

VIRUS ALERT-2022

Resistance-breaking (RB) tomato spotted wilt virus (TSWV) and beet curly top virus (BCTV) have been identified in Colusa and Sutter counties.

RB-TSWV

The resistance-breaking (RB) strain of TSWV (RB-TSWV) has been detected in northern Sutter County as of May 2022 and southern Sutter County in 2021. Please carefully monitor your own fields for symptoms of TSWV, especially in resistant varieties and continue managing thrips.

Detection of TSWV: We are fortunate to have the rapid immunostrip test for TSWV, which takes 10 minutes and can be performed in the field. However, this test will detect **BOTH** the existing wild-type non-resistance breaking strains and the RB strains. RB-TSWV also infects lettuce, peppers (without the *Tsw* gene) and radicchio. RB-TSWV must be detected with 1) a molecular test, either RT-PCR or LAMP, and 2) by inoculating resistant varieties and observing development of typical spotted wilt symptoms.

If you think you have TSWV in a resistant variety, contact UCCE Vegetable Crops Advisor, Amber Vinchesi-Vahl (acvinchesi@ucanr.edu, 530-458-0575). You can also drop off samples to the UCCE Colusa office (100 Sunrise Blvd., Suite E, Colusa, CA) or the UCCE Sutter-Yuba office (142A Garden Hwy, Yuba City, CA) for Amber to have tested.

RB-TSWV ACTION PLAN-2022-MONITOR/CONFIRM/MANAGE**Current season (now)**

- Monitor for appearance of spotted wilt especially in fields with resistant (Sw5) cultivars.
 - Note: Very low levels of spotted wilt may be explained by a small proportion of plants not having the gene (incomplete penetrance) and infected with non-RB strains.
 - Levels of >3% are suggestive of RB-TSWV as is the appearance of extremely severe symptoms (extensive distortion, yellowing and necrosis of leaves) in certain genotypes when Sw5 is broken by RB-TSWV (e.g., some fresh market varieties).
- Confirm RB-TSWV with molecular tests and direct inoculation of Sw5 tomatoes.
- Carefully document locations of outbreaks to allow follow-up in 2023.
- Thrips monitoring and management. Thrips monitoring is done by 1) **yellow sticky cards** (a major effort) or by 2) monitoring the **‘Thrips Degree Day (DD) Predictive Model’** developed by Neil McRoberts and associates, which predicts when thrips generations will appear, based on temperature, but not actual populations.
[https://ucanr.edu/sites/TSWVfieldriskindex/Thrips Population Projections/](https://ucanr.edu/sites/TSWVfieldriskindex/Thrips%20Population%20Projections/)

- For the DD model, thrips management is recommended when the 2nd and 3rd generations appear, with earlier sprays (within this window) if spotted wilt is observed in a field, and then as needed up to full canopy cover with well-sized early fruit set. This can slow the spread of TSWV.
- For 2022, the peak of the second thrips generation adults passed in early May on the DD model. Thus, this is an appropriate time to spray for thrips, especially if spotted wilt has been seen in a field.
- For fields having high populations of thrips and RB-TSWV infections, a spray for thrips just before harvest (1-2 weeks) can substantially reduce the spread of the winged viruliferous adults to nearby fields. Note: check labels for preharvest intervals.
 - There are limited insecticide options.
 - These are currently the most effective materials for the Western flower thrips (the predominant vector in California): dimethoate, Radiant (spinetoram), Success (spinosad) and Lannate (methomyl).
 - In general, the effect of these material is relatively short-lived (~2 weeks).

Additional resource management tools

- TSWV informational brochure
 - [http://ipm.ucanr.edu/PDF/PMG/Tomato Spotted Wilt Print.pdf](http://ipm.ucanr.edu/PDF/PMG/Tomato_Spotted_Wilt_Print.pdf)
- Thrips population predictions (by regions/counties)
 - [https://ucanr.edu/sites/TSWVfieldriskindex/Thrips Population Projections/](https://ucanr.edu/sites/TSWVfieldriskindex/Thrips_Population_Projections/)
- Variety susceptibility/tolerance to TSWV (Tom Turini's field research)
 - https://ucanr.edu/sites/veg_crop_sic/files/343457.pdf
(key frames are #9, 11 and 12)

Beet Curly Top Virus



In 2021, we had an outbreak of beet curly top virus (BCTV) which is not generally a major issue for processing tomatoes in the northern growing region. The prevalence of the disease last year may be due to the hot dry winds in March/April that caused a dry down of weeds in the foothills and resulted in atypical timing or patterns of beet leafhopper migration. In addition, the virus confirmed in the northern counties was an unusual strain of BCTV called BCTV-SpCT, which is different from what is found in Fresno and Kern counties. This same strain of the virus has already been confirmed in Colusa County in 2022 on processing tomatoes, so please be on the lookout for BCTV symptoms and contact Amber Vinchesi-Vahl (acvinchesi@ucanr.edu, 530-458-0575) if high incidence is found.

Plants infected with BCTV show stunting, dull green/yellow coloring, and leaves curled upward with swollen purple veins. Beet leafhopper is the only vector of the disease, other insects cannot transmit the virus to tomatoes. The virus is also not transmitted or spread by seed, touch or machinery. Beet leafhoppers do not like tomatoes and do not complete their life cycle within a tomato field. They taste tomatoes as they migrate into the valley and while tasting, they transmit the virus to the plant. But then they move on to find plants in the sugarbeet family, their preferred hosts. Due to this behavior, it is unlikely you will find beet leafhoppers in your tomato field and there will be no tomato-to-tomato spread of BCTV in the field. Once the beet leafhopper flights are finished, the infection you see is what you will end up with, with early infected plants dying. Often, there will be a mix of different aged plants with symptoms reflecting different times of infection from multiple leafhopper flights. Insecticides are not usually effective at controlling beet leafhoppers or reducing BCTV in crop fields due to the biology of the pest, but managing surrounding weed hosts may be helpful in reducing sources of the virus.

We do not know whether BCTV will be as big of an issue as it was in 2021, but please let Amber know if you find high incidence in your fields in 2022 since we have already confirmed the unusual BCTV-SpCT strain this year, though it remains at low incidence so far.

Please feel free to contact me with any vegetable crop issues in the field, questions or comments, or to subscribe to this newsletter electronically.

Amber can be contacted at the Colusa UCCE office at 530-458-0575, or at acvinchesi@ucanr.edu.