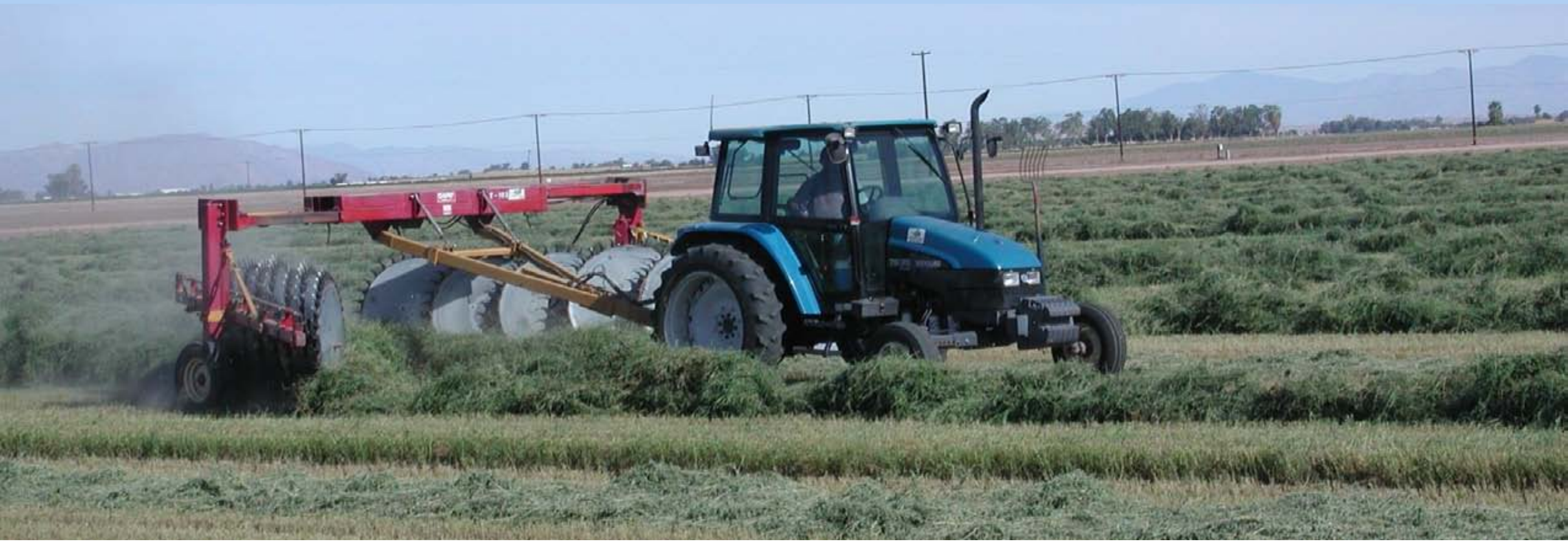
Imperial County Agricultural Briefs



Features

From your Farm Advisors

April, 2010

Page

GYPSUM, LIME, AND SULFUR

Khaled M. Bali

Clay particles in soil consist of platelets. These negatively charged platelets attract positively charged ions (Ca, Mg, K) in soil solution. The presence of excessive exchangeable sodium (Na) in soil solution may cause clay particles to swell. Clay swelling makes soil less permeable and in a poor physical condition where salts can not be leached out of the soil profile. The amount of swelling and eventual dispersion (when soil pores become plugged by clay platelets) depends on the concentration of Na relative to the combined concentration of Ca and Mg. Infiltration rate can be improved by the addition of a soluble form of Ca such as gypsum ($CaSO_4.2H_2O$). When gypsum is added to the soil, Ca ions replace Na ions which are relatively larger than Ca ions. This replacement process improves soil structure and enhances the stability of soil aggregates.

Gypsum is often used as a source of abundant quantities of calcium. Gypsum is inexpensive and easy to apply. Amendments such as sulfur, sulfur dioxide gas, lime sulfur, potassium and ammonium thiosulfate, and sulfuric acid release calcium by dissolving soil lime. Using lime ($CaCO_3$) on neutral or acidic soils (pH less than 7.5) can also increase calcium levels in the soil and at the same time also increase pH. Adding lime will do neither if the soil pH is greater than 7.5. The pH of most soils in Imperial Valley is between 7.5 and 8.5, therefore, adding lime is not recommended.

Lime ($CaCO_3$) is another source of calcium, however, the calcium in the lime is usually not available to replace the exchangeable sodium. Sulfuric acid (H_2SO_4) mixed with the irrigation water dissolves lime and releases the available calcium in the soil. Sulfuric acid is dangerous and extreme caution should be exercised when handling any acid.

Sulfuric acid may be added to the irrigation water to neutralize bicarbonate ($HC\ O_3$) or to reduce the alkalinity (high pH) as a result of direct application of ammonia to irrigation water. The amount of acid needed depends on the concentration of bicarbonate or ammonia in irrigation water.

CALLING ALL OKRA GROWERS

Native PBW Moth in Trap

Did you know okra is a host for Pink Bollworm?

The pink bollworm moth is a significant economic pest. Pink bollworm is a moth that feeds primarily on cotton and related plants such as okra and kenaf. California is starting its fourth year of an area-wide eradication program to rid the southwestern United States and northern Mexico of this devastating pest.

I am trying to locate all okra fields within Imperial and Riverside Counties and I need your help. If you are currently growing or know of someone or a field location, please contact me; Jodi Brigman, California Pink Bollworm Program, 4151 Hwy 86, Bldg. 10, Brawley, CA or call at 760-344-1152.

As part of the area-wide program, the Department of Food and Agriculture, Pink Bollworm Program will pheromone rope okra fields in Imperial and Riverside Counties. Pheromone roping has been used in the past to disrupt mating of the pink bollworm by overwhelming the male to find a female, thus, mating is disrupted resulting in overall reduction of egg laying, and ultimately lowering pink bollworm infestation.

California Department Food and Agriculture personnel will apply one application of the pheromone. Pheromone application is accomplished by placing a small stick with a pheromone rope dispenser twisted onto the stick throughout the field or around perimeters. This is done at no cost to the grower nor will it affect any organic status.

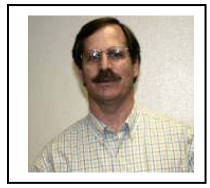
Once applied there are no restricted entry intervals or any pre-harvest intervals.

Additionally, Pink Bollworm traps will be placed and monitored at field sites throughout the growing season.

Help us with our efforts to eradicate this destructive pest from our valley.

Jodi Brigman
California Department of Food and Agriculture
Pink Bollworm Program
4151 Hwy 86, Bldg. 10
Brawley, Ca 92227
760-344-1152

INSECTICIDE EFFICACY FOR WORM PEST CONTROL IN ALFALFA, 2009



Eric T. Natwick and Martin I. Lopez

An insecticide efficacy trial was conducted at the UC Desert Research and Extension Center on a stand of CUF-101 alfalfa. The objective of the study was to evaluate the efficacy of the new and older insecticidal compounds used against larvae of lepidopterous pests (Beet armyworm (BAW), *Spodoptera exigua* (Hübner), Alfalfa caterpillar (AC) *Colias eurytheme* Boisduval, and Alfalfa webworm (AWW) *Loxostege cereralis* (Zeller) on alfalfa grown for hay production under desert growing conditions. The experimental design was RCB using four replicates with eight insecticide treatments and an untreated check. Plots were 23 ft wide by 50 ft long. Formulations and rates for each compound are provided and test materials were applied on 17 Aug 2009 at the specified rate equivalencies listed in the tables. Broadcast applications were delivered through 14 TJ-60 11003VS nozzles using a Lee Spider Spray Trac operated at 25 psi delivering 32 gpa. A non-ionic surfactant was applied at 0.1% v/v with all treatments. Pretreatment (PT) evaluations of insect populations in each plot were conducted on 14 Aug or 3 days pre-treatment (DPT). Post treatment evaluations were made on 20, 23, 31 Aug, 8 Sep or 3 days after treatment (DAT), 6 DAT, 14 DAT, and 22 DAT. During each evaluation, ten sweeps per plot were collected with a standard 15-inch diameter sweep net. Sweep samples were bagged, labeled, and frozen for later counting of BAW, AC, and AWW larvae (Tables 1 - 3). Treatment means were analyzed using 2-way ANOVA and means separated by a protected LSD (P=0.05).

Pretreatment numbers of beet armyworm larvae were similar (P=0.05) among treatments (Table 1). Beet armyworm means for all insecticide treatments were significantly lower (P=0.05) than the untreated check 3 DAT and all insecticide treatments except Baythroid XL had significantly fewer BAW than the check 6 DAT. Only the insecticide treatments Radiant at 5.0 and Belt 480 SC at 3.0 fl oz and 4.0 fl oz rates had significantly lower beet armyworm means than the untreated check 14 DAT and only Intrepid at 8.0 fl oz, Radiant at 5.0 fl oz Belt 480 SC at 4.0 fl oz had beet armyworm means that were significantly lower than the untreated check 22 DAT. Beet armyworm post treatments averages for all treatments but Baythroid XL were lower than the check.

Pretreatment numbers of alfalfa caterpillar were similar (P=0.05) among treatments (Table 2). Alfalfa caterpillar means were significantly lower in all insecticide treatments compared to the untreated control 3 DAT, 6 DAT and 14 DAT. None of the insecticide treatments had means for alfalfa caterpillar that were significantly lower than the mean for the untreated check 22 DAT. All insecticide treatments had post treatment averages for alfalfa cater pillar that were significantly lower than the check.

Pretreatment numbers of alfalfa web worm were similar (*P*=0.05) among treatments (Table 3). The insecticide treatments Radiant, Lorsban Advanced, Cobalt, Belt at 2.0 fl oz and Belt at 4.0 fl oz all had alfalfa webworm means that were significantly lower (*P*=0.05) than the untreated check until 3 DAT. Intrepid, Radiant, Cobalt, and all three rates of Belt all had significantly fewer alfalfa web worms than the check 6 DAT, but Baythroid XL had significantly more worms than the check. All insecticide treatments significantly fewer alfalfa webworms than the check 14 DAT and 22 DAT. All insecticide treatments except Baythroid XL had post treatment averages that were significantly lower than the check.

Radiant and Belt 480 SC provided superior alfalfa worm pest control, but neither are currently registered for this use. Baythroid XL did not perform well against beet armyworm or alfalfa caterpillar.

Table 1. Means [y] of Beet Armyworms per Ten Sweeps in Alfalfa, Holtville, CA, 2009.

Treatment	**oz/acre**	**3 DPT**	**3 DAT**	**6 DAT[y]**	**14 DAT[y]**	**22 DAT**	**PTA[yz]**
Check	--------	39.50	20.75 a	1.35 a	1.07 a	23.00 a	1.30 a
Intrepid 2F[w]	8.0	26.00	1.75 c	0.37 bc	0.82 abcd	9.75 c	0.78 bc
Radiant[x]	5.0	22.75	1.50 c	0.08 c	0.57 cd	12.25 bc	0.72 c
Lorsban Advanced	32.0	30.75	0.25 c	0.29 bc	0.93 abc	13.75 abc	0.85 bc
Cobalt	32.0	19.00	0.75 c	0.68 b	0.95 ab	21.50 ab	0.98 b
Baythroid XL	2.8	21.25	11.50 b	1.31 a	0.82 abcd	20.75 ab	1.28 a
Belt 480 SC[x]	2.0	31.00	0.25 c	0.08 c	0.60 bcd	20.00 ab	0.82 bc
Belt 480 SC[x]	3.0	19.75	0.00 c	0.12 c	0.56 cd	13.50 abc	0.71 c
Belt 480 SC	4.0	20.75	0.00 c	0.00 c	0.50 d	5.00 c	0.44 d
LSD values; *P*=0.05		***NS***	***4.69***	***0.50***	***0.37***	***9.54***	***0.22***

Mean separations within columns by $LSD_{0.05}$.
[w] Supplemental Label , R846-059 for non-grass forage, fodder, straw and hay (CA accepted 06/10/08).
[x] Not labeled for this use.
[y] Log transformed data used for analysis.
[z] Post treatment Average.

Table 2. Mean Numbers of Alfalfa Caterpillar per Ten Sweeps in Alfalfa, Holtville, CA, 2009

Treatment	oz/acre	3 DPT	3 DAT	6 DAT[y]	14 DAT	22 DAT	PTA[z]
Check	---------	15.75	10.25 a	0.69 a	5.75 a	2.00	5.56 a
Intrepid 2F	8.0	20.75	0.25 b	0.19 bc	1.50 bc	1.50	1.00 bc
Radiant	5.0	9.00	1.25 b	0.08 bc	0.75 bcd	1.00	0.81 bc
Lorsban Advanced	32.0	13.25	0.00 b	0.15 bc	1.75 b	2.50	1.19 bc
Cobalt	32.0	14.00	0.50 b	0.00 c	1.25 bcd	1.25	0.75 bc
Baythroid XL	2.8	13.00	0.50 b	0.25 b	0.75 bcd	3.25	1.44 b
Belt 480 SC	2.0	14.00	0.50 b	0.08 bc	0.25 cd	0.00	0.25 c
Belt 480 SC	3.0	12.50	0.75 b	0.00 c	0.00 d	1.00	0.44 bc
Belt 480 SC	4.0	14.25	0.50 b	0.00 c	0.25 cd	0.50	0.31 bc
LSD values; *P*=0.05		***NS***	***2.44***	***0.24***	***1.48***	***NS***	***1.19***

Mean separations within columns by $LSD_{0.05}$.
[w] Supplemental Label , R846-059 for non-grass forage, fodder, straw and hay (CA accepted 06/10/08).
[x] Not labeled for this use.
[y] Log transformed data used for analysis.
[z] Post treatment Average.

Table 3. Mean Numbers of Alfalfa Webworms per Ten Sweeps in Alfalfa, Holtville, CA, 2009

Treatment	oz/acre	3 DPT	3 DAT[y]	6 DAT[y]	14 DAT[y]	22 DAT	PTA[yz]
Check	---------	3.25	0.67 ab	0.83 b	0.71 a	5.00 a	0.76 a
Intrepid	8.0	4.75	0.47 bc	0.27 cde	0.15 bcd	1.75 bc	0.36 bc
Radiant	5.0	3.25	0.23 c	0.21 cde	0.19 bcd	0.75 c	0.23 bc
Lorsban Advanced	32.0	2.50	0.25 c	0.50 bc	0.39 bc	2.50 abc	0.46 b
Cobalt	32.0	1.50	0.15 c	0.44 cd	0.33 bc	3.75 ab	0.46 b
Baythroid XL	2.8	2.50	1.08 a	1.21 a	0.42 b	1.50 bc	0.96 a
Belt 480 SC	2.0	2.75	0.19 c	0.00 e	0.12 cd	0.00 c	0.10 c
Belt 480 SC	3.0	2.00	0.33 bc	0.00 e	0.19 bcd	1.25 bc	0.27 bc
Belt 480 SC	4.0	2.75	0.12 c	0.08 de	0.00 d	0.50 c	0.11 c
LSD values; *P*=0.05		***NS***	***0.42***	***0.37***	***0.29***	***2.56***	***0.28***

Mean separations within columns by $LSD_{0.05}$.
[w] Supplemental Label , R846-059 for non-grass forage, fodder, straw and hay (CA accepted 06/10/08).
[x] Not labeled for this use.
[y] Log transformed data used for analysis.
[z] Post treatment Average.

Cucumber Mosaic Virus of Celery (*Appium* spp.)

Donna Henderson

Cucumber Mosaic Virus (CMV), previously referred to as Southern Mosaic Virus, infects 1200 species of plants and can result in severe economic losses in many vegetable and horticultural crops. CMV is transmitted by aphids, and causes a systemic infection in most host plants. However, in some hosts like alfalfa, CMV may remain symptomless. Symptoms of cucumber mosaic can vary greatly depending on the crop infected and the age of the plant when infection occurs. Symptoms of CMV on celery (*Appium* graveolens L. var. *dulce* (Miller) Pers.) include leaves that initially will develop vein-clearing and mosaic, and later these same leaves may show yellowing and veinal necrosis (Figure 1). The petioles of these plants show elongated, brown to translucent, sunken beige colored lesions (Figure 1). Symptoms may also become dull or muted later in the growing season or if conditions turn cool.

Symptoms of Cucumber Mosaic Virus on Celery Petioles and leaves.

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ALFALFA, FORAGES AND BIOFUELS FIELD DAY

Wednesday April 14, 2010

Location: UC Desert Research & Extension Center
1004 E. Holton Rd.
El Centro, CA 92243

Agenda
8:15 Registration & Coffee
8:45 Begin Field Day

Alfalfa and Forages:

Evapotranspiration Estimations/ Alfalfa Deficit Irrigation, Blaine Hanson, UC Davis
Alfalfa Varieties for the Low Desert, Dan Putnam, UC Davis
Nematodes in Alfalfa -- Donna Henderson, UCCE-Imperial County
Brownleaf in Sudangrass – Donna Henderson., UCCE-Imperial County
Insect Pest Management in Alfalfa – Vonny Barlow, UCCE-Riverside County
Low Cost Flumes to Measure Flow Rate - Khaled Bali, UCCE-Imperial County

Biofuels:

Prospects for crop-based biofuels in California, Steve Kaffka, UC Davis
Switchgrass and Miscanthus as Biofuels, Dan Putnam, UC Davis
Jatropha Production for Biofuel, Sham Goyal, UC Davis
Sugarcane as Biofuel and Sugarcane Water Use, Dave Grantz, UCR and Khaled Bali
Sorghum Irrigation for Forage or Biofuel, Mike Ottman, University of Arizona, Tucson

12:00 BBQ LUNCH

If you need special accommodations, please contact us at 760-352-9474
For additional information please contact Khaled Bali kmbali@ucdavis.edu or Dan Putnam dhputnam@ucdavis.edu

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 April 1 to June 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 (visit http://tmdl.ucdavis.edu and click on the CIMIS link).

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

Station	April		May		June	
	1-15	15-30	1-15	16-31	1-15	16-30
Calipatria	0.26	0.29	0.32	0.36	0.39	0.40
El Centro (Seeley)	0.24	0.28	0.31	0.34	0.36	0.38
Holtville (Meloland)	0.25	0.28	0.32	0.35	0.38	0.39

* Irrigation Management Unit, Imperial Irrigation District.

Link to UC Drought Management Publications

http://ucmanagedrought.ucdavis.edu/