.60	1.60	2.80 a	0.40	0.00	0.00	0.40	0.00	0.00	0.65 a
Rimon 0.83 EC ^z	12.0	2.80	0.80	0.40 b	0.20	0.00	0.00	0.20	0.00	0.00	0.20 b
Rimon f/b Avaunt	12.0 f/b 3.5	2.40	0.80	0.20 b	0.00	0.00	0.00	0.00	0.00	0.00	0.18 b
Voliam Xpress	9.0	4.80	0.80	0.60 b	0.00	0.00	0.00	0.00	0.00	0.00	0.13 b

Means within columns followed by the same letter are not significantly different, ANOVA; LSD ($P < 0.05$). f/b = followed by
^z Rimon 0.83 EC is labeled for use on sweet corn under EPA Reg. No. 66222-35-400; EPA Est. No. 014/093011; CA label for this use was pending at time of publication.



Insecticide Efficacy Against Desert Corn Flea Beetle on Sweet Corn During the Spring of 2011

Eric T. Natwick and Martin I. Lopez



The objective of the study was to evaluate the efficacy of Assail and a standard insecticide for control of flea beetle (DCFB) on sweet corn under desert growing conditions during the spring season. Sweet corn was direct seeded on 25 Feb 2011 at the University of California Desert Research and Extension Center, Holtville, CA into single row beds on 40 inch centers. Stand establishment and crop maintenance was achieved using furrow irrigation. Plots were 2-beds wide (6.67 ft) by 25 ft long. Five replications of each treatment were arranged in a RCB design. Formulations and rates for each compound are provided in Table 1. The insecticide applications were made on 6, 16, and 27 May with a 6-nozzle, 2-bed boom, on a hand held CO₂ propelled sprayer, with 3 Conjet TXVS-4 nozzles per bed spaced 15” apart; outer 2 nozzels on 15” drops facing the plant angled 135° down from vertical delivering 11.2 gpa at 24 psi. Data sets were analyzed using 2-way ANOVA and means separated by a protected LSD ($P<0.05$).

The DCFB pressure was low as is normal for the spring sweet corn season. There were no differences ($P=0.05$) among the treatments for numbers of DCFB during the pre-insecticide treatment evaluation of 4 Sep (Table 1). All of the insecticide treatments had fewer DCFB than the check on all sampling dates following the first insecticide treatments on 6 May. No symptoms of phytotoxicity were detected following any of the insecticide applications.

Table 1.

		DCFB per twenty corn plants										
Treatment	Oz/acre	4 May	10 May	13 May	18 May	24 May	27 May ^x	31 May	3 Jun	6 Jun	10 Jun	PTA ^z
Check	-----	8.80	2.20 a	18.20 a	6.40 a	7.00 a	3.8a	1.60 a	1.60 a	1.60 a	3.60 a	5.11 a
Sevin XLR Plus	32.0 fl	11.60	0.00 b	2.80 b	0.80 c	1.20 b	1.00 b	0.00 b	0.40 b	0.40 b	0.40 b	0.78 b
Assail 70 WP	1.14 dry	12.40	0.40 b	3.00 b	2.80 b	1.20 b	0.40 bc	0.00 b	0.40 b	0.40 b	1.00 b	1.07 b
Assail 70 WP	2.29 dry	10.80	0.20 b	3.80 b	0.80 c	0.60 b	0.00 c	0.20 b	0.00 b	0.60 b	1.00 b	0.80 b

Means within columns followed by the same letter are not significantly different; LSD, P = 0.05.

^x Log (10^x) transformed data used for analysis; actual means shown in parentheses.



Spinach Diseases

Jose Luis Aguiar, Farm Advisor UCCE Riverside County



Spinach is an important leafy vegetable produced in our region. 90% of the US Spinach crop is grown in California and Arizona. In 2010:

- Monterey County led the state with 9,329 acres planted and a gross crop value of a little over \$127 million.
- Yuma Valley, Arizona had 7500 acres planted in spinach with a gross of \$45 million.
- Imperial County reported 6,184 acres with a gross value of a little over \$20 million.
- The Coachella Valley reported 189 acres of spinach for a gross value of \$2 million.

Many diseases are out there and are just waiting for the right conditions to develop. First we need spinach host plants, secondly we need the presence of the pathogens and finally the right temperature for disease development. Overwatering combined with poor field drainage enhances disease development conditions. Broad rows and crowded plants with leaves that do not get to dry out also favor disease development. If possible spinach should be planted in well-drained sandy soils. Sprinkler or furrow irrigation will not be as problematic for disease development if there is good drainage.

Seedling Diseases

In the category of seedling blights or damping off diseases, there are several fungi that prey on emerging seedlings. Symptoms can include poor growth characterized by yellowing, stunting, rotting and plant death. Over watering can contribute to help these fungi that are also called water molds. *Pythium* spp., *Fusarium* spp., and *Rhizoctonia* can cause seedling death. Fungicides are effective especially for *Pythium* spp., which are one of the most common fungi in the Coachella Valley.

Young and Mature Plants

Imperfections on the spinach leaf can ruin the marketability of the crop. Several fungi cause leaf spots that ruin the crop: Cladosporium leaf spot, Stemphylium leaf spot, Anthracnose and Downy Mildew. These fungal pathogens are favored by long lasting leaf wetness and cool wet-weather in the 50-68F range. Proper disease identification is important because many leaf spot symptoms can appear to be very similar. These are very common diseases in spinach production fields.

Cladosporium Leaf Spot



Stemphylium Leaf Spot



Downy Mildew is currently the world's worst disease on Spinach. Up to 1997 there were 4 races of Downy Mildew. In 1998 race 5, 6 and 7 were identified. Soon 8, 9, and 10 showed up. In January 2010, race 13 was found in a spinach field in Holtville. In December 2011, race 13 was also found in a spinach field in the Coachella Valley. When collecting samples ask the Pathologist to identify the race. Plant breeders and seed companies have varieties that are partially resistant to some of the downy mildew races.

Fungicides should be applied before infections occur. Downy Mildew spores will germinate at 48F and temperatures between 54-60F favor disease development. Densely planted spinach with leaves that remain wet for long periods also favors disease development.

Downy Mildew symptoms include bright yellow spots on the cotyledons and leaves. Over time these spots get larger and dry out. When these leaves are turned over a purple grey growth of the fungus can be seen on the leaf underside.

Start with clean seed, begin with those partial resistant cultivars, practice crop rotations, disk fields immediately to prevent spinach volunteer plants from growing, improve field drainage and do not overwater.

Wilt diseases

In Spinach fields along the coast of California, Verticillium Wilt is the more common wilt. This fungus usually shows up in the older leaves, with interveinal chlorosis and plant death.

In the desert valleys, Fusarium Wilt may be the more common wilt encountered. Fusarium wilt can be a seedling or a mature plant disease. Symptoms include plant wilting, plant stunting, the plants become flaccid (leaves drooping down), the vascular tissue and the taproot can be brown, dark brown or black. Both of these fungi are long-term soil inhabitants. A grower would be wise to avoid planting spinach in fields with a history of Fusarium Wilt. This disease survives in the soil a long time and may also be seedborne.

Viral diseases

Three viral diseases are reported on spinach. 1. Beet Curly Top Virus (BCTV) is not seed borne and is vectored by the beet leafhopper. 2. Beet Western Yellows Virus (BWYV) is not seed borne and is vectored by several aphid species. 3. Cucumber Mosaic Virus (CMV) can be seed borne and can be vectored by several aphid species. In the Coachella Valley I have not seen virus problems in spinach fields. In Imperial County, Tom Turini (now at UCCE Fresno) found Beet Curly Top Virus and Beet Severe Curly Top Virus. Controlling the beet leafhoppers that seasonally fly in from the hillsides can be difficult. Many times they have left the field and only when the plants show the virus symptoms is one aware that they had been there.

Postharvest disorders

Freezing injury occurs at 31.5F. Spinach is also very sensitive to Ethylene. *Erwinia* and *Pseudomonas* species are the two common soft rot pathogens on spinach leaves. Harvesting can also injure the petioles and provide a wound for bacteria to enter. Spinach is highly perishable and will decay if stored longer than 10-14 days. (Bacterial leaf spot has not been a serious problem in desert spinach production fields so it was not mentioned earlier.)

Food Safety

Growers should always be thinking of food safety, from planting all the way to the consumer endpoint. There is a lot of excellent information on food safety on the web site for the California Leafy Green Products Handler Marketing Agreement:

<http://www.caleafygreens.ca.gov/home>

The common diseases of Spinach can be found here:

<http://www.apsnet.org/publications/commonnames/Pages/Spinach.aspx>

Downy Mildew: Race 13 in the Coachella Valley



4-day Farm Supervisor Seminar (in Spanish)

Modesto, California, March 13-16, 2012. Topics that will be covered include employee discipline (including how to deal with the most difficult subordinate behaviors), interpersonal negotiation skills, and the importance of praise in day-to-day communications.

Those who attend will participate in numerous role-plays, and receive individualized attention and evaluation. A copy of the individualized participants' scorecard will be sent to each farm enterprise. Registration limited to two individuals per farm operation.

Any questions, contact Gregorio Billikopf at gebillikopf@ucdavis.edu or 209-525-6800, or Marie Harter at the same phone.

Seminar contents:

- Effective praise
- Interpersonal negotiation skills
- Employee discipline – 7 steps
- Employee discipline – dealing with difficult behavior
- Understanding piece-rate pay design
- Preventing sexual harassment – power and abuse of authority
- Conflict management
- Listening skills

Participants will have the opportunity to role-play many of the skills discussed.

Seminar cost:

Cost is \$128 and includes materials and lunches over the four days. **Early registration discount:** Those who register early, by January 31, 2012, can do so for \$97. If sending a check, the envelope must be postmarked by January 31, 2012.

Payment. You may pay through check or credit card. **If paying through check:** Make checks out to UC Regents and mail to Workplace Mediation / c.o. G. Billikopf / 3800 Cornucopia Way Suite A, Modesto, CA 95358. If paying by credit card, go to <http://ucce.ucdavis.edu/survey/survey.cfm?surveynumber=1763>.

Map to the location:

We will meet in Rooms H & I of the **Stanislaus Building**. <http://www.cnr.berkeley.edu/ucce50/ag-labor/7map.htm>

Instructors and coaches:

Gregorio Billikopf, Ryan Boothe and Horacio Bertinetti. Invited by not confirmed yet, are: Rodrigo López, Jorge Wicha, Juan Horacio Grant and Oscar Quezada (coming from Chile).



California Garlic and Onion Symposium 2012

The latest research results for Growers and Allied Industry

MONDAY - FEBRUARY 13, 2012

AGRICULTURE Building Auditorium

UC Cooperative Extension, Tulare County - 4437 S. Laspina Street in Tulare
(Directly across the street from the World AG Expo)

8:15 am	Registration – Coffee and refreshments	
8:55	Welcome	<i>Michelle Le Strange, Farm Advisor, UCCE Tulare Co.</i>
9:00	CAGORAB - Opening Remarks	<i>Kevin Lehar, CA Garlic & Onion Research Advisory Brd</i>
9:10	Update on Rust and <i>Embellisia</i> Diseases of Allium Crops	<i>Steven Koike, Farm Advisor, UCCE Monterey County</i>
9:30	Biotech Approaches to Allium White Rot: Perils and Pitfalls	<i>Colin Eady, Plant Geneticist, New Zealand Plant and Food Research Institute</i>
9:50	New Research for the Control of White Rot in Garlic	<i>Allison Ferry, Graduate Student, Plant Pathology Dept, UC Davis</i>
10:10	Evaluation of Diallyl Disulfide and Biological Disinfestation for Controlling White Rot in Garlic	<i>Bo-Ming Wu, Professor, Botany & Plant Pathology Dept, Oregon State University</i>
10:30	Refreshment Break	
10:50	<u>Thrips Control in Onions:</u> Evaluation of Insecticides in Southeastern California	<i>Eric Natwick, Farm Advisor, UCCE Imperial County</i>
11:10	Control Programs & Population Dynamics in the Central SJV	<i>Tom Turini, Farm Advisor, UCCE Fresno County</i>
11:30	Strategies to Optimize Control in the Klamath Basin	<i>Steve Orloff, County Director, UCCE Siskiyou County</i>
11:50	Allied Industry Updates	<i>(5 to 10 minute updates on products, registrations and uses in CA garlic & onion crops)</i>
12:15	LUNCH <i>Courtesy of CAGORAB & Allied Industry</i>	
1:05	Allied Industry Updates - <i>Continued</i>	<i>(5 to 10 minute updates on products, registrations, and uses in CA garlic & onion crops)</i>
1:30	Seed Treatments for Control of Onion & Seed Corn Maggots	<i>Mary Ruth McDonald, Univ of Guelph, Ontario, Canada</i>
1:50	Management of Maggots and Weed Control in Processing Onions	<i>Rob Wilson, UC IREC Director, Tulalake, Siskiyou County</i>
2:10	Growing Onions More Cheaply	<i>Jeff Mitchell, Cropping Systems Specialist, UC Davis</i>
2:30	Insecticides Reduce Honeybee Visitation and Pollen Germination in Hybrid Onion Seed Production	<i>Sandra Gillespie, Post-doc, Entomology Dept, UC Davis</i>
2:50	Pesticide Registrations & Regulatory Outlook plus Meeting Wrap-Up	<i>Bob Ehn, CAGORAB CEO and Technical Manager</i>
3:00	Adjourn	
3:15	CAGORAB - Board of Directors Meeting	<i>UCCE Tulare Co. CONFERENCE Room</i>

PLEASE CALL and LET US KNOW YOU ARE COMING SO WE CAN PLAN FOR LUNCH! Michelle Le Strange (559) 684-3300

CE hours requested from DPR and CCA

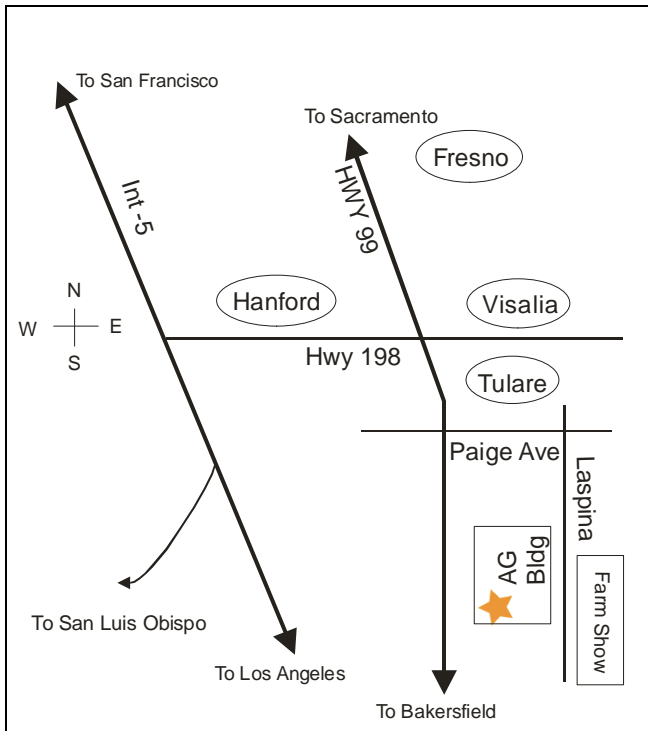


This meeting is open to any interested party. Meeting facility is handicap accessible. Advance notice needed for additional special accommodations.

California Garlic & Onion Symposium

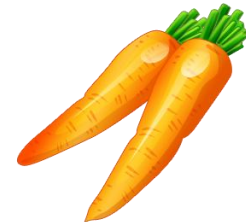
FEBRUARY 13, 2012

AGRICULTURE Building Auditorium
UC Cooperative Extension, Tulare County



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36th Annual UC/USDA Carrot Field Day



Date: February 28, 2012

Location: 1004 E. Holton Rd. El Centro, Ca

Time: 10:00am

More Info. : (760) 356-3060 or email fmiramontes@ucdavis.edu

CIMIS REPORT AND UC DROUGHT MANAGEMENT PUBLICATIONS



Khaled Bali and Sharon Sparks*

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 February 1 to April 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 (760-352-9474) or the IID, Ag Water Science Unit (760-339-9082). 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	February		March		April	
	1-15	16-29	1-15	15-31	1-15	16-30
Calipatria	0.12	0.14	0.18	0.22	0.26	0.29
El Centro (Seeley)	0.12	0.14	0.16	0.20	0.24	0.28
Holtville (Meloland)	0.12	0.14	0.17	0.21	0.25	0.28

* Ag Water Science Unit, Imperial Irrigation District.

Link to UC Drought Management Publications

<http://ucmanagedrought.ucdavis.edu/>