Imperial County Agricultural Briefs

Features

From your Farm Advisors

December, 2007

Our Website is http://ceimperial.ucdavis.edu/

INSECT-TRANSMITTED VIRUS DISEASES OF MELONS

Eric T. Natwick

APHIDS

There are several aphid transmitted viruses that may be of concern in the low desert such as *Watermelon mosaic virus* (WMV II) and *Zucchini yellows mosaic virus* (ZYMV). WMV II is a potyvirus which can cause substantial economic damage. Symptoms include a green mosaic pattern, foliar distortions and blisters on leaves. Fruit can be distorted, especially with early infections. Symptoms can vary widely depending with environmental conditions, melon variety and viral strain. The disease is most damaging with infections early during plant development. WMV II can be transmitted by at least 35 different aphid species and the virus host range includes many wild and cultivated host plants including cucurbit species, cotton, and cheese weed.

ZYMV is also a potyvirus that is capable of causing substantial economic damage to melon crops. Foliar symptoms include a mosaic pattern, blisters and necrosis. Fruit can be distorted, color abnormally, net improperly, and star shaped cracks may form on the fruit. It is vectored by nine aphid species, seven of which are in Imperial County. Cucurbit species are common host plants in Imperial County.

Elimination of sources of ZYMV and WMV II and aphids is the only effective management technique for these two common mosaic virus and other aphid-transmitted mosaic virus found in Imperial County. Once infected with a mosaic virus, little can be done for a melon crop. However, with careful management and cooperation among melon growers the incidence of aphid-transmitted virus diseases can be on the next year's spring melon crop.

Photo courtesy of Whitney Crenshaw

WHITEFLY

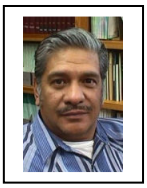
Two whitefly-transmitted virus diseases are common in Imperial County melon crops, *Cucurbit leaf crumple virus* (CuLCrV) and *Cucurbit yellow stunting disorder virus* (CYSDV). CuLCrV is a whitefly-transmitted begomovirus that causes leaves to crumple and cup toward the petiole and irregular yellow areas may also be present. Both cantaloupe and watermelons may show symptoms; however, cantaloupes rarely if ever suffer economic injury and watermelon crops are only mildly injured. Often, cantaloupe canes show severe crumpling symptoms for several inches or up to a foot and a half and the plant apparently arrests the disease and the remainder of the cane

will be symptom-less. The disease caused by CuLCrV causes mild damage to cantaloupe and water melons but is devastating to most squash.

A new whitefly-transmitted disease became apparent in the fall of 2006, cucurbit yellow stunting disorder (CYSD) disease caused by *Cucurbit yellow stunting disorder virus* (CYSDV) genus *Crinivirus*. CYSDV can be a devastating disease of several melon and squash crops and caused substantial damage to fall melons in the Valley this year and last. This virus is also found in Arizona as well as several melon and squash growing areas in Mexico. The symptoms on melons squash and cucumber are expressed first on crown leaves as a yellow mottling. The yellow spots soon coalesce into a general yellowing between veins which remain green. Infection with CYSDV early in the plants life cycle can lead to severe loss of yield through reduced set, and reduced fruit size. There can also be a quality loss due to reduced sugar in the fruit of melons.

CYSDV is dependant on the silverleaf whitefly for transmission in the Imperial Valley. The virus is not seed-borne nor mechanically transmitted. The virus is transmitted by whiteflies in a semi-persistent manner. The whitefly adult must feed for at least 2 hours to acquire this crinivirus and can remain infectious for 7 to 9 days. Natural infections have been reported in summer and winter squashes, cucumbers, musk melons such as cantaloupe and honeydew melon, and watermelon.

In Texas where CYSDV was first detected in 2000, host free periods have been successful in managing the disease. Insecticides can not protect crops from CYSDV because whitefly adults migrate from field to field spreading the virus. Complete crop destruction followed by a cucurbit host free period is the only proven control method. It may be several years before CYSDV-resistant cucurbit cultivars are available to growers. Proper identification of CYSDV is available at the UCD, Plant Pathology Department. Cucurbit plants suspected to have CYSDV infection can be brought to the Cooperative Extension Office in your county and they will be shipped to Dr. Robert Gilbertson at UCD or Dr. William Wintermantel at USDA ARS, Salinas, CA**.**



Muddy pens

Juan N. Guerrero

Average annual rainfall in the Imperial Valley is only about 2.85 inches. The wettest months of the year are November, December, January, and February; mean monthly precipitation of 0.36, 0.36, 0.46 and 0.32 inches, respectively. This winter is predicted to be dry, however even a small rainfall event may cause muddy pens and great discomfort for cattle. The irrigated Sonoran Desert is known principally for its torrid summers; however, winter rains may cause problems for penned cattle. During winter, the worst climate related problem for penned cattle is mud, not the cold. Cattle in mud 4 to 8 inches deep may have decreased feed intakes of 20%, cattle that don't eat don't gain weight. Cattle in mud 4 to 8 inches deep may have reduced weight gains, 15 to 20%, and have reduced feed efficiency by 10 to 15%. Cattle in mud will gain less weight and the weight that they do gain will be more expensive.

For persons feeding only a few cattle in one small pen, runoff diversion is a good practice to keep pens dry during rainfall events. Building a berm around the high side of the pen to prevent rainfall runoff from the adjacent field will help keep the pen dry. Small cattle pens should also have drainage. Pen runoff may be diverted to an adjacent field. Great care must be taken, however, that pen drainage not flow into canals or irrigation drains. Federal law prohibits the contamination of the nation's waterways from the runoff of cattle pens.

Locally, a small rainfall event, as small as .25 inch, may cause mud problems in cattle pens. When cattle walk in muddy pens, they expend great amounts of energy merely for locomotion; that same amount of energy may have been used for weight gain. Moreover, in muddy pens, the skin of cattle is in contact with cold, wet mud; which causes greater energy expenditures to maintain normal body temperatures; again, energy that might have gone to weight gain.

Because of the problems that we have with heat in the irrigated Sonoran Desert, we generally place more cattle within a given area, than in the rest of the country. Locally, we recommend from 110 to 150 ft² per head of pen space. On dirt pens, in the rest of the country, from 250 to 500 ft² per head of pen space is generally recommended. Placing so many animals in a given space helps reduce dust problems, an equally unhealthy problem, during the desert summer. However, this practice of placing so many animals within such a small area does have its associative negative effects during winter rains.

Perhaps the best way to maintain feed intake in muddy pens is to construct a concrete apron along the interior of the feed bunks. There should be a small 4" step from pen level up to the apron. From the fence line to the edge of the apron; the apron

should be 8 to 10 ft. wide. The apron should also be 4 to 6 inches thick. The use of this cement apron will help prevent the problems associated with muddy cattle pens.

An emergency effort that may be made during wet weather is to place bedding in cattle pens to reduce the effects of muddy pens. Old, weathered hay is the perfect solution.

Nitrogen Fertilization of Wheat

Juan N. Guerrero

When the grain crude protein percentage is from 12 to 14%, wheat requires from 33 to 37 lb of N for every 1000 lb of grain. While taking soil samples to determine fertilizer applications is a common practice, predicting the exact amount of N to apply is difficult because N may be released from crop residues, from soil mineral and from applied N. The amount of N for grain production at various grain protein contents is depicted in Table 1.

Applied N should occur with plant physiological development (Figure 1). Excessive amounts of N pre-plant should be avoided because N fertilizer efficiency is about 20% less than during the growing season. N application should coincide with plant N needs. To maximize grain yields, N should be applied from the 5-leaf stage until heading.

Desert durums should have at least 13% protein in the grain. The application of 30 lb/a from heading until two weeks after flowering will increase grain protein percentage by 1% and hard vitreous amber count (HVAC) by 12% (Table 2).

I asked Dr. Mike Ottman, University of Arizona agronomist, regarding his recommendations for durum wheat N fertilization. He recommends 250 lb total N/a; 75 lb N/a pre-plant, and about 50 lb N/a at each irrigation. An example of N fertilizer application is depicted in Table 3. N fertilizer may be banded, broadcast, injected, or water-run. However, if more than 30 lb of N is banded, germinating seedlings may be damaged. Urea or diammonium phosphate, if place near the seedling may burn the seedling.

Tissue testing is a good way to know exactly how much N to apply during the growing season. Before jointing, the nitrate content of the plant from the seed to the soil surface should be analyzed. After jointing, two inches from the soil surface should be analyzed. For the analyses to be valid and representative, about 25 to 30 plants ***randomly*** selected should be analyzed. Based on the NO_3 content of the stem samples, Table 4 may be used to determine N application rates.

Currently durum wheat prices are quite good and properly applied N will help boost grain yields and grain protein content.

Source: Ottman, Mike, and Tom Thompson. 2006. Fertilizing small grains in Arizona. http://www.cals.arizona.edu/pubs/crops/az1346.pdf

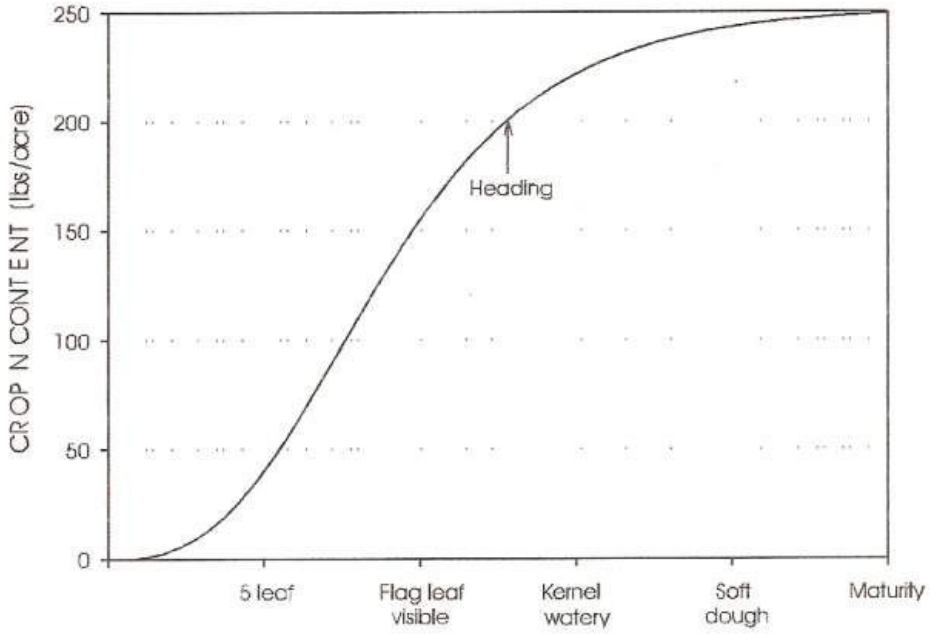


Fig. 1. Generalized small grain N content over the progress of the season.

Table 1. Nitrogen content of wheat (grain, straw, and roots) at various grain yield and grain protein levels.

	Grain protein (%)		
Grain yield	12	13	14
lbs/acre	Crop N (lbs N/acre)		
5000	166	176	185
6000	200	211	222
7000	233	246	259
8000	266	281	296

Assumptions: 1) Grain yield on a 7% moisture basis, 2) Grain protein on a 12% moisture basis, 3) Grain N = grain protein/5.7, 4) Grain yield/total above-ground yield = 0.42 (Ottman et al., 2000; Ottman and Pope, 2000), 5) Straw N = 0.34% (Ottman et al, 2000), 6) Root yield = 0.2 xtotal above-ground yield (Rajala and Peltonen-Sainio, 2001), and 7) Root N = 1.5% (Hicks, 1928)

Table 2. The effect of nitrogen fertilizer applied near flowering on yield, protein, and HVAC of durum at Maricopa (Doerge et al., 1989; Doerge and Ottman, 1990, 1991; Ottman et al., 2000).The nitrogen applied before this flowering period averaged 175 lbs N/acre. Grain protein and HVAC are statistically different, but not grain yield.

N Rate near flowering	Grain Yield	Grain Protein	HVAC
lbs N/acre	lbs N/acre	%	%
0	6818	11.6	79
30	6717	12.7	91
60	6697	13.6	96

Table 3. Example of a nitrogen fertilizer schedule for barley (full season) and durum at Maricopa. Fertilizer applications after heading are intended to boost durum grain protein content and are not required for barley.

Date	Stage	Fertilizer rate Barley	Durum
		---------- N/acre ----------	
Dec 10	Planting	75	75
Feb 04	5 leaf	40	40
Feb 27	2 nodes	40	40
Mar 16	Pre-boot	40	40
Mar 30	Heading-Flowering	0	30
Apr 11	Milk	0	30
	TOTAL	195	255

Table 4. Recommended nitrogen fertilizer rates based on nitrate-N in dried lower stem tissue of barley and wheat. To generate guidelines based on stem sap, divide the stem nitrate figures by 6.32.

Stage Sampled	Stem Nitrate-N	Description	N rate*	Stage to apply Fertilizer
	ppm		lbs N/acre	
3 to 4 leaf	> 5000	Excess	0**	3-4 leaf to Jointing
	2000-5000	Adequate	0-50	
	<2000	Deficient	50-100	
Jointing to boot	>3000****	Excess	0	Jointing to Heading
	1000-3000	Adequate	0-50	
	<1000	Deficient	50-75	
Heading****	>3000	Excess	0	Heading to Milk
	1000-3000	Adequate	30-60	
	<1000	Deficient	60	

** Decrease N rates by 20% for barley or if expected wheat yields are less than 5400 lbs/acre.*

*** Apply 30 lbs N/acre regardless of stem nitrate-N content at the 3-4 leaf stage if the pre-plant soil test for nitrate-N was below 10 ppm.*

**** For malting barley, 2000 ppm is considered excessive between jointing and boot.*

***** Nitrogen applications after heading are intended for wheat only, to increase grain protein content.*

Soil Testing and Phosphorus Fertilization in Alfalfa

Khaled M. Bali

Phosphorus is the most important nutrient needed for alfalfa production. Potassium (K) and sulfur are also important but in many soils in the low desert areas of California, the amount of K in the soil and irrigation water is sufficient for alfalfa growth. Most nutrients for alfalfa production come from the soil and some from irrigation water. The most effective way to evaluate the nutrient requirements for P in alfalfa is to measure the concentration of P in the plant tissues and the soil. But sometimes, such as prior to planting, it is not possible to use plant tissue analysis to evaluate the status of P in the alfalfa. Soil testing could also be helpful prior to planting to evaluate the amount of P needed for alfalfa growth.

Soil testing and plat tissue analysis are needed to determine the amount of P required for the proper application of P and other fertilizers. Soil testing is usually conducted prior to planting and approximately two to three years after planting. Plant tissue analysis could be done every year or more frequently if needed. Soil samples should be taken from the first foot or so of the soil profile if broadcast P was used applied to the field. Deeper samples maybe needed if water-run P was applied to the field. However, most of water uptake and nutrient uptake in alfalfa in the low desert region occurs from the top two to three feet of the soil profile. In heavy cracking clay soils, some of water-run P may move to depths below three feet and may not be available to the alfalfa roots. It is better to avoid applying water-run P when the soil profile is dry and deep cracks are present. Therefore, fertilizer application practices must be taken into account when soil testing is needed. Most top dressed P is in the top six inches of the soil profile.

Phosphorus analysis should be conducted using the Olsen method (for soils in southern California). The method is applicable for the conditions in the desert region (high pH and calcium soils and low organic matter). The phosphorus concentration should be reported in ppm (parts per million) P. If other units are used (such as PO_4 or P_2O_5), the values should be converted to ppm P using one the following equations:

$$PO_4 = 3.07 * P$$

$$P_2O_5 = 2.29 * P$$

For alfalfa, the following guidelines have been developed for P soil tests:

P concentrations between 0 and 6 ppm of P, the amount of P in the soil is: LOW

P concentrations between 7 and 10 ppm of P, the amount of P in the soil is: MARGINAL P

concentrations between 10 ppm of P and higher, the amount of P in the soil is: ADEQUATE

The amount of P fertilizer needed per year based on soil P tests:

Soil test level (ppm)	Amount of P_2O_5 needed per ac per year (based on 8-10 tons of alfalfa per year)
0-3	200
3-6	150
6-10	100
10-15	50
Above 15	0

Most irrigated soils in the Imperial Valley have soil P in excess of 5-10 ppm; therefore, applications of P in excess of 100-150 lb of P2O5 (200-300 lb of 11-52-0) may not be needed. The removal rate of P by alfalfa is about 15 lb of P2O5 per ton of hay (approximately 120-150 lb of P2O5 per year). In general, dry forms of P fertilizers for alfalfa such as 11-52-0 or 0-45-0 are as effective as liquid forms (10-34-0, phosphoric acid).

Desert Vegetable Crops Workshop is Nov. 27 in Holtville, Calif.

Desert crop growers should mark their calendars to get the latest information on desert vegetable crops and more during the 18th Annual Desert Crops Workshop on Nov. 27, 2007 at the Barbara Worth Resort, Holtville, Calif.

The workshop is free to growers and will cover a wide range of topics ranging from E. coli to pests and field solarization.

The University of California (UC) and the University of Arizona (UA) are jointly organizing the conference. Eric Natwick, UC Cooperative Extension Director, Imperial County, is the conference chairman.

Western Farm Press is the official conference sponsor.

Continuing education credit is pending for California and Arizona, plus CCA credit.

The tentative agenda includes:

7:30 **Registration**

7:45 **Farm workers provide insight for improving field labor retention in Arizona** – Kurt Nolte – UA Area Extension Agent, Yuma County, Ariz.;

8:00 **Refining Solarization Technology for Desert Agriculture** – James Stapleton, IPM Plant Pathologist, UC Kearney Agricultural Center, Parlier, Calif.;

8:15 **Efficient, Low Cost Sugarbeet Production in the Desert** – Stephen Kaffka, Extension Agronomist, UC Davis, Davis, Calif.;

8:45 **Aphid Control in Desert Vegetable Production** - John Palumbo, UA Research Scientist, Extension Specialist, UA Yuma Agricultural Center; Yuma;

9:00 **Using Sensor Technology to Understand Tillage Efficiency** – Pedro Andrade, Precision Ag Specialist, UA Maricopa Agricultural Center, Maricopa, Ariz.;

9:15 **Feedstock for Imperial Bio-Energy Production** - Juan Guerrero, Area Farm Advisor, UC Desert and Extension Center, Holtville;

9:30 **Update on E. coli and Leafy Vegetables** – Steven Koike, UC Farm Advisor, Plant Pathology, Monterey County, Calif.;

9:45 **Large Bed Vegetable Cropping Systems Enhance Productivity and Water Conservation** - Kurt Nolte, Area Agriculture Associate Agent, UA Cooperative Extension, Yuma County;

10:00 **Break**

10:15 **Lettuce Drop Control in the Low Desert** – Thomas Turini, Vegetable Crops Farm Advisor, UC Cooperative Extension, Fresno County;

10:30 **Tolerance of Vegetables to a New Experimental Herbicide** - Milton McGiffen Jr., UC Cooperative Extension Specialist, Plant Physiologist, Riverside, Calif.;

10:45 **New Insecticides for Worm Control in Vegetables** - Eric Natwick, Imperial County Extension Director and Entomology Farm Advisor, UC Desert and Extension Center, Holtville;

11:00 **Update on the Introduction of Tomato Yellow Leaf Curl Virus into California: Implications for California Tomato Production** – Maria Rojas – Plant Biologist, UC Davis;

11:15 **Epidemiology and Management of Cucurbit Yellow Stunting Disorder Virus in Desert Melons -** William Wintermantel, Research Plant Pathologist, USDA-ARS, Salinas, Calif.;

11:30 **Spinetoram Field Studies in Western Vegetables** – Jesse Richardson, Dow AgroSciences, Hesperia, CA;

11:45 **Phosphorus Application Practices on Alfalfa and Runoff Water Quality** - Khaled Bali, Irrigation/Water Management Advisor, UC Desert and Extension Center, Holtville; and

12:00 **Lunch** - provided at no charge for those who RSVP by Nov. 19 – courtesy of Western Farm Press and commercial suppliers.

For more information and to pre-register, contact Annette Tietz at atietz@ucdavis.edu , or Cary Blake, Associate Editor, Western Farm Press, at cblake@farmpress.com.

Growers can return this form or register at the door.

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REGISTRATION FORM
Desert Vegetable Crops Workshop November 27, 2007

Name _____

Business _____

Number attending: _____

Please e-mail atietz@ucdavis.edu or return this form to: Workshop, 1050 E. Holton Rd. Holtville, CA 92250

Monday, December 17, 2007 Field Tour

9:00 a.m.-5:00 p.m. – Pre-Symposium Tour. The group will visit vineyards transplanting operations, the Nat'l. Steinbeck Center/Ag Museum and artichoke harvests. Rachael Long, Chair. Hosts: Richard Smith & John Inman, Monterey County UCCE Farm Advisor & former Farm Advisor

Tuesday, December 18, 2007 – Morning Session – Day 1 (8:00 a.m. – Noon)

Industry Trends: Economics, Dairy Trends and the Environment

6:30-10:00 a.m. Registration

8:00 Announcements & Welcome – Dan Putnam, Forage Specialist, Univ. of California, Davis, CA
8:10 CA Hay Price & Supply Situation – Seth Hoyt, Nat'l. Ag Statistics Service, Sacramento, CA
8:35 California Dairy Trends – Mike Marsh, Western United Dairymen, Modesto, CA
9:00 Forage Production Strategies with Reduced Water Supplies—Blake Sanden, UCCE Kern County, Bakersfield, CA
9:25 Water Quality: Preventing Offsite Pesticide Movement in Alfalfa – Terry Pritchard, UCCE San Joaquin County, Stockton, CA
9:50 Discussion
10:00 BREAK
10:30 What is the Potential of Alfalfa as a Biofuel?– Mark McCaslin, Forage Genetics, Minneapolis
10:55 Trucking Regulations & How They Affect Hay Growers – Emily Robidart, CA Farm Bureau
11:20 Grazing Alfalfa Systems: Argentinean Pampas – Daniel Basigalup, INTA, Cordoba, Argentina
11:45 Overview of CA Alfalfa & the Irrigated Alfalfa Manual – Dan Putnam, Univ. of CA, Davis, CA

Noon *Banquet Lunch – From Acorns to Sardines: A Brief History of Monterey* by Tim Thomas, Museum Historian, Monterey Maritime & History Museum, Monterey, CA

Afternoon Breakout Sessions – Back-to-the-Basics: Producing Alfalfa A to Z (1:30 – 5:00 p.m.)

Session I. Agronomic Techniques

1:30 Site Selection & Stand Establishment – Shannon Mueller, UCCE Fresno County, Fresno, CA
2:00 Alfalfa Variety Selection for Maximizing Yields, Quality & Pest Management – Dan Putnam
2:30 Applying Manures & Biosolids to Alfalfa – Rollie Meyer, CE Specialist, Univ. of CA, Davis, CA
3:00 BREAK
3:30 Recent Advances in Alfalfa Tissue Testing to Assess Fertilizer Needs – Steve Orloff, UCCE Siskiyou County, Yreka, CA
4:00 Irrigation for a Successful Alfalfa Crop – Blaine Hanson, Dept. of LAWR, UC Davis, CA
4:30 Overseeding and Old Stand Management – Rob Wilson, UCCE Lassen Co., Susanville, CA

Session II. Managing Pests

1:30 Basics of Controlling Weeds – Mick Canevari, UCCE San Joaquin County, Stockton, CA
2:00 Controlling Insects in Alfalfa – Larry Godfrey, Dept. of Entomology, Univ. of CA, Davis, CA
2:30 Diseases and Nematodes of Alfalfa – Carol Frate, UCCE Tulare Co. Farm Adv., Tulare, CA
3:00 BREAK
3:30 Vertebrate Pests in Alfalfa – Duane Schnabel, Agricultural Biologist, CDFA, Sacramento, CA
4:00 Producing Organic Alfalfa – Rachael Long, UCCE Yolo County, Woodland, CA
4:30 Diagnosing Problems in Alfalfa – Charles Summers, Kearney Ag Center, Parlier, CA
5:00 ADJOURN

5:00-6:30 .Exhibitor's Reception

5:30-7:00 Hay Growers Auction (organized by California Alfalfa & Forage Association)

Wednesday, December 19, 2007

6:15 a.m. CAFA Breakfast

Main Session – Back-to-the-Basics: Producing Alfalfa A to Z

Session III: Producing a Quality Alfalfa Product

8:00 Harvest Management, Scheduling, & Storage – Steve Orloff, UCCE Siskiyou Co., Yreka, CA
8:25 Economic Costs of Harvesting Systems – Steve Blank, Ag & Res. Economics, UC Davis
8:50 Fundamentals of Forage Quality – Ed DePeters, Animal Science, UC Davis, CA
9:15 Visual Assessment of Forage Quality & Requirements for Different Classes of Livestock – M.J. Bakke, Dairy Nutritionist, Custom Dairy Performance, Clovis, CA

9:40 BREAK

Main Session: Roundup Ready and Genetically Engineered Alfalfa – What is the Future?

10:10 What Have We Learned from Two Years of Roundup Ready Alfalfa? – Pros & Cons – Mick Canevari, UCCE San Joaquin County Farm Advisor, Stockton, CA
10:30 Is It Possible for GE & Non-GE Alfalfa Hay to Coexist? – Dan Putnam, UC Davis, CA

Should Roundup Ready Alfalfa Be De-Regulated

10:50 Why Further Environmental Review for Roundup Ready Alfalfa is Necessary– Kevin Zelig Golden, Staff Attorney, Center for Food Safety, San Francisco, CA
11:10 Why Roundup Ready Alfalfa Should Be De-Regulated – Mark McCaslin, President, Forage Genetics, Inc., Minneapolis, MN

11:30 **Round Table Discussion (including speakers)**

- Conventional and Organic Grower: Don Cameron, Terranova Ranch, Helm, CA
- Marketing Cooperative: Rick Staas, San Joaquin Valley Haygrowers Assn., Tracy, CA
- Hay Exporter: Jeff Plourd, El Toro Export, El Centro, CA
- Organic Dairy: Albert Strauss, Strauss Dairy, Marshall, CA

12:30 ADJOURN

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Registration Form
2007 California Alfalfa & Forage Symposium, Monterey, CA (one form per person)

Name	Company/Ranch
Address City, State, Zip Code	
Phone	E-mail (important) Confirmation is by E-mail only.
☐ Pre-Symposium Tour $45.00	☐ Early Registration (before 11-16-07) $125.00
☐ Extra Exhibit Booth Rep. Registration: $75.00	☐ Late Registration (after 11-16-07) $160.00

☐ Single Day Registration $90.00 for 12-18-07 or $75.00 for 12-19-07
☐ Extra: Guest Banquet Lunch Ticket(s) @ $29.00 each

☐ Extra: Additional Copies of Proceedings @ 12.00 ea. (one included with registration)

To register online go to our Web site at http://alfalfa.ucdavis.edu.
Total Enclosed $_____

Mail your check, payable to "UC Regents," to Janice Corner (jecorner@ucdavis.edu or 530-752-7091), Department of Plant Sciences, MS-4, UC Davis, One Shields Ave., Davis, CA 95616-8780.

CIMIS REPORT

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 December 1 to February 28 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	December		January		February	
	1-15	16-31	1-15	15-31	1-15	16-28
Calipatria	0.07	0.07	0.08	0.09	0.12	0.14
El Centro (Seeley)	0.06	0.06	0.08	0.09	0.12	0.14
Holtville (Meloland)	0.06	0.06	0.08	0.09	0.12	0.14

* Irrigation Management Unit, Imperial Irrigation District.