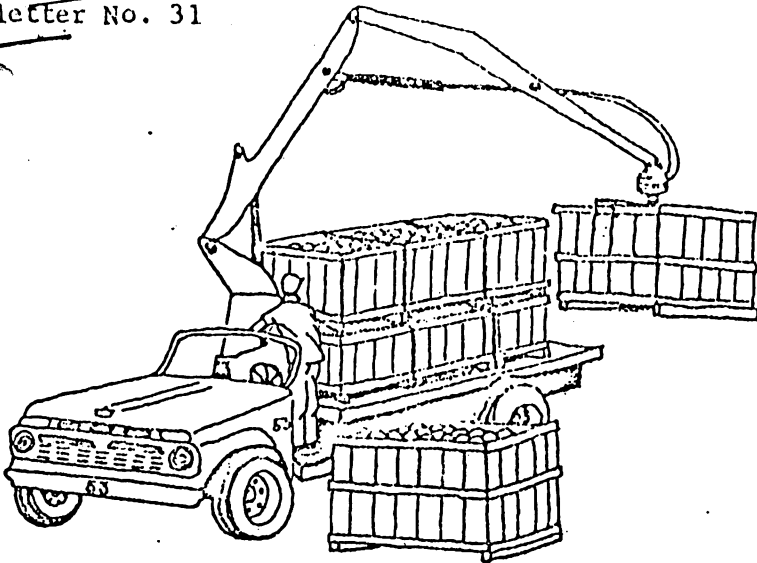


Citrus Station Mimeo Report CES 70-30
May 22, 1970
750-WFW-Lake Alfred, Florida 33850



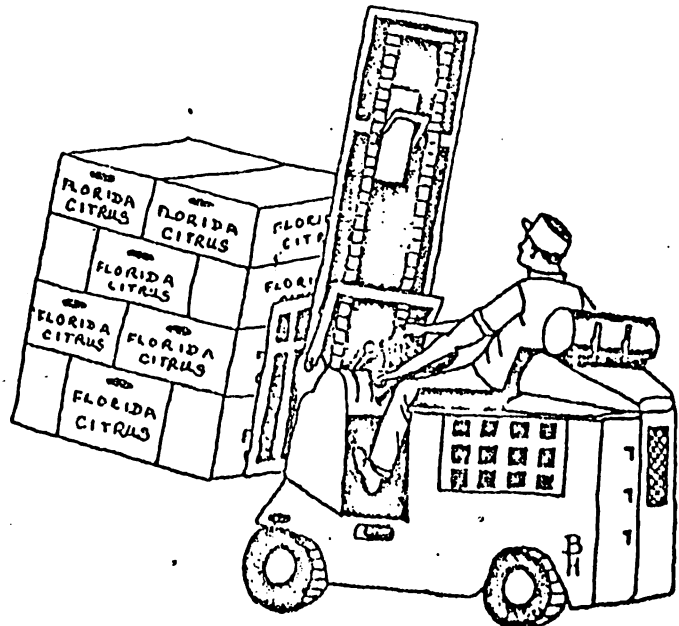
Editor: W. F. Wardowski
Harvesting and Handling Section*
University of Florida
Citrus Experiment Station
P. O. Box 1088
Lake Alfred, Florida 33850

Packinghouse Newsletter

UNIVERSITY OF FLORIDA INSTITUTE OF FOOD AND AGRICULTURAL SCIENCES

and

STATE OF FLORIDA, DEPARTMENT OF CITRUS



*Complimentary to members of the Florida Fresh Citrus Shippers Association. Others wishing to receive this newsletter must send a dozen stamped, preaddressed envelopes to the above address.

Harvesting and Handling Section

P A C K I N G H O U S E N E W S L E T T E R

RECOMMENDATIONS FOR COMMERCIAL USE OF TBZ

Thiabendazole (TBZ) has been used by several packinghouses during the 1969-70 season with good results. Samples of treated fruit, taken from these packinghouses, have been held with comparable check lots to determine the best methods for applying TBZ. No marked differences in decay control were found among methods of application.

Methods of Application.--Apply TBZ in water wax or as a nonrecovery spray. A recovery flood may be used but is not recommended because there is no rapid method for determining the strength of the TBZ suspensions. TBZ must not be washed or rinsed from the fruit after it is applied.

Solution Strength.--Concentrations should be 1,000 ppm whether TBZ is applied in wax or in a water suspension. The Food and Drug Administration has established a maximum residue of 2 ppm. Fruit treated with water wax containing TBZ at a concentration of 1,000 ppm have approached but not exceeded the maximum residue permitted. Water suspensions which are sprayed or flooded on the fruit usually leave a residue below 0.5 ppm.

Washing fruit.--Nonfungicidal, biodegradable detergents are available for washing citrus. If Dowicide A is used for washing fruit, it must be declared as a fungicide by appropriately labeling the containers.

Preliminary Grading.--To cut down the amount of fruit treated with TBZ, most of the grading can be done after washing (before color-adding and waxing). If your average packout is 60%, this would mean that 40% of the fruit does not need to be treated with TBZ. This should result in a better TBZ treatment and some saving in the amount of TBZ used.

Drying.--Fruit to be treated with TBZ should be washed and 'damp-dried' before applying TBZ as a nonrecovery spray or in water wax. It is not desirable to have fruit completely dry before TBZ application. A little moisture on the fruit will help to spread the fungicide. Where necessary, use absorber (do-nut) rolls to remove excess water before TBZ treatment. After TBZ is applied as a nonrecovery spray, excess water can be removed with sponge+rubber rolls if dryer capacity is not adequate. If drying capacity is adequate, fruit can go into the dryer without removing excess TBZ suspension. There is no danger of 'burning' the fruit.

After water wax is applied, fruit should not be brushed or rolled, except for a half turn about halfway through the dryer. Drying time will vary with particular wax, rate of application, and weather.

Labeling.--When TBZ is used, cartons and bags must be labeled to comply with the Food and Drug Administration regulations. A label might read: "Thiabendazole, used as a fungicide." Thiabendazole is the generic name for TBZ which should appear on the label. If Dowicide A or diphenyl are used, they should also be stated on the label. Individual bags must be labeled; hence, it is not necessary to label master cartons.

May 22, 1970

TBZ is the best postharvest fungicide for citrus fruit that is approved by the Food and Drug Administration. If it is properly applied, good decay control can be expected. Fungicides, however, can not take the place of good handling methods from picking through packing.

Dr. John J. Smoot
Market Quality Research Division
USDA
Orlando

Andrew A. McCornack
Florida Department of Citrus
Citrus Experiment Station
Lake Alfred

AN INJURYLESS ACCIDENT

A tire cage built by John Miller, Shop Foreman, Mount Dora Growers, prevented an accident from being a disaster. The tire cage was designed and built to contain tires while they are being repaired. The case of the exploding tire being contained and not causing an injury was reported to the April meeting of the Florida Citrus Safety Association. It could be worth your trouble to view Mount Dora's slightly bent tire cage, and build a similar safety device.

Will Wardowski
Extension Service
Citrus Experiment Station

NEW BULLETIN ON PRECOOLING

Those who visited the Citrus Experiment Station in the seasons of 1964-65 and 1965-66 will probably remember seeing a very large experimental precooler on a semi-trailer body at the back of the packinghouse. This piece of equipment belongs to the USDA, Transportation & Facilities Research Division and was here for cooperative studies on cooling citrus on a moving belt. The results of this have now been published as ARS 52-40, April, 1970. (See below.)

The following is taken from the summary of this bulletin:

"Tests demonstrated that fruit in open cartons or wirebound boxes can be effectively cooled with forced air in 30 minutes by maintaining sufficient temperature differential between the fruit surface and the airstream. During this period, the mean mass-average temperature reduction for all types and sizes was 33° F for fruit in open cartons and 38° F for fruit in open wirebound boxes. Closing the containers cut the cooling rate in half for the 30-minute period. The 30 minutes were adequate for cooling fruit in polyethylene net Vexar bags and in shrink-film tray packs, provided the tray packs were standing on edge. In these tests, the mass average temperature was reduced by 40° F. A comparable reduction for fruit in polyethylene film bags, or for fruit in shrink-film tray packs lying flat, required 45 minutes.

"Size 126 and 216 'Pineapple' oranges were cooled in open 4/5-bushel wire-bound boxes. The mass-average temperature of the larger fruit was reduced from 75° to 52° F in 30 minutes. The smaller fruit cooled to 44° in the same time, indicating the fruit size affects the cooling rate. This effect of fruit size on cooling rate is also demonstrated with tests of fruit in bulk. In these tests, specimen 'Valencia' oranges carried loose on the conveyor were selected at random for size and temperature measurement at entrance and exit from the precooler. Cooling rate was inversely related to both fruit size and duration of cooling period. Temperature drop was greater for size 324 in 20 minutes than for size 96 in 33 minutes. The difference between cooling rate by size was found to be statistically significant at the 5-percent level of probability for both the 20 and the 33-minute periods.

"Because of operating conditions encountered during these tests, much of the refrigerating effect was lost by infiltration of hot and humid ambient air and by unusually high solar radiation.

"Although the experimental precooler performed inefficiently, test results indicate that this concept of forced-air precooling has commercial potential for packinghouse "in-line" precooling of citrus fruit."

Will Wardowski
Extension Service
Citrus Experiment Station

TFFD, USDA, ORLANDO TO GAIN ENGINEER

Bill Goddard, Mechanical Engineer, will transfer from Hyattsville, Maryland to Orlando, July 1, 1970. Bill will conduct Transport Equipment Investigations to complement the packaging and handling work currently being carried out at the Transportation Research Branch, Transportation and Facilities Research Division, Agricultural Research Service, USDA, 2607 N. Orange Avenue, Orlando.

Mr. Goddard has the earned reputation of being a practical "shirtsleeves" engineer and has made several working trips to Florida since 1960, working with Russ Hinds. Bill said that he needs objective values for the design of equipment, and he will call on various segments of our industry for information and advice. Mr. Goddard plans to return our cooperation with better designed refrigerated containers (semi-trailers in this case) to insure correct commodity temperature.

We would like to take this opportunity to welcome Bill Goddard and his family to Florida.

Will Wardowski
Extension Service
Citrus Experiment Station

AVAILABLE PUBLICATIONS

Available from Transportation Research Branch, ARS, USDA, 2607 N. Orange Avenue, Orlando, Florida 32804.

"An Evaluation of Various Types of Disposable Pallets for Handling and Transporting Florida Citrus." by J. P. Anthony, Jr., and J. A. Rebentisch, Jr., ARS 52-43. March, 1970.

"Are Perishables too Perishable for Profit?" and "Progress on Problems in Mechanical Refrigeration," by R. F. McKee, Pacific Fruit Express. Refrigerated Transporter, April, 1970. pp. 36-38.

Available from Market Quality Research Division, ARS, USDA, 2120 Camden Road, Orlando, Florida 32804.

"Degreening of Citrus Fruits in Response to Varying Levels of Oxygen and Ethylene." by Otto L. Jahn, William G. Chace, Jr., and Randall H. Cubbedge. Amer. Soc. Hort. Sci. Vol. 94, No. 2, March, 1969.

Available from USDA, Foreign Agricultural Service, Washington, D. C. 20250.

"The Marketing Situation for Winter Citrus in Europe." FCF 2-70, April, 1970. 21 pp.

"Citrus Processing in Brazil." FAS M-215, March, 1970.

Available from Dr. Robert C. Rock, Agricultural Extension Service, Univ. of Calif. Riverside, Calif. 92502. (Limited supplies-first come, first served.)

"A Comparison of Costs of Loading, Shipping, and Receiving California Oranges from California to Eastern Markets by Selected Unitized Handling Methods." by R. C. Rock, March, 1970.

"The Citrus Situation and Outlook with Special Reference to the San Joaquin Valley." by R. C. Rock. Presentation at the Fresno County, AES, Bankers Seminar, March, 1970.

Available from Harvesting and Handling Section, P. O. Box 1088, Citrus Experiment Station, Lake Alfred, Florida 33850.

"Traitements des oranges contre les Penicillium avec des formules à base de Thiabendazole." by J. Cuillé and L. Bur-Ravauli. Fruits d-Outre Mer, Vol. 24, No. 9-10. 1969. pp. 421-424. We have typed on English translations for the summary and figures.

Program for South Florida Citrus Institute, June 2 and 3, 1970. 4-H Camp Cloverleaf, Lake Placid, Florida.

Available from three locations: Harvesting and Handling Section, Citrus Experiment Station, Lake Alfred, 33850; USDA/TFRD, 102 Agricultural Engineering Building, University of Florida, Gainesville, 32601; and Transportation and Facilities Research Division, ARS, USDA, Federal Center Building, Hyattsville, Maryland 20782.

"Forced Air Precooling of Citrus Fruit on a Moving Conveyor." by W. Grierson, A. H. Bennett, and E. K. Bowman. USDA, Agr. Res. Ser. ARS 52-40. April, 1970.