



INSTITUTE OF FOOD AND
AGRICULTURAL SCIENCES
UNIVERSITY OF FLORIDA

FLORIDA
COOPERATIVE
EXTENSION SERVICE

PACKINGHOUSE NEWSLETTER

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Packinghouse Newsletter No. 139

January 17, 1985

Key Word Index: Canker, Chlorine, Film Wrapping, SOPP

CITRUS FRUIT TREATMENT FOR CITRUS CANKER PROJECT

Citrus Canker (Xanthomonas campestris pv. citri) was found in a Florida citrus nursery in August 1984. As of this writing, citrus canker lesions have been found only in nine citrus nurseries and not in any grove (citrus canker bacteria were found by washing symptomless leaves in one citrus nursery budwood grove). The Citrus Canker Project, administered by the USDA and the Florida Division of Plant Industry, requires that all fresh symptomless citrus fruit be treated to prevent the inadvertant spreading of citrus canker bacteria on the fruit peel.

Chlorine (200 ppm free Cl_2 , pH 6.0-7.5 for 2 minutes) was the only treatment approved until the end of November 1984 (Table 1). Many packers found that two-minute treatments required that they reduce their volume. They also expressed concern about the potential for chlorine to rust metal.

In response to this need, SOPP (sodium o-phenylphenate) was approved by the USDA as an alternative to chlorine for fresh citrus fruit treatment. SOPP at 2% may be used in a soap formulation over brushes for a minimum of 45 seconds or in a non-soap application for 1 minute (Table 1). The fruit must remain wet with the SOPP formulation for the specified time. It is then thoroughly rinsed to avoid peel injury on the fruit. The SOPP must be carefully diluted according to the directions of the supplier to obtain the required strength and to maintain the required high pH. Contrary to normal expectations, dilution of the labeled treating strength will lower the pH causing excessive conversion of the material to the o-phenylphenol form which may injure the fruit peel.

Table 1. Approved citrus fruit treatments by Florida packers for the Citrus Canker Project.

Treatment conditions	Chlorine	SOPP	
		Soap	Non-soap
Solution	200 ppm	2.0% ^Z	2.0% ^Z
Range ^Y	150-200 ppm	1.86-2.0%	1.86-2.0%
pH	6.0-7.5	11.5-12.2	11.5-12.2
Time ^X	2 minutes	45 seconds	1 minute

^Z2.0% = 20,000 ppm

^YAcceptable solution strength range to meet the regulatory requirement.

^XFruit is required to be thoroughly wet for the times shown. The total surface of the fruit must be visibly wet and a droplet of liquid must form at the bottom surface of the fruit when it is held stationary.

SOPP has been used by Florida citrus packers for nearly 30 years as a fungicide. It is approved on citrus in the United States with a residue tolerance of 10 ppm and in most other countries at 10 or 12 ppm. This long history of use and established residue tolerances on citrus helped to speed approval of SOPP as a fruit treatment in the citrus canker project.

All Florida citrus packers must sign a Compliance Agreement with the Citrus Canker Project to properly treat the fruit and to carry out other responsibilities such as seeing that all loads are covered, that trucks, pallet boxes and load covers are treated on each trip, that all trash is properly disposed, etc. The chlorine or SOPP treatment procedure must be inspected and approved before a packer is allowed to pack, and the treatment is frequently checked.

Florida citrus packers have been working to deliver the 1984-85 crop to markets. The U.S. market is now open except American Samoa, Arizona, California, Hawaii, Louisiana, Puerto Rico and Texas. Sales within Florida are scheduled to end for the season on April 1, 1985.

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INDIVIDUAL FILM WRAPPING APPROVED BY CITRUS CANCKER PROJECT

Citrus fruit sold in Florida must be sealed in approved containers in addition to various other precautions to prevent the inadvertant spread of citrus cancker bacteria. Individual film wrapping has been added to approved bags and cartons as an acceptable means of packaging fruit. The bag or carton must be labeled:

U.S. Department of Agriculture, APHIS Plant Protection and Quarantine
Hyattsville, Maryland 20782, LIMITED PERMIT, Movement of NONCERTIFIED
articles permitted to addressee ONLY under provisions of applicable Federal
or State cooperative domestic plant quarantines, NOT for distribution within
American Samoa, Arizona, California, Hawaii, Louisiana, Puerto Rico or Texas

No.
SER-CC401

and the individual film wrapped fruit must be labeled:

USDA, APHIS, PPQ
LIMITED PERMIT
NOT FOR DISTRIBUTION WITHIN
AMERICAN SAMOA, AZ, CA, HI, LA, PR, or TX
NO. SER - CC - 205

The number at the end of the label is a packer identification code. The approval of film wrapping as a package will allow bulk displays in Florida and allow Florida customers to better view individual fruit in stores.

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Additional articles on film wrapping can be found in Packinghouse Newsletter Nos. 106, 114, 128 and 130.

AVAILABLE PUBLICATIONS

Available from Dr. W. Wardowski, CREC, 700 Experiment Station Rd., Lake Alfred, FL 33850

"Citrus Canker" by J. Ferguson, T. Schubert and J. Miller.
Fruit Crops Fact Sheet FC-72. 4 pp.

"Citrus Canker in dooryard plantings" by J. J. Ferguson.
Fruit Crops Fact Sheet FC-73. 2 pp.

"Unipack: Individually wrapped storage of citrus fruits" by K. Kawada, W. F. Wardowski, W. Grierson and L. G. Albrigo. Proc. Int. Soc. Citriculture pp. 725. 1981.

"Polyethylene film packaging of citrus fruit: containment of decaying fruit" by C. R. Barmore, A. C. Purvis, and P. J. Fellers. J. Food Sci. 48(5):1558-1559.

"Florida citrus postharvest extension programs" by W. F. Wardowski and M. A. Ismail. Proc. Int. Soc. Citriculture pp. 837-840. 1981.

Twenty-third Annual Citrus Packinghouse Day Program

Available from Dr. S. Ben-Yehoshua, Agricultural Research Organization, The Volcani Center, P. O. Box 6, Bet Dagan, Israel

"High-density polyethylene wrap improves wound healing and lengthens shelf-life of mechanically harvest grapefruit" by A. Golomb, S. Ben-Yehoshua, and Y. Sarig. J. Amer. Soc. Hort. Sci. 109(2):155-159.


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