BEET CURLY TOP VIRUS CONTROL PROGRAM

Integrated Pest Control Branch

Plant Health and Pest Prevention Services Division

California Department of Food and Agriculture

Today's Outline

- Beet Curly Top Virus
- Beet Leafhopper
- BCTVCP and BCTVCB
- Program Surveys
- 2023 Program Updates

Beet Curly Top Virus Symptoms

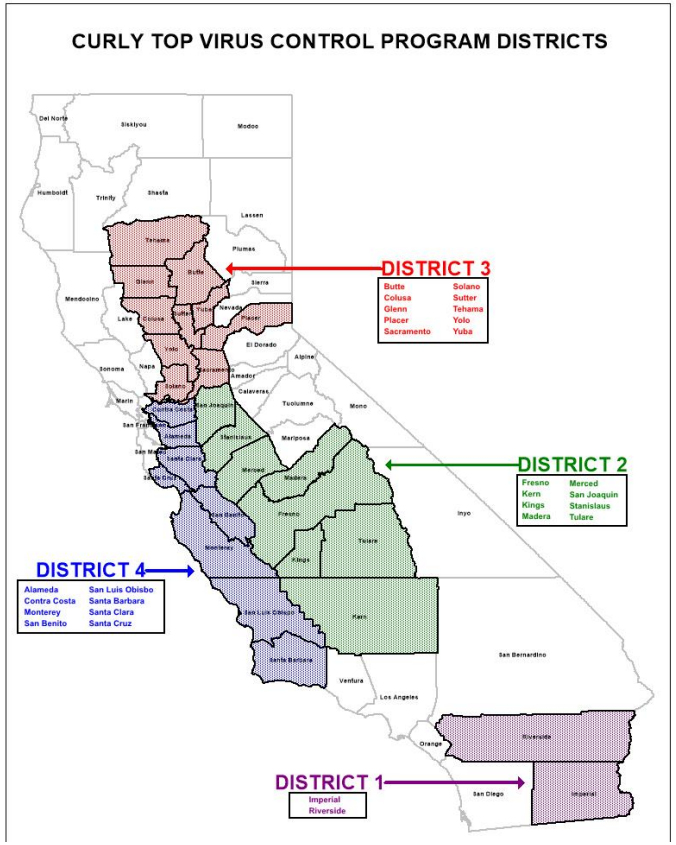
- Curling and yellowing of leaf tissue
- Necrosis (purpling) of vascular tissue
- Stunted growth
- Premature ripening of fruit
- Reduced crop yields

Note: Since BCTV is phloem-limited, crops cannot be infected through plant-to-plant transmission. The only known vector of BCTV is the beet leafhopper.

Beet Leafhopper, *Circulifer tenellus*

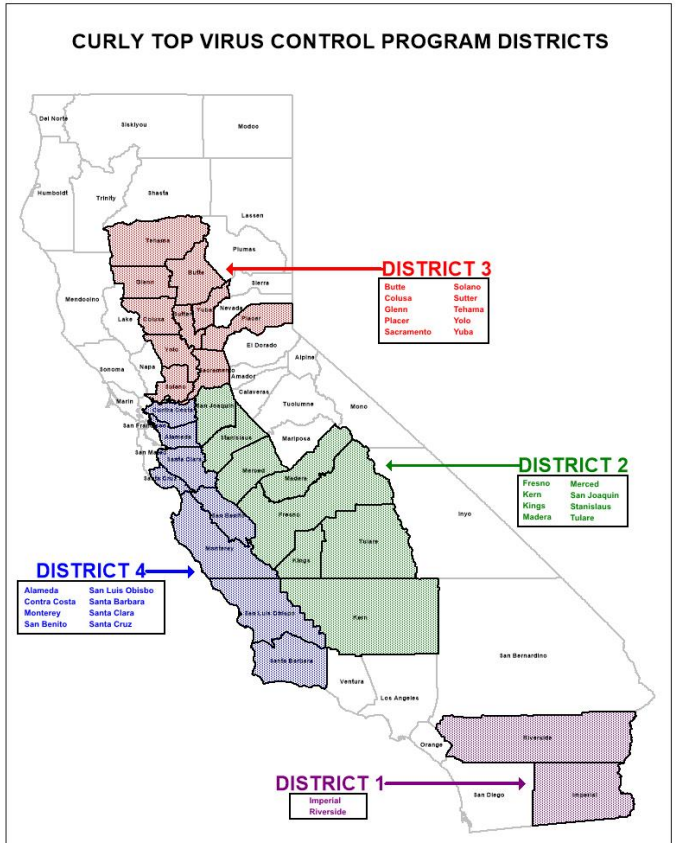
- The beet leafhopper (BLH) is the only known vector of the Beet Curly Top Virus
- BLH are migratory; overwintering in the westside foothills on host weeds including filaree, peppergrass, and *Plantago,* and migrating to the valley floor as the host weed vegetation dries up in the foothills
- While these host weeds do not exhibit any symptoms of BCTV, they can act a reservoir for BCTV. As BLH feed on host weeds that contain BCTV, they become carriers of the virus
- As BLH migrate to the valley floor and feed on susceptible crops, they transmit the virus and infect plants with BCTV

Impact of BCTV Felt Throughout California



- Reports of BCTV-induced crop damage have been reported as far south as the Imperial Valley, and well into the Sacramento Valley
- Historically, the southern San Joaquin Valley, in District 2, has consistently experienced the highest instances of BCTV damage in susceptible crops
- In 2021 and 2022, BCTV outbreaks occurred in non-traditional areas, namely the northern San Joaquin Valley in District 2 and the Sacramento Valley in District 3.

Beet Curly Top Virus Control Program



- In 1943, in direct response to widespread BCTV-induced damage seen throughout the state, the California Legislature crafted regulations pursuant to the control of the beet leafhopper
- The California Food and Agricultural Code states that:
  - Controlling BLH, the only known vector of BCTV, is in the public's interest
  - Since the control program primarily is carried out in uncultivated areas, involving both private and public lands, often far removed from the areas receiving benefits, it is necessary for a state agency to take primary responsibility
  - The Program shall be funded in part by industry
  - Industry funding is determined by an assessment rate, which varies from district to district and from crop to crop based on the degree of vulnerability to damage from beet curly top virus experienced by those crops in those districts

Beet Curly Top Virus Control Board

- The California Food and Agricultural Code states that the Secretary shall appoint a Beet Curly Top Virus Control Board consisting of 10 members
  - Nine members will be representatives from each of the primary crop commodities assessed and shall include representation from each of the Districts assessed; one member will be a public member
- The Board shall be advisory to the Secretary and may make recommendations on all matters pertaining to the Beet Curly Top Virus Control Program including, but not limited to, the annual budget, the adoption, modification, and repeal of regulations and procedures, the use of funds for research, and necessary assessments

Beet Curly Top Virus Control Program Survey Timeline

- Winter/Spring Survey
- Summer Survey
- Fall Survey
- Commodity Survey

Winter/Spring Survey

- During the winter months and into the spring, BLH are typically found in foothills above the valley
- In the late fall, as summer host plants (Russian thistle, goosefoot, *Bassia*) die off and seasonal rains start to bring up vegetation in the westside foothills, BLH migrate to their overwintering grounds
- Primary host plants for BLH in the foothills during winter and spring are filaree, peppergrass, and *Plantago*

Winter/Spring Survey

- Once vegetation emerges in the foothills (typically November/December) Program staff will begin monitoring BLH populations in the foothills
- Population counts are estimated using a long sweep net, and are recorded as the average number of BLH per ten net sweeps
- As BLH monitoring surveys continue into spring, areas with consistent counts of at least 8 BLH per 10 sweeps are identified and mapped as potential control areas
- Vegetation dryness is also monitored throughout the season. When vegetation in the foothills becomes >75% dry, it is an indicator of when migration of BLH back to the valley floor will occur

Summer Survey

- From late spring and into fall, BLH are found on a wide variety of weeds where they can propagate for multiple generations
- There are several different host plants that BCTV Program personnel monitor during late spring and summer including London rocket, goosefoot, lambsquarter, Russian thistle, *Bassia*
- Surveys are conducted along roadsides and in fallow fields using sweep nets. BLH counts are recorded as average BLH per one sweep
- Ground-rig spot treatments are conducted throughout the summer on roadsides and fallow fields, as necessary

Fall Survey

- At the end of summer, areas containing fall BLH host weeds (Russian thistle, *Bassia*) are mapped and closely monitored for BLH populations
- As host weeds are disced, grazed, or otherwise removed, BLH populations will tend to concentrate on the remaining available host weeds
- Program personnel continually monitor these areas for developing populations and designate potential control areas as necessary

Commodity Damage Surveys

- Often conducted alongside summer BLH surveys
- Susceptible commodities are visually inspected for BCTV-induced damage.
- Leaf samples of symptomatic plants are collected by personnel and growers and sent to the CDFA lab in Sacramento to be tested for BCTV.

Program Updates

- Beet Curly Top Virus increase in non-traditional areas
- BCTVCP bringing on additional positions
- Increase in fallow fields and beet leafhopper host plants
- Newly designed BCTVCP web page
- New Beet Leafhopper Sighting Report

Fallow Field Disking and BLH Dispersal

- The Program would like to remind growers and PCA's that any fallow fields or weedy areas adjacent to susceptible crops should be inspected for BLH prior to disking or mowing.

- Displaced BLH have the potential to disperse into nearby commodity fields and cause damage.

- If a BLH infestation is present, please contact the Program prior to disking. The Program can be available for BLH surveys.

Resources

- Newly designed BCTVCP web page: https://www.cdfa.ca.gov/plant/ipc/curlytopvirus/ctv_hp.htm
- NEW – Beet Leafhopper Sighting Report:
  - This report is available using the following web browser link: https://arcg.is/O9LyK (desktop link, Google Chrome recommended)
  - For mobile use, download the **ArcGIS Survey123** app from the **Google Play Store** or **Apple App Store** and use the QR code on the right.
  - A user guide for the BLH Sighting Report is available on the BCTVCP webpage

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