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W. R. Gromes, Director of Cooperative Extension, University of California

INSECTICIDE EFFICACY AGAINST EGYPTIAN ALFALFA WEEVIL AND BLUE ALFALFA APHID, 2001

Eric T. Natwick

A field study was conducted during the spring of 2001 at the UC Desert Research and Extension Center. A stand of alfalfa, VAR. CUF 101, was used for the experiment. Plots were arranged in a randomized complete block design with four replications. Ten insecticide treatments were included along with an untreated control. Insecticide treatments and rates as pounds active ingredient (ai) per acre are listed in Table 1. Plots measured 35 feet by 50 feet and insecticide treatments were applied March 11, 2002, using a broadcast application with a tractor mounted boom.

Populations of Egyptian alfalfa weevil (EAW) larval populations were measured in each plot with a standard 15-inch diameter insect net consisting of ten 180^{o} sweeps. Blue alfalfa aphids were counted on ten randomly extracting stems per plot. Pre-treatment samples were taken on March 7 and post-treatment samples were taken 1-day after treatment (DAT), 4-DAT, 7-DAT, 14-DAT, and 21-DAT.

All of the insecticide treatments provided excellent Egyptian alfalfa weevil control from 3-DAT through 21-DAT. All treatments with Warrior, the Furadan treatment and the XDE-225 provided excellent blue alfalfa aphid control from 1-DAT through 21-DAT.

The EAW larval populations were found to be homogenous among the plots in the experiment from the pre-treatment samples, Tables 1. All insecticide treatment means for EAW larvae were significantly lower ($P \leq 0.05$) than for the untreated control treatment means from 1-DAT through 21-DAT. The Furadan treatment at 1-DAT had an EAW larval mean that was significantly lower than all other insecticide treatments except Warrior at 0.3 lb ai/acre and at 0.025 lb ai/acre and Steward plus Warrior at 0.065 lb ai/acre and 0.0094 lf ai/acre, respectively. The 3-DAT the EAW larval mean for Warrior at 0.3 lb ai/acre was significantly lower than treatment means for Steward at 0.025 lb ai/acre and 0.11 lb ai/acre and lower than the mean for XDE-225, but not lower than means for other insecticide treatments. Steward at 0.025 lb ai/acre had significantly more EAW larvae than Warrior at 0.025 lb ai/acre and Steward at 0.065 lb ai/acre plus Warrior at 0.094 lb ai/acre 7-DAT, but there were no other differences among the insecticide treatments for EAW larvae. The XDE-225 treatment had significantly more EAW larvae at 14-DAT than all other insecticide treatments except Steward at 0.025 lb ai/acre, 0.045 lb ai/acre and 0.11 lb ai/acre. Steward at 0.025 lb ai/acre and 0.045 lb ai/acre had significantly more EAW larvae than Warrior at 0.03 lb ai/acre and Steward at 0.065 lb ai/acre plus Warrior at 0.094 lb ai/acre 14-DAT. The XDE-225 treatment had significantly more EAW larvae at 21-DAT than all other insecticide treatments except Steward at 0.025 lb ai/acre, 0.065 lb ai/acre and 0.11 lb ai/acre, but there were no other differences among insecticide treatments 21-DAT.

The blue alfalfa aphid populations were found to be homogenous among the plots in the experiment from the pre-treatment samples, Tables 2. All insecticide treatment means for aphids were significantly lower ($P \leq 0.05$) than for the untreated control treatment means from 1-DAT through 21-DAT with the exception of the Steward treatments. Steward at rates of 0.045 lb ai/acre, 0.065 lb ai/acre and 0.11 lb ai/acre all had significantly more aphids than all other insecticide treatments except Steward at 0.025 lb ai/acre 1-DAT and 7 DAT. All steward treatment with out the addition of Warrior had significantly more aphids than all other insecticide treatments 3-DAT. Steward at 0.025 lb ai/acre and at 0.045 lb ai/acre had significantly more aphids than all other treatments except Steward at 0.065 lb ai/acre and 0.11 lb ai/acre 14-DAT. Both rates of Warrior had significantly lower means for aphids than all four rates of Steward 14-DAT and had significantly lower means for aphids than Steward at 0.11 lb ai/acre 21-DAT.

The experimental insecticide, XDE-225, is under development by Dow and is not registered for use on alfalfa grown for hay, forage or seed.

Table 2. Mean Numbers[w] of Egyptian Alfalfa Weevil Larvae per Ten Sweeps, Holtville, CA, 2002.

Treatment	lb ai/a	4 DPT[x]	1 DAT[yz]	3 DAT[z]	7 DAT	14 DAT[z]	21 DAT[z]
Untreated	---------	33.5 a	134.7 a	172.1 a	182.5 a	83.4 a	26.8 a
Warrior 1 CS	0.025	42.5 a	8.1 ef	1.8 cde	1.5 c	0.4 cd	0.0 c
Warrior 1 CS	0.03	27.3 a	8.9 ef	0.7 e	2.0 bc	0.0 d	0.2 c
Steward 1.25 SC	0.025	29.0 a	29.2 bcd	6.0 bc	28.5 b	2.0 bc	0.9 bc
Steward 1.25 SC	0.045	27.8 a	35.4 b	2.6 bcde	6.3 bc	1.8 bc	0.0 c
Steward 1.25 SC	0.065	28.0 a	29.5 bcd	3.4 bcde	2.3 bc	0.2 cd	0.6 bc
Steward 1.25 SC	0.110	31.5 a	33.0 bc	5.6 bcd	4.8 bc	1.1 bcd	0.5 bc
Steward 1.25 SC + Warrior	0.025 + 0.0094	28.8 a	15.0 cde	3.2 bcde	2.5 bc	0.3 cd	0.3 c
Steward 1.25 SC + Warrior	0.065 + 0.0094	37.0 a	12.6 def	1.2 de	1.0 c	0.0 d	0.2 c
XDE-225	0.0125	29.8 a	38.1 b	7.8 b	5.8 bc	3.2 b	1.7 b
Furadan 4F	0.500	28.3 a	5.2 f	1.8 cde	3.3 bc	1.6 cd	0.0 c

[w] Mean separations within columns by $LSD_{0.05}$. [x] Days prior to treatment. [y] Days after treatment.
[z] Log transformed data used for analysis; reverse transformed means reported.

Table 3. Mean Numbers[w] of Blue Alfalfa Aphid Ten Alfalfa Stems, Holtville, CA, 2002.

Treatment	lb ai/a	4 DPT[x]	1 DAT[y]	3 DAT[z]	7 DAT[z]	14 DAT	21 DAT
Untreated	---------	9.5 a	27.0 a	45.8 a	85.0 a	34.0 a	34.8 a
Warrior 1 CS	0.025	12.3 a	2.3 c	1.6 de	0.6 de	3.8 d	5.5 c
Warrior 1 CS	0.03	8.5 a	4.5 c	1.0 e	0.2 e	4.3 d	3.3 c
Steward 1.25 SC	0.025	13.3a	12.5 bc	22.2 a	20.5 b	31.3 a	16.8 bc
Steward 1.25 SC	0.045	13.5 a	18.8 ab	20.8 a	48.9 ab	34.5 a	32.8 bc
Steward 1.25 SC	0.065	8.3 a	23.0 ab	26.5 a	40.2 ab	25.8 ab	14.0 bc
Steward 1.25 SC	0.110	11.3a	29.5 a	41.4 a	38.8 ab	24.5 abc	26.4 ab
Steward 1.25 SC + Warrior	0.025 + 0.0094	7.3a	5.3 c	6.8 bc	2.8 cd	9.5 bcd	7.3 c
Steward 1.25 SC + Warrior	0.065 + 0.0094	14.3 a	3.0 c	4.2 bcd	3.5 c	12.0 bcd	3.3 c
XDE-225	0.0125	10.5 a	6.3 c	2.2 cde	6.3 c	8.3 bcd	8.0 c
Furadan 4F	0.500	11.8 a	5.8 c	7.3 b	3.0 cd	6.0 cd	4.5 c

[w] Mean separations within columns by $LSD_{0.05}$. [x] Days prior to treatment. [y] Days after treatment.
[z] Log transformed data used for analysis; reverse transformed means reported.

BOTTOM ROT OF LETTUCE

Thomas A. Turini

The fungus, *Rhizoctonia solani*, causes bottom rot. This disease can cause serious losses by destroying entire heads in early season lettuce in the desert.

The disease first appears as sunken, rust-colored, dead spots on midribs of leaves that touch the ground. As the disease progresses, the fungus may infect leaves inside the head. The dead tissue may be covered with fine, web-like, tan to brown fungal growth, which may be peppered with small brown sclerotia. Frequently, bacteria invade the diseased tissue and cause a slimy decay.

Disease development is favored by moist, warm weather conditions. (50^{o}-89^{o}F; optimum 77^{o}-81^{o}F). High levels of organic material in the soil favor growth and survival of *R. solani* so avoid planting lettuce in fields until after crop residues have decomposed.

Currently, Dr. Frank Martin (USDA-ARS, Salinas) is researching which *R. solani* groups are responsible for bottom rot. Some groups can attack a much greater variety of plants than others. Therefore, the identity of the causal organism could lead to information regarding the usefulness of different crop rotations.

Imperial county *R.. solani* isolates have not been tested by Dr. Martin. To gain information, regarding the fungi that are responsible for bottom rot in Imperial County, samples from this county will be sent for analysis. This season, if bottom rot symptoms are observed, please contact Tom Turini at the University of California Cooperative Extension Office in Imperial County at 760-352-9474.

SUGAR BEET NITRATE PETIOLE TESTS

Herman Meister

The use of "sugar beet nitrate petiole tests" for measuring the nitrogen levels present in sugar beet plants is an excellent method to monitor nitrogen utilization by the crop during the temperate part of the growing season.

The petiole tests indicate how much nitrate nitrogen (N) is in the plant. Low-test results (<1200 ppm) may be obtained during the colder times of the year, especially in January and February. Does this mean that additional N should be applied for a May or June harvest? Perhaps, or perhaps not, depending on several factors such as soil type, soil temperature, total amount of N applied, and number of irrigations.

Petiole samples for nitrate N in lighter soils may have a much steeper decline due to leaching and may require addition applications of N to reach harvest. Heavier soil types (clays, silty clays, and clay loams) have the capacity to retain more N and resist leaching.

If the petiole nitrate results are low, the total N for the crop has been applied, and soil temperatures have been in the range of 50 –55 ^{0}F in a clay soil, a soil test to determine the N available may be appropriate. If soil test indicate an adequate amount of N present to finish the crop, then additional applications are unnecessary.

Temporary low levels of nitrate N during January and February may be due to plant growth proceeding faster than the roots can supply N under the cold soil temperatures. Adding a soluble source of nitrate N may raise the levels of nitrate N, but this additional N could be a major problem at harvest with high brei concentrates. Over fertilization with N can reduce sugar yields, increase the cost of production and harvest, and can result in leaching of N into groundwater supplies in some areas of the state.

AGRICULTURAL MANAGEMENT PRACTICES TO IMPROVE QUALITY OF DRAINAGE WATER

Khaled M. Bali

Section 303(d) of the Clean Water Act requires California Regional Water Quality Control Boards (CRWQCBs) to identify surface water bodies that do not comply with the applicable water quality standards. California Regional Water Quality Control Boards are in the process of developing total maximum daily loads (TMDLs) that define how much of a "pollutant" a water body can tolerate on a daily basis. Regional Boards are also expected to establish TMDLs for the identified pollutants and set limits for these pollutants such that these water bodies attain their "beneficial" uses. The list of water bodies in this region that are considered "impaired" includes the Alamo River, New River, Imperial Valley Agricultural Drains, Salton Sea, and Coachella Valley Storm Water Channel. According to the list, major "pollutants" impairing these waters are silt, pesticides, salts, nutrients (mainly phosphorous), and other pollutants. Currently the two TMDLs of concern to us are the Salton Sea Nutrient TMDL and the silt/sediments TMDLs for drains and rivers in this region. Once the TMDLs are fully approved by the appropriate state and federal authorities, growers usually have one to two years implement management practices to improve the quality of drainage water.

Here is a partial list of alfalfa irrigation/fertigation management practices that may improve the quality of runoff water and achieve the objectives of the silt/sediments and nutrient (phosphorous) TMDLs. Information about additional practices can be obtained from our office (760-352-9474, kmbali@ucdavis.edu) or from the Imperial County Farm Bureau (see contact information below).

1- Irrigation water management- determining and controlling the rate, amount, and timing of irrigation water applied to minimize soil erosion, runoff, and fertilizer movement in surface runoff water.
2- Runoff reduction- reducing the amount of surface runoff, using a runoff reduction method developed by UCCE. Runoff can be reduced during irrigation events when water-run P fertilizer is applied. Runoff water can be reduced to less than 5% of applied water. Impact of reduced water application on yield is minimal when this practice is limited to one or two irrigation events out of approximately 16 irrigations per year.
3- Precision application rates/GIS utilization- within a particular field, applying precise amounts of P-fertilizer to the soil in specific parts of the fields according to the plant needs. Generally, lower rates can be applied, especially where soil/plant tests show residues are present from previous applications. GIS grids can be established in the field. Broadcast-P application rates in each grid can be based on soil and plant tests.
4- Proper fertilizer applications- selecting the proper time and method of fertilizer application (water-run P applications vs. broadcast-P applications) to reduce P losses through runoff and soil erosion.
5- Filter strip- a section of land in permanent vegetation, established down slope of agricultural operations to control erosion and slow, reduce, or eliminate pollutants from entering water ways.

For additional information contact UCCE or the Imperial County Farm Bureau at the address below.

Nicole Rothfleisch (ivtmdl@earthlink.net)
Imperial County Farm Bureau
Voluntary TMDL Compliance Program Director
1000 Broadway
El Centro, CA 92243
Tel:760-352-3831

WINTER HAY TARPS

Juan N. Guerrero

Even though the irrigated desert is the driest part of the U.S., it does rain here during the winter, December is the rainiest month of the year in the Imperial Valley. The long-term mean monthly precipitation for December is 0.52 in. The long-

term mean monthly rainfall for January is 0.42 in. The winter of 2002/03 is predicted to be a wet winter, an "El Niño" winter.

Storing hay during rainy periods presents special problems for growers. During February and March, quality alfalfa hay is usually in short supply, and any grower that has quality hay during this critical period may benefit. Uncovered stacked hay often becomes wet and molds during the winter, and much hay often has to be thrown away or be sold at a lower price because it is rain-damaged. Bottom bales often absorb ground moisture and never completely dry out and must be discarded.

One method of storing alfalfa hay during rainy periods is to place the hay in hay barns. Some local producers, indeed, have hay storage barns to protect valuable alfalfa hay. Unfortunately, most alfalfa growers do not have hay barns for protecting alfalfa hay quality during rainy periods.

Another method of protecting hay is to cover it with a plastic tarp. During rainy periods, with uncovered hay, the top level of hay bales in the stack is exposed to rainfall and often during the winter turns black with mold. Bottom bales also absorb ground moisture during wet weather and mold. Covering winter hay with a plastic tarp is a cheap way to conserve both hay quality and hay yield.

I would advise to cover at least the top ½ of the haystack. Covering the entire stack prevents desiccation of the hay. The plastic tarp should be securely tied down to the stack so that it doesn't blow away during strong spring winds. Protecting winter hay with plastic tarps not only prevents mold growth but prevents bleaching as well. Yes, even during the winter exposed hay will bleach. Strong spring winds desiccate the hay, making it brittle and unpalatable to cattle. An adequately tarped haystack will not desiccate as severely as an unprotected haystack. Green, soft hay from February and March cuttings is highly valued by the dairyman.

Several different types of plastic tarps are commercially available. Plastic tarps come in several different colors. I am not aware of published scientific research comparing the different types of plastic tarps, so I have no advice regarding which kinds of tarps are better than others. In my experience, the plastic should at least be 4 to 6 mil thick so that it doesn't tear easily when wind-blown. Even though there is a scarcity of information regarding the use of plastic tarps for hay protection, I wholeheartedly advise their use. Tarped, green, and soft hay is a valuable commodity during February and March, and if the predicted "El Niño" winter does eventuate, it might be the only dry hay in town.

2002 WHEAT VARIETY TRIAL RESULTS

Herman Meister

Dr. L. F. Jackson, Extension Agronomist, University of California Cooperative Extension, UCD, conducted cereal grain variety trials at various locations through out the state. The test results from the trial at the UC Desert Research and Extension Center are shown in Table 1.

TABLE 1. 2002 IMPERIAL DURUM WHEAT TEST.

Entry	Name	Yield (lbs/acre)	Test Wt (lbs/bu)	Shatter	Plant Ht (in)	Lodging (soft dough)	Lodging (harvest)	Days to Head (from 1/1)	Days to Mature (from 1/1)	% Protein
CULTIVARS										
878	DURAKING	8520	62.0	1.0	33	1.0	2.8	82	133	13.1
1211	TOPPER	8150	63.0	1.3	36	1.0	2.5	87	134	12.7
1103	DELUXE	8120	60.8	1.0	34	1.0	3.5	84	132	14.0
1215	ORITA	8110	61.0	1.3	32	1.0	2.8	82	132	14.4
1166	CROWN	7970	59.3	1.0	35	1.0	3.5	85	135	14.2
983	RIA	7890	60.8	1.0	36	1.0	4.5	86	134	14.9
1057	TACNA	7530	62.0	1.0	33	1.0	4.0	78	130	15.1
951	KRONOS	7470	60.8	1.0	34	1.5	5.8	83	132	14.2
1024	MOHAWK	7200	61.3	1.0	34	1.3	5.8	81	130	13.1
947	KOFA	7180	60.3	1.0	34	1.3	5.3	83	133	14.0
1210	PLATINUM	7170	63.0	1.0	31	1.0	5.0	86	131	13.7
1179	MATT	7120	61.0	1.0	35	2.3	4.8	83	131	14.0

Duraking continues to be the top yielding variety in the trials conducted at the Desert Research and Extension Center (DREC) with approximately 350 lbs more grain than the nearest competing variety. The next 4 varieties, Topper, Deluxe, Orita, and Crown all fit in a 200 lb range of each other. Kronos, eighth on the list, is still the variety preferred by farmers due to buyer acceptance and demand even though it yields approximately 1000 lbs less. Orita is quickly becoming a close second in preference due to the ease of making protein limits as compared to Kronos, which at times can be difficult to make the minimum of 13 %.

More information on trials from previous years and other tests throughout the state can be found at the Agronomy and Range management site http://agronomy.ucdavis.edu/agronomy/.

-Pre-registration form-

55th Annual California Weed Science Society Conference

Fess Parker's Doubletree Resort ●Santa Barbara, California January 20, 2003
Hotel Reservation: Call the Double Tree Resort at (877) 893-0892.
Cut-off date for discounted CWSS rate of $139 (single room) is prior to 12/26/02.

Rre-registeration (postmarked no later than January 8, 2003	**$90**	**$**
Pre-registration - full-time student (with proper I.D.)	**FREE**	**FREE**
2003 Proceedings		
Hard Copy Only	**$25**	**$**
CDRom Only	**$35**	**$**
Hard Copy and CDRom	**$50**	**$**
Total Remittance		**$**

Early registration closes after January 10, 2003. Late registration or At-conference registration is $ 125 for members, $15 for students. 2003 membership dues are included in the registration fee. No purchase orders will be accepted Visa/Mastercard will be accepted for mail-in and at-conference registration.

Registration Information (Please Print):

Name_____
DPR License#_____
Company_____
Mailing Address_____
City_____ State_____Zip Code_____
Telephone (____)_____Fax (___)_____
E-mail address _____
If paying by Visa/Mastercard: Credit card number___-___-___Expiration date____/____

Name On Visa/Master card or company name if business credit card.
If paying by check or money order: PLEASE COMPLETE AND RETURN THIS REGISTRATION FORM with your check or Money order made payable to **CWSS**; addressed to **CWSS**, **PO BOX 3073, SALINAS, CA 93912-3073.** Please use one form per registrant_____

On-line registration for Visa/Mastercard users is available through the CWSS website at www.cwss.org. Confirmation will be mailed to all confirmed seminar attendees. If you do not receive your written confirmation, please call 831-442-0883.
NOTE: All requests for refunds of registration fees must be in writing and postmarked no later than December 31, 2002. No exceptions!

CIMIS REPORT

Khaled M 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 November 1 to January 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).

The Irrigation Management Unit (IID) provides farmers with a weekly CIMIS update. Farmers interested in receiving the updated CIMIS report on a weekly basis can call the IID at the above number. Please feel free to call us if you need additional weather information. Or check the latest weather data on the worldwide web. Imperial County Weather Stations:
http://www.ipm.ucdavis.edu/calludt.cgi/WXSTATIONLIST? COUNTY=IM
California weather databases: http://www.ipm.ucdavis.edu/WEATHER/weather1.html
CIMIS web page http://www.cimis.water.ca.gov/

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

Station	November		December		January	
	1-15	16-30	1-15	15-31	1-15	16-31
Calipatria	0.14	0.10	0.07	0.07	0.08	0.09
El Centro (Seeley)	0.13	0.09	0.06	0.06	0.08	0.09
Holtville (Meloland)	0.13	0.10	0.06	0.06	0.08	0.09

* Irrigation Management Unit, Imperial Irrigation District.

To simplify our information it is sometimes necessary to use trade names of products or equipment. No endorsement of named products is intended nor is criticism implied of similar products, which are not named

Keith S. Mayberry
County Director