UNIVERSITY OF FLORIDA
INSTITUTE OF FOOD AND AGRICULTURAL SCIENCES

COLLEGE OF AGRICULTURE AGRICULTURAL EXPERIMENT STATIONS AGRICULTURAL EXTENSION SERVICE SCHOOL OF FORESTRY

Harvesting and Handling Section CITRUS EXPERIMENT STATION

PACKINGHOUSE NEWSLETTER

POST OFFICE BOX 1088
LAKE ALFRED, FLORIDA 33850

No. 9 April 25, 1967

THE S.M.I. PRODUCE BUYERS' SCHOOL
April 2-7

NOTE: IT IS SUGGESTED THAT THIS NEWSLETTER WILL BE OF VALUE TO CITRUS SALES MANAGERS WHO WILL BE DOING BUSINESS WITH THE BUYERS WHO ATTENDED THIS SCHOOL.

Origin:

The Super Market Institute has instituted a series of schools for produce buyers to help improve the quality and volume of fresh produce handled in their stores. The first such school was held last year in Fresno, California. The second has just been conducted by the S.M.I. and the University of Florida. It started with lectures in Gainesville and traveled for a week down the length of Florida, visiting packinghouses and production areas, pausing for demonstrations, exhibits and lectures. Six faculty members participated, of which only one (Grierson) was in the field of citrus. Since I also covered the technicalities of refrigeration methods, it seemed possible that there was a certain loss of perspective in distinguishing between those principles that applied to vegetables, those that applied to citrus and those that were common to the two. (No wonder--these buyers were exposed to as much information in a week as many students get in a 3 credit course lasting a full semester.) I am, therefore, reviewing what was covered from the viewpoint of citrus and distributing this newsletter to all who participated in the Produce Buyers' School, as well as to our regular readers.

Major Benefit

The school started with a common complaint of "someone should do something" about various problems. It finished with an universal attitude of "Let's get together and do it better." The S.M.I. has now established lines of communication between the buyers, sellers and research workers that, in the long run, should help us move more and better fresh produce.

Major Complaints

Container breakage:

A talk by a representative of the Railway Perishable Inspection Agency precipitated almost universal complaints about container breakage.

For citrus, much of it seemed to concentrate on damage in the rear of truck loads--largely "piggybacks." Apparently many loading crews are not aware that in piggybacks (unlike over-the-road trucks) loads shift backwards as well as forwards. EVERY LAYER MUST BE BRACED AGAINST BACKWARD MOVEMENT.

Load stacking and temperature distribution:

There was considerable, even acrimonious, discussion on load stacking and uneven cooling (even heating) in the loads. It was a great pity that Russell Hinds (Transportation and Facilities Research Division, AMS, USDA, Orlando) was not present, as there seemed to be little comprehension of the bonded-block airflow stacking method and what it should accomplish. Certainly the RPIA slides did not look as though the instructions in his publications were being followed.[1]

Palletizing:

Several receivers wanted to know why they could not receive loads on disposable pallets as they do for some other commodities. This might be worth discussing, as it might also be cheaper for shippers who are handling on pallets up to the highway truck or piggyback.

Keeping quality:

Particularly in sideline conversations, these buyers were often very critical of the shelf life of our fruit, good shelf life being vital if they are to maintain the big displays, and have the repeat buying, that is essential to move large volumes of fresh fruit. I tried to spell out (both with words and demonstrations) that for Florida citrus the best protection is to use fungicides fully and (for consumer packages) use well ventilated containers. However, the overwhelming preponderance of vegetable interests usually meant that the single solution of more and prompter refrigeration received almost the entire emphasis. SEE COMMENTS BELOW ON RECOMMENDED PRACTICES FOR FLORIDA CITRUS.

Appearance of our fruit:

We came in for many criticisms on this score. The troubles can be classified as:

Grove origin:

On this, I will say no more than that we have our problems and they will be made worse by any attempts at expensive "economies," such as those

---

[1]Copies of these loading instructions are available from: The Corrugated Container Institute, P. O. Box 1752, Lakeland, 33802.

discussed under the heading "Parsimony Can Be Bad Economics" on page 29 of The Citrus Industry for March, 1967.

After harvest:

In this group, come the peel injuries that the trade usually incorrectly calls "gas burn," but which are almost entirely due to low humidities between the tree and the packing line.[2]

Flavor:

Contrary to a very general impression, we soon found that these buyers were acutely concerned about the flavor (as well as the appearance and keeping quality) of their produce. On this point, I think we came out rather better than did the vegetable shippers.

REFRIGERATION

Types of produce:

Before reviewing the refrigeration situation, attention is drawn to a very important distinction. That is to say between those products that die pathologically (i.e. of disease) and those that die physiologically (of just plain old age). This latter group includes fruits and vegetables such as celery, corn, apples, lettuce, that have a very high rate of respiration and whose useful life is terminated far more often by mealiness, shriveling and discoloration than by disease. For such products, very prompt refrigeration is critical.

Citrus fruits tend to die pathologically--almost always from a fungus disease. They respire very slowly (about like Irish potatoes) and their primary need is for protection against decay organisms. (In this, real help is on the way in a new FCC regulation that is being discussed and is expected to be approved. It would make correct use of a suitable fungicide arbitrary.) Refrigeration can be very helpful, but it does not play nearly as important a role (except possibly for tangerines) as it does for, say, corn or celery.

Another special problem of Florida citrus is that during much of the year refrigeration cannot be applied promptly, due to the need for ethylene degreening at 80 - 85° F for up to 3 days.

Types of refrigeration:

At this School, as in innumerable meetings and conferences in the past, there was endless confusion and obfuscation due to the use of

---

[2]For preventative measures see Fla. Ext. Circ. 286, May 1965 "Practical Measures for Control of Stem-end Rind Breakdown of Oranges." Request this if you do not have it.

various trade names for refrigeration methods.[3] Refrigeration research has been conducted virtually continuously for 20 years by the University of Florida and the USDA and most of it has gone unused because of this and (oddly enough) the attitude of certain buyers' representatives whose slogan has been "cold fruit is old fruit." This attitude seems to be passing, but the confusion due to insisting on various trade names, instead of just "adequate refrigeration," still persists. All advertising to the contrary, the only practical approach is to deal in terms of pulp temperature and leave it to the shipper and his advisers to work towards a desired standard without being hampered by the arbitrary use of trade names. BUT BUYERS PLEASE REMEMBER THAT ALMOST ANY FAIR SIZED FLORIDA PACKINGHOUSE IS A MILLION DOLLAR INVESTMENT THAT CANNOT BE CHANGED QUICKLY OR INEXPENSIVELY. In the past, many shippers have been gravely discouraged by the failure to command a premium for pre-cooling with which to help pay for very expensive refrigeration installations.

SPECIFIC RECOMMENDATIONS FOR IMPROVEMENT OF SHELF LIFE OF FLORIDA CITRUS FRUITS[4]

1. Time between the tree and the packing line should be kept to a minimum.

2. During this period, humidity is far more critical than is temperature. Provide shade, if possible, prior to reaching the packinghouse (particularly for early and midseason oranges). In the packinghouse, keep humidity high (approximately 90% R.H.) where possible. Use live steam in degreening rooms to maintain humidity and keep ethylene levels down to 1 - 2 parts per million. (See Newsletter No. 5.)

3. Do not polish fruit if it can be avoided. Where polisher-driers <u>are</u> used, keep air temperature as low as possible.

4. Use of a FDA approved fungicide, properly applied, will reduce decay by (on the average) about 80%.

5. A good wax job is essential for both shrinkage control and persistent shine.

6. Shipping containers must be ventilated unless diphenyl pads are used. With tangerines, containers must <u>always</u> be well ventilated (i.e. openings equal to 7% or more of inside area), even when diphenyl is used.

---

[3] Sorry, I do not intend to repeat any of them here. We have no funds for legal fees!

[4] Virtually all of this is covered, in much more detail, in Fla. Bul. 681 "Better Handling of Florida's Citrus Fruit." This has been distributed to all shippers, but additional copies are available.

7. Optimum shipping temperatures vary with the type of citrus, but usually most of the gains have been made by getting down to 50° F.

Oranges can be cooled with benefit down to 34° F, but this is usually only economical for long holding periods.

Tangerines should be refrigerated as fully as possible, even when fungicides are used. They can go down to 32° F with benefit if they are to be kept refrigerated after arrival.

Early grapefruit should not be cooled below 55° or late grapefruit below 50° for fear of surface pitting.

Limes and lemons should not be cooled below 50° F.

CONCLUSION

In conclusion, I would like to take this opportunity to say that it was worth going through a rather rugged week in order to meet the 52 buyers who are now added to our list of friends and cooperators, instead of being mythical ogres who "insist" (all research to the contrary) on over-polished fruit, shipped warm in outlandish containers!

If any of you wish to receive this Newsletter in the future, just send a dozen stamped, preaddressed envelopes. We have no fixed publication schedule, writing when we have something to say and, between whiles, we follow Brer Rabbit's advice and "Lay low and say nuthin."

Bill Grierson, Head
Harvesting & Handling Section
Citrus Experiment Station