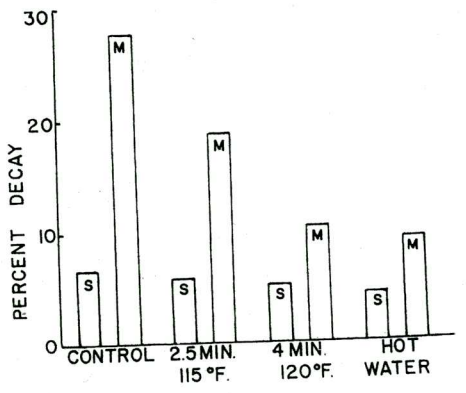

Figure 3. Effects of color-adding and hot water treatments on decay of Temple oranges by stem-end rot and mold at 17 days from packing.

similar reduction of decay by the hot water treatment indicated that a temperature effect was responsible rather than fungicidal action by any chemical in the emulsion.

Figure 3 shows the average decay due to stem-end rot and mold at 17 days from packing for control samples without color-add, for samples color-added for 2½ minutes at 115° F. and for 4 minutes at 120° F. The results of treatment with hot water for 4 minutes at 120° F. are also shown. No significant differences in stem-end rot are shown by the various treatments. Decay due to mold was appreciably reduced by color-adding for 2½ minutes at 115° F., the legal limits for Temple oranges and tangelos. Further reduction in decay by mold was shown for samples color-added at the legal limits for oranges of 4 minutes at 120° F. Hot water treatment for 4 minutes at 120° F. gave similar results. Reduction of decay by mold thus accounts for the improved keeping quality shown by color-added Temple oranges.

Summary

1. The color of Temple oranges is improved by color-adding but does not exceed that of natural-color fruit selected for best color.

2. Residues of Citrus Red No. 2 increase with time of exposure to the color-add emulsion but are well within the legal tolerance of 2 ppm.

3. Exposure of Temple oranges to the elevated temperature of the color-add emulsion results in appreciable reduction in decay due to mold.

Literature Cited

1. Ting, S. V. 1955. Determination of artificial coloring agents on oranges and in orange products. Proc. Fla. State Hort. Soc. 68: 157-160.

2. _____. 1959. Tolerance of 2 ppm for Citrus Red No. 2 on oranges. Fed. Reg. 24 (75): 2945, Apr. 17, 1959.

3. _____. 1962. Regulations, Fla. Citrus Commission, 105-1, 12, Sec. (13) p. 4, 5/1/62.

HARVESTING CITRUS FRUIT WITH AN INERTIA SHAKER

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For many years the concept of shaking trees to remove their fruit has been practiced in the commercial harvesting of nut crops such as walnuts, pecans, etc. Recently this concept has been adapted to commercial harvesting of prunes (6) and red tart cherries (5). At present, it is also being tried experimentally in peaches harvested for processing (3).

The commercial machines available may be classified as fixed stroke and inertia shakers, depending on the principle at work in releasing fruit from a tree. Usually a catching frame is employed in combination with the shaker to collect the fruit as it drops from the tree.

The authors (4) evaluated a fixed stroke shaker in 1958, and found it unsuited for citrus because of low fruit removal and poor maneuverability. Coppock (2) discussed the concept of a tree shaker and catch frame for fruit harvesting using an inertia shaker. The objective of the experiments reported in this paper was to provide additional information on the merits of this concept for harvesting citrus. Emphasis was placed primarily on fruit removal without much regard to the catching and collecting of fruit.

Experimental Equipment

The inertia shaker shown in Figure 1 was used in the tests. It employs the same inertia principle developed by Adrian and Fridley (1)

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