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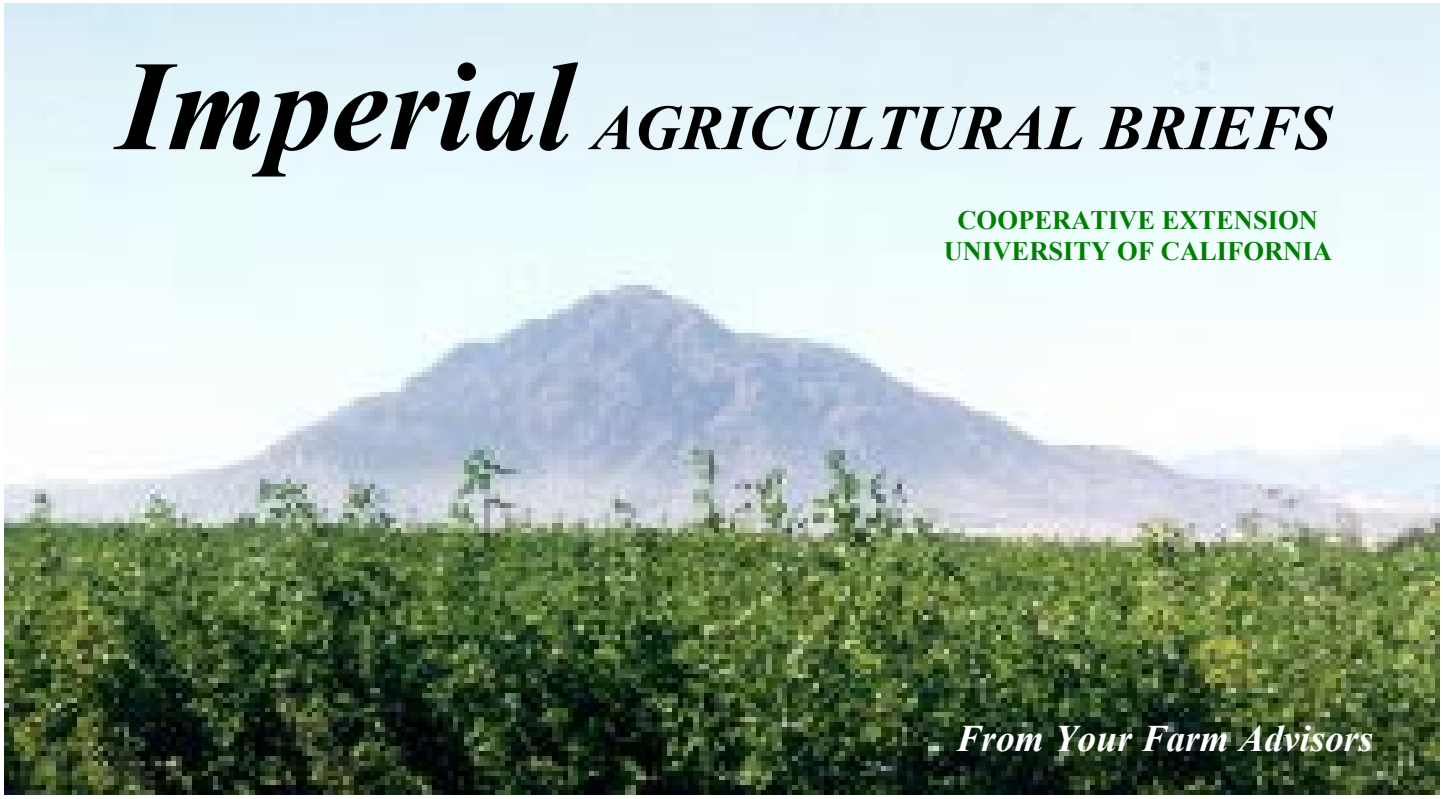

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APHID MANAGEMENT IN LOW DESERTS WHEAT

Eric T. Natwick

Low desert wheat growers occasionally need to treat with insecticides to control aphids. However, insecticide treatments at low aphid population densities or prophylactic insecticide treatments are usually not economically justifiable and can lead to problems with aphid resurgence later in the season, requiring further insecticide treatments. The low desert wheat normally has an abundance of aphid natural enemies, both predators and parasites. Poorly timed insecticide applications can destroy these natural enemies. When more winged aphids enter the wheat field or if some aphids survive the insecticide treatment, they are free of the natural control by lady beetles, syrphid fly larvae, lacewing larvae and several species of aphid parasitoids.

Greenbug is the most damaging aphid of wheat in the low desert. However, most wheat fields do not develop greenbug infestations that are economically damaging. Greenbug is capable of killing seedling wheat plants before tillering is complete. Greenbug infestations usually start near a field border and advance into the field in large irregular areas with plants developing a rusty-red discoloration on the leaves and plants less than 9 inches tall may die.

Several biotypes of greenbug are resistant to insecticides across the United States. Fortunately, the green bugs in southern California are fairly easy to control, most likely due to the infrequent need to treat with insecticides.

Adult greenbugs are approximately 1/16 inch long, light green with a dark green stripe down the back. Their legs and cornicles are green with black tips. There are both winged and wingless forms of adult. Unfortunately, the description above also describes the rose grass aphid. Rose grass aphid is much less damaging than greenbug and rarely requires treatment. The length of the antennae, color and size of the adults distinguish greenbug from rose grass aphid. Adult greenbugs are smaller than the rose grass aphid adults, greenbug antennae not extend beyond the base of the cornicles, and their antennae are dark colored for most of their length. Antennae of adult rose grass aphid frequently extend beyond the base of the cornicles and usually only the joints of the antennae are dark colored. Rose grass aphids are light green and some individuals have a dark stripe down the back, similar but less prominent than the stripe on greenbugs.

Feeding damage from greenbug also distinguishes it from other grain aphids. Greenbug salivary fluids injected into the leaf blade during feeding are phytotoxic, causing the local tissues around the aphid to first turn yellow and then a rusty orange color. As the tissue dies from the toxin, the aphids continually move to new feeding sites. Greenbug feeding frequently kills young plants. Check for greenbug often from seedling emergence until the plants height exceed 8 inches tall; greenbugs does not normally cause economic damage to wheat after plants are 8 inched tall. Insecticide treatments are justified when greenbug colonies are widespread and causing discoloration to young plants.

Russian wheat aphid is a very serious pest of wheat in the western United States. Fortunately, this aphid has only rarely reached economically damaging levels requiring insecticide treatments to wheat in the low deserts of southern California since it was first found here in 1988.

Russian wheat aphid is a small insect less than two millimeters long, greenish in color, with an elongated spindle shaped body. This aphid may be confused with greenbug or rose grass aphid, but can be easily distinguished from other aphids by several characteristics. The Russian wheat aphid has very short antennae, a pseudo-caudal process that projects above the cauda giving a two-tailed appearance, and appears to lack cornicles. Similar to greenbugs, Russian wheat aphids also have toxic salivary fluids. The toxins of Russian wheat aphid cause leaf blades to roll into a soda straw shape and cause longitudinal white streaks. Heavily infested plants may appear flattened or wilted. Russian wheat aphids prefer to feed in the youngest growth, often within the tightly curled leaves. This behavior helps to protect them from aphid predators and parasites and from non-systemic foliar insecticide treatments.

Other aphids that may be found on low desert wheat include: bird-cherry oat aphid, English grain aphid and corn leaf aphid. Wingless bird-cherry oat aphids are dark green with purplish mottling and black-tipped cornicles. The youngest nymphs are light green. A reddish patch is present on the abdomen at the base of the cornicles. The English grain aphid is large and light green or tan, with, long, black cornicles. Corn leaf aphids are bluish to grayish green, with short black cornicles that have dark patches at their base. When aphid populations (other

than greenbug or Russian wheat aphid) are above 50 to 60 per tiller on the average, economic loss to small grain crops may occur. When natural enemies hold the aphid populations below 50 per tiller, insecticide treatments are not needed.

IMPERIAL VALLEY COTTON VARIETY TRIAL

Herman Meister and Eric T. Natwick

Introduction

Imperial Valley's cotton acreage has dropped to new lows in recent years. Unfavorable markets compounded by increasing expenses such as fuel costs and workman's compensation insurance rates have reduced acreage dramatically. Cotton acreage in the last 30 years has ranged from a high of 140,000 acres in 1977 to a low of approximately 5200 acres this year. Nevertheless, cotton is a viable crop for the Valley and growers have the capability of rapidly increasing acreage providing markets show some upward movement.

Procedure

Arrangements were made with Bob Bedwell (grower and gin manager) and John Benson (operator) to plant a variety trial on Oleander 27, which is adjacent to Planter's Ginning Co east of Brawley, CA. Six varieties were planted with a John Deere planter on 30-inch row spacing: DP 555BR, DP 565, DP 448B, DP 449BR, DP 33B and SG 125. The six varieties were replicated 4 times in a block design. The trial was planted on March 10th and irrigated to a stand on March 12th. The field was pre-irrigated and the weeds were burned down with Roundup. Prowl and Roundup were applied pre-emergence for weed control.

Emergence was satisfactory, but cool spring weather hindered plant development, consequently an application of Kelthane was necessary to control mites on April 23rd. Observations indicated that the DP565 showed the strongest emergence followed by DP449BR and SG125. Bloom was initiated in all the varieties during the first week of June. Petiole nitrate nitrogen levels were adequate with levels in the 18,000-ppm range on May 28th. The level gradually declined to 5600 ppm on July 15th.

Results

Stand Count

A stand count early in the crop cycle was inadvertently omitted. Consequently, the stand count was made after the crop was picked. At this time I noted a situation that I would not have seen earlier. Approximately 10% of the plants were "crowded out" or dominated by stronger plants. They were present, but they did not contribute to the yield of the crop. The average plant population was 72,333 plants per acre with an average plant spacing of 2.9 inches. An analysis of variance indicated that there was no difference in plant populations between varieties.

Impact of Mepiquat Chloride (Pix Ultra)

Many researchers have been investigating how to "time" Pix applications for cotton growth suppression. This trial provided an opportunity to compare the "H:N ratio" method to the "maximum internode distance" (MID) technique on several different varieties. The results support previous observations where the MID method is more effective in detecting treatment levels and measuring the impact of the growth suppression during mid and late season the H:N method. The reason for this difference is that the H:N measures the impact of Pix on the entire plant whereas the MID considers the impact on the distance between the 4th and 5th internode only.

H:N Evaluations*

	June 10	June 23	July 1
DP 565	1.78	1.81	1.82
DP 555	1.55	1.65	1.64
DP 448B	1.48	1.64	1.46
DP 449BR	1.53	1.69	1.63
DP 33B	1.46	1.70	1.62
SG 125	1.67	1.81	1.84

*Pix applied on June 13th

Maximum Internode Distance Evaluations (cm)*

	June 10	June 23	July 1
DP 565	8.0	5.7	5.4
DP 555	7.4	5.5	4.0
DP 448B	7.1	6.1	4.4
DP 449BR	7.5	5.8	4.3
DP 33B	8.6	5.6	4.9
SG 125	7.9	7.2	5.1

Pix applied on June 15th

Silverleaf Whitefly (SWF) Observations

In early August, some varietal differences in response to SWF populations were visually evident. A SWF population assessment was performed to determine if there were vartietal differences in SWF attractiveness. The results indicated a significantly higher SWF nymph population on the SG 125 than the other Delta Pine varieties. There was no difference in SWF egg and adult populations on the different varieties.

Yields

The March 10th planting date would be considered "early" for our area. The grower intended to plant early and harvest early. The last irrigation was July 18th and Def was applied on August 8th. The field was picked on September 15th. It would have been picked earlier, but the commercial harvesting company delayed an earlier harvest. Even with an early harvest, five of the six varieties averaged close to 2.5 bales. DP555BR, a variety designed to grow on "tough" ground came up short with about a 2.0 bale average.

The exact yields were:

DP 565	2.53 B/A	A*	32% Turnout
DP 33B	2.49	AB	34%
DP 448B	2.40	BC	35%
SG 125	2.40	C	36%
DP 449BR	2.39	C	37%
DP 555	1.98	D	37%

*Duncan's Multiple Range @ 5%

DP 565 and DP 33B produced about 2.5 bales with no difference in production. The DP 448B, SG 125, and DP 449BR were not different from each other in the second group with about 2.4 bales per acre. DP 555BR was last in production with about a 2-bale average.

Summary

In this trial under a "short season" regime, the DP 565 performed the best with 2.53 bales per acre. Early season crop monitoring using the H:N is adequate up until bloom. Once fruiting begins, measuring the distance between the 4th and 5th internode (MID) may be a better choice to monitor plant growth for Pix decisions. In this trial under Imperial Valley conditions, 72,000 plants/acre may have been too high in light of the observations indicating that crowding apparent. Observations indicate that SG 125 is susceptible to SWF damage.

Note: SWF counts were provided with the help of Eric Natwick, Farm Advisor, Entomology, Imperial County.

KEY OBSERVATIONS ABOUT THE MOST SUCCESSFUL FARMS

Keith S. Mayberry

Over my career, there have been some farm enterprises that continue to grow and prosper. Others tend to fade away for a myriad of reasons. The long-lived successful farms seem to have some things in common. They pay attention to detail, they plant fields with top quality soil, they have good management teams, and they often have loyal employees that have been with the company for years. Most are not too large or too small for a good cohesive unit. They have good communication among the management.

Here are some comments regarding management in farming practices ---

It is better to farm 40 acres of good land than 80 acres of marginal land. Farming marginal land requires the same inputs of fertilizer, seed, water, etc. as productive land, but the yield and quality of the crop will often be significantly lower. This is especially true for salt sensitive crops such as lettuce, onions and carrots.

Selecting farmland with multiple textures can be a challenge. Many fields have two or more soil types within their boundaries. If the soil types present have similar characteristics, then the problems of fertilizing and irrigating will be minimal. If there is a major difference in soil type, it will be nearly impossible to perform or time cultural practices that benefit all soil types.

The best farming companies know that it is critical to establish a good working rapport with their consultants (PCA, fertilizer, seed representative). Mutual trust is imperative to long-term success.

Reward employees for performance, rather than on a calendar basis. The employee may be looking for the Christmas bonus next year even though he/she did not deserve it. Receiving none makes for disgruntled employees. Give employees performance rewards as soon as the outstanding job is accomplished. Then give a standard normal Christmas present to all employees of the same rank.

Kill the weeds BEFORE they go to seed. Viable weed seed can be formed in some species while the plant is still green. It is often said that killing weeds after they make seed is "revenge, not control". Also, weeds that line the irrigation ditch are capable of spreading seed over vast acreage.

Timing of power mulching is a critical factor. Avoid working the soil for bed preparation when it is dry. Power mulching when dry produces fine powdered soil and clods. Once this happens the beds are nearly impossible to precision plant seed as both depth and spacing are compromised.

Planting and harvesting are the two most critical stages of growing crops. If you have a failure of either, then the profit for the crop may be lost. Get the best people you can find to oversee these two field operations. Make sure they put in the hours to make sure these tasks are performed at peak efficiency.

Splitting a field and planting each side with a different variety or fertilizer practice does not make a valid test plot. It is an observation plot. The variability that occurs in nature make in necessary that each treatment be replicated at least 4 times (or more) in order to make accurate conclusions. Observation plots can be of value in pointing out major differences among treatments. A yield difference of less than 10% is not apparent visually.

The equipment used by the veteran farming companies is not always new. But the tractors, planters, discs, triplanes, etc. were very well maintained. A farming company using all brand new equipment is usually a sign of someone new in the business. They may not be around in a year or two.

ADDING WATER TO DRY HAY

Juan N. Guerrero

During the winter, often, fresh hay is not available. The only available hay may be hay stored roadside for 4 to 5 months, hay that during the winter is very dry and brittle. Livestock do not like to eat dry, brittle hay. Hay stored all summer or year old hay often is fed to livestock. This type of hay is extremely dry, often having 5% moisture or less. This kind of dry, brittle hay can cut the inside of a horse's or steer's mouth. Many persons feed this type of hay because it is inexpensive to purchase. Besides the fact that dry has is not only unpalatable, it is also less nutritious to feed.

Can this kind of hay be used at all? Yes, it can, with some care. Livestock prefer to eat soft, green hay. The preferred hay moisture range for livestock is 18 to 22%. Over 20% moisture, hay may mold and at 22% moisture, molding is very probable. At about 12% moisture, hay starts to be brittle. Hay stored roadside in May at 18% moisture, by October dries to about 5% or less. How do you make dry, brittle hay soft? The answer is, add water.

Water may be added in two ways. You may add the water directly to the bale, then let the bale equilibrate (let the moisture spread throughout the bale) for about 4 to 6 hours. This softened bale may then be broken and fed as "flakes" or ground (preferable). Water may be added to ground hay, mixed, equilibrated, and then fed. Once water has been added to hay, feed all the rewetted hay during the same day, ***do not store rewetted hay***.

Below is a table that you might use in adding water to dry hay. Do not rewet to more than 24% moisture. Less than 10% moisture is too dry. Again, the optimal moisture range for hay palatability is about 18-22%.

Table 1. Gallons of water to add to one ton of dry hay.

Actual Hay Moisture, %	Desired Hay Moisture Percentage 20	18	16	14	12	10
12	24	18	11	6		
11	27	20	14	8		
10	30	23	17	11	5	
9	33	26	20	14	8	
8	36	29	23	17	11	5
7	46	39	32	26	14	8
6	49	42	35	29	16	11
5	45	38	31	25	19	13
4	48	41	34	29	22	16

CANARYGRASS RESISTANCE REMINDER

Herman Meister

As wheat fields begin to emerge and thoughts turn to monitoring wheat fields for weeds and grass, keep in mind that there may be some wheat fields that canarygrass control could be marginal or poor with current herbicides.

Joseph M. DiTomaso and Guy B. Kyser, Weed Science Program, Department of Vegetable Crops, UCD, conducted test with littleseed canarygrass from the Imperial Valley last year to determine the degree of susceptibility to several commonly used post emergence herbicides. The results of the investigation indicated that littleseed canarygrass was becoming resistant to Poast, Prism, Puma, and Fusilade. All the herbicides have the same mode of action (lipid synthesis inhibitors).

Timing of the application and rates of herbicide recommended are critical to achieving adequate canarygrass control. Low herbicide rates and large canarygrass may result in poor control especially with a tolerant canarygrass population present.

Reports of problems or unsuccessful control will help establish the patters of resistance in reference to locations and may help in future strategies of resistance management.

VARIETAL SUSCEPTIBILITY TO VINE DECLINE HOLTVILLE, 2003

Thomas A. Turini

In spring 2003, the response of 30 cantaloupe and 10 honeydew varieties to *Monosporascus cannonballus* was compared at the Desert Research and Extension Center in Holtville, CA. Seeds were sown on 80-inch beds and the beds were irrigated with underground drip on 1 April. A list of the varieties appears in Table 1. The experimental design was a 4 replication randomized complete block. Each plot consisted of 30 ft of one bed.

On 16 June, early symptoms of Monosporascus vine decline were observed, which included triangular dead areas on the leaves extending from the petiole, wilting and brown lesions on roots. In addition, the fungal structures (perithecia) that are diagnostic for this fungus were found on the roots. With the naked eye, these structures are seen as small, black, round structures protruding from dead root tissue.

On 19 June, vine collapse of each melon variety was rated on a scale of 0 to 10 based on the percentage. A plot rated 0 would appear healthy with no collapsed vines and no foliar lesions. A plot in which vines are completely collapsed would receive a 10 rating.

Between 1 and 4 July, 3 root systems from each plot were carefully dug with shovels. These roots were rated for disease severity on a scale of 0 to 10. This scale was based on the percentage of the root system that was covered with brown lesions that characterize this disease.

The means are presented as percentages below.

Overall, honeydew melon types had lower levels of vine decline severity than cantaloupes as determined by orthogonal comparisons (P≤0.001). Esteem and Montagua had lowest vine decline severity, which was not different as determined by Least Significant Difference analysis (P ≤ 0.05) from Impac, XME 0069, Hymark and XME 0164.

Table 1. Vine decline and root lesions on cantaloupe varieties at Desert Research and Extension Center at Holtville, CA in 2003.

Cantaloupe variety	Vine collapse (%) 19 June		Root lesions (%) 1-4 July	
Esteem	3	g [z]	27	g
Montagua	3	g	37	fg
Impac	5	efg	47	cdefg
XME 0069	5	efg	58	abcdef
Hymark	8	fg	61	abcde
XME 0164	8	defg	51	cdef
Gold Express	13	bcdef	48	cdefg
Olympic Gold	13	cdefg	44	defg
Valley Pac	13	cdefg	42	efg
Mission	15	abcdef	65	abcde
HMX 0584	18	cdefg	61	abcde
HMX 8586	18	cdefg	70	abc
Oro Rico	18	bcdef	79	a
SME 0031	18	abcde	64	abcde
Zodiac	18	abcde	62	abcde
Western Express	18	abcdef	52	bcdef
Nito	20	abcdef	58	abcdef
Laredo	23	abcd	76	a
Sparkle	23	abcd	56	abcdef
Valley Gold	23	abcdef	50	cdefg
Cruiser	20	abcd	63	abcde
Don Carlos	25	abc	55	abcdef
Ocotillo	28	abcd	76	a
Gold Eagle	28	abcd	67	abcd
Gold Rush	28	abcd	77	a
Rocket	30	abc	62	abcde
Caravelle	38	a	56	abcdef
Gold Mine	38	ab	69	abc
Sol Real	38	a	74	ab

[z] Means within a column followed by the same letter are not significantly different as determined by LSD (P ≤ 0.05).

Table 1. Varietal response of honeydews to Monosporascus cannonballus at Desert Research and Extension Center at Holtville, CA in 2003.

Cantaloupe variety	Vine collapse (%)	Root lesions (%)
	6-19	1-4 July
Honey Ace (Takii)	0 e[z]	44 a
Morning Ice (Harris Moran)	0 e	19 bc
Twilight (Harris Moran)	3 de	23 b
Saturno	5 cd	22 b
Silver World (Known You)	5 cd	46 a
Santa Fe (Peto)	8 bc	22 b
Honey Brew (Sakata)	10 b	23 b
Honey Gold (Harris Moran)	10 b	43 a
Mega Brew (Sakata)	10 b	18 bc
Emerald [OP honeydew]	20 a	11 c

[z] Means within a column followed by the same letter are not significantly different as determined by LSD ($P \leq 0.05$).

MEETING NOTICE

The 33rd annual Plant and Soil conference will be held on February 3, and 4, 2004 at the Visalia Holiday Inn conference facilities in Visalia, California. Sponsored by the California Chapter of the American Society of Agronomy, the conference focuses on current agronomic topics that are of importance to farmers, consultants, suppliers, educators, and governmental organizations.

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

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

Station	January		February		March	
	1-15	16-31	1-15	15-28	1-15	16-31
Calipatria	0.08	0.09	0.12	0.15	0.18	0.22
El Centro (Seeley)	0.08	0.09	0.12	0.14	0.16	0.20
Holtville (Meloland)	0.08	0.09	0.12	0.14	0.17	0.21

* 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