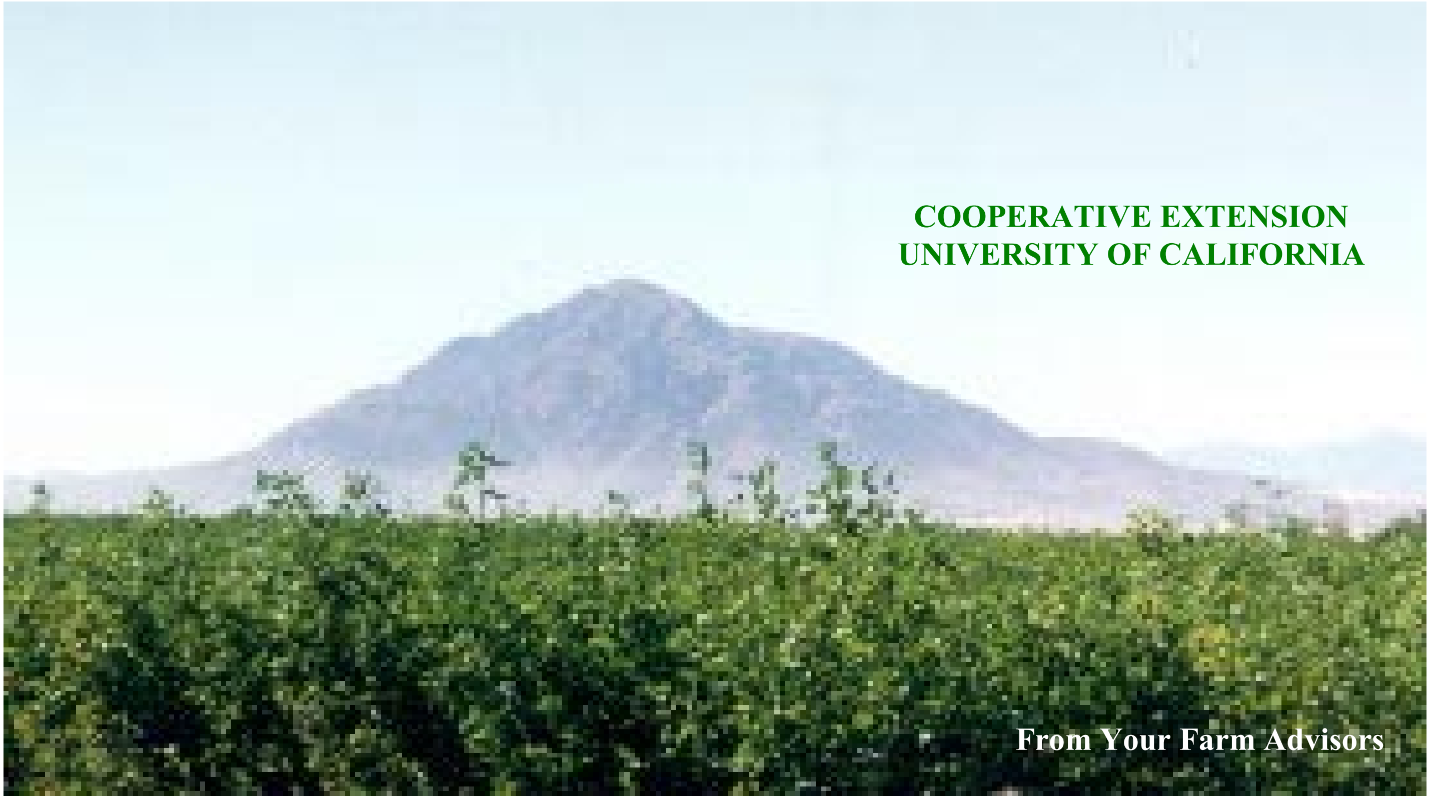

Features

May 2004

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CONSERVATION TILLAGE FIELD DAY

Herman Meister

Efficient farm management has always been of prime importance to farmers, but large increases in capital and operating costs in recent years have made it even more important. Farmers must find ways to maximize their net returns so they can operate within existing economic constraints and respond to growing environmental concerns such as water quality and particulate matter emission. Nearly 13.4 billion Btu's of energy is expended in tillage operations in California; almost all of this energy is derived from diesel fuel.

Greater farm profits can be achieved through increased return or decreased costs. Producing higher value crops depends on factors over which growers have little control, such as climate and market demand. Improved varieties, fertilization strategies, irrigation methods and management have substantially increased crop production, but these changes tend to occur slowly over time. Expanding acreage is one way to increase total profit, but land constraints and market conditions often prohibit this option. Therefore, reducing costs without changing any other parameters is an attractive option. Land preparation prior to planting generally requires significant energy inputs, resulting in high operating costs. New techniques to reduce the cost of preparing land could be beneficial to growers.

Due to increased production costs and growing concerns about the impact of agricultural production on the environment, interest in conversation tillage has increased in recent years. Conservation tillage uses new techniques that reduce soil erosion, conserve moisture, reduce energy inputs and production costs, improve land use and reduce labor. Conservation tillage attempts to reduce primary soil tillage operations such as plowing, ripping, discing, chiseling, and dedicates tractor-traffic zones in row crops away from crops root zones. As a result of deliberate reduction in tractor operations, growers may save energy, produce less dust and sequester more carbon in the soil.

Most of the research on conservation tillage has been conducted in the Mid-west on soils of entirely different derivation than ours, an environment that includes natural rainfall and a very seasonal crop rotation system. In California under semi-arid conditions and saline soils, adoption of conservation tillage methods has been very slow although higher energy costs and higher worker compensation insurance rates have spurred new interest in conservation tillage in California. Some research on the economic benefits of conservation tillage has been conducted by UCCE in the Davis, California area on various loam type soils. One attempt on a clay soil was unsuccessful due to soil moisture problem (soil was too dry to operate the one-pass tillage machine). Results from this research indicated an average of 50% reduction in fuel usage and an average time saving of about 70%. (California Agriculture, September-October, 2001)

Several equipment companies had one-pass tillage equipment on display at the Tulare Farm Show in February (Wilcox Agri-Products, Tillage International, Tillso Limited, Case-IH, Hahn Tractor Company, Inc.). These companies and local equipment companies (Jordan Central Implement, Empire Machinery, RDO Equipment, Torrence Farm Implements) have been invited to a local UCCE field day to be held on May 19th at a location to be determined and announced as we near the May 19th date. Along with the one-pass tillage equipment demonstration, a seminar will be conducted to review conservation tillage principles and concepts. This program is especially important to those who have applications in the EQIP program with NRCS.

HEAT INDEX

Juan N. Guerrero

The heat of the Sonoran Desert summer will shortly be felt by all of us. Relative humidity has a tremendous effect on heat discomfort that our bodies perceive. In northern climates, wind makes cold weather feel colder. Well in warm climates, high relative humidity makes hot weather feel even hotter. Every summer in the Sonoran Desert, humid winds come off the Gulf of California and make the climate miserable; July through September are specially humid. Climatologists call this heat sensation caused by high relative humidity the *Heat Index*. Table 1 has the heat index values. Suppose that one August day the thermometer temperature is 110° (not abnormal during the summer) *and* the relative humidity for that August day is 30%, the heat index value (the temperature that our bodies feel) is 122°. Such high temperatures cause heat stress on livestock, crops, and to humans. Great care must be taken when working outside during these days of heat stress.

Table 1. Heat index, effect of relative humidity on apparent temperature.

Relative Humidity %	**Thermometer temperature °F**									
	70	**75**	**80**	**85**	**90**	**95**	**100**	**105**	**110**	**115**
0	70	75	80	85	90	95	100	105	110	115
6	70	74	78	82	86	90	94	98	103	107
9	71	74	78	82	86	90	95	99	104	109
12	72	75	78	82	86	90	95	100	106	112
15	73	75	78	82	86	91	96	102	108	115
18	74	76	78	82	86	91	97	103	110	118
21	74	76	79	82	86	92	98	105	113	122
24	75	76	79	82	87	92	99	107	116	126
27	76	77	79	83	87	93	101	109	119	130
30	76	77	79	83	88	94	102	112	122	134
33	76	77	79	83	89	96	104	114	126	139
36	77	77	80	84	89	97	106	117	130	144
39	77	77	80	84	90	98	108	120	134	150
42	77	78	80	85	91	100	111	124	139	156
45	77	78	80	85	92	102	114	127	143	162
48	77	78	81	86	94	104	116	131	148	168
51	77	78	81	87	95	106	119	135	154	175
54	77	78	81	87	96	108	123	140	159	182
57	76	77	81	88	98	111	126	144	165	189
60	76	77	82	89	100	113	129	149	171	197
63	75	77	82	90	101	116	133	154	178	204
66	75	77	82	91	103	119	137	159	184	213
69	74	77	83	92	105	122	141	165	191	221
71	74	77	83	93	107	124	144	168	196	227

CHARCOAL ROT

Thomas A. Turini

The soil-borne fungus, *Macrophomina phaseolina*, causes charcoal rot. On melons, the first disease symptoms appear as a water-soaked lesion that forms on the stem near the ground level. An amber gum may ooze from the lesion. As the lesion ages, the affected area becomes dry and tan to brown in color. Small black structures (microsclerotia), which are between 0.02-0.08 inches in length, can be found embedded in diseased stems and roots. However, distinguishing this disease from gummy stem blight can be difficult.

The disease usually does not kill the plant, but causes crown leaves of infected plants to turn yellow and wither, which exposes fruit to sunburn. The disease is generally considered to be of minor importance, but it can cause economic loss under environmental conditions favoring disease development.

High temperatures and plant stress favor the occurrence of this disease; although, infections can occur when soil temperatures are as low as 50 °F.

This fungus has an extremely broad host range, although some crops are more severely affected than others. This disease can kill young bean plants. Garbanzo, blackeye, lima, and common beans are particularly susceptible. When temperatures are high and plants are water stressed, charcoal rot can kill or weaken cotton plants, although some varieties are more susceptible than others.

Charcoal rot is a disease that is favored by plant stress. To reduce the likelihood that this disease will become a concern is reduced by maintaining optimal soil moisture and avoiding stressing the plants. Generally, fungicides are not recommended for control of this disease, but trials are underway in Imperial Valley to test the efficacy of chemicals to control charcoal rot of melons under our growing conditions. In addition, fumigants have not shown promise in controlling this disease, and crop rotations are not feasible due to the large host range.

<u>MEETING NOTICE</u>: A Conservation Tillage Demonstration Field Day and Seminar is planned in cooperation with the NRCS for **<u>May 19th</u>**. Mark your calendar now for this special event.

The meeting agenda has not been finalized and will follow in early May. A separate Meeting Notice will be sent out as soon as arrangements are confirmed. If you have any questions, you may contact our office at (760) 352-9474.

INSECTICIDE EFFICACY AGAINST BEET ARMYWORM ON ALFALFA IN 2003.

Eric T. Natwick

An insecticide efficacy study was conducted during the summer of 2003at the UC Desert Research and Extension Center. A first year stand of the alfalfa variety CUF 101 was used for the experiment. Plots were arranged in a randomized complete block design with four replications. Eight insecticide treatments were included along with an untreated control. Insecticide treatments and rates as ounces of formulated product per acre are listed in Table 1. Plots measured 35 feet by 50 feet and insecticide treatments were broadcast applied August 5, 2003 using a tractor mounted spray boom with 19 X TJ-60 11003VS nozzles at 20 psi delivering 29 gpa.

Populations of beet armyworm were measured in each plot with a standard 15 inch diameter insect net consisting of ten 180^o sweeps on August 4, 6, 8, 12 and 19, 2003 or 1 day prior to treatment (DPT), 1, 3, 7, and 14 days after treatment (DAT).

The Lorsban 4 E treatment and all rates of Steward provided excellent beet armyworm control through the 14 DAT sample, Table 1. Assail, Warrior, gama-cyhalothrin, and zeta-cypermethrin did not adequately control beet armyworm.

Table 1. Numbers[v] of Beet Armyworms per Ten Sweeps in Alfalfa, Holtville, CA, 2003.

Treatment	oz/acre	1 DPT[w]	1 DAT[xy]	3 DAT[y]	7 DAT	14 DAT[y]	PTM[yz]
Check	**------**	**19.0 a**	**39.1 a**	**42.5 a**	**42.5 a**	**34.3 a**	**39.3 a**
***(DE-225) Gama-cyhalothrin**	**0.015**	**13.0 a**	**39.8 a**	**36.9 ab**	**40.5 a**	**24.6 ab**	**35.0 ab**
Warrior	**0.03**	**14.5a**	**24.8 a**	**15.8 ab**	**24.0 abc**	**16.7 abc**	**21.0 b**
Steward 1.25SC	**0.045**	**16.3 a**	**2.2 b**	**0.9 d**	**0.0 d**	**6.9 d**	**2.9 d**
Steward 1.25SC	**0.065**	**21.8 a**	**3.8 a**	**0.7 d**	**1.0 d**	**12.1 bcd**	**4.4 cd**
Steward 1.25SC	**0.09**	**23.5 a**	**6.3 b**	**5.0 c**	**8.0 cd**	**8.6 cd**	**6.3 c**
***(F0570 0.8 EW) zeta-cypermethrin**	**0.02**	**16.3 a**	**42.8 a**	**14.8 b**	**21.3 d**	**14.0 bcd**	**23.9 ab**
Lorsban 4 E	**1.00**	**14.3 a**	**2.0 b**	**0.4 d**	**0.8 bc**	**11.3 bcd**	**3.9 cd**
***Assail WSP**	**1.2**	**15.3 a**	**35.0 a**	**22.4 ab**	**31.0 ab**	**21.2 ab**	**26.9 ab**

[v] Mean separations within columns by $LSD_{0.05}$.
[w] Days pre-treatment.
[x] Days after treatment.
[y] Log transformed data used for analysis; reverse transformed means reported.
[z] Post treatment mean.
*** Not registered for this use at time of publication.**

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 May 1 to July 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).

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	May		June		July	
	1-15	16-31	1-15	15-30	1-15	16-31
Calipatria	0.32	0.36	0.39	0.40	0.39	0.38
El Centro (Seeley)	0.31	0.34	0.36	0.38	0.38	0.37
Holtville (Meloland)	0.32	0.35	0.38	0.39	0.39	0.38

* 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

Eric T. Natwick
County Director