



CITRUS EXPERIMENT STATION

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Harvesting & Handling Section

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

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WHY, WHAT and WHEN

WHY    At various times there have been requests that we issue a newsletter from this Section in order to improve channels of communication on all matters of interest concerning the harvesting, packing and shipping of fresh citrus fruit. Until now, we have not done so, trying to use the usual trade journals within the Florida citrus industry. This has not been too successful because of the limited space that such grower-oriented publications can devote to packinghouse matters and because of the problem of deadlines when information needs to be communicated urgently.

Another problem is that the development of a considerable mailing list would be an unreasonable load on our hard working secretarial office. This is being avoided by offering to supply agencies such as the Florida Fresh Citrus Shippers Association with copies to mail out to their memberships. Others who wish to receive this newsletter can do so by sending in a supply of stamped and addressed envelopes.

WHAT    Intended subject matter will include three principal areas:

1. Emergency information: as when a critical period of decay or peel injury is observed to be developing.
2. Information about current research programs in which cooperators are needed or in which "information to date" may be useful to the industry, even though the program is not ready to be closed out and published as a bulletin, circular or scientific paper.
3. Reviews of topics of general interest. This issue, for example, includes a review on the current status of diphenyl in the Florida Citrus Commission's decay control program.

Although the results of research at this Experiment Station will naturally provide most of our subject matter, we hope to provide information on (or draw attention to) worthwhile developments from other sources.

WHEN    In order to avoid the problem of having to say something when we have nothing to say, we do not plan any definite schedule. The newsletter will be issued when we have something to pass on that might be of value. Between whiles, we hope to be like Brer Rabbit and "lie low and say nuthin'!"

W. Grierson, Head  
Harvesting & Handling Section

USE OF DIPHENYL FOR DECAY CONTROL OF CITRUS FRUIT<sup>1</sup>

Diphenyl, as formulated for use on citrus fruit, has proven to be very effective for controlling decay. The Food and Drug Administration has approved the use of diphenyl for all citrus fruits and hybrids thereof, and a tolerance of 110 ppm is established.

The effectiveness of diphenyl for citrus decay control depends on the concentration of diphenyl vapor around the fruit. Better decay control results if citrus fruit is packed with diphenyl in closed cartons (except tangerines) or if an entire room, truck or rail car is filled with packed, ventilated cartons containing diphenyl pads. Fruit packed with diphenyl is rarely soiled with mold spores because diphenyl prevents their formation. Two 11" x 17" diphenyl pads should be placed with each 4/5-bushel carton of citrus or the equivalent. Tangerines are an exception. Better decay control is obtained by packing with one diphenyl pad for each ventilated carton. Unlike other citrus fruit, tangerines may absorb enough diphenyl to exceed the Food and Drug Administration tolerance if more than one diphenyl pad is used per 4/5-bushel carton.

Porous paper impregnated with diphenyl is used in the following ways:

1. Individual fruit wraps.
2. Liners for boxes and baskets.
3. "Pads" to be placed in cartons with packed fruit or in master cartons with bagged fruit.

The best decay control can be obtained by first giving the fruit a Dovicide A-hexamine fungicidal treatment, following with a non-fungicidal wax. Then the treated fruit should be packed with one of the diphenyl sources listed above. The decay control obtained from this combination treatment is consistently better than either treatment alone. Gift fruit shippers should use this double treatment as their shipments are often slow in reaching destinations. If a Dovicide A-hexamine treatment can not be used, a fungicidal wax is recommended before packing the fruit with diphenyl.

The following table gives the average decay in check and treated lots of 'Hamlin,' 'Pineapple' and 'Valencia' oranges, including both degreened and non-degreened fruit, used in a series of experiments during the 1964-65 season. Diphenyl pads (11" x 17") placed top and bottom in 4/5-bushel ventilated cartons were the diphenyl source in these experiments.

Number of Experiments	Average Percent Decay 2 Weeks at 70° F			
	Check	Diphenyl Pads	Dow-hex*	Dow-hex* + Diphenyl Pads
21	20.2	10.3	7.5	4.1

\* Dow-hex = Dovicide A-hexamine

<sup>1</sup> Cooperative research of the Florida Citrus Commission and Florida Citrus Experiment Station.

If the holding temperature in these experiments had been reduced as little as ten degrees, the average decay would have been much less. After citrus has been removed from the diphenyl source, the decay control effect has been found to last for as much as a week.

Care of diphenyl pads, wraps and liners: Diphenyl is a volatile material. When diphenyl pads, wraps and liners are exposed to air, they lose their effectiveness. The warmer the air the faster the diphenyl leaves the pads. Store diphenyl pads in air-tight packages in a cool place.

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