Methods of Packing and Shipping Citrus Fruits

L. B. Skinner

Mr. Hume: This subject of packing citrus fruits is somewhat time-worn and it is a very difficult matter to get a report from a committee that gives us something new and something to attract our attention. I think that has been accomplished in this case.

Mr. Skinner: I had a letter from Mr. Warner saying that he could not be present, and Mr. Burbank does not seem to be in the audience, so I suppose my paper will represent the whole committee.

In this connection I want to emphasize one thing, and that is, that a man who puts up a poor pack not only hurts himself, but he hurts the reputation of the Florida orange, he hurts the reputation of every man putting fruit into the market where he disposes of his poorly packed fruit. That is not the worst phase of it. If a buyer gets hold, in a single instance, of this poorly prepared fruit, he is going to turn, next time he is in the market, to other fruit. If much of this poor stuff goes to a market, that market is sooner or later going to be closed to us. We can obtain the result we want only by every man putting his fruit into the market in the shape it should go in. I think we ought to have a discussion about that, and a live one, too.

Mr. Sample: I would like to ask Mr. Skinner about this withertip. I am not very familiar with it. That is, what is the evidence shown on the fruit?

Mr. Skinner: You had better visit that room where the citrus disease exhibit is, and spend an hour in it. There is some withertip fruit in there.

The first evidence on the fruit is the "tear stains," and once in a while you will see little brown spots on your June bloom oranges late in the season. But if you have a car of withertip fruit go to the market and come back to you, you will think all the oranges have smallpox.

Prof. Rolfs tells me we had some trouble with it early in the season and then it disappeared, and then about the first of February, the trees were ripe for it and it got in its work again. You have to fight against it, and be prepared for it all the time, so that it will not catch you napping. You can always tell its presence, first by the "tear-stains," and when you see these you had better get busy. I suppose every grove in the state has it, more or less.

Mr. Penny: How much bluestone do you use in the washing water?

Mr. Skinner: I don’t remember exactly the amount now. I have it in my packing-house, written up in big letters on the wall. Mr. Ramsey knows; he can tell you the exact proportion.

Mr. Hart: I would like to ask Mr.
Mr. Skinner: The tanks are made of wood. I do not think the permanganate of potash, however, affects metal. The difficulty in using the permanganate of potash is that where you have whitefly and soot, and much dirt, the permanganate loses its strength and becomes worthless. Of course, it is all right if you renew it occasionally. I use permanganate on my grapefruit and bluestone on my oranges.

Mr. Derby: What would be the effect if your fruit was first washed and then put through the bluestone bath?

Mr. Skinner: I should think it would be better.

Mr. Derby: I should think it would be better to get the dirt off first. That would save your bath from getting so very dirty.

Prof. Rolfs: In connection with the washing of the fruit, I would say that the method just spoken of is one of the first arrangements designed for preventing anthracnose in transit. You understand that anthracnose may attack the fruit on the tree and infect the fruit before it is picked. In that case, all the after-washing will be that much time wasted. You cannot affect it after it has gone into the tissues.

We found in 1893 a great deal of anthracnose was affecting the lemon in the coloring bin and we perfected an arrangement where the ammoniacal solution of copper carbonate was sprayed onto the lemons after the washing was done. After they fell onto the drying rack, the spray came down upon them in four jets; wetting them thoroughly with the ammoniacal. We found that to be the most effective way of preventing the "in transit" infection.

Mr. President, Ladies and Gentlemen:

What is to be accomplished?

First—Freedom from decay.

Second—Attractiveness of the package.

How can these best be done, and not sacrifice either one to the other, or at least make it on a practical basis.

We know the dangers which so easily ruin our best efforts; they hang over us and lurk around us, all the way from the tree to the consumer; and mechanical injury, blue mold, stem end rot, withertip, and the warm, moist, still days, when not a leaf is stirring on the trees and hardly a breath of air in the packing house, unless we compel it—these are our main enemies.

Knowing these dangers, we have got to go to work and plan our campaign carefully, securing the best assistance possible.

MECHANICAL INJURIES

This danger is one that is within our control, depending on the care we are willing to exercise throughout this journey of the fruit from the tree to the box. Rest assured that extra care is its own reward, and carelessness is its own undoing.

The Government workers have demonstrated this conclusively to us, but it would seem as if they would have to keep
everlastingly at it, day in and day out—in the field and in the packing house.

Closely linked with the danger of mechanical injury is blue mold, and blue mold is most active on warm, moist, still days. Then the stem end rot, a new menace, and the withertip, a dangerous enemy of the grapefruit grower, should always be kept in mind, as they will get him if he “don't watch out.”

Bearing in mind these dangers, we conclude we must have a method of packing that will handle the fruit without a drop, a blow, or even a rapid motion, that will injure the fruit, from field to house. From the standpoint of avoiding decay, one could pack the fruit right from the tree, but it is not practical.

Mr. Ramsey is a very particular man, condemning even the running of fruit on a runway at more than a snail’s pace. I believe the fruit should not drop—that it should be handled by motions as slow as possible to attain the results aimed at.

WITHERTIP

Withertip is a trouble that may cause a great deal of injury to fruit in the house and in the box, and must be carefully guarded against. Unlike blue mold, it thrives in cold, damp places, such as cellars and moist, cold storage plants.

I remember talking with a prominent grower some years ago when he was packing his grapefruit. He was washing it, and packed up several cars and sent to Boston. By the time the first car had arrived he had packed several others. He recived a wire, that practically the entire shipment had gone bad, and the next car the same.

He said, “I shut down and sent for Prof. Rolfs.” They began to investigate, and found that the trouble was caused by the withertip, that had been spread by the washing water to all the fruit shipped, from some that had it on the tree. They treated the water with bluestone, and the trouble was remedied by killing the spores.

This season the foreman in one of my houses failed to treat his tank of water with bluestone, at a cost to me of perhaps two thousand dollars, caused by withertip. Care costs a few pennies here and there, but carelessness and forgetfulness costs dollars and dollars.

The withertip attacks fruit even after it leaves the jobber and goes into cold storage. One packer tells me that two weeks after his fruit had gone into cold storage, brown spots developed and almost ruined the car. I think that Prof. Rolfs could give us some interesting talks on that.

By the way, in talking with Prof. Rolfs a few minutes ago, we were discussing the citrus exhibit which is in that little room, and I asked him why it was not possible to have the photographs printed in the form of a bulletin and gotten into the hands of the men who had our work to do, superintendents and managers. We cannot get our men who do the work to realize the danger. Prof. Rolfs said, he was going to try to do it this year—get such a bulletin printed on paper about the size of this paper from which I am reading, have the photographs about full size. I asked him what the
expense would be and he said about $250. —he did not know whether the State of Florida could afford it. I told him I would be willing to pay my share of it, and knew every other packer would be willing to have it done, and without delay. I will say that, if necessary, I will be responsible for raising that $250 in an hour’s time, because I think everyone realizes the necessity of having something like that in every packing house. I will personally stand responsible for $50. or $100. Prof. Rolfs had better get busy, and if this grand old state of ours cannot raise that $250, we can.

It is important, and not always easy to get men to realize the imperative necessity of greatest care possible, and never to let up on it.

Unfortunately, to get our attractive package, one that will sell—we must wash our fruit, at least all whitefly sections must do so, and to avoid decay we must have perfectly dry fruit to pack.

Washing has been a problem that has confronted us all, and several people think they have solved the problem satisfactorily. Preliminary to the washing machine there are at least two systems. One is a soaking tank, and the other is a rack with the water spraying on it as it rolls down an incline, or moves along on a belt or chain.

Personally I prefer the tank method, because I can more easily handle the fruit, and because I can treat the water with bluestone, and last, but not least, because I can pick out with unfailing accuracy, all the light fruit—the fruit without juice—as it floats up to the elevator. I would not be without this feature in a packing house for any money.

Several years ago, a prominent fruit man was getting big prices for his fruit; all his fruit in large markets—he led the market. I took the train and went to see why. I found a large portion of the secret was in his water tank, by means of which he was able to eliminate dry fruit and pack only heavy, juicy fruit. The light fruit was thrown away.

No man can tell whether a fruit is light or heavy, after he has been trying to do it for a couple of hours, but water does not get tired, and the law of gravitation is always on the job. The water in the tank should always be circulating.

From the tank the fruit should be taken up by an automatic elevator to the washing machine, and it should be an elevator that does not drop the fruit, but lets it roll away easily to the washer. From the washer—which should be one that cleans, but does not injure—it should go to a drip chain and thence to the dryer.

The dryer problem is the packing house problem that confronts us today. There is no trouble in drying fruit with power and heat, but to do it economically, and to do it in that dangerous, warm, moist, still weather, is another matter.

When the hygrometer shows that the air is 100 per cent moist, how are you going to get it to take up more water? There is only one way, and that is by heat. Supply heat, and you can dry them; and I believe that if fruit is dried dry—bone dry—it will carry well in moist weather, and that the danger of wither-
tip infection is much lessened.
Recent experiments with dryers show that the dryer that revolves the fruit all the time, is the very best possible arrangement. The difficulty we have been up against before has been that the fruit would dry on top, but not underneath. A dryer to be effective, I believe, should turn the fruit and blow air on it at the same time.

Also we must have capacity. The amount of air necessary to dry a car load of oranges would astound you.
I believe also, that this air that has been blown over the fruit should be carried out doors by a supplementary system of ventilators or exhaust fans, drawing new air into the house.

Having dried the fruit dry, then comes the matter of grading, and I believe a grading belt that turns the fruit will also be the coming grading belt. The grader can see at a glance defects that he would have to pick up an orange and turn it over to see, and failing, it would pass by.

The grading will be taken up by another committee.
All fruit should of course be wrapped, and with a twist, and with at least printed wraps on the top layer. The box should be the hoopless box, with a three inch cement coated staple to fasten the center of lid.

And lastly the box—the package—should be as attractive as it can be made with Brand and Grade well marked.

DISCUSSION

Mr. Stevens: Mr. Hart, as you are one of the committee on the "Uniform Grade known as the Florida State Horticultural Society Grade, can't you give us your report?

Mr. Hart: I think there is some little misunderstanding between the rest of the committee and myself. Mr. Skinner wrote to me, as he was chairman of the Committee and asked my ideas in regard to the matter, and I replied, giving him my ideas upon it. I had them fully in mind then, but let the matter drop, supposing it would be embodied in the report already given as a report along.

My main idea was this: That as fruit from different groves is of a different class entirely, and sometimes different sections of the same grove will produce different grades of fruit, some of it being of a fine grade and some being coarse, the same requirements will not fit all conditions. In grading the different classes of fruit, there is almost sure to be a great difference in the results. Coarse fruit will be graded low; I mean by that, that the fancy grade of the coarse fruit will be much below fancy grade of the finer class of fruit.

As a general thing, it is very difficult to teach the graders the method, and train their eyes so that this will not be the result.

Now, I suggested as the most feasible method of getting them down to a correct way of grading, to get their fruit all alike as far as may be possible, that photographs be taken of what should be classed as fancy fruit. It is graded into three grades, fancy, number one bright, and number two, make two or
three photographs of oranges of each class; then have these enlarged and have them framed and put in shape so that they can be posted in each packing-house. Then you have something to refer to. It seems to me that in that way you can come nearer to a uniform method of grading your fruit than any other way.

I have here photographs taken by Prof. Webber—or possibly by Prof. Hume—for illustrating matter for the Agricultural Department of Washington in their Year Book. You cannot all see this because it is small, but here are two photographs of two oranges of the fancy grade; one taken equatorially and the other facing the stem end. In that way, they are almost a perfect fruit. You cannot get perfect fruit, however, on a commercial scale, but you can approach it.

The second two oranges are the Number One grade, showing more or less of marks and blemishes. The third are the Number Two Brights, and are all of the marketable fruit below the Number One grade. The Fancies are really the finest of all and take a very fine class of fruit. The Number Twos are so badly marked you cannot class them as a middle grade, which is the Number One. Below that, of course, is the culls.

Now, by having the pictures made in colors, of good size, that could be posted in every packing-house, it seems to me it would illustrate the matter and bring it right before the eyes of all the growers in such form that it would give them a very correct idea of what constituted a fancy orange, of the middle grade, of Number One Bright, or whatever you call it, and the lowest grade, and what constitutes a cull.

In a letter to Mr. Skinner, I went into this matter more in detail and, perhaps, covered more ground, but I had so much on my mind of late in matters of considerable importance, that I am not this afternoon prepared to go into it further. I offer my remarks simply as a suggestion. It seems to me a practical one, if I may be allowed to say so, and one that comes nearer to bringing us all into line, if you have to have one system of grading. I leave it with you to discuss it or not, as you choose.

This is the only photograph I have, but I will leave it here on the desk and I hope it will not be destroyed nor lost.

UNIFORM GRADING OF FRUIT.

R. P. Burton

Mr. President, Ladies and Gentlemen:
I have not prepared any paper on this subject. I shall discuss it from a purely commercial point of view. The question of grades is one that has been in a constant state of evolution for a good many years. In former days in Florida, the general