

Field Check

August 2000

A project of the Cotton Pest Management Alliance

University of California-Cooperative Extension and California Cotton Growers Association participating

☑ Calendar

UCCE, USDA-ARS (Shafter) and Monsanto Alternative Tillage Field Days:

August 8

Madera County: Firebaugh area, Newhall Ranch, Ron Vargas: (559) 675-7879

August 10

Kern County: Buttonwillow area, WAY Farms, Bob Hutmacher: (661) 746-8020

UC Research & Extension Center – Cotton Field Days:

Sept. 19

Shafter REC

Sept. 21

West Side REC

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Handling the heat

The weather can be friend or foe to cotton, but when temperatures hit the 107-110 degree range, that can spell trouble for the crop.

At those temperatures, square and small-boll loss can occur. Losses can worsen when nighttime temperatures stay above 78–80 degrees for a prolonged period.

“In August, cotton is particularly vulnerable to heat losses due to higher boll loads and strong carbohydrate demands,” says Bob Hutmacher, UCCE statewide cotton specialist.

During this high boll-demand period, photosynthetic rates are reduced. High temperatures also contribute to higher respiration losses.

“While you cannot do much to change the prevailing temperature, you can modify your irrigation management practices to make the heat less damaging,” says Hutmacher. Here’s how:

● Avoid severe water stress.

This will allow the plants to remain hydrated and continue their evaporative cooling. This lowers the leaf temperature, keeping the plant canopy, even squares and young bolls, cooler.

● Avoid ponding water in fields with infiltration problems.

High temperatures combined with very high humidity can reduce the plant’s evaporative cooling ability, making matters worse. Water logging and/or aeration problems can partially close the stomata, further reducing carbohydrate availability. “If you have waterlogging problems, you might consider alternate-row irrigation, or lighter, more frequent applications to avoid making the problem worse,” says Hutmacher. ☐

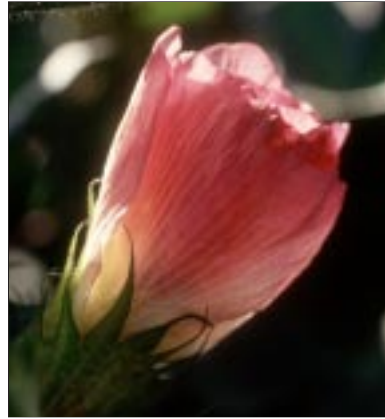


Photo: Catherine Merlo

Adequate irrigation sustains the cotton plant’s evaporative cooling system during the hottest days.

A closer look at Verticillium wilt

- A soil-borne fungus that can survive—and remain waiting—in resting forms for years.
- Verticillium fungi invade roots, grow into stems and plug the plant’s vascular or water-conducting tissue. Eventually, this reduces water flow and causes wilting.
- Disease is spread by water movement through the soil.
- Tends to be more severe in medium and fine-textured soils, but can be present and cause problems in a range of soils and conditions.
- Infected plants develop yellow or yellowish-green irregular patches between leaf veins and at leaf margins. These chlorotic areas eventually will turn brown.
- In earlier stages, damaged leaves tend to be seen in the lower or mid-canopy areas. As the fungal growth progresses, leaves can turn completely brown through much of the plant canopy. Eventually, plants can be largely defoliated, small bolls can be shed or their development arrested, and brown streaks appear if you cut open the lower stem of the plants. — Bob Hutmacher

Heads up on Verticillium wilt

Verticillium wilt lurks in some San Joaquin Valley cotton fields, says Dr. Shane T. Ball, new UC specialist and head of the testing program for the San Joaquin Valley Cotton Board.

“Growers and consultants should keep an eye open for this slow-working, methodical disease,” advises Ball, who’s with the UC Department of Agronomy and Range Science at the Shafter Research and Extension Center. “You should keep track of where symptoms develop, how early they develop, and in what varieties.”

A few growers saw early Verticillium symptoms in some fields in late July, says Ball, who studied the disease as a New Mexico Extension agronomy specialist.

Prevention is essential. The most effective way to deal with potential or current Verticillium problems is choosing a resistant variety (where other characteristics of the variety are acceptable to you) and crop rotation. The most successful rotations are to small grains, corn and sorghum.

Not all varieties grown in the San Joaquin Valley are equally susceptible to Verticillium wilt. “Most plant pathologists and breeders would likely say that *no* available cotton varieties are truly resistant to Verticillium when high soil inoculum levels are present,” says Bob Hutmacher, UCCE cotton specialist.

For example, even though it is one of the more resistant varieties available, the Maxxa variety can still be infected by Verticillium under the right conditions, he says.

The greater the varietal resistance or tolerance, however, the less likely there will be as widespread an occurrence of symptoms and losses. ☐

Ultra-narrow row cotton holds promise

Although it's only his third year of field testing a modified ultra-narrow row (UNR) cotton, UCCE Merced County farm advisor Bill Weir already is optimistic the system holds promise for San Joaquin Valley growers.

Weir's modified UNR system focuses on double-row 30-inch cotton. The plants sit in double rows planted about 7 inches apart on 30-inch bed spacing. Weir compares his system with cotton planted in a single seed row, also on 30-inch bed spacing. Plant population averages about 100,000 plants per acre vs. 50,000–60,000 in single-row plantings.

So far in his studies, Weir has seen an 8.4 percent average increase in cotton yields and a \$42.25 per-acre reduction in production costs, compared to 30-inch conventional cotton. UNR earliness ranged from three to five days.

"UNR savings come from weed control, fewer cultivations and less irrigation ditch work," Weir says.

This year, Weir has two major field trials—or 250 acres—in Merced County devoted to UNR cotton. He is evaluating yield and plant-growth responses using various soil types, cotton varieties and planting populations.

Most of this year's UNR acreage is planted to Roundup Ready varieties.

Weed cost savings

In addition to yield increases, Weir has been pleased with the cost-of-production differences between the two systems.

"There's a big possibility this will particularly catch on for areas with weed problems," he says.

He sees a lower-cost advantage using the system with transgenic, herbicide-resistant cotton, such as the Riata variety, an approved Acala with the Roundup Ready gene.

At high plant populations, with herbicide-resistant plants in a UNR system, cotton plants can better

shade out weeds competing for available sunlight. The result? Fewer weeds with lower production costs.

These studies also are investigating the most suitable plant



Photo: Catherine Merlo

Bill Weir reports yield increases of 8 percent and production savings of \$42 per acre in his narrow-row cotton tests in Merced County.

population density to use in the double-row 30-inch cotton system.

Weir and Merced County growers/cooperators—San Juan Ranch and Bowles Farms—designed the double-row 30-inch cotton with harvesting in mind. To avoid lint-quality problems that result from stripper picking, this cotton will be harvested with a standard spindle picker.

They also hope to have a modified commercial planter available next year for planting. "Interestingly, growers who have cooperated in our UNR studies acquired the necessary equipment to plant these trials," Weir says. "They modified older equipment and then shared it among their farms to get the fields planted at the most reasonable cost."

Weir also is conducting alternative row-spacing research with UCCE farm advisors Bob Hutmacher, Bruce Roberts and Brian Marsh.

Conducted at both the Shafter and the West Side Research and Extension Centers, these studies are evaluating the growth and yield responses of an Acala and two California Upland varieties. Researchers are comparing conventional plantings (in one planted row per bed) with double-row plantings (two planted rows per bed) in both 30-inch and 40-inch beds.

More alternative row-spacing research

In addition, Hutmacher, Roberts and Dr. Phillip Jost of California State University-Fresno are cooperating on several field trials totalling more than 2,000 acres at Dana and Kelly Hair's farm in Kings County.

They are evaluating the impacts of variety and plant population on growth and yield in 15-inch row spacing—UNR cotton—vs. 30-inch spacing.

"The focus is on transgenic herbicide-resistant varieties planted to something closer to the UNR cotton plantings of current interest in the southern United States," says Hutmacher, UCCE statewide cotton specialist.

Fields are planted with a specialized planter in 15-inch row spacing. A range of plant populations are being tested to evaluate where the most favorable responses for yield and earliness occur.

In other studies, Marsh, a Kern County farm advisor, has been assisting in evaluations of a high density, ultra-narrow row planting, or 7.5-inch row spacing at more than 150,000 plants per acre. These are being conducted at Palla Rosa Farms south of Bakersfield with farmer/cooperator Kevin Palla.

The alternative row-spacing trials are receiving partial support through the Cotton Foundation and National Cotton Council. □

Helpful Web sites

<http://cottoninfo.ucdavis.edu>
UC cotton Web site with California cotton production information.

www.ccgga.org
New Web site of California Cotton Growers and Ginners Association.

Field Check Archives

You can find all past issues of *Field Check* and *Quick Check* at the UC Web site at <http://cottoninfo.ucdavis.edu>. Click on "Publications."

Insect Hotline

1 (800) 880-0981
SJV pest situation updated weekly by IPM Specialist Pete Goodell

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