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PACKINGHOUSE NEWSLETTER

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CITRUS PACKINGHOUSE DAY

Don't forget Citrus Packinghouse Day, Agricultural Research and Education Center, Lake Alfred, Wednesday, September 3, 1980. Registration starts at 9 AM and the program begins at 9:40 AM. Arrive on time to purchase a lunch ticket and to get a seat. We had a full house last year in spite of hurricane David.

Editor

STATUS OF SOPP (DOWICIDE A) IN JAPAN

News accounts in mid-July that Japanese researchers have produced cancer in rats with 2% and 4% solutions of SOPP are causing some concern.

Ordinarily, we are reluctant to comment on something of which we have received only press or telephoned accounts. But since this matter affects a critical market for our fresh fruit shippers, we will make such purely technical comments as might be helpful.

1. SOPP, Dowicide A, Stop-Mold B, OPP-NA, etc. are all terms for sodium o-phenylphenate. This fungicide has been used world-wide for 20 or more years, not only on citrus but on deciduous fruits. (The Florida Citrus Commission patent for the "Dow-Hex" formulation was issued 6 April, 1954).
2. Solutions of SOPP are stable only in high pH (alkaline) solutions. As soon as SOPP encounters the low pH (acid) conditions in minute wounds on the fruit, it is precipitated as insoluble o-phenylphenol (OPP). Any SOPP remaining on the outside of the fruit is then removed at the rinse following washing. Residues of 10 parts per million are allowed (but a typical residue is about 1 ppm = 0.0001%) and any inside the peel can only be there as the insoluble OPP. **THUS THE CHEMICAL FED IN SUCH EXTRAORDINARY QUANTITIES TO THOSE UNFORTUNATE RATS WAS NOT THE FORM IN WHICH EVEN THESE MINUTE RESIDUES COULD REACH THE CUSTOMER.**
3. The above points are elementary chemistry with which we deal regularly. The following is scientific speculation. One of the major points of controversy in the banning of saccharin was that when fed as 3% of the diet, it precipitated in the bladder, could not be excreted, and so set up a totally abnormal irritant condition. Presumably SOPP would be precipitated as OPP in the bladder setting up a similar condition.

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FLORIDA U S DEPARTMENT OF AGRICULTURE, AND BOARDS OF COUNTY COMMISSIONERS COOPERATING

We cannot help but express our admiration for those Japanese rats for merely surviving the experiment. Diets including 2% and 4% of table salt would be bad enough, much less surviving such concentrations of a salt (SOPP) that is bound to precipitate as an insoluble phenol.

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A VALUABLE GUIDE TO MARKETING FRUIT IN JAPAN

One of the most useful publications we have seen from the Foreign Agricultural Service, Washington, DC (see available publications) describes the marketing of fresh and processed fruits and vegetables imported by Japan.

Three of the top five valued U.S. produce exports to Japan in 1978 were fresh citrus fruits (totaling \$124.9 million out of \$326.3 million) as shown in the following table.

"Leading U.S. fruit and vegetable exports to Japan (1978) (in millions of dollars)"

Lemons and limes	\$67.8
Grapefruit	\$36.2
Shelled Almonds	\$33.0
Raisins	\$21.9
Oranges	\$20.9
Onions	\$13.3
Potato flakes and granules	\$12.0
Canned peaches	\$11.1
Frozen french fries	\$ 8.4

Major Competitors: Fresh fruit and vegetables—Taiwan, New Zealand; canned fruits and vegetables—South Africa, Australia, Taiwan, Philippines."

Additionally, this 70 page guide includes the plant quarantine restrictions for each imported (or prohibited) type of produce, tariffs on fresh and processed produce, amounts of each item imported from the U.S. and other countries over six years, pertinent Japanese laws for imported agricultural products, the cost of each marketing step for the three types of fresh citrus listed above, and 13 pages of names and addresses of Japanese fruit and vegetable importers, associations and trading companies and a 4 page list of assistance for U.S. exporters.

This publication will be valuable to many people in citrus and other horticultural industries.

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GENERAL PRINCIPLES OF PACKINGHOUSE MACHINERY DESIGN

So much interest has been shown in Bulletin 803 (see "Available Publications") that it seems worthwhile to elaborate on some of the principles involved. These principles can be applied with little modification for most types of packinghouse machinery handling other types of fruits and even vegetables.

1. If a fruit is not going to make money as packed fresh fruit, get it off the line as soon as possible. From this it follows:
 - a. If packing only one grade, precede the washer with a mechanical presizer and follow it with a grader.
 - b. When you are packing a second grade, consider diverting No. 2 fruit into pallet boxes and running them over the same line after the No. 1's. It is usually cheaper in both machinery and labor cost.
 - c. Don't spend money unnecessarily on "eliminations" destined for the cannery. Fruit drying is energy intensive and chemical treatments (wax, fungicides, color-add) add costs and can lower the grade of cannery products, particularly cold-pressed oils.
2. Within reason, the shorter and wider the packinghouse line, the better. The packinghouse machinery is basically so many square feet of conveying surface and:
 - a. The length of the line is the major factor in the size of building needed and the cost of installation, particularly plumbing and electrical costs.
 - b. The wider the line, the less the cost of framing, the less the number of brush bearings, etc. (Much of the cost of the machinery is at the sides of the line).
 - c. For equal through put, the forward velocity of the fruit decreases; thus minimizing fruit damage and allowing for limited increases of line capacity.
3. Distinguish between time-dependent and time independent operations. Washing, drying, color-adding are time-dependent with some minimum time necessary. Dumping, fungicide application (except SOPP), sizing, packing are not time-dependent.
4. The capacity of each unit operation depends on certain characteristics of the type of fruit being handled. i.e.
 - a. Dumper---boxes of fruit per minute or hour.
 - b. Conveyor belts---the area covered by one box of fruit spread in a single layer.
 - c. Slat and roller conveyors---the linear length of a box of fruit lined up end to end.
 - d. Grading and packing---the number of pieces of fruit per box.

These values vary widely for the different types of fruit. They are given for grapefruit, oranges, tangerines, limes and lemons in Table 1 of Bulletin 803.

Once these values are determined, size and speed necessary to match each operation can be calculated from the formulas in Table 2 in Bulletin 803. Such values are given in both U.S. and metric measures.

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AVAILABLE PUBLICATIONS

Available from Dr. W. Wardowski, AREC, P. O. Box 1088, Lake Alfred, FL 33850

"Packingline machinery for Florida citrus packinghouses" by W. Grierson, W. M. Miller, and W. F. Wardowski. Fla. Agr. Exp. Sta. Bull. 803, 30 pp, December 1978.

"Marketing of Florida grapefruit in Japan" by H. Kitagawa and K. Kawada. Proc. Fla. State Hort. Soc. 92:241-245, 1979. (See Packinghouse Newsletter No. 108 for an article with some of the results in this paper. Editor).

"Quality standards for citrus fruits, juices and beverages" by W. Grierson and S. V. Ting. Proc. Int. Soc. Citriculture 21-27, 1978.

Available from Foreign Agricultural Service, Room 5918 South, U.S. Dept. of Agriculture, Washington, DC 20250

"A guide for U.S. exporters of fresh and processed fruits and vegetables to Japan" by M. L. Humphrey. FAS M-293. 70 pages. March 1980.

Available from Dr. J. Knapp, AREC, P. O. Box 1088, Lake Alfred, FL 33850

"Control of insects, mites and diseases of Florida's dooryard citrus trees" by J. L. Knapp, University of Florida, Extension Circular 139 G, 28 pages. April 1980.

"The citrus blackfly in Florida" by J. L. Knapp, R. V. Dowell, R. H. Cherry, G. E. Fitzpatrick and J. A. Reinert. University of Florida Extension Circular 475, 8 pages, undated, printed in 1980.



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