California Oranges to Korea 2022-2023

USDA-APHIS-PPQ, California Program Managers

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Septoria citri

Management Using GAPs

- Field: 1st fungicide spray (Oct. 15 – Nov. 30) after first rain
- Packinghouse: chlorinated wash, postharvest fungicide; grade out ice mark
- Storage: 3-5°C, segregate Korea fruit
- Make records available

NAVEK Lab latency testing

- Scouting: 50 fruit/ 20 trees per lot
- Sampling: 20 fruit before Feb. 7; 30 fruit afterwards
- 45-day validity
- If a sample is submitted **wait** for results before scheduling inspection for exports
- NAVEK guidelines on testing of fruit if second spray not applied.

Good Agricultural Practices (GAPs) for the Management of Septoria Spot of Oranges in California

2022-23

Summary: Septoria spot is a fungal disease that occurs on leaves, twigs, and in rind injuries of fruit of several species of citrus. The disease has historically been considered a minor disease with <3% detections in grower lots in the most severe outbreaks. Research has indicated that:

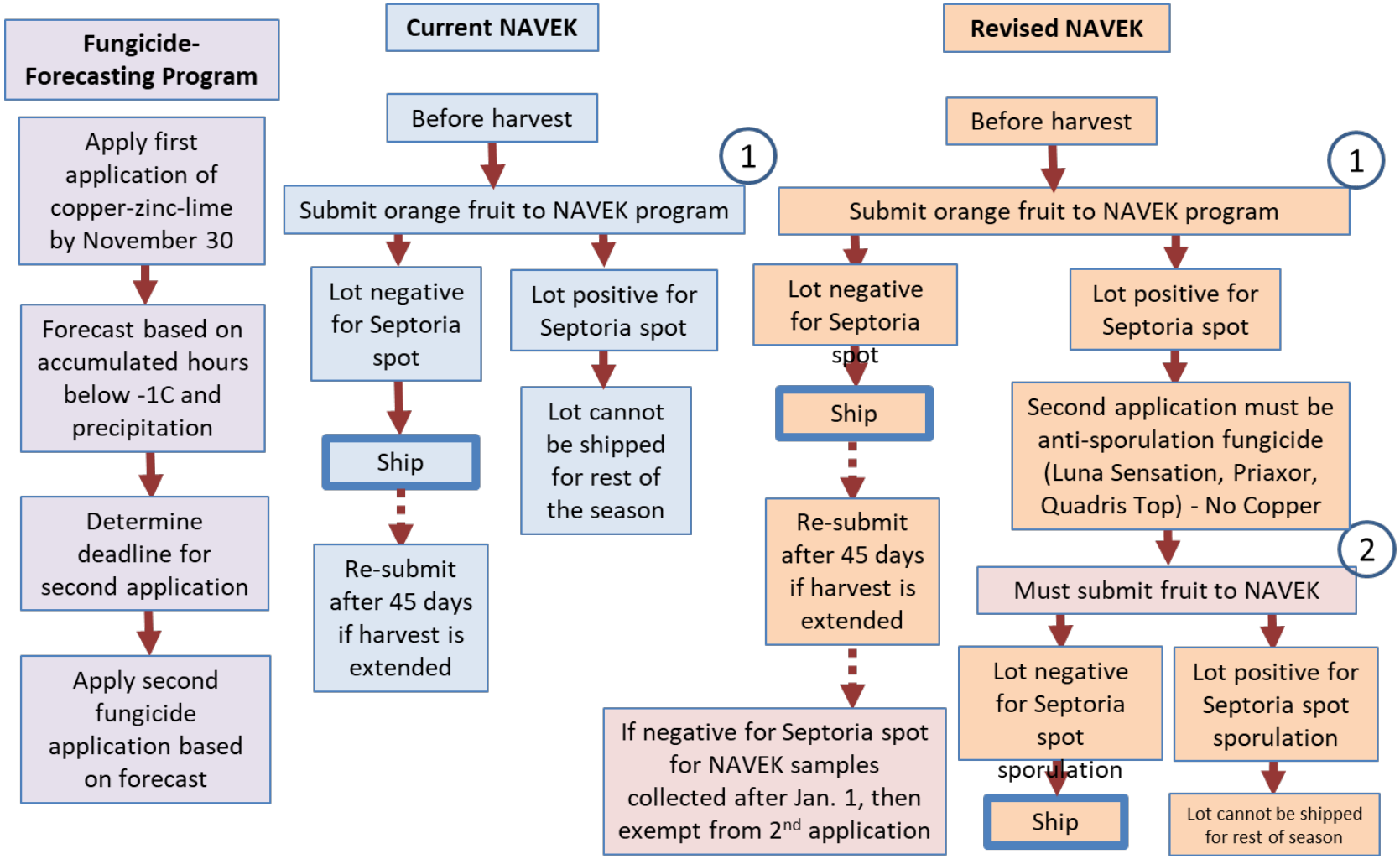
- The pathogen cannot infect healthy tissue and needs injuries for infection.
- The disease requires a minimum of 3-4 weeks to develop under constant incubation temperatures (e.g., 20°C) and longer under fluctuating temperatures.
- Fruit on trees are free of the disease going into the harvest season (cold, rainy season).
- Cold injury is one of the most common injuries correlated with the incidence of disease.
- Cold injury of rind tissue has been reproduced experimentally.
- Severity of disease has been correlated with increases in precipitation after cold injury to fruit.
- A risk assessment model has been developed based on the accumulated exposure to temperatures less than 1°C and total precipitation after the first freeze event.
- The model has been implemented on a large-scale for the last several seasons to identify periods of high risk for infection and timing of fungicide applications.
- Efficacy data has been developed identifying effective new preharvest fungicide treatments. Both pre- and postharvest fungicides are currently registered for preventing and suppressing the disease on fruit.
- Chronological graphs indicate that most of the disease develops between Feb. and April (indicating a major time of infection between January and March). GPS data indicates that the distribution of the disease for the first seven harvest seasons of the NAVEK program is mainly between Kern Co. and Madera Co., with most detections in Tulare Co.
- A web-based database should be used for submitting samples by each of the participants in the program that is accessed by the NAVEK lab personnel to recognize incoming samples without errors associated with the manual re-entering information from submitted forms.
- Detection of Septoria is currently based on the use of a real-time PCR-based method using a portion of the beta-tubulin DNA sequence from *Septoria citri*.

I) **Management of the disease:** Removal of dead branches and twigs that harbor the pathogen and designing irrigation systems to minimize wetting of foliage are fundamental practices for managing the disease. Zinc-copper-lime treatments or registered alternatives (e.g., Abound, Quadris Top, Priaxor, Luna Sensation) should be applied prior to winter rains and, if necessary, additional applications during the winter (e.g., January) and early spring late Feb. or March) may need to be done. Zinc-copper-lime and other fungicide treatments are preventative or protective treatments. Zinc-copper-lime has been part of management guidelines for the disease in California for over 70 years.

A) **Fungicide Treatments:**

1) The first field-application of the fungicide treatment of zinc-copper-lime or registered alternative is **highly recommended** for all oranges planned for exportation to Korea.
2) The treatment **should be applied between October 15 and November 30** for all California oranges (Navels and Valencias) shipped to Korea.
   (a) Specifically, **the zinc-copper-lime treatment can be made as follows (see Table 1)**: When using zinc sulfate (neutral and acidic forms) and copper hydroxide, copper oxide, or basic copper sulfate (i.e., **fixed or basic coppers**):
      i. The rate of metallic zinc equivalent (mze) should be a minimum of 2.5 lbs mze per acre. The rate of metallic copper equivalent (mce) per acre should be a minimum of 1.65 lbs mce per acre. A minimum of 2 lbs hydrated lime should be added when using 1.65 lbs copper (mce) and a minimum of 4 lbs hydrated lime

Revision to NAVEK



(#) - NAVEK sample number

All fruit should be postharvest treated with Graduate A+ to minimize sporulation of *S. citri*

NAVEK Revisions

If 1st sample is positive

- Second non-copper treatment option and submit a second sample to NAVEK

If 2nd NAVEK sample is positive, lot is removed for the season

If a second spray is recommended and a second spray is not applied or NAVEK Sample test is not completed the lot is not eligible

If negative for Septoria spot for NAVEK samples collected after Jan. 1, then exempt from 2nd application

Fuller Rose Beetle (FRB)

Korea will continue to fumigate on arrival but, has requested APHIS to keep it out of the pathway

Manage using UC IPM guidelines

- Skirt pruning
- Weed control
- Two (2) FRB treatments – Foliar, Drench or Trunk Spray

Records

- Letter of Affirmation, Treatment Record, Lot Map, Lot List

Viable FRB eggs during Phytosanitary inspection rejects grower lot pack date

California Red Scale

Expected to keep CA Red Scale out of the pathway

No formal guidelines for control

Recommended UC IPM Guidelines for CA Red Scale

http://ipm.ucanr.edu/PMG/r107301111.html

Rejected if found alive during Phytosanitary inspections

Phytosanitary Inspections

Septoria citri

- Voluntary testing at NAVEK lab
- Don’t ship until results come back

2% visual inspection

- Check under 10 calyxes for FRB per box

Reject lots for live/viable pest of concern

- CA Red Scale grower lot pack date
- FRB egg masses, for grower lot pack date
- Harmful Organisms List

Record Keeping

Shipper Records

- FRB Affirmation Letter
- FRB & *Septoria citri* Treatment Reports
- NAVEK *Septoria citri* Sample Results
- Grower lot list and lot map

County

- Review records prior to inspection

USDA

- Provide records upon request

Contact Information

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