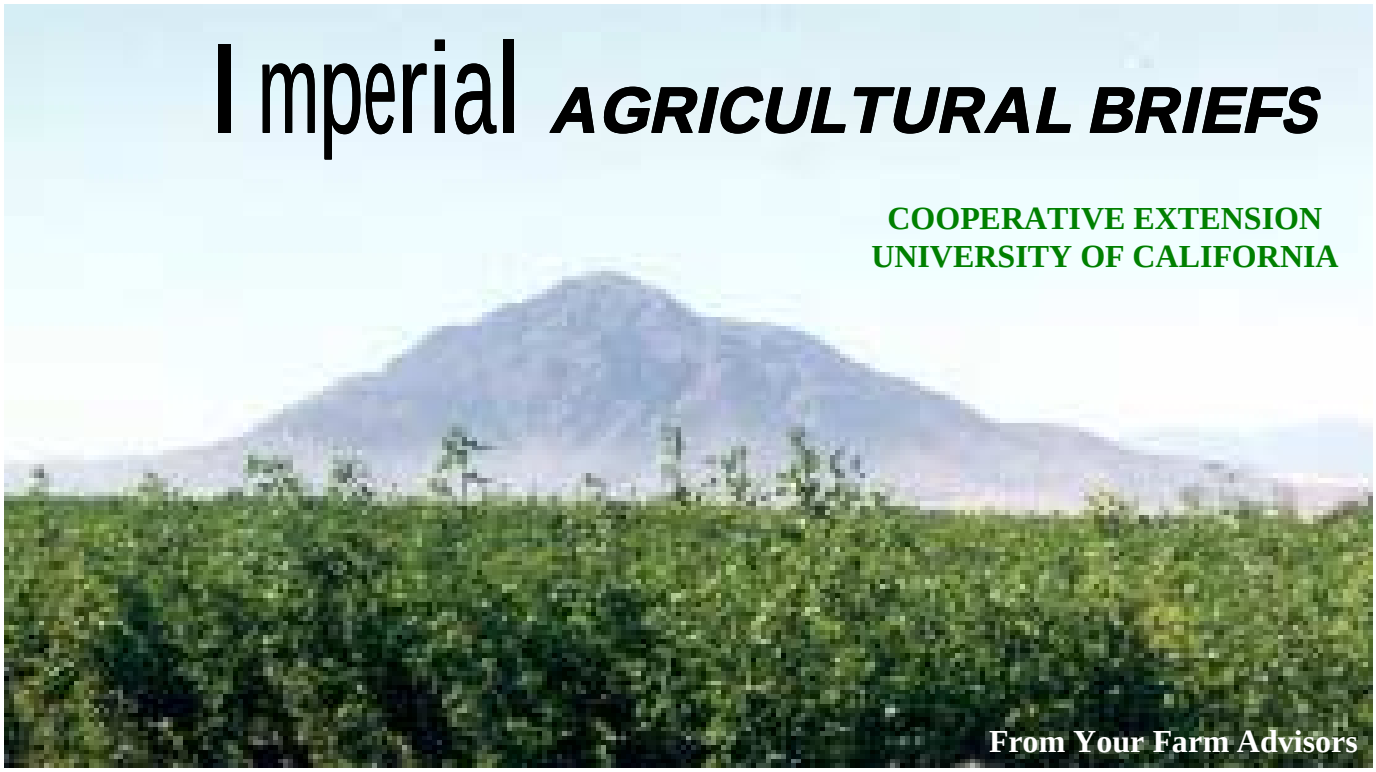
Imperial AGRICULTURAL BRIEFS

COOPERATIVE EXTENSION
UNIVERSITY OF CALIFORNIA



Features

March 2003

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

1050 E. Holton Road Holtville, CA 92250-9615 (760) 352-9474

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with U.S. Department of Agriculture
W. R. Gromes, Director of Cooperative Extension, University of California

IDENTIFICATION AND CONTROL OF LEAF BLIGHT DISEASES OF CARROTS

Thomas A. Turini

There are a few organisms that can cause leaf blight of carrots. These are all favored by warm wet conditions. Because of the moisture requirement, these diseases are usually of minor concern in the low desert, but if a spring rain occurs or if there are heavy dews, some of these diseases can be severe.

Alternaria leaf blight, caused by the fungus *Alternaria dauci*, can cause substantial yield loss under the warm, damp climatic conditions that favor disease development. Alternaria leaf blight symptoms appear as dark-brown or black irregularly shaped lesions on leaves and petioles. It can kill or weaken leaves. These leaves will fall off when gripped by a mechanical harvester resulting in poor harvest. Rovral, a systemic fungicide, is effective against this disease when applied at first appearance.

Bacterial leaf blight, caused by the bacterium *Xanthomonas campestris* pv. *carotae*, is usually of minor importance and chemical control is rarely needed to avoid economic damage. Symptoms appear as dark-brown or black irregularly shaped lesions on leaves and petioles. Bacterial ooze is a diagnostic characteristic produced by lesions on flower stalks of plants that have bolted or less commonly, on leaves or petioles. Under conditions favoring disease development, foliar sprays with copper sulfate aid in disease management.

Cercospora leaf blight, caused by the fungus *Cercospora carotae*, is of minor importance in the inland valleys of California. Cercospora leaf blight lesions are rust colored and round to oval. If conditions favor disease development and there is a history of this disease in the field, apply Bravo Weather Stick.

All three pathogens are seed-borne and are capable of surviving on crop residue. Alternaria- and Xanthomonas-indexed seed is available. Planting indexed seed will insure that you are not bringing the pathogen into your field. Also, these fungi survive in the soil on crop residue; so turn under crop residues to hasten decomposition and practice a 2- to 3-year crop rotation.

HORSES AND BERMUDAGRASS

Juan N. Guerrero

Several days ago I responded to a telephone call from a horse owner. The horse owner, originally from the Northeastern US, had been told by reputable sources that ***only*** timothy hay could be fed to the horse as a safe forage source. After gaining my composure, I informed the horse owner that locally and in many other parts of the southern US, bermudagrass hay is the basis of horse nutrition. Traditionally the basis for horse nutrition has always been a good quality grass hay. Horses evolved as consumers of tough, fibrous grasses.

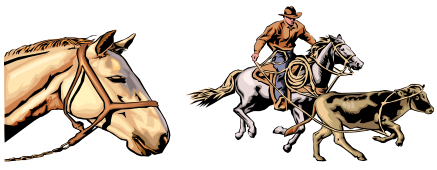
In the Imperial Valley, pleasure horses can be maintained solely on well fertilized and well-watered bermudagrass pastures. Bermudagrass hay is adequate for horse maintenance level feeding. In the event that the horse may be doing some strenuous work then alfalfa hay or oats may be included into the ration. Too many pleasure horse owners observe sweat under the horse blanket and assume that the horse has had a strenuous workout and overfeed the horse. Many people believe that their horses receive strenuous exercise and therefore merit extra feed. A leisurely, afternoon, hour walk along the ditch banks is not rigorous exercise for a horse. By *definition*, a light workout for a horse lasts for about 1-3 hours where much of the time the horse is at least at a ***canter***. Few local horses receive strenuous exercise by this definition. Horses that are involved in team penning events are examples of horses with strenuous workouts.

If horses are maintained on pasture for part of the day, it is quite important not to overgraze the bermudagrass pasture. A well-irrigated and fertilized bermudagrass horse pasture should not be grazed to less than 3 inches in height. Yes, bermudagrass pastures may be abused and grazed to ground level without visibly damaging either the horse or the pasture. However, bermudagrass pasture grazed to ground level is not as nutritious as pasture with much more available forage (a taller forage plant). Secondly, an overgrazed pasture is much more likely to spread horse intestinal parasites. Most important of all, an overgrazed pasture is not productive. If horses are grazing the pasture to less than 3 inches height, they should be moved

to other pastures or stabled and fed hay for part of the day.

The greatest single problem with many pleasure horses is that they are simply too fat, too overfed. Of all domestic animals, horses are supposed to look like athletes, but all too often they appear more like couch-potatoes. Rather than looking like a sprinter, too many pleasure horses look like sumo wrestlers. A horse in moderate condition, not too thin and not too fat, has a flat back (no crease), ribs ***easily*** felt, knobs on the backbone between the withers are rounded but still discernable to the touch, and the neck and shoulders blend smoothly into the body. A fat horse has a definite crease (furrow) along the back (rump and loin), the ribs are difficult to feel because excess fat covers the ribs, a definite thickening of the neck, spongy fat on the withers, and so much fat along the inner thighs that the two hind legs rub together. There is nothing wrong with being able to see the ribs of a horse, you're supposed to.

An adult horse at maintenance needs only about 7.2% crude protein and about .82 Megacalories (Mcal) of digestible energy per lb of feed (100% dry matter, 1989 ***NRC Nutrient Requirements of Horses***). If a horse is permitted to eat all it wants, it may eat 2 to 2.5 lb of feed (100% dry matter) per 100 lb of body weight. If a horse consumes only alfalfa hay, with 20-22% crude protein, in unlimited quantities, then that horse will become obese. According to 1989 ***NRC Nutrient Requirements of Horses,*** fresh bermudagrass has 12% crude protein and Mcal/lb of digestible energy; bermudagrass hay cut at 28 days growth has 12% crude protein and .95 Mcal/lb digestible energy. Clearly, bermudagrass hay is adequate for horses at maintenance.



MELON DISEASES CAUSED BY VIRUSES

Thomas A. Turini, Eric T. Natwick, Keith S. Mayberry and Bob Gilbertson*

There are several melon viruses that may be of concern in the low desert. Aphid-transmitted viruses such as watermelon mosaic virus (WMVII), zucchini yellows mosaic virus (ZYMV) become widespread in spring melons some years. Cucurbit leaf crumple virus (CuLCrV), a recently reported whitefly-transmitted virus, was widespread in cantaloupe and squash fields in the low desert production areas of California during the past 3 fall seasons.

ZYMV is a potyvirus capable of causing substantial economic damage. Foliar symptoms of this virus include mosaic patterns, 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 known to be present in Imperial County. Of possible hosts of ZYMV, only cucurbits species are common in Imperial County.

WMV II is another aphid-transmitted potyvirus, which causes a green mosaic symptom, foliar distortions and blistering on the leaves. Although symptoms can vary widely depending upon environmental conditions, the cultivar of the host and the viral strain. This virus can cause damage when it infects at early stages of plant development. WMVII can be transmitted by at least 35 aphid species and the host range includes many wild and cultivated plants, which includes many cucurbit species, cotton and cheeseweed.

Elimination of sources of virus and aphids is the mosaic virus management technique available. Once the crop has the virus there is little that can be done, but with careful management, the incidence of aphid-transmitted viruses can be limited on the next years spring melon crop.

CuLCrV, a recently described whitefly-transmitted geminivirus causes leaves to crumple and a cup toward the petiole. Irregular yellow areas may also be present. Often, a runner can be found with symptomless older leaves, stunted and crumpled leaves on the middle portion of the runner and young leaves with no symptoms. This virus was widespread in fall cantaloupe fields in 2002. It has also been detected in

watermelon and most squash, but does not appear to cause disease in honeydew melons. In squash, squash leaf curl virus (SLCV), another whitefly-transmitted geminivirus, has also been found in Imperial Valley. On squash, SLCV causes foliar and fruit distortions and has been found in mixed infections with CuLCrV.

*Associate Professor, Agricultural & Environmental Sciences, Davis Campus

BROAD MITE

Eric T. Natwick

The broad mite *Polyphagotarsonemus latus* (Banks) is an almost microscopic arthropod pest. They are found in groups hidden around the mid-vein on the undersides of the leaves and are crab-like in appearance. They are so small that they may be hard to see even with a good 10X hand lens.

ADULTS
Adults are elliptically shaped, tapering slightly toward the rear end. Female broad mites are about 1.5 mm long and males are smaller, about 1.1 mm long, more broad, and faster moving than the female. The hind legs of the adult male are greatly enlarged for lifting and placing a female pupa on his back. Adults are light translucent yellowish green with a pale white stripe runs longitudinally down the back of the female. Females are highly fecund, on average laying about 5 eggs per day. The generation time is 4 to 10 days, depending on temperature, with 20-30 generations per year. Broad mite can quickly over-exploit its environment, leading to plant death.

EGGS
Broad mite eggs are small, approximately 0.7 mm long, but can be seen with a 14X hand lens. Eggs are clear, oval in shape, and marked with rows of white tubercles that appear gem-like under proper lighting. They are usually laid singly on the undersides of new growth leaves, but on fruit they are laid on a protected surface or in depressions of the fruit. Eggs hatch in 2 to 3 days during warm weather.

LARVAE
The pear-shaped larvae are very small, have three pairs of legs and just after hatching they are translucent, but become yellowish green to yellowish brown upon feeding. Larvae feed for 1 to 3 days before entering the pupal or resting stage.

PUPAE
The mite does not feed during the pupal stage. This stage lasts 2 to 3 days. Adult males will pickup female pupae with their enlarged hind legs. Female pupae are held securely on the backs of adult males and moved to new leaves or fruit. Males mate with the newly emerging females they have transported

HOSTS AND DAMAGE
Broad mites attacks many fruit and vegetable crops including beans, cucumber, eggplant, pepper, potato, pumpkin, and tomato. Mouthparts are piercing and sucking and mites tend to crowd into crevices and buds and feed on the growing tips. They have toxic saliva that causes twisted, hardened and distorted growth in the terminal of the plant. Leaves may, become brittle and may turn rust colored, coppery, or purplish. Flowers may become distorted and fail to open normally; heavy feeding can cause flower abortion. Young leaves are cupped downward and narrower than normal. This new growth may be stunted as internodes shorten. Lateral buds may be killed, break more than normal, which forces out additional shoots. Heavy feeding can cause russeting of fruit. Uncontrolled, broad mites will destroy the commercial value of infested crops. Due to toxins injected during feeding, the effects of their feeding may persist long after the mites have been eradicated.

Broad mites are a particular problem on greenhouse grown nursery crops during the winter months. The mites are found on the undersides of leaves and in cupped young foliage and flower buds. Affected leaves turn bronze in color, and appear cupped or otherwise deformed as they emerge. Occasionally, the growing point of the plant is killed. Feeding causes deformed buds and newly expanded leaves on host plants.

An unusual behavior of broad mites is that they will hitch a ride on the legs of other insects such as whiteflies.

CONTROL
Chemical control of broad mite is not difficult. AgriMek, Dicofol, or sulfur gives good broad mite control. It should be noted that none of these materials kills eggs or seems to have enough residual to kill all hatching larvae. Foliar spray applications of sulfur are more efficacious than dust applications. To achieve control it is necessary to make two applications about 5 days apart to allow time for eggs to hatch and target emerging larvae.

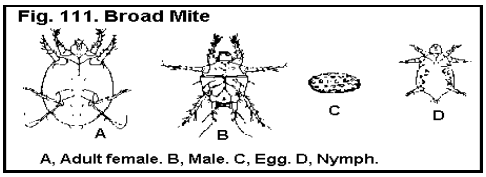


Fig. 111. Broad Mite
A, Adult female. B, Male. C, Egg. D, Nymph.

CONSIDERATIONS FOR CROP ROTATION CHOICES

Keith S. Mayberry and Thomas A. Turini

Most crops grown in the Imperial Valley are annuals. An annual crop is planted and harvested within a year. Crops such as lettuce and broccoli take 3-4 months from start to finish. Alfalfa can be grown for up to five years. Asparagus can be grown 8-10 years. This information is important when selecting a crop rotation.

If one plants a vegetable such as lettuce, then a second crop such as wheat or sudangrass is often selected as a rotation crop. The field may then be planted once again to lettuce, then to the same crop sequence over and over again. When should one stop planting lettuce in the field?

The answer is perhaps it will never be necessary to abandon lettuce as a rotation crop on a specific field *provided that* one does not encounter soil borne disease problems that attack lettuce. The same is true for many other crops. The need to rotate away from specific crops for an extended period of time is frequently due to the occurrence of disease and/or nematode problems. Some soil borne diseases can be extremely long lived. In addition, some soils are very suitable as a nematode habitat.

Foliar diseases often enter the field on wind currents or are carried by insects. Their presence is usually attributable to favorable weather conditions and nearby cropping patterns. Foliar diseases may or may not repeat in the same area year after year.

The presence of foliar diseases is not usually a criterion on which to base crop rotation, but there are exceptions. One exception is downy mildew of onions. The fungus that causes this disease, *Peronospora destructor*, produces resting structures (oospores) that survive in the soil for many years. When conditions are favorable, these resting structures produce airborne spores that can infect onions or garlic. In a field that had severe downy mildew on onions, a 3 to 5 year rotations to anything but a relative of onions can help reduce likelihood of having an outbreak in that field.

Some crops that are hosts for soil borne diseases show few or no symptoms. However, the disease may be a major problem for a susceptible crop. A prime example is pink root of onion caused by *Phoma terrestris*, which can live on wheat without causing damage, but can destroy a pink root susceptible onion variety. A crop rotation that does not include wheat or other asymptomatic hosts is needed to manage pink root of onions.

There are crops with in the same family that differ in degree of susceptibility to a particular disease. Vine decline in melons is caused by *Monosporascus cannonballus.* If an infested field is planted in squash, the damage that it causes to that crop will probably be minimal. However, if one were to plant cantaloupes in the same field this disease could cause devastating losses. A crop rotation including squash should be avoided if vine decline is known to occur in the field.

Often crops are grown on a soil type that is not suitable. When planning a crop rotation, be sure the soil type is adapted to your rotation plan. For example, one should not use carrots in a rotation on silty clay soils. However, cauliflower or broccoli can grow well on soils of this texture.

Some areas of Imperial Valley are warmer than others. When planning a crop rotation, take into consideration the cold tolerance of the crop as well as need for early or later production. While some crops can grow in cooler locations, the cold can cause cosmetic damage that affects marketability of the crop. For example, freeze injury causes browning and blistering of lettuce,

tip damage on asparagus, and splitting of celery stalks.

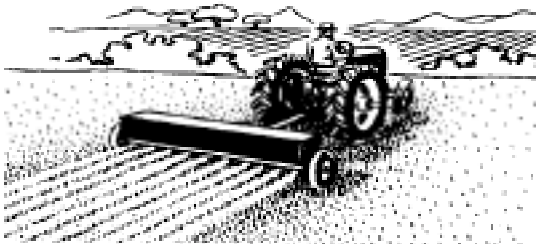
Sandy areas, especially near the edges of the Valley adjacent to the desert, are prone to have wind damage injury to crops. For example, fine sand or silt can be blown into lettuce heads as they start to wrap. These areas are also prone to wind whip damage that causes girdling of the stems of young plants. Sand blast may cause cosmetic damage on crops such as cabbage and watermelons.

Multi-textured fields may be a problem for some rotation crops. For example, a field may be grown to melons and cereals for years with no evident problem due to soil texture. However, when planted to carrots the multi-texture changes from sandy to clayey areas can result in a problem. The clayey areas may develop cavity spot disease, caused by *Pythium violae*, which is favored by water-logged soil conditions.

Toxic breakdown products from crops such as sudangrass, corn, and grain sorghum are known to cause damage to some vegetable rotation crops. Substantial damage can occur when susceptible crops such as lettuce, carrots and onions are planted in soil with sudangrass, corn, and grain sorghum crop residues.

There are other factors that need to be considered in choosing rotations including crop salinity, compacted soil, weeds, birds, mice, and insects.

Prepare a rotation plan and consult with your pest control advisor before you finalize your decision. Careful planning can save money.



COTTON PLANTING TIPS AND VARIETIES

Herman Meister

It is crucial to stick to basics if you want to achieve a strong and vigorous stand of cotton. These include monitoring soil temperatures before planting and keeping a watchful eye on the weather forecast. Ideally, soil temperatures at seeding depth should be no less than 65^{o} F at 8 am three consecutive days prior to planting. A favorable five-day forecast for the intended planting timeframe is also recommended to avoid seedling disease and stand problems. We can often get by with soil temperatures of about 60^{o} F at seeding depth. However, if the temperature drops lower than this point, germination, emergence, and vigor will begin to suffer substantially.

Some producers choose to get a very early start and will begin planting soil temperatures as low as 55º F. When planting into this condition, farmers should (1) recognize the marginal nature of the situation, (2) choose a very vigorous variety, (3) consider increasing the seeding rate, (4) and carefully monitor germination and emergence. The incidence of seedling diseases will increase if soil temperature conditions are less than ideal, and the probabilities of achieving a good stand will decline. Seedling diseases and less than optimum stands often translate into growth and development problems later in the season.

Information on upland cotton variety test for 2002 from California and Arizona is included for your convenience. Additional information can be located at the Arizona Crop Information site, http://ag.arizona.edu/crops/ and the UCCE Cotton Production Information site, http://cottoninfo.ucdavis.edu/.

Table 3. **CALIFORNIA UPLANDS ADVANCED STRAINS (Farm Advisors & Specialists Trials) – 2002**. Lint yields (in lbs/acre and as % of Approved Acala variety "Phytogen-72") by test location and average gin turnout for each variety in *2002 California Upland Advanced Strains Variety Trial* (2 locations with 1 Acala variety (Phytogen-72) and 19 California Upland varieties). *(UCCE Cooperators: R. Hutmacher, B. Marsh, M. Keeley, R. Delgado , S. Ball, J. Bergman, S. Perkins in fields at the UC Shafter Research & Ext. Centers and Borba Farms; Borba Farms Cooperators: M. Borba, B. Prys).*

Seed Company **	Variety Name or Number	40" rows Shafter REC Lint Yields		40" rows Fresno County (Five Points area) Lint Yields		Average Lint Yields Across 2 Locations		Average Gin Turnout Across Two Locations
		(lbs lint per acre)	(as % of Phy-72 Yield)	(lbs lint per acre)	(as % of Phy-72 Yield)	(lbs lint per acre)	(as % of Phy-72 Yield)	(%)
Phytogen	**Phy-72 (Acala for comparison**	2288	100	2119	100	**2204**	**100**	**33.4**
Olvey & Assoc.	**OA-85**	2140	93.6	1967	92.8	**2054**	**93.2**	**35.7**
Olvey & Assoc.	**OA-87**	2178	95.2	2040	96.3	**2109**	**95.7**	**34.1**
Olvey & Assoc.	**OA-90**	1945	85.0	2138	100.9	**2042**	**92.6**	**36.5**
Olvey & Assoc.	**OA-91**	2074	90.6	1726	81.5	**1900**	**86.2**	**32.5**
Phytogen	**PSC-355**	1924	84.1	1740	82.1	**1832**	**83.1**	**31.2**
Phytogen	**PSC-355-112**	1899	83.0	1820	85.9	**1860**	**84.4**	**30.2**
Phytogen	**PSC-2983**	2162	94.5	1899	89.6	**2031**	**92.2**	**34.5**
Delta & Pine Land Co.	**DP-555 BR**	2184	95.5	1824	86.1	**2004**	**90.9**	**36.0**
Delta & Pine Land Co.	**DP-565**	2222	97.1	1915	90.4	**2069**	**93.9**	**33.0**
Delta & Pine Land Co.	**DP-5415-RR**	2106	92.0	1562	73.7	**1834**	**83.2**	**33.0**
Delta & Pine Land Co.	**DP-449 BR**	2130	93.1	1647	77.7	**1889**	**85.7**	**33.1**
CPCSD	**CS-1**	2096	91.6	1816	85.7	**1956**	**88.7**	**33.3**
CPCSD	**CS-2**	2100	91.8	2146	101.3	**2123**	**96.3**	**35.1**
CPCSD	**CS-3**	2102	91.9	1924	90.8	**2013**	**91.3**	**33.7**
CPCSD	**CS-4**	1947	85.1	1656	78.2	**1802**	**81.8**	**30.8**
Stoneville	**ST-457**	2105	92.0	1745	82.4	**1925**	**87.3**	**33.1**
Stoneville	**ST-4793 R**	2025	88.5	1752	82.7	**1889**	**85.7**	**33.6**
Stoneville	**STX-0003**	1881	82.2	1707	80.6	**1794**	**81.4**	**34.0**
Stoneville	**STC-9905**	2015	88.1	1755	82.8	**1885**	**85.5**	**32.4**
Average		**2076**		**1845**		**1961**		**33.4**
LSD 0.05		183		240		160		0.8
C.V. (%)		6.2		9.2		8.2		2.5

VARIETY by LOCATION interaction (for yields): (LSD 0.05 = 200; C.V. (%) = 7.2; P = 0.001

Table 4. .. Lint yields (in lbs/acre) by test location and average gin turnout. Average lint yields across all sites are expressed both as pounds of cotton per ace and as percent of yield average for variety "S-7" (the SJV Cotton Board Approved Pima "standard"). Data from Fresno County and Merced County sites are not included in 2002 averages for yield or gin turnouts due to plant population (Merced Co.) and soil salinity issues (Fresno Co.). Statistics shown are as described in table footnote. Average yields across locations shown in bold italics and underlined are from San Joaquin Valley Cotton Board tests (Shane Ball, coordinator). *UCCE Cooperators: Hutmacher, Vargas, Roberts, Wright, Munk, Marsh, Weir, Keeley, Delgado in grower/cooperator fields; Shane Ball and staff in SJVCB tests; staff at the West Side and Shafter Research & Extension Centers).*

Seed Company	**Variety**	**Location of Trial – 2002 Lint Yield (lbs lint per acre)**				**Average Across 4 Sites**		**Average Yield by Year of Trial (as a % of S-7 variety yields) – all locations**					Fresno Co. Trial site 30" rows		Merced Co. Trial site 30" rows	
		Shafter REC 40" rows	West Side REC 40" rows	Kern Co. Co. 38" rows	Kings Co. 30" rows	**Lint Yield (lbs/ Acre**	**Gin Turn-Out (%)**	2002	2001	2000	1999	1998	Lint Yield (lbs/ Acre)	Gin Turn-Out (%)	Lint Yield (lbs/ Acre)	Gin Turn-Out (%)
Public variety	**S-7**	1226	1868	882	1882	**1465**	**32.2**	100	100	100	100	100	340	30.1	1093	31.6
Phytogen	**PSC-57**	1248	2043	1296	1963	**1638**	**31.6**	112	91	100	97	96	620	30.9	645	30.0
Phytogen	**Phy-76**	1451	2104	1425	2080	**1765**	**31.8**	121	102	***98***	***99***	***97***	773	31.7	623	29.3
Delta & Pine	**DP-HTO**	1144	1872	963	1873	**1463**	**35.3**	100	96	104	95	102	577	33.5	960	32.6
Delta & Pine	**DP-340**	1289	2069	1317	2032	**1677**	**33.2**	114	106	***104***	***111***	***107***	706	32.1	925	29.8
Delta & Pine	**DP-744**	1370	2115	1188	2098	**1693**	**33.6**	116	104	110	92	***110***	629	31.8	859	30.6
Mean		1288	2012	1179	1988	1617	**32.9**						608	31.7	851	30.7
LSD 0.05 LSD 0.10		169	81	117	168	64	0.5						130	1.7	271	1.5
C.V. (%)		10.6	2.7	6.6	4.7	5.2	2.1						14.2	3.6	21.1	3.1
P		0.074	0.000	0.000	0.050	0.000	0.000						0.000	0.02	0.014	0.002

C.V. = coefficient of variation; P = probability at 5% level of significance; LSD = least significant difference (if means differ by this amount or more, they are significantly different.) VARIETY BY LOCATION interaction (for yields): LSD 0.05 = 133; C.V. = 5.8%; P = 0.006 VARIETY BY LOCATION interaction (for gin turnout): LSD 0.05 = NS; C.V. = 1.9%; P = 0.165

UNIVERSTIY OF ARIZONA
COOPERATIVE EXTENSION

2002 Upland Cotton Variety Trial Results

Somerton, AZ

Planting Date: 5 April **Final Irrigation Date** 16 August **Harvest Date** 7 September
Total Number of Irrigations: 8 **Total N Applied** 153 lbs N/acre **General Soil Texture** Sandy loam

Cooperator:				Fiber Quality						
Company	Variety	Lint Yield (lbs/Acre)	Percent Lint	Micronaire	Fiber Length (100ths)	Staple Length (32nds)	Fiber Strength (g/tex)	Uniformity Index	Premium/ Discount[5] (points)	Value[6] ($/acre)
Stoneville	ST4892BR	1495.2 a[1]	35.3 bcd	5.4 a	1.12 cde	36.3 cde	29.8 de	83.0 ab	-171	752
Deltapine	DP555BR	1305.0 ab	39.2 a	5.0 bcd	1.13 cde	36.5 cde	30.1 de	81.3 d	144	698
Deltapine	SG215BR	1266.3 abc	35.7 bc	5.2 abc	1.07 f	34.0 f	26.1 g	83.0 ab	-263	626
Stoneville	ST4793R	1212.7 bcd	33.6 bcdef	5.2 abc	1.11 ef	35.5 e	28.8 ef	82.0 bcd	-119	615
Buttonwillow	BR303	1207.3 bcd	32.8 cdef	4.8 e	1.23 a	39.5 a	32.7 bc	83.0 ab	230	604
Deltapine	DP388	1182.6 bcd	34.9 bcd	4.9 cde	1.11 de	35.8 de	30.0 de	82.5 abc	273	647
Fiber Max	FM658	1176.2 bcd	36.0 b	4.8 de	1.15 bcd	36.8 cd	32.4 bc	82.3 bcd	420	661
Fiber Max	FM989BR	1117.3 bcd	34.3 bcde	5.1 bc	1.12 cde	36.0 cde	31.0 cd	81.7 cd	67	592
Buttonwillow	BR9801	1094.6 bcd	32.9 bcdef	5.2 ab	1.19 ab	38.0 b	33.0 b	83.7 a	-50	569
Deltapine	DP451BR	1062.1 bcd	32.4 def	5.2 abc	1.13 cde	36.5 cde	29.4 de	81.8 cd	-68	545
Deltapine	DP20B	1044.3 cd	31.7 ef	4.8 de	1.11 de	35.7 de	27.1 fg	81.3 cd	137	560
ACGA	AG3601	982.0 d	31.2 f	5.1 bc	1.16 bc	37.0 bc	35.0 a	82.3 bcd	59	516
$LSD_{0.05}$[2]		247	3.1	0.3	0.04	1.2	1.9	1.2	--	--
OSL[3]		0.0126	0.0007	0.0008	0.0001	0.0001	0.0001	0.0115	--	--
CV (%) [4]		13.5	5.9	3.2	2.3	2.1	3.9	1.0	--	--

[1]Means followed by the same letter are not significantly different according to a Fisher's LSD means separation test.
[2]LSD: Least Significant Difference.
[3]OSL: Observed Significance Level.
[4]CV: Coefficient of Variation.
[5]Average premium or discount applied to the lint based on CCC loan schedule.
[6]Value of lint per acre based on CCC loan schedule of discounts and premiums and assuming a base value of 52.00 cents per pound.

UNIVERSTIY OF ARIZONA
COOPERATIVE EXTENSION

2002 Upland Cotton Variety Trial Results

Wellton, AZ

Planting Date: 5 April **Final Irrigation Date** 3 August **Harvest Date** 13 September
Total Number of Irrigations: 7 **Total N Applied** 0 lbs N/acre **General Soil Texture** Silt loam

Cooperator:				Fiber Quality						
Company	Variety	Lint Yield (lbs/Acre)	Percent Lint	Micronaire	Fiber Length (100ths)	Staple Length (32nds)	Fiber Strength (g/tex)	Uniformity Index	Premium/ Discount[5] (points)	Value[6] ($/acre)
Stoneville	ST4892BR	1616.8 a[1]	34.7 ab	4.9 a	1.11 de	35.5 de	29.1 cd	81.3 bc	181	868
Deltapine	DP451BR	1554.6 a	32.1 cd	4.4 de	1.13 cd	36.5 c	27.8 d	80.8 cd	358	864
Buttonwillow	BR303	1528.2 a	30.8 de	4.4 cde	1.22 a	39.0 a	31.8 ab	81.8 abc	405	856
Deltapine	DP555BR	1523.3 a	35.6 a	4.2 e	1.12 cde	36.0 cd	29.7 c	79.7 e	370	808
Stoneville	ST4793R	1523.0 a	34.1 abc	5.0 a	1.10 ef	35.3 de	28.3 cd	82.3 ab	-44	787
Deltapine	SG215BR	1492.5 ab	34.7 ab	4.7 ab	1.08 f	34.7 e	25.3 e	81.3 bc	80	806
Deltapine	DP388	1366.3 bc	33.1 bc	4.2 e	1.12 cde	36.0 cd	29.5 c	80.8 cd	274	748
Buttonwillow	BR9801	1333.6 c	32.0 cd	4.7 abc	1.17 b	37.8 b	31.7 ab	82.5 a	409	747
Fiber Max	FM958	1306.3 c	34.2 abc	4.4 de	1.12 de	36.0 cd	29.8 c	80.0 d	363	726
Fiber Max	FM989BR	1083.2 d	32.4 cd	4.3 e	1.12 cde	36.0 cd	31.3 b	81.5 abc	393	605
ACGA	AG3601	1064.2 d	28.8 e	4.6 bcd	1.14 c	36.7 c	33.1 a	81.0 cd	415	597
$LSD_{0.05}$[2]		337	2.2	0.3	0.03	1.0	1.5	1.0	--	--
OSL[3]		0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	--	--
CV (%) [4]		6.7	4.6	4.0	1.5	1.8	3.4	0.8	--	--

[1]Means followed by the same letter are not significantly different according to a Fisher's LSD means separation test.
[2]LSD: Least Significant Difference.
[3]OSL: Observed Significance level.
[4]CV: Coefficient of Variation.
[5]Average premium or discount applied to the lint based on CCC loan schedule.
[6]Value of lint per acre based on CCC loan schedule of discounts and premiums and assuming a base value of 52.00 cents per pound.

UNIVERSTIY OF ARIZONA
COOPERATIVE EXTENSION

2002 Upland Cotton Variety Trial Results

Buckeye, AZ

Planting Date: 1 April **Final Irrigation Date** 17 September **Harvest Date** 7 December
Total Number of Irrigations: 20 **Total N Applied** 10 tons manure/acre **General Soil Texture** Silt loam

Cooperator:				Fiber Quality						
Company	Variety	Lint Yield (lbs/Acre)	Percent Lint	Micronaire	Fiber Length (100ths)	Staple Length (32nds)	Fiber Strength (g/tex)	Uniformity Index	Premium/ Discount[5] (points)	Value[6] ($/acre)
Deltapine	DP555BR	2282.2 a[1]	37.1 a	4.6	1.08 d	34.7 c	30.9 bcd	80.7 b	227	1239
Deltapine	DP565	2242.2 a	34.4 bcd	4.8	1.14 a	36.7 a	32.3 bc	81.3 b	160	1203
Deltapine	DP449BR	2211.7 ab	36.3 ab	4.9	1.09 cd	35.0 bc	31.4 bcd	81.7 ab	173	1184
Stoneville	BXN49B	2083.7 bc	35.2 abcd	4.7	1.11 bcd	35.3 bc	29.7 d	81.7 ab	68	1097
ACGA	AG3601	2026.8 c	31.9 e	4.8	1.14 ab	36.7 a	37.2 a	81.7 ab	147	1083
Stoneville	ST4892BR	2021.9 c	35.5 abc	5.1	1.10 cd	35.3 bc	32.6 b	82.7 a	-543	941
Delatpine	DP33B	2001.0 cd	33.6 cde	4.8	1.10 cd	35.3 bc	31.3 bcd	81.0 b	125	1066
Deltapine	DP448B	1862.9 de	32.9 de	4.7	1.12 abc	36.0 ab	30.6 cd	81.7 ab	190	1005
Fiber Max	FM989BR	1766.7 e	34.7 bcd	4.8	1.09 cd	34.7 c	32.6 b	81.0 b	305	973
Fiber Max	FM966	1603.0 f	34.6 bcd	4.6	1.12 abc	36.0 ab	38.1 a	82.7 a	402	898
$LSD_{0.05}$[2]		147.4	2.3	NS	0.03	1.2	1.9	1.2	--	--
OSL[3]		0.0001	0.0065	0.0656	0.0072	0.0127	0.0001	0.0339	--	--
CV (%) [4]		4.3	3.9	3.5	1.7	1.9	3.4	0.9	--	--

[1]Means followed by the same letter are not significantly different according to a Fisher's LSD means separation test.
[2]LSD: Least Significant Difference.
[3]OSL: Observed Significance level.
[4]CV: Coefficient of Variation.
[5]Average premium or discount applied to the lint based on CCC loan schedule.
[6]Value of lint per acre based on CCC loan schedule of discounts and premiums and assuming a base value of 52.00 cents per pound.

UNIVERSTIY OF ARIZONA
COOPERATIVE EXTENSION

2002 Upland Cotton Variety Trial Results

Marana, AZ

Planting Date: 12 April **Final Irrigation Date** 22 August **Harvest Date** 16 October
Total Number of Irrigations: 7 **Total N Applied** 87 bs N/acre **General Soil Texture** Clay loam

Cooperator:				Fiber Quality						
Company	Variety	Lint Yield (lbs/Acre)	Percent Lint	Micronaire	Fiber Length (100ths)	Staple Length (32nds)	Fiber Strength (g/tex)	Uniformity Index	Premium/ Discount[5] (points)	Value[6] ($/acre)
Stoneville	ST4892BR	1549.0 a[1]	37.8	4.9 a	1.09 d	35.0 d	26.6 e	82.0 ab	64	814
Stoneville	ST4793R	1474.2 ab	37.4	4.9 a	1.09 d	35.0 d	26.5 e	82.5 a	253	804
Deltapine	DP449BR	1461.8 ab	36.3	4.6 bc	1.13 bc	36.5 bc	29.4 c	82.3 ab	361	813
Deltapine	DP555BR	1460.3 ab	40.0	4.4 c	1.12 cd	36.0 c	27.6 de	79.5 d	305	804
Deltapine	DP565	1459.5 ab	36.5	4.5 bc	1.18 a	37.8 a	28.7 cd	82.0 ab	345	809
Deltapine	DP448B	1395.3 b	35.4	4.4 c	1.13 c	36.5 bc	27.2 e	81.3 bc	331	772
Fiber Max	FM958	1249.1 c	37.5	4.6 b	1.15 bc	37.0 ab	30.0 b	80.8 c	365	695
Fiber Max	FM966	1218.7 c	36.9	4.5 bc	1.15 bc	36.8 bc	33.4 a	82.3 ab	376	679
ACGA	AG3601	1213.5 c	34.1	4.4 bc	1.16 ab	37.0 ab	31.3 b	81.5 abc	374	676
$LSD_{0.05}$[2]		106.7	--	0.2	0.03	1.0	1.4	1.0	--	--
OSL[3]		0.0001	--	0.0001	0.0001	0.0001	0.0001	0.0001	--	--
CV (%) [4]		5.3	--	2.7	1.7	1.9	3.3	0.9	--	--

[1]Means followed by the same letter are not significantly different according to a Fisher's LSD means separation test.
[2]LSD: Least Significant Difference.
[3]OSL: Observed Significance level.
[4]CV: Coefficient of Variation.
[5]Average premium or discount applied to the lint based on CCC loan schedule.
[6]Value of lint per acre based on CCC loan schedule of discounts and premiums and assuming a base value of 52.00 cents per pound.

CALIFORNIA HAY STOCKS HIGHER ON DECEMBER 1, 2002

Herman Meister

All hay stocks on hand on December 1, 2002 in California totaled 2,235,000 tons, up 14 percent from December 1, 2001. The ten-year average of December 1 hay stocks is 2,295,000 tons and the five year average is 2,335,000 tons. While an additional 274,000 tons of hay on hand this year over last year would appear to be bearish to the early 2003 hay market, it all comes down to utilization. How much hay will be utilized from December 1, 2002 to May 1, 2003? Year to year hay utilization in California has grown by 4 percent each of the past two years. Hay utilization the past five years is outpacing the ten-year average by about five percent. This increased usage is being driven by a growing number of dairy cows and heifers. Sources indicate that more of the hay inventory on December 1, 2002 was in dairy producer's hands and less in dealer and grower hands compared to last year.

With low milk prices in 2002 and dairy cow slaughter up 11 percent from 2001, it appeared that the growth in dairy cow numbers in California would begin to stall in 2002. This has not happened. Dairy cow numbers in California in 2002 continued to grow about 5,000 cows per month. While the number of milk replacement heifers shipped into California in 2002 from out-of-state declined slightly from the previous year (the first year to year decline since 1996), milk replacement heifer numbers in the State continued to grow. These additional cattle could boost hay utilization again in 2003.

While the May 1, 2002 hay stocks of 232,000 tons were up 29 percent from the low stocks of 180,000 tons on May 1, 2001, they were still below the five-year average of 314,000 tons and the ten-year average of 334,000 tons. With the significant growth in dairy cattle numbers in California in recent years, higher stocks on hand number (unless it is a substantial increase) may not be as bearish to the alfalfa hay market as 15 to 20 years ago. Having said that, we are in a period of extended low milk prices and the possibility exists that this could be the longest depressed market on milk in history. Some industry and government experts are forecasting lower milk prices for at least the first half of 2003. Will this alter the dairy producer's feed purchasing and usage patterns as they try to reduce feed costs?

Even during periods of low milk prices, higher testing alfalfa hay will normally be in higher demand than lower quality alfalfa. With so many by-product feeds and other types of hay and forages in California, dairy producers can substitute feed for dry cows easier than they can for milk cows. One way that dairy producers can partially offset the lower milk prices is to produce more milk. Higher quality alfalfa hay is a key ingredient to higher milk production.

When looking at the spring 2003 alfalfa hay market in California the two key elements are how much milk cow quality alfalfa hay do dairy producers have on hand and how high will the TDN tests be on early cuttings? With the growth of dairy cow numbers in central California, there has been good demand for several years for early cuttings of milk cow hay in the southern desert selling to San Joaquin Valley dairies. Contracting of new crop alfalfa hay in the southern desert had begun by mid-December in most years. In mid December 2001, contracting of first thru third cutting 2002 season new crop alfalfa hay ranged from $115 to $128 per ton, fob, to move and to store. This year, according to Market News, there were only a few contracts in the southern desert written in early January for first and second cutting 2003 alfalfa hay that brought $105 to $115 per ton, to move and store. A few contracts in mid January on new crop hay to store brought $118 to $123 per ton. As of mid January 2003, the number of contracts and volume of alfalfa hay purchased this year in the southern desert was below past years. Dairy hay buyers are proceeding very cautiously.

People ask me how many acres of alfalfa hay will we have in California in 2003. Because I'm the one that estimates the official USDA hay acreage for California it is a conflict for me to give my personal opinion. But sources in the industry think that alfalfa hay acreage will be down in 2003. The reasons they give are 1.) More acres planted to cotton in the Central Valley in 2003 because of the Cotton Loan Program in the U.S. Farm Bill and 2.) Alternative crops to plant that have profit potential. The second reason was reflected in the mid-January report on acres in the Imperial Valley from the Imperial Valley Irrigation District (IID). According to IID, there were 163,376 acres of alfalfa hay in the Imperial

Valley on January 13, 2003, 10 percent less or 18,290 fewer acres than the same time last year. Wheat acreage in the Imperial Valley was 42,956 acres, up 53 percent or 14,829 more acres than last year. I believe much of this increase in wheat was due to strong contract prices this past October.

When I was in the Imperial Valley in October, an alfalfa hay grower said he was reducing alfalfa hay acres in 2003 and planting other crops, including vegetables. He indicated that alfalfa was an expensive crop to grow compared to other crops. He said for the first time in a few years there were other crops with profit potential. I'm not sure if the water uncertainties in the Imperial Valley had anything to do with the fewer alfalfa hay acres in mid January 2003.

Our first indication of hay and other crop acres in California will be in the Planting Intentions report issued by USDA in late March. At that time I should have some feedback from seed company representatives and their take on hay acres in California. As I said in a talk a couple of years ago, current year hay acres and production may have more of an impact on the hay market than carryover from the previous year. There are years, such as in 1999 when carryover does heavily impact the market. The tremendous amount of El Nino rain damaged hay from 1998 caused a very bearish dry cow hay market in 1999. Our first barometer of the early 2003 alfalfa hay market will be in the Imperial Valley in the coming weeks.

**Article by Seth Hoyt, California Agricultural Statistics Service-Reprinted with permission from California Alfalfa and Forage Association Newsletter.

AGRO BAJA 2003

Juan N. Guerrero

What: AgroBaja is the only agricultural exposition that takes place on the border. AgroBaja will have over 310 exhibitors that will show their products, services, implements, and state of the art concepts.

When: MARCH 27-29, 2003

Where: Mexicali, Baja California, Mexico

Contact **Ms. Ana I. Hermosillo**
(619) 384-5463 **(US)**
011 52 686 5921186 **(Mexico)**
ahermosillo@agrobaja.com.mx **email**

http://www.agrobaja.com.mx

AgroBaja 2003
MEXICALI, MEXICO
Farmers' Show in Baja California

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 March 1 to May 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	March		April		May	
	1-15	16-31	1-15	15-30	1-15	16-31
Calipatria	0.18	0.22	0.26	0.29	0.32	0.36
El Centro (Seeley)	0.16	0.20	0.24	0.28	0.31	0.34
Holtville (Meloland)	0.17	0.21	0.25	0.28	0.32	0.35

*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