Imperial County Agricultural Briefs

Features

From your Farm Advisors

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INSECTICIDE EFFICACY AGAINST WHITEFLY IN BROCCOLI, 2012

Eric T. Natwick

Sweetpotato whitefly: *Bemisia tabaci* (Gennadius) – biotype B (SWF) is a common pest annually infesting winter vegetable crops such as leafy greens and *Brassica spp.* crops. Neonicotinoid insecticides injected beneath the vegetable seed or injected beneath transplants at planting are commonly used measures used to prevent injury to young vegetable crops. Alternative chemistries may also be used in place of soil injections or to supplement soil injections for whitefly management on winter vegetable crops. Alternative classes of insecticide chemistry are also important for whitefly insecticide resistance management. Therefore, newer insecticides were evaluated for efficacy against SWF during the fall of 2012.

The objective of the study was to evaluate the efficacy of insecticides for control of SWF on broccoli under desert growing conditions. Broccoli, (General) was direct seeded on 1 Sep 2012 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 via furrow irrigation thereafter. Plots were four beds, 13.3 ft wide by 40 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 are provided in the tables. All insecticide treatments were foliar sprays applied with a Lee Spider Spray Trac Tractor, 4-row sprayer with three TJ-60 11003VS nozzles per row delivering a directed spray application at 30 psi and 53 gpa on 1, 15 and 29 Oct 2012. An adjuvant, Dyne-Amic (Helena Chemical Co.) was added at 0.25% vol/vol to each foliar spray mixture. Numbers of SWF adults were counted on a leaf from 10 plants per plot in each replicate and data were recorded. Numbers of SWF eggs and nymphs were counted on the abaxial leaf surface, within a leaf disk of 1.65 cm^2 of basal leaves, from 10 random plants per plot, in each replicate and data were recorded. All sampling for SWF adults, eggs and nymphs occurred on 28 Sep, 2-days prior to insecticide treatments

(2DPT) and post treatment samples were taken on the following dates and days after treatments (DAT): 8 Oct (7DAT1), 18 Oct (3DAT2), 22 Oct (7DAT2), 30 Oct (1DAT3), 5 Nov (7DAT3), and 13 Nov (15DAT3). Post treatment averages were calculated for SWF adults, eggs and nymphs. Data were analyzed using ANOVA. Differences among means on each sampling date were determined using Least Significant Difference Test ($P \leq 0.05$).

The SWF population level was high when this project was started in Sep 2012. None of the treatments had significantly fewer SWF adults than the check on 29 Sep (2DPT) and 8 Oct (7DAT1), Table 1. Only the Sivanto treatment had fewer SWF adults than the check on 18 Oct (3DAT2). All insecticide treatments except Closer @ 1.5 fl oz/acre had significantly fewer SWF adults than the check on 22 Oct (7DAT2) and 30 Oct (1DAT3). All insecticide treatments except Closer @ 2.0 fl oz/acre had significantly fewer SWF adults than the check on 5 Nov (7DAT3). Only the Sivanto and Movento treatments had fewer SWF adults than the check on 13 Nov (15DAT3). For the PTA, Sivanto had significantly fewer SWF adults than all other treatments followed by Movento, Closer @ 2.0 fl oz/acre, Closer @ 1.5 fl oz/acre and the untreated check.

There were no differences among the treatment for numbers of SWF eggs on 29 Sep, 8 Oct, 18 Oct, 30 Oct, 13 Nov and for the PTA (Table 2). All insecticide treatments had significantly fewer SWF eggs compared to the check on 2 Oct (7DAT2) and only Sivanto and Movento had fewer SWF eggs than the check on 5 Nov (7DAT3). There were no differences among the treatment for numbers of SWF nymphs on 29 Sep, 8 Oct and 18 Oct (Table 3). All insecticide treatments had significantly fewer SWF nymphs than the check on 22 Oct (7DAT2), 30 Oct (1DAT3) and for the PTA. Only Sivanto and Movento treatments had significantly fewer SWF nymphs compared to the check on 5 Nov (7DAT3). All but the Closer treatment @ 2.0 fl oz/acre had significantly fewer SWF nymphs than the check on 13 Nov (15DAT3). No phytotoxicity symptoms were resulted from any of the insecticide treatments. This research was supported by industry gifts.

Table 1.

Treatment	fl oz/acre	SWF adults per leaf						
		29 Sep 2DPT	8 Oct 7DAT1	18 Oct 3DAT2	22 Oct 7DAT2	30 Oct 1DAT3	5 Nov 7DAT3	13 Nov 15DAT3
Closer SC	1.5	19.42 a	14.58 a	36.58 a	51.18 ab	57.52 a	32.06 b	7.68 abc
Closer SC	2.0	12.62 a	10.74 a	37.40 a	38.74 bc	35.94 bc	39.14 ab	11.54 ab
Sivanto	14.0	15.48 a	11.48 a	10.60 b	20.36 c	17.60 d	7.56 d	3.94 c
Movento	5.0	15.86 a	10.70 a	47.02 a	37.08 bc	20.66 cd	20.04 c	7.02 bc
Check	-------	13.00 a	12.62 a	51.78 a	61.60 a	46.94 ab	47.24 a	12.68 a

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

Table 2.

Treatment	fl oz/acre	SWF eggs per cm^2 of broccoli leaf						
		29 Sep 2DPT	8 Oct 7DAT1	18 Oct 3DAT2	22 Oct 7DAT2	30 Oct 1DAT3	5 Nov 7DAT3	13 Nov 15DAT3
Closer SC	1.5	65.49 a	267.40 a	57.72 a	18.11 b	1.96 a	14.13 ab	2.81 a
Closer SC	2.0	55.14 a	348.80 a	48.00 a	18.89 b	2.56 a	12.34 abc	3.22 a
Sivanto	14.0	62.00 a	247.20 a	53.14 a	14.18 b	1.82 a	6.08 c	1.48 a
Movento	5.0	54.02 a	227.20 a	55.44 a	9.72 b	1.67 a	7.52 bc	2.74 a
Check	-------	75.92 a	340.40 a	75.06 a	45.31 a	2.50 a	16.27 a	3.13 a

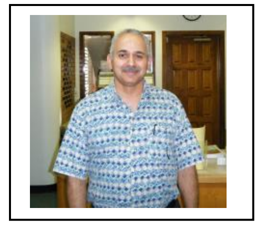
Means within columns followed by the same letter are not significantly different; LSD, P>0.05.

Table 3.

Treatment	fl oz/acre	Whitefly nymphs per cm^2 of broccoli leaf						
		29 Sep 2DPT	8 Oct 7DAT1	18 Oct 3DAT2	22 Oct 7DAT2	30 Oct 1DAT3	5 Nov 7DAT3	13 Nov 15DAT3
Closer SC	1.5	5.64 a	10.35 a	19.56 a	17.19 bc	9.72 b	21.58 a	9.55 b
Closer SC	2.0	2.69 a	15.04 a	12.53 a	20.92 b	7.61 b	21.77 a	12.46 ab
Sivanto	14.0	3.55 a	9.28 a	12.97 a	10.23 c	6.91 b	4.44 b	2.40 c
Movento	5.0	5.18 a	10.21 a	16.24 a	12.41 c	10.01 b	8.70 b	3.90 c
Check	-------	1.37 a	8.40 a	24.19 a	37.58 a	20.70 a	29.09 a	14.88 a

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

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

RED-WINGED BLACKBIRDS: A MAJOR HINDRANCE TO GRAIN SORGHUM PRODUCTION IN THE LOW DESERT

Oli Bachie

Grain producers in the low desert may like to grow sorghum because of its drought tolerance and lower cost of inputs compared to other grain crops. We planted various grain sorghum varieties at the Desert Research and Extension center (DREC) to test adaptability to the hot summer in the low desert. The crop germinated and grew satisfactorily until the Red-winged blackbirds (Figure 1) started to attack the grain crop starting at milk or dough stage. Red-winged Blackbird (*Agelaius phoeniceus*) belongs to the family Icteridae and found in most of North and much of Central America, generally migrating south to Mexico and the southern United States (*Wikipedia*). Some sources reveal that Red-winged Blackbirds can form huge roosts of up to a million birds staying in one area at night and disperse during the day in search of food.

Figure 1: Red-winged blackbird

Crop Damage

Figure 2: Flocks of red-winged

Although Red-winged blackbirds may be beneficial for feeding on harmful insects, they are sighted as causing considerable damage to ripening corn, sunflower, sorghum, and other grain crops. We observed this tendency and intensity of damage from the sorghum research plots at DREC. The intensity of the damage was probably unique in that the flocks were a kind of gregarious and very destructive. Flocks of red-winged blackbirds coming to roost in the sorghum field are shown in Figure 2. It is obvious that such large flocks of birds can cause wide-scale damage to grain crops, particularly in summer, when smaller acreages of mostly irrigated crop are available. Birds not only eat but also knock the grain off the crop, causing additional wastage. Birds may also create health risks for consumers (Allen, 2009). This obvious damage to grain crops and health risk can be economically severe and quite frustrating when control measures are not readily available.

Our approach to reduce or control the damage

Our immediate and short term strategy to reduce bird pressure in our grain sorghum trial was to scare away the birds with Pyrotechnic Pistol (Figure 3). However, this approach was not successful for; 1) there has to be someone in the field constantly shooting as the birds come to roost in the crop field. 2) the birds got accustomed to Pistol shot sound and kept coming back after brief fly away, demanding for many consecutive shoots. It was hence, ineffective, uneconomical and unsustainable strategy. Our second and alternative approach was to cover the sorghum heads with paper bags (Figure 4). While the latter approach was effective for our purpose and small scale research plots, it may not be feasible under a large scale farming condition.

Figure 3: bird shotgun

Figure 2: paper covered sorghum heads

General agricultural bird control methods

It is vital to determine potential bird damage levels, value of the crop and assess crop loss in order to develop methods to control crop damaging birds (Bruggers et al., 1998). The following are suggested for grain damaging bird control.

1) **Cultural Practices:** Plant crops (such as potatoes, or hay) that do not attract blackbirds. If some crops are particularly vulnerable to bird damage, planting other crops near bird roost may provide alternative food source and reduce the feeding pressure on the main crop. Also, if there can be synchronized planting dates to allow crop maturity at the same time, crop damage on a particular vulnerable crop can be minimized. In the absence of alternative feeding sources, any maturing grain crop field becomes more attractive to blackbirds and protecting that specific crop becomes more difficult.

2) **Frightening:** Frightening devices can be effective in protecting crops but require considerable work and long hours. Frightening devices need to be used especially in the early mornings and late afternoon, when the birds are most actively feeding. Furthermore, it is more effective if multiple device types can be used alternatively, because birds can easily adapt to a sound and lose fear to a frightening device over time. If available, automated scare devices placed at different location of the crop field may be more desirable and economical than these manually operated. Since many species of bird are naturally afraid of predators, owl statues and kites can also be used to scare blackbirds.

3) **Cattail (**such as Typha**) Marsh Management:** Blackbirds have a natural affinity for marsh areas (Balser, 1966) and use them as their major roosting sites. Such sites, if close to crop fields can be sprayed with recommended herbicide (s) to reduce favorable roosting conditions and hence disperse blackbird population density.

4) **Repellants**: In some countries, seeds are coated with some chemicals such as avitrol (Allen, 2009) to reduce bird seed consumption. When a blackbird eats one or more coated seeds, it makes it fly erratically and emit distress calls. Such abnormal behavior often causes the remaining birds to leave the field. Repellants are particularly used to coat planting seeds (Allen, 2009). In South Dakota, they used methiocarb as an aerial spray of a vulnerable grain sorghum in which they observed a 43% less damage from eared doves compared to the untreated field. Methiocarb's repellency to birds is post-ingestion disturbance in that birds learn to avoid treated foods (Crase and Dehaven, 1976).

5) **Bird-Resistant Crops:** Planting crop varieties resistant to blackbird could be the best alternative. Therefore, it is important to check if such crop varieties are safe to be used in areas of high risk to bird attack and if such are commercially available with seed companies. It is also worth for crop breeding programs to develop crops that are resist to bird damage and be used in bird prone regions.

In general, Red-winged blackbirds are obvious hindrance to grain crop production, particularly when only few grain crops (with no other sources of bird food) are produced, such as during the summer season of the low desert. Information on effective red-winged blackbird management is scarce. In conditions where chemicals are listed as potential blackbird control, one who intends to use them must make a thorough survey or consult with local PCA if such or similar chemicals exit for use in California

Even within available management options, more research is necessary to identify bird problems and to develop simple and effective bird control methods that can be applied to both small and large scale farms.

For more information, readers can refer to the following materials;

Allen, R. G. 2009. The Grain-Eating Birds of Sub-Saharan Africa

Balser, D. 1966. Agricultural bird problem in the west. Bird Control Seminar Proceedings

Bruggers, R. L., Rodriguez E. & M. E. Zaccagnini. 1998. Planning for bird pest problem resolution: a case study. International Biodeterioration & Biodegradation. 42 (2): 173–184

Bullard, R. G. and J. O.York. 1996. Screening grain sorghums for bird tolerance and nutritional quality. Crop protection. 15 (2): 159-165

Crase, F. T. and R. W. Dehaven. 1976. Methiocarb: Its current status as bird repellent. Proceedings of the 7th Vertebrate Pest Conference.

Wikipedia: http://en.wikipedia.org/wiki/Red-winged_Blackbird

Combine performance helps alfalfa seed profitability

Cary Blake
Western Farm Press
Aug. 22, 2013

GATHERED for the Combine Clinic for alfalfa seed production held in El Centro, Calif. in July include from left: Sam Wang, University of California (UC) Desert Research and Extension Center, El Centro; Oli Bachie, UC Cooperative Extension, Holtville; Kevin Grizzle, alfalfa seed grower, El Centro; John Aubin (instructor), Combine Harvesting Solutions, Lewisville, Texas; and Jose Arias, Forage Genetics, Napa, Idaho.

RELATED MEDIA

The efficient and effective use of a combine during the harvest of crop can help growers achieve higher seed yield and quality which can maximize profitability, says veteran combine specialist John Aubin.

"The grower spends a lot of time, effort, and resources to bring a crop to harvest," Aubin says. "The combine needs proper configuration and adjustments to achieve maximum performance."

Aubin owns Combine Harvesting Solutions based in Lewisville, Texas. Aubin, who retired from John Deere, has helped growers in 46 states, plus Australia and Europe, maximize combine performance across a wide range of crops during his 35-year career.

In mid July, Aubin led a half-day workshop and field demonstration on ways to improve combine performance in alfalfa seed during a Combine Clinic held in El Centro in Imperial County, Calif.

The event was sponsored by the California Alfalfa Seed Production Research Board, University of California Cooperative Extension, and Imperial Valley Milling.

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 July 1 to September 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 visit the CIMIS site at 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/