University of California Cooperative Extension

Vegetable Crop Facts

Merced and Madera Counties

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TOMATO EARLY SEASON PEST CONTROL

UC IPM Guidelines for some common insect pests on seedlings and transplants. Goto www.ipm.ucdavis.edu for more details.

Cutworms. Chew on the stem at the soil line. They can become a real problem in localized areas in the field. As such, spot treatments can be effective. Management: if not using reduced tillage, cultivate the beds shortly before transplanting to kill larvae and incorporate crop residues. Carbaryl (Sevin) bait at 30 – 40 lbs/A ground application will help control.

Flea beetles. Common pest on tomatoes. The adults chew holes in the leaves—high populations result in stand loss. Worse in back-to-back tomatoes, warm windy weather, and along field borders. Management: crop rotation, monitoring, and insecticides. One treatment usually clears up the problem. Carbaryl (Sevin), Guthion, Endosulfan (Thiodan. Restricted near waterways), pyrethrins, Asana, and Platinum (new Syngenta product).

Garden Symphylans (garden centipedes). More of a problem north of here, but can dramatically reduce stands through root feeding. These little white pests live in the soil and are difficult to see because they move quickly. Prefer high organic matter soils. Diazinon is registered, but control erratic. Platinum may provide some suppression.

Wireworms. Slender brown worms that live in the soil and are the larvae of the click beetle. Not usually a significant problem for tomato growers. Chew on roots and seeds. Admire drench is labeled for control. Vapam (metam sodium) would also provide pre-plant control.

Aphids (green peach aphid). Rarely cause plant or yield loss on there own, the main problem is that they can transmit viruses. Often controlled by natural enemies. Reflective mulches also offer early season suppression. There are many registered insecticides if required: Fulfill (new material from Syngenta), Warrior, Dimethoate, Vydate, Malthion, Endosulfan (restricted near waterways), pyrethrins, thyme oils, insecticidal soaps. If Platinum or Admire has been applied as a soil drench, they will provide control as well. Later in the season potato aphids (often pink color) may flare. These are more damaging and can cause yield reductions. In addition to the insecticides already mentioned, these can be controlled with Monitor and Danitol.

Beet leafhopper. See early season disease guide.

Thrips. See early season disease guide.

EARLY SEASON DISEASE GUIDE

Bacterial Speck (*Pseudomonas syringae*) and Bacterial Spot (*Xanthomonas compestris*). Cause weakened plants with dark spots and patches on leaves and stems. Both cause superficial dark spots on green fruit. Speck prefers cooler weather and wet conditions—it is more common in Merced County. Yield losses of 25% can occur if the crop is infected at the 3 – 5 leaf stage, so early and prompt control is necessary. Apply copper + mancozeb (Dithane) at first signs of disease and repeat if cool moist conditions continue.

Bacterial Canker (*Clavibacter michiganensis*). Usually only a problem with transplants. Causes yield reductions and spots on fruit. It can be acquired and spread in the spring with rain and equipment, but symptoms typically do not show until mid-season. Once identified, there is little that can be done. Keep equipment out of the field to limit spread. At the end of the season, disc and rotate the field out of tomatoes.

Late Blight (*Phytophthora infestans*). Can quickly spread through a field and cause complete loss in the right conditions. Prefers high humidity, standing water, and warm (not hot) conditions. Control: thorough coverage with fungicides when conditions favor disease. Quadris, Bravo, Dithane, Mancozeb, Tatoo, and Cabrio are all registered.

Curly Top. A virus disease transmitted by the beet leafhopper. Causes stunting, purpling of leaves, premature red fruit, and yield losses. Plants are usually infected in the spring as the foothills dry down and the

leafhoppers migrate into fields. CDFA has a program where they spray Russian Thistle with malathion to reduce populations. In field transmission may be reduced by using Admire or Platinum sidedressed or drip-applied at first bloom. Malathion could also be used as a foliar spray. Actara (same a.i. as Platinum) has a label for foliar applications on peppers. Double row plantings help compensate for plant losses.

Corky Root (*Pyrenochaeta lycopersici*). Most damaging to early plantings with cool conditions and in fields with history of the problem. Root banding may show up at 4 – 6 leaf stage. Plants are stunted and slow growing. Usually doesn't kill plants but will reduce yields. No in-season methods to control the disease. Shorter interval between harvest and irrigation cut-off may be needed to compensate for the weak root system. Contrary to conventional wisdom, later plantings are still susceptible. Rotating the field out of tomatoes will reduce but not eliminate the problem. Vapam has also been shown to reduce disease severity.

Spotted Wilt. A virus disease transmitted by thrips. Infected plants are stunted, and leaves are bronzed with necrotic spots. Fruit are deformed with large concentric rings. Often occurs simultaneously with TMV and/or CMV. More of a problem with fresh market than processing tomatoes. Very difficult to control because of the wide host range for the virus and the nature of thrips. UC IPM has no management recommendations, but there is information from other states. Control guidelines: avoid planting next to infected crops/ornamentals, control thrips with insecticides both in field and in adjacent areas such as canals and ditches, fallow fields, crop rotation to non-host crops such as small grains. Success or Entrust (spinosad), pyrethoids, Admire, Platinum, and Monitor will reduce thrips populations. Early monitoring and control of thrips is critical to reduce the severity of this disease.

Tomato spotted wilt causes lumps, rings, and uneven ripening on fruit at all stages of maturity.

COVER CROPS AND CONSERVATION TILLAGE

Did you plant a cover crop this year on your tomato beds? Though not common (yet), cover crops can provide benefits like improved water infiltration, improved soil tilth, reduced dust, and if a legume is used, even some free nitrogen. They can also make spring tillage and planting more difficult. Along those lines, Gene Miyao, Farm Advisor in Yolo County, did some research last year where he found that terminating the cover crop at 6 – 12" provided all the benefits of letting it grow to full height, but greatly reduced the time and effort to transplant. Early termination will also help conserve soil moisture.

Cover crops will also reduce the amount of surface water runoff from winter rains. This is important, because the Central Valley Regional Water Quality Control Board is now regulating farm water runoff on irrigated lands. Most of you now know that with the sunsetting of the ag water discharge waiver on January 1, 2003, farmers with irrigated crop land are now working under a new set of rules regarding tailwater or rain runoff. Basically, those rules state that if water runs off your property, it better be clean.

Thinking of doing some sort of reduced tillage in your tomato/cotton rotation? The economics are compelling: by eliminating heavy tillage in the fall, you can save some big bucks. Instead, you just lightly rework the beds, then plant in the spring. Research by Dr. Jeff Mitchell has shown that tomatoes planted after cotton will give very good results, but that cotton planted after tomatoes usually results in yield reductions. Cotton germinates and grows better in a warm fluffy bed. Following tomatoes, the beds are compacted from harvest, and there is a lot of trash on the surface that keeps the soil cooler.

CONDITIONAL WAIVERS AND WATER COALITIONS

Farmer, grower, now discharger. Another name to call yourself. Beginning this year, if you irrigate crops and any irrigation or storm water leaves your property that contains contaminants that can impair downstream surface water quality, you are a "discharger" subject to regulation. You are a discharger whether you own or rent the land. You will now be required to monitor your runoff so that you will be permitted to continue to discharge (or really, you have a waiver from obtaining a waste discharge permit based on certain conditions, i.e., conditional waiver). In response to this, water coalitions

have formed in an attempt to comply with the new regulations. The goal is to represent all farmers within a watershed so they don't need to file individually.

Basically, growers have three options: 1.) file an individual waste discharge permit with the Central Valley Regional Water Quality Control Board (CVRWRB); 2.) join a water coalition; 3.) do nothing and see what happens (the current waiver is subject to review and change by the end of 2005). Option 1 may cost up to $10,000 for the first year and $3000 to $6000 per year thereafter for monitoring and reporting. Option 2 may cost you $100 to join the coalition plus $4 - $5 per acre to cover the cost of monitoring. Option 3 may cost something as well in the form of fines, but nobody is saying what this could be at this time.

I have attended several sessions on this subject and can tell you that the new regulations and how they may or may not impact you are not easy to understand. The wording is long, filled with "bureaucrat-ese", and ambiguous. It is still unclear, for example, whether these new rules apply to you if water does not run off your land, or whether you are exempt if you have already implemented strategies to keep this from happening (tailwater return system, for example). Also unclear is what happens to a farm or ranch that is both dry land and irrigated (the new rules only apply to irrigated land). Furthermore, I have seen nothing on how these new rules will be regulated or enforced.

About the only thing clear about this issue is that it will cost a lot of money. But look at the bright side: at least you're not a dairyman. They have to deal with this issue in addition to numerous other regulations such as nutrient management plans, air quality plans, and permits.

The issue is too complex to summarize either here or in a 20 minute talk at an Extension meeting. With this in mind, I encourage you to attend one of the meetings by the Merced County Ag Commissioner and the East San Joaquin Water Quality Coalition:

- April 14, 9 – 11:00 am. UCCE Classroom, 2145 Wardrobe Ave, Merced.
- April 14, 2 – 4:00 pm. Our Lady of Lourdes Church, Legrand Rd and Chapman St., LeGrand.
- April 16, 9 – 11:00 am. Livingston United Methodist Church, 11695 W. Olive Ave, Livingston.
- April 16. 2 – 4:00 pm. UCCE Classroom, 2145 Wardrobe Ave, Merced.
- April 20, 9 – 11:00 am. Japanese-American Citizens League Hall, 12985 N. Cortez ave, Turlock.

For those of you on the Westside, your water coalition is the Westside San Joaquin River Watershed Coalition. Contact Joe McGahan at 209-826-9696 to get more information about joining or upcoming meetings.

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