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31 May 2005

(Volume 45-1)

# TOMATO INFO



## FOLIAR DISEASE MANAGEMENT NOTES IN LOCAL FIELDS

With multiple rain episodes during our spring, bacterial speck and spot are present in tomatoes this season. At our Woodland weather station, we've logged 30 days of some precipitation from February through May. While our bacterial speck control program has not had breakthrough developments in recent years, a simple review is provided.

Bacterial speck favors cool, high-moisture conditions. The temperature range of 64 to 75°F is considered ideal for the pathogen, *Pseudomonas syringae* pv. *tomato,* while higher temperatures with daily means above 70°F suppress development.

Bacterial spot, caused by *Xanthomonas campestris* pv. *vesicatoria*, also favors wet weather conditions, but thrives in a higher temperature range of 75 to 86°F.

Both bacterial pathogens favor rainy weather as a key factor. For speck, the warmer expected temperatures in late spring and summer will arrest the disease. For bacterial spot, which can tolerate warmer temperatures, the disease may persist longer.

Symptoms on the foliage from bacterial speck are dark lesions that are angular/blocky often surrounded by a yellow ring. Bacterial spot generally produces small, circular lesions without the yellow halo. As the disease spreads on a leaflet, dark streaks are often seen on the leaf margin and leaf tip where moisture collects. In moist conditions, the dark lesions may appear shiny.

What are the control strategies? Speck resistant varieties offer a level of protection, but the genetic resistance has been overcome with another race. Rotation out of an infested field for a year is helpful. Switching from a sprinkler irrigation system reduces the duration of leaf wetness. Copper sprays, as a preventive treatment, are helpful. If allowed by the processor, adding the fungicide Dithane® to tank mix with copper improves control slightly.

The chemical control program is needed during prolonged wet weather conditions. However, the effectiveness of chemicals is only moderate at best as the materials are not eradicants. Subsequent, new growth is not covered and thus repeated applications are needed under high disease pressure conditions. Thorough spray cover is important.

Application timing is more important. UC Farm Advisor Peg Mauk demonstrated that copper applied prior to rainfall as a preventive is critical. Her greenhouse tests clearly indicated that post inoculation applications were inferior.

When should applications begin? A reasonable approach would be to spray after first sign of the disease if continued rainfall is expected and temperatures remain cool. The problem of course is predicting the weather to time sprays ahead of the next storm.

When should spraying stop? With temperatures in the 90°F range, spraying should cease. High temperatures and dry weather will control speck/spot development much better than any spray program. Extension Pathologist Mike Davis and I are currently

working in a couple of local tomato fields where we've flagged plants to follow various disease severity levels through harvest. Spread of the disease has stopped with our high temperatures.

Side Note: Late blight has been confirmed in our area as well as in other tomato production areas. Locally, the diseased plants have been seedlings transplanted in a May schedule so it is unlikely spread within a field has been extensive. Locally, we are not experiencing region-wide problems with late blight. Be vigilant should we have another flurry of late spring to early summer rains. Late blight favors warm, rainy weather. Growers using sprinkler irrigation systems would need to be the most cautious in that event. Many fungicide choices are available for late blight control.

**NITROGEN MANAGEMENT**

For tomato growers, nitrogen management has been relatively straightforward. The norm has been to apply 120 to 150 lbs of nitrogen as a sidedress application at the layby growth stage. The consequence of a luxuriant supply of N has not resulted in a yield reduction, delayed harvest or out-of-control vine growth in canning tomatoes.

With an increase in cost of N, some growers are considering reducing nitrogen rates. Field tests conducted in the late 90's by UC Veg Crop Specialist Jeff Mitchell's graduate student Henry Krusekopf indicated that soil residual nitrogen at or above 16 ppm nitrate-N in the top foot prior to sidedressing was sufficient to produce maximum yields. No supplemental N was required. Most of the fields were in Fresno County's Westside, but a couple of the tests were in our area. Timing of the soil sample was in the spring sufficiently ahead of sidedress period to allow completion of lab work.

In N-depleted soils, an application of 75 pounds of N per acre provides the bulk of the yield gain. Higher rates of nitrogen provide incremental increases, but at a diminishing rate of return. Thus as N costs increase, the rate of N would tend to be reduced.

What is the risk of using the soil N residue sampling plan? Is the sample representative of the field? The plan is only as good as the sample representation.

A practical grower-approach would be to sample a couple of fields to obtain soil lab reports specific to the field. If the soil tests are above 25 ppm, cut back from the normal N application rate to 75 lbs of applied N or so on part of your field and compare that to your normal application. If the levels are extremely high, 35 ppm or more, reduce the N to zero in some of the acres, half on the majority of the field, and the remainder will be a full normal rate. Of course, all of this involves extra adjustments and effort to assess the results in each particular field.

In fields where well water is used, checking nitrate-N levels may provide additional information on N availability. The conversion factor for calculating N applications from irrigation water is 2.7 x nitrate-N in parts per million = pounds of N per acre-foot of water. For example if lab results are 5 ppm of nitrate-N and 3 acre feet are applied per cropping season, then 40 lbs of N were delivered from the irrigation. It is unlikely all 40 pounds would be available to the crop because of run off and perhaps leaching.

**FUSARIUM WILT**

The concern over spread of Fusarium wilt race 3 shouldn't be overlooked. We have many instances of race 3 in our area over the past few years. Limiting soil movement into clean fields may be important. Clearly, power incorporators/mulchers and irrigation ditch makers and closers can be implements along with those tractors where higher volumes of soil are carried from one field to another. A little prevention may prove to be valuable in the long run. While rotational crops are unaffected, contaminated soil

movement should also be restricted in the off-season years since Fusarium is long-lived.

I suspect these next few years will be good indicators of the extensiveness we might experience from our Fusarium wilt race 3 in our area.

**NUTSEDGE CONTROL- PLANT BACK LIMITATIONS**

The herbicide Sandea® (halosulfuron) has a fit as a post emergent nutsedge control material in tomatoes. As sunflowers are a major crop in our area, be aware of the 18-month plant back precaution on the label for this crop following application. Sunflower appears to be very sensitive to Sandea resulting in severe stunting and perhaps some stand loss. Common sunflower is listed as one of the weeds controlled by halosulfuron. Winter wheat, on the other hand, has a 2-month plant back.

**REDUCED TILLAGE PRACTICES**

UC Extension Veg Crops Specialist Jeff Mitchell is organizing a farm tour conference that may provide insight into reducing tillage during the fall as well as in-season.

**Conservation Tillage Farm Tour**
**7 AM to 4 pm**
**Thursday, July 16, 2005**
**UC West Side Research & Extension Center**
**Oakland x Lassen Ave.**
**Five Points, CA**

The tour starts at the UC West Side Research and Extension Center in Five Points. There are 7 stops planned for the tomato-cotton portion of the tour that ends near Dos Palos. A separate tour with 4 stops is planned for growers interested in dairy forage. For the tomato-cotton tour, the farm stops involved are: Farming D, Couto, Sano, Sun Pacific, Goodman, San Juan Ranch, and Bowles Farms. While the drive is long, I hope many will take this opportunity to visit and learn. Some folks may only have time to visit a few of the stops. The program can accommodate this need as well.

Cost of the tour is $10 for early registration and $20 for on-site registration. Breakfast and a lunch are provided. Contact Diana Nix for information at (559) 646-6526 or Diana@uckac.edu.

Meeting #2. A local conservation tillage field day will be held in Davis at the UC Davis Russell Ranch on Thursday June 23 from 7:30 to 2 pm. The event will include a tour of the campus research plots comparing standard to reduced tillage in organic, cover cropped and conventionally grown corn and tomatoes. For the program, contact Kabir at (530) 754-6497 or kabir@ucdavis.edu. Location of the meeting is west of UCD campus along Russell Blvd., ~ 0.5 miles west of CR 95.

Submitted by,

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