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# Oregon Agricultural College

## EXTENSION DIVISION

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### HANDLING THE FRUIT CROP

BY

C. I. LEWIS AND W. S. BROWN



JANUARY, 1914

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### HANDLING THE FRUIT CROP.

In times past the watchword of the fruit grower has been production. He has striven to produce the largest quantity of fruit of marketable quality, and has left the selling of this fruit to his local dealer or the city commission man. In many instances he has not known the real needs of his market, and in others he may have suffered at the hands of some unscrupulous dealer. Often he has seen the profits from a large crop melt before his eyes like dew before the sun. Adversity and disappointment have taught the farmer many things, one of which is that he must master the conditions of his market either by himself or through his direct representative. Standardizing his pack, efficient advertising of his goods, wider distribution and greater consumption of fruit, and the organization and co-operation with his fellows for the common good, are some of the problems he is facing. To help him solve these problems, is the object of this bulletin.

The fruit industry, like every other, is influenced by conditions of business surrounding it, and has its periods of depression. During the past sixty years the apple business has had several such periods, followed by good prices and renewed interest in the industry. In most cases the man who held on and kept up his orchard came out well in the end. The last census showed a decrease of one-fourth of the bearing apple trees in the United States since 1900, and nearly 16% decline in the number of bushels produced. The total amount of tree fruits increased during that time only 1.8% while the population of the United States increased about 21%. This situation is especially interesting to the Pacific States, as 21.4% of all their agricultural crops are fruit and nuts combined.

Of course, before satisfactory results can be obtained in marketing, it is necessary to have a good product to market. This means skillful growing and careful handling. The specimen of fruit is alive, so to speak, and must accordingly be handled very carefully. Its commercial life will depend very much upon its method of handling. From the time the fruit bud forms until the fruit breaks down from natural decay there is a constant evolution. The development of a fruit on the tree is influenced largely by soil, climate, etc.

Its ultimate commercial worth depends to a very large extent on the time it is picked and the manner in which it is handled from the time it is picked until it is consumed. To get the most out of our fruit crop we must not only study such factors as markets, better distribution, and methods of sales, but we must make a careful study of all the factors influencing the fruit from the time it leaves the tree until it is consumed.

## PICKING.

**The Apple.** Picking is one of the most important phases of getting the apple upon the market. It has a marked influence upon the keeping qualities, color, size and flavor of the fruit. Too much attention is frequently given to getting depth of color, and, as a consequence, over-ripeness, caused by the fruit hanging too long upon the tree, is very often the result. The time of picking is influenced very markedly by the variety, climate, soil, elevation, shipping distance, and season. Apples may be divided, according to their condition at maturity, into several different classes.

Among the apples that drop when they are ripe, we may mention the Grimes Golden, Wagener, Wealthy, and Winesap. Other apples that drop before they are ripe are such varieties as the Gravenstein, McIntosh, and Snow. Many apples that hang too long on the tree develop core rot, and we find that the Jonathan, Gravenstein, Delicious, and Ortley come under this class. Others, if they hang too long, get mellow or soft after picking, and have a short season of consumption. In this class we would include such apples as Jonathan, King, and Baldwin. Some varieties, such as Early Harvest, Duchess, Red Astrachan, and the Jonathan are troubled with cracking at the calyx. On the other hand, there are varieties like the Spy and Ben Davis that may hang after maturity before picking. Summer apples should be picked green for shipment. They should have some color, but should not be soft. These varieties drop badly if too ripe. The grower himself must be the judge of his local conditions of season, soil, shipping distance, and the like.

The time of picking has a marked influence upon the color of all apples. The yellow and green colors change after picking but the reds change very little. With many varieties it will pay to make several pickings; especially is this true of red and striped varieties. The increase in size and added depth of color gained by leaving the immature fruit for a second picking more than repays the grower for the additional trouble. Summer apples usually attain their best flavor upon the tree, but late fall and winter apples are better some time after picking.

**The Pear.** Most of our commercial varieties of pears, if allowed to mature on the tree, become granular, and also have a tendency to develop core rot. In order to have juicy, fine and smooth grained fruit, it is necessary to harvest the pear while it is still hard and green. The most common practice has been to recommend that the pear be severed from the tree as soon as the stem will separate easily from the spur by giving the wrist a gentle twist. In some cases it is recommended that the pears be picked when they reach a certain diameter. With some pears, at least, it will be found advantageous to pick the fruit over an extended period. The Bartlett, for example, can be

picked over a period of six weeks, and where an extended period like this is allowed, the total weight of the fruit gathered from the trees is very materially increased.

Occasionally pears are picked by clipping the stems with scissors or knives. This is done in order to place the fruit on an early market and thus reap a fancy price. If the fruit is picked too early, however, it will be very insipid, and tend to shrivel; it will have a tendency to scald; and the texture will be leathery. As concerns the Bartlett pear, recent investigations conducted in the Rogue River Valley by the United States Department of Agriculture have shown that it is better to allow the pears to hang from ten days to two weeks longer than is now the common practice; that when this is done the fruit becomes larger, develops a better quality, and keeps better.

**The Peach.** It is very hard to give explicit directions for picking the peach, as so much depends upon the individual judgment of the grower. The fruit sells best when it shows the highest color, but for long shipments fruit highly colored would be too ripe and "fall down." Peaches are picked for shipment when the greens begin to shade to white or yellow. The freestones will feel elastic under a slight pressure of the thumb on the suture side. The fruit should be in a hard ripe condition. Be careful not to rub off the bloom, or soil the fruit, or pile deep enough for fruit to bruise, as a "mussy" appearance means a much lower sale price.

**The Plum and Prune.** As this class of fruit always improves in flavor by ripening on the tree, it is best to let it hang as long as distance of shipment will permit. Plums can be tested for maturity much the same as the peach, by slight pressure of the thumb on the suture side. The bloom should be disturbed as little as possible and the fruit should never be dumped in piles or be left in deep baskets before packing.

**The Cherry.** The color, size, and taste are the main guides to the picking of this fruit. When the fruit is sufficiently mature to fill the ordinary packs in a 10 lb. box it will be colored enough for shipment and the taste will improve as the fruit colors on its way to the consumer. Cherries are easily bruised, and the lighter varieties, especially, show such bruising badly when packed. They should be picked by the stems and handled only as much as necessary for packing. Cherries heat easily and should never be piled more than 3 or 4 inches deep. Many sent to the cannery are ruined by being placed in too deep receptacles.

**Fruits Picked Stems On.** Apple, Pear, Quince, Strawberry, Plum, Cherry, Currant, Gooseberry.

**Fruit Picked Stems Off.** Peach, Apricot, Bush Berries.

### PICKING OPERATIONS.

One of the first lessons a foreman must give a picker is to tell him not, under any circumstances, to bruise or puncture the skin of the fruit or to rub off fruit spurs or injure the tree in any way. If the fruit is bruised or punctured, it soon decays, and thus, losses which are attributed to the commission man are often the fault of the fruit grower himself.

The organization and distribution of labor is always a problem of orchard management. In picking, it is usually advisable to divide the pickers into crews, giving to some of the older men and to the women and girls the job of picking from the lower branches which they can reach from the ground or from short step ladders. The fruit on the upper branches can be picked by another crew working on taller ladders.

The ladder should never be leaned into the tree, if it is possible to avoid it. Fruit spurs often cover the ground under such conditions, and not only is the crop for the succeeding year damaged, but openings for disease are left in the tree itself. The act of picking is a very simple one. A simple twisting movement up and down on the fruit removes it from the spur without loss of stem, and this easy removal is usually a fair indication of the maturity of the fruit. There are some special varieties, notably the Ortley apple, which very often, though mature, break their stems and puncture the fruit, if not carefully handled. The stem may be broken without hurting the salability of the fruit but should never puncture the skin or be pulled out of its socket.

**Picking Pails.** The receptacle selected for picking should prevent all bruising, as far as possible, and should give ease in handling. Theoretically, it would seem that bags or canvas bottom pails would be the best for picking, but, practically, such is not the case. There is a bad tendency among pickers to let the fruit fall into the receptacle and, unless this fruit can be heard by the foreman as it falls, there is no way to prevent consequent injury. Bags allow the fruit to be damaged by not protecting it against bruising when coming in contact with ladder or tree. When the bottomless bags are used the pickers very frequently will allow the fruit to shoot into the field box when emptying, thus causing damage.

A galvanized pail about ten inches high and narrow enough to fit down into the apple box when it is emptied, so that the apples can be poured into the box very carefully without bruising, is a good one for this purpose. Such a pail should have a hook attached to the bail for hanging on the ladder or tree limb. Several so-called bottomless pails have been constructed of galvanized iron, or tin, which allow the fruit to be emptied into the bottom of the box and the pail to be lifted without rolling or bruising the fruit. Some of these pails have

merit, and, where not too expensive, should be money-savers for the grower. In the case of peaches and plums and other stone fruits, shallow pails or baskets should be used, as these fruits bruise easily when piled one upon the other to any depth.

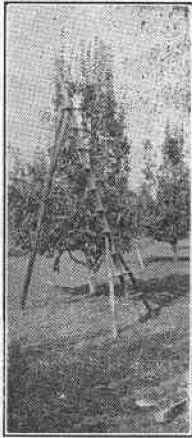


Fig. 1. The Japanese Ladder.

**Ladders.** There are many different types of ladders, some of them very awkward and clumsy. A ladder should be light and easily handled, braced strongly, and so constructed that it will not tip over easily. All joints should be tight so that there will be as little wobble to the ladder as possible. For picking the lower parts of the tree the short step ladder, three or four feet high, and made rigid, is good. For lighter work, the tripod step ladder is fine. It combines lightness with ease of operation, and is also very strong and solid. In some sections the so-called Japanese tripod ladder is used to quite an extent. Other ladders, such as the rail ladder, consisting of a single strong stake with a wide base and rounds projecting from it, are used for very high work. In the East the wire apple picker is sometimes used to pluck some of the very highest apples growing in the center of the tree; but in the Northwest these pickers have been needed very little as yet because our trees are lower.

**Picking Boxes.** The picking or lug box should preferably be somewhat larger than the packing box, in order to keep it separate from the latter. This size also has the advantage of holding about a packed bushel of apples. The box should have slits cut in the ends so that the fingers may enter for lifting the box, and these ends preferably should be higher than the sides so that as one box is set upon the other there will be no jamming of the fruit.

Some orchardists have a very light portable stand which pickers working on the ground among the lower branches take with them for setting the picking box on. The picker then does not have to stoop to deposit his fruit in his box, and bruising is minimized.

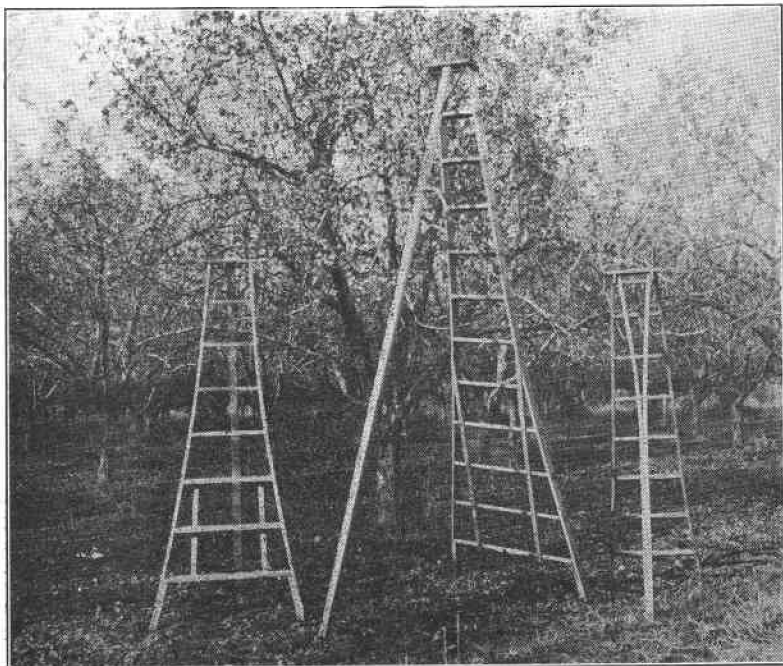


Fig. 2. Tripod Picking Ladders. Two Types.

**Orchard Trucks.** Orchard trucks should be low for ease in loading; should be easy riding; and preferably should have a cross reach so that the rear wheels follow in the track of the front wheels in turning sharp angles.

#### GRADES AND GRADING.

**The Apple.** Nowhere is lack of uniformity seen more strongly than in the grading of Northwestern apples. There are several faults of the present system which can be pointed out. For one thing, the grade names are often meaningless or misleading. It is unfortunate that the two best varieties from the same locality should often have such names as "Choice" or "Fancy." The buyer does not realize the difference between the two grades unless he is familiar with the brand,



and very often is confused in his purchasing. Then, again, the same name sometimes is used for different qualities of fruit in different sections of the Northwest. For instance, "Extra Fancy" and "Fancy" are the two higher grades of apples in one section, and "Fancy" and "Choice" occupy these relative positions in another region. The buyer, if he compares the grades from the two different localities, is naturally confused.

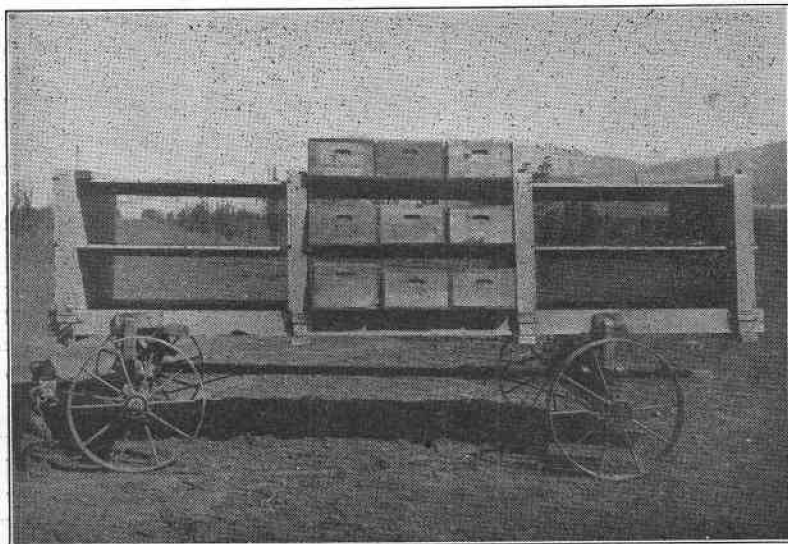


Fig. 3. Orchard Truck with Platform.

We need uniform standards in regard to grades, not only all over the Northwest but all over the United States as well. Such organizations as the Northwest Fruit Exchange and the North Pacific Fruit Distributors can do much along the lines of standardizing our grades and acquainting the markets with them. It seems to the writers that too many grades are being shipped east. It is poor business policy to sell our common grades of apples or other fruit in New York City, for example, and pay \$1.00 per hundred freight, when apples and fruit just as good can be grown and shipped into New York City on a freight charge of from 10c to 25c per hundred. It would seem that the grades, in apples especially, should be slightly broadened and made more elastic, so that all fruit good enough to ship east can be included in two grades, at the most.

It is very doubtful if it will be found profitable to send from the Pacific Coast to the Atlantic seaboard and European points more than

two grades of apples. During certain seasons, when the crop is very light, it will pay to make more than two grades, but under normal conditions it is doubtful if the practice will prove profitable, at least under present conditions of packing and marketing.

The third grade should be used largely for home purposes and for shorter shipping distances. We would suggest that the greater bulk of the crop be thrown into two grades; that the first grade should have fruit of high color, free from blemish, of normal shape and development. We would suggest further that the question of size be treated in a broad way; in fact, in a much broader way than has generally been the custom on the Pacific Coast. An investigation will show that the question of size is a very variable market requirement, and frequently changes from season to season.

The second grade we would allow for fruit which is not of such high color, and which has certain minor blemishes and imperfections. In this grade, also, we would allow a wider leeway of size than is the custom.

**The Pear.** During normal seasons very few grades of pears are made, the pears being packed like apples, largely according to size. In many varieties of pears the color requirement is not as important as it is in the apple. True it is, that with certain varieties a typical color is necessary to realize the fancy prices.

Probably not over two grades of pears should be made. There may be certain seasons, however, when a special grade of pears will be warranted. This special grade will include frost marked or otherwise slightly imperfect specimens. When the pear crop of the country is light such a grade can frequently be handled profitably. During a season of a heavy crop, however, it would be much more satisfactory to utilize such grades for evaporating or canning.

**Peach, Plum, and Cherry.** With the stone fruits, including the peach, plum, and cherry, there should be but one grade for shipment, depending upon quality. This grade should be subdivided into different sizes suiting the variety to be shipped. Fruit suitable for shipping should be normal in color and shape, should be practically free from insect and fungous trouble and should not have bruises, skin punctures, split pits, limb rubs, or other blemishes. Peaches are usually graded into three sizes for shipment, and the balance left for home consumption and canning.

In one section of the state, where a great many fine peaches are grown and shipped, they divide the grades into "Fancy" peaches, 64 and under to the box; "grade A," those running from 64 to 80; and "grade B," running 80 to 92 to the box. Lower grades are consumed at home.

### SORTING AND GRADING.

It has been the custom with our apples to sort and grade them immediately after they have come from the orchard. The fruit should be put upon tables made for the purpose, and the sorters supplied with flannel cloths or with cotton flannel gloves which are turned inside out, with which they wipe the fruit. When it is wiped, it is sorted for belmishes of all sorts; the good fruit is then placed in separate boxes according to its size, when it is ready for the packing room.

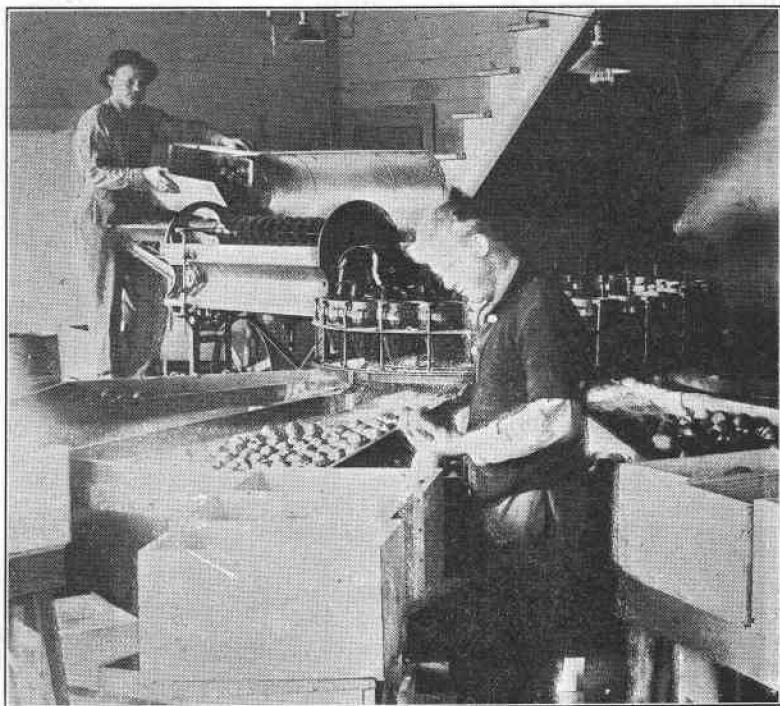


Fig. 4. Interior Packing House of A. P. Paasch. This is Same Room as Other Packing Scene from A. P. Paasch. The Oregon Fruit Grader in Operation. This Machine Cleans the Fruit and Grades It Into Different Sizes.

Grading has been done by hand in the past. At present, however, grading machines of several different types are coming into use. With the apple, one type does both the wiping and sizing of the fruit, and another type simply grades the fruit according to size. If the apples are to be wiped by the machine, the task should be done soon after picking. It is impossible to wipe clean after the apples sweat, as they then become sticky and gummy. Apple grading ma-

chines should be able to do rapid, efficient work, without bruising or damaging the fruit and should leave the fruit in convenient receptacles for packing it in the boxes.



Fig. 5. Cutter and Grader in Packing Tent of Dickerson & Peck, Hood River, Oregon.  
T. Owen French, Facker, Richmond, N. S. W., Australia.

With peaches the fruit is graded into different sizes only, either by hand or by means of mechanical graders.

#### PACKAGES AND PACK.

One of the great needs of the fruit industry is not only a standardized pack but also a standardized package. We are using too many packages. Not only that, but the laws of the different states vary tremendously as regards the amount of fruit which will go in a package, and the form of the package itself. The wide range of variability in these laws means that the box fruit trade is in a very chaotic condition and will probably continue to be so, until some steps are taken to get uniform state laws, which will really mean national laws, to cover all packages used for our fruits. The entire Pacific Coast should unite and take up this matter of deciding what packages we can use to the best advantage, and then take steps to have these adopted as national packages. Recently, national barrel laws have been enacted, and there is no doubt that these laws will very materially benefit the grower of barrelled apples. There are very few state laws governing the size and contents of the box, however; so that a man can dump anything he desires into a box and label it largely as he chooses.

Unless some steps are taken to correct this condition, it will be but a relatively short time before box packages are utterly discredited.

During this past season some of the packages of fruit, especially berries and cherries, have been refused in some of our eastern cities. Some were rejected because of short weight, but most of them because of the use of false bottom boxes.

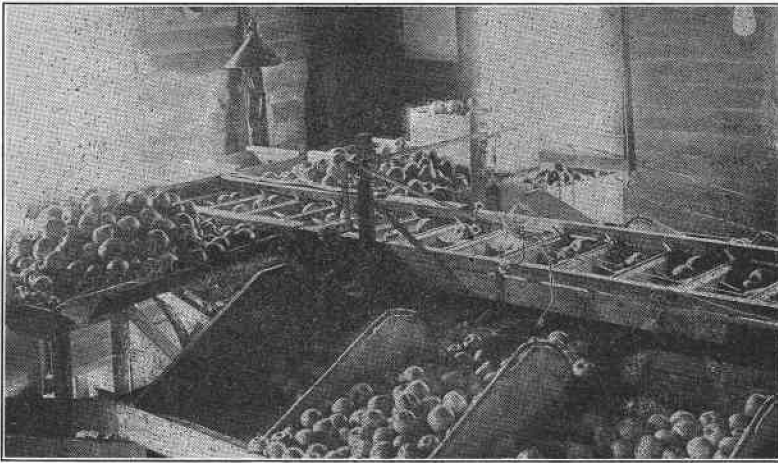


Fig. 6. The Oregon Fruit Grader in Operation. This Machine Cleans the Fruit and Grades it Into Different Sizes

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(Belongs with tables on pages 14 and 15)

**Remarks:** At a special meeting of the Northwestern Association of Box Manufacturers held in Portland, Ore., Oct. 22, 1913, the meeting went on record as favoring the U. S. standard dry quart and dry pint as the unit of measure of all berry boxes manufactured in the Northwest.

Utah law states that package shall have stamped upon it name and address of owner of fruit at time of packing, variety name, and grade of fruit.

Connecticut and South Dakota demand plain marking of weights on fruit packages. Indiana and Iowa condemn false bottoms in berry boxes.

Nevada, New York, and South Dakota specify that berry boxes of other sizes than those specified by law must have the quantity held plainly marked.

MEASURES AND PACKAGES.

APPLES.

Boxes	Other Boxes	Bushel and Aliquot Parts	Standard Barrel	Other Barrels	Dry Quart and Aliquot Parts
10 "x11 1/2" x18"					
Ia., Md., Mont., N. C., N. Mex., Ore., Wash., W. Va.,	Ark., 9" x12" x20" Idaho, 2150.42 cu. in. Me., 10" x11" x20" Ore. Special, 10" x11" x20"	Cal., Ind., Minn., Nev., Pa., S. D., Wis., Ill., Kans., N. Y., O.	Me., N. Y., N. C., Va.	(Head and center diameters and length of stave given). Me., 17 1/4" x20 1/2" x28 1/2" Mich., Fleur barrel. Md., 17" x18 1/2" x27 1/2"	

PEACHES.

	Del., 1/2 bu. basket; N. C., 3/4 bu. in 6 bskt. carriers.	Cal., Ill., Ind., Minn., Nev., Kans., N. Y., O., Ore., Pa., S. D., Wis., Mich.—1-8 bu. Stricken Measure.			

PEARS.

	8' x11 1/2" x18" N. M., Ore., Wash.	Cal., Ill., Ind., Kans., Minn., Nev., N. Y., O., Pa., S. D., Wis.,			

## CHERRIES.

	Cal., Ill., Ind., Kans., Minn., Nev., O., Ore., S. D., Wis.			N. Y., Wash.
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## PLUMS.

	Cal., Ill., Ind., Kans., Minn., Nev., O., Ore., S. D., Wis.			N. Y.
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## QUINCES.

	Cal., Ill., Ind., Kans., Minn., Nev., N. Y., O., Ore., S. D., Wis.			
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## BERRIES.

Kans. & N. C. Dry qt. boxes N. Mex. Qt. and pt. boxes (Liquid Meas.)	Cal., Minn., O., Ore., Wis.			Del., Idaho, Ill., Ind., Ia., Nev., N. Y., N. H., S. D., Vt., Wash.
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## GRAPES.

Ia. and N. Y. 4, 8, and 20 pound baskets				
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It has been customary on the Pacific Coast to use the false bottom berry baskets. The system of packing the fruit and the type of crate used have been largely responsible for this form of package. There has been a feeling in some markets in the country, however, that the false bottom is misleading, that it is a cheat, so to speak, since in some cases it has been used to deceive people as to the contents of the package. Accordingly, many eastern states and cities are passing laws legislating against the use of false bottom baskets.

We would recommend that the berry growers of Oregon cease to use such packages for shipments of fruit outside the state. In order to meet the requirements of eastern markets, it will be generally necessary to put the fruit in either pint, quart, or pound packages. During the past season, shipments of fruit condemned in some of the eastern cities, were finally accepted with the understanding that the practice of shipping in false bottom boxes be discontinued in the future. This relates not only to berries but also to cherries or any fruit packed in false bottom packages.

The Canadian Fruit Marks Act, a copy of which is shown in the appendix, has proved to be one of the greatest stimulators that the Canadian apple growers have had. A standardization of our boxes and packs will help us also, in the same way.

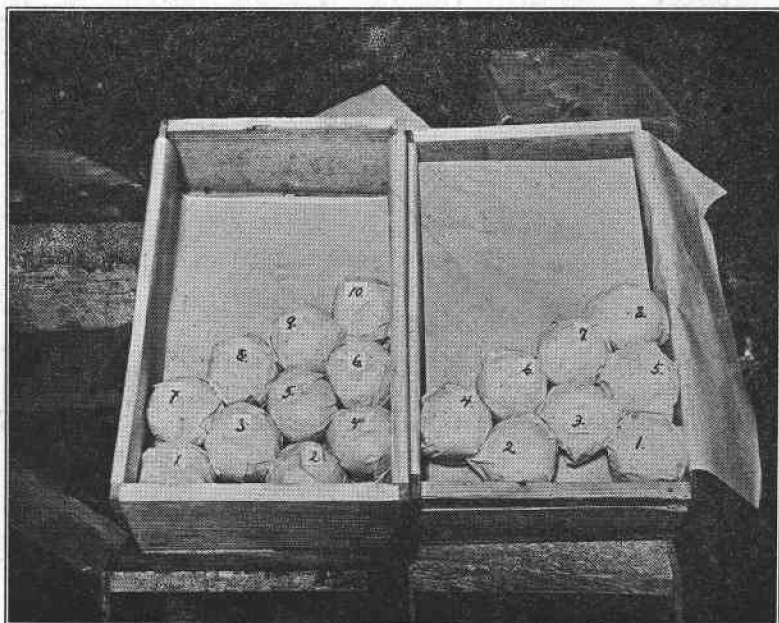
**The Apple.** At the present time Oregon is using two boxes for the apple. The first is known as the Standard, or Oregon Box, and measures  $10\frac{1}{2} \times 11\frac{1}{2} \times 18$  inches, inside measurement; sides  $\frac{3}{8}$  inch, top and bottom  $\frac{1}{4}$  inch, ends 13-16 inch thick.

The second box used is known as the Special, or California Special. It measures  $10 \times 11 \times 20$  inches. This box should be called the Oregon Special, as California has boxes of different dimensions from the ones noted. The Special box is used to accommodate certain apples which do not pack nicely in the Oregon Standard.

There is a tendency to establish too many packs. Already 30 packs are recognized in Oregon. The number of these could be very materially reduced. It would also be possible to pack all our apples in one size box, and, while with some packs this size might not meet with the greatest approval, still, on the whole, our packs would be commercial packs. There has gradually been an evolution in style of



pack used for Oregon apples. The pack that was used formerly to a great extent was known as the offset pack, but this pack soon came into discredit because it allowed too many empty spaces on the sides of the box.



No. 7. Two Diagonal Packs.

The square pack has been used very extensively but is gradually being discarded. It is too hard on the fruit and gives rise to too many bruises and damaged specimens. All the pressure is brought directly on individual specimens rather than against the spaces between the specimens. Whenever it is possible, the square pack should be discarded and the diagonal pack used.

The diagonal pack is the best for local conditions in Oregon, yet certain diagonal packs once recognized are now being discarded. Any form of the diagonal pack which leads to stem punctures, which means that the stem comes against the cheek of the apple, is being discarded. Only the diagonal packs which do not cause punctures are now being

recognized as the best commercial types. The diagonal pack has a distinct advantage in that the pressure against any one apple is always indirect. It is also possible to get the maximum amount of fruit in the box.

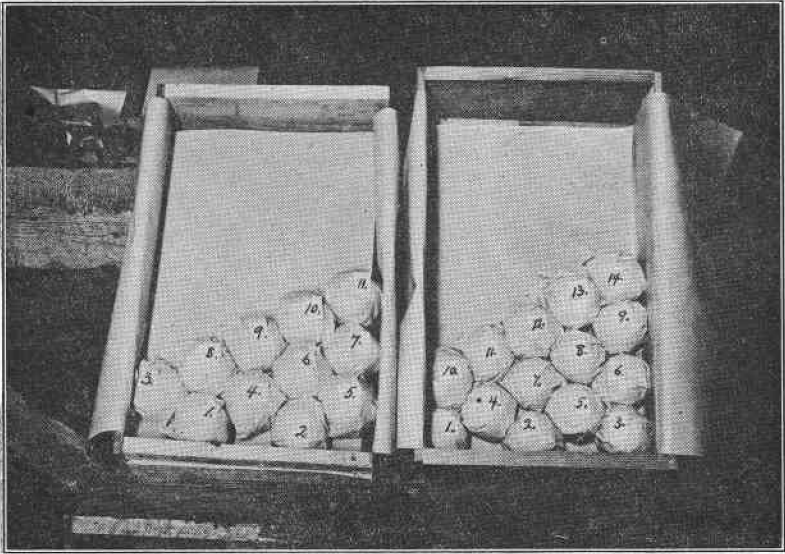


Fig. 8. Smaller Sizes in Diagonal Pack.

In packing the better grades of apples one should be very careful to see that the boxes are neat, and that they come up to the proper inside measurements. Paper should also be supplied for all such grades. First, the lining paper, for the boxes; second, layer paper to put in between the layers of fruit; and third, wrapping paper for each individual apple. The use of the paper helps in making the pack firm, absorbs excessive moisture, confines whatever decay may take place, and keeps the fruit clean.

The paper used for box fruit can be purchased from any wholesale paper house. It can be purchased in various sizes. Apples 72 and larger will need 12x12; apples from 80 to 112 will need 10x10; apples from 125 to 175 will need 9x9; while everything smaller than this will use 8x8. In ordering paper, the following estimates will be of some value: The lining paper for 100 boxes will weigh about 7½ lbs.; the wrapping paper for the fruit will average about 50 lbs., while the layer paper will average 16 lbs.

The following table of commercial packs will be of interest and assistance to beginners in fruit packing:

**Table I.**

**COMMERCIAL APPLE PACKS IN STANDARD BOX.**

Tier	Number ap- ples in row.	Number ap- ples in box.	Number layers.	Pack	
3	4-4	36	3	2-1	Diagonal
*3	5-5	45	3	...	Straight
3 ½	3-3	48	4	2-2	Diagonal
3 ½	3-4	56	4	2-2	Diagonal
3 ½	4-4	64	4	2-2	Diagonal
3 ½	4-5	72	4	2-2	Diagonal
3 ½	5-5	80	4	2-2	Diagonal
3 ½	5-6	88	4	2-2	Diagonal
3 ½	6-6	96	4	2-2	Diagonal
4	4-5	113	5	3-2	Diagonal
4	5-5	125	5	3-2	Diagonal
4	5-6	138	5	3-2	Diagonal
4 ½	6-6	150	5	3-2	Diagonal
4 ½	6-7	163	5	3-2	Diagonal
4 ½	7-7	175	5	3-2	Diagonal
4 ½	7-8	188	5	3-2	Diagonal
5	8-8	200	5	3-2	Diagonal
5	8-9	213	5	3-2	Diagonal
5	9-9	225	5	3-2	Diagonal

All long apples and all flat apples should be packed on the side.

Never place the stem of one apple next to the cheek of another nor directly to the side of the box.

Five tier apples smaller than 213 may be packed straight.

Very large apples may be packed flat in the box with the stems all the same way.

If the special is used, packs containing 104, 112, and 120 can be made in a 2-2 pack.

Packers should strive to pack all apples in the Standard box using the diagonal pack. There are very few apples that make it necessary to use either the Special box or the straight pack.

\*The 45 pack may be packed diagonal in a 2-1 pack.

It is impossible in a bulletin of this scope to go into all the details of apple packing. This subject has been thoroughly treated in a number of previous publications, but with the assistance of the photographs and tables given in this bulletin almost anyone with a good eye can easily pick up fruit packing, it being largely a matter of practice. The best advice we can give to those interested in fruit packing is to attend the packing schools, such as are held at the Ore-

gon Agricultural College, or given annually in various cities in the fruit centers. The main points for the beginner to master in packing his fruit, are, first, grade carefully for size—without good grading it is impossible to pack well; second, make the package firm. This will mean that when the box of apples is packed there will be a bulge of

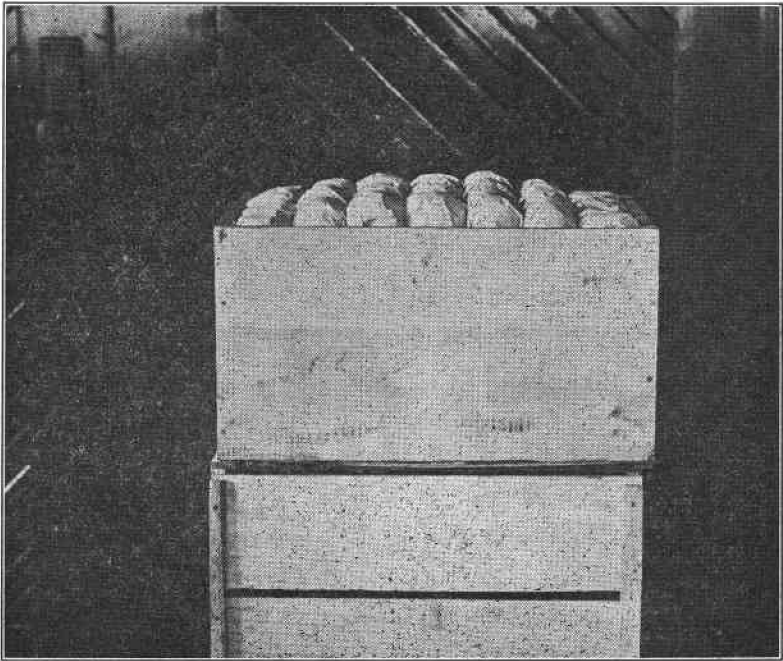


Fig. 9 Showing a Good Bulge for Packed Apples.

at least  $\frac{3}{4}$  of an inch. This bulge must be given to the package in such a way that the ends are not too high. The fruit should also be wrapped and packed in a neat orderly way, the alignment of the apples straight and the spaces uniform in size. It is only by practice that one can master such details.

**The Pear.** There are two pear boxes used quite generally in Oregon. What is known as the bushel box measures  $8\frac{1}{2} \times 11\frac{1}{2} \times 18$  inches. The half box has the same width and length but only half the depth, and is used for the finer grades. Pears packed in half boxes and the better grades packed in the bushel boxes should be wrapped; and it generally pays to use lithographs. In the very fancy grades, lace paper and fancy inside lithographs can be used to advantage. The system

of packing the pear means that we can get along with a much smaller number of packs than are used with the apple. The packs that have been used in this state for the past few years are shown in the following table.

Table II.

## STANDARD PEAR PACKS.

Tier	Style	Row	No. in Box
5	4-3	6-6	210
5	4-3	6-5	193
5	3-3	6-6	180
5	3-3	6-5	165
5	3-3	5-5	150
5	3-3	5-4	135
5	3-3	4-4	120
4	3-2	6-5	110
4	3-2	5-5	100
4	3-2	5-4	90
4	3-2	4-4	80
4	3-2	4-3	70
4	3-2	3-3	60

The diagonal pack is used for all pears.

Pears are generally packed directly from the picking box and the rules for packing are about the same as in the case of apples. They are generally packed with a much greater bulge, however, than is customary with apples, since the shrinkage of the pear is greater than that of the apple.

**The Peach.** It is only by using extreme care that peaches can be handled to the best advantage. There are a few varieties such as the Elberta that carry better than others, but most soft varieties of peaches must be quickly and skilfully handled if they are to arrive on the market in good condition. Fruit should not be kept in large receptacles. Packing benches and tables should be lined with burlap. The peaches should be handled rapidly. It is customary to pack the peaches two layers deep, and since there is such a great range in the size of the fruit there has to be a corresponding range in the depth of the box. Peach boxes measure  $18\frac{1}{2} \times 11\frac{1}{2}$  inches. The depth is  $2\frac{1}{2}$ , 3,  $3\frac{1}{2}$ , 4,  $4\frac{1}{2}$ , 5, and  $5\frac{1}{2}$  inches, according to the size of the fruit. The better grades should all be wrapped individually, and great care must be taken not to bruise the fruit in nailing the boxes. The pack should be so firm that the top layer comes in contact with the cover of the box. All small and blemished fruit should be discarded.

**The Apricot and Prune.** The apricot is even more difficult to handle than the peach. It is a very soft fruit and is damaged very easily. The same type of package is used in this state for prunes and apricots: what is known as the California Crate, which measures

16x16x4½ inches and contains four veneer baskets 8 inches square and 4 inches deep. Such a crate contains about 20 pounds of fruit, usually, although the weight varies tremendously, at times running up as high as 30 pounds.



Fig. 10. Different Stages of the Pack of Fresh Prunes.

This same package can be used to great advantage for grapes, like the Malaga, Muscat, and Tokay.

Long strips of layer paper are used in packing such fruit, a strip of the paper passing between each layer of the fruit, the paper being worked back and forth across the basket as each layer is placed in

position. All fruit should be large enough to fill the basket and high enough to touch the lid. It is the best practice to pack the baskets after they are placed in position in the crate. A nicely packed crate should have the appearance of being packed as one basket. Great care must be taken to have the fruit snugly packed.

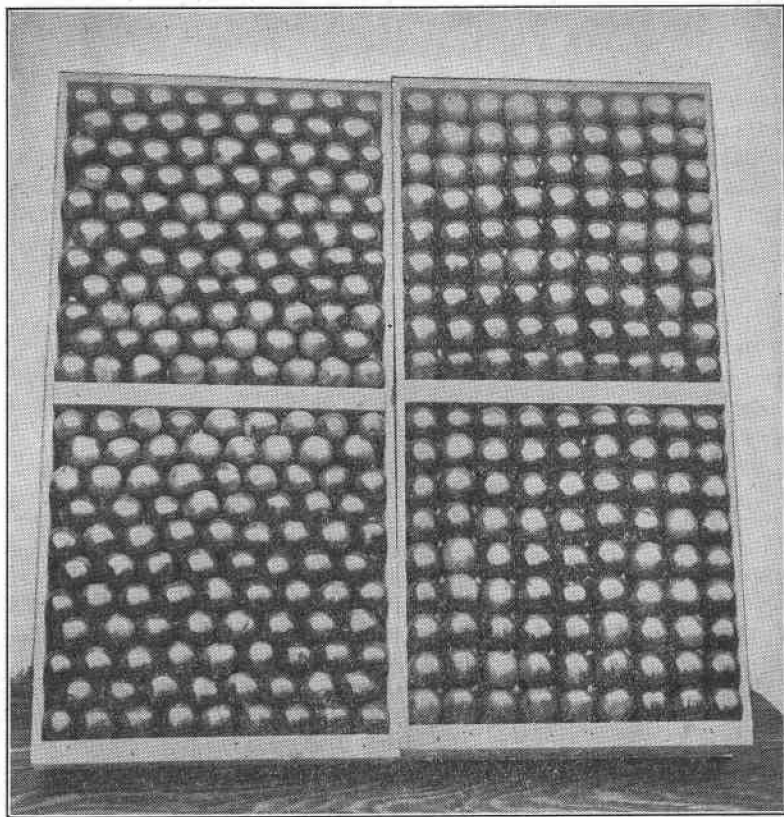


Fig. 11. The Straight and Diagonal Packs of Oregon Cherries.

Prunes are packed in the same way as apricots. Great care should be taken not to rub off the bloom from the prunes.

**Cherries.** The most common package used for the cherry is the ten pound box, which measures  $18\frac{1}{2} \times 9 \times 2\frac{1}{4}$  inches, though other packages are common with cherries. Boxes holding as high as 30 pounds were formerly used quite extensively, and while these make a nice appearance before they are disturbed, they soon become unattractive on the fruit stands after the top layer is broken into. The smaller

packages are coming into greater favor in the eastern markets. The cartons have been used in some markets to good advantage, while in other markets they have not succeeded so well. The small baskets, such as berry baskets, can be used to good advantage. Where berry baskets are to be used, however, the false bottom type should be discarded, and they should comply with the weight laws of the cities to which they are sent. For local use, the Climax grape basket can be used to splendid advantage. The tops of these baskets can be covered with cheese-cloth so as to keep out insects. Cherries should be handled very rapidly. Care should be used not to let them accumulate in large quantities. It is a better practice to use small utensils for handling. The bottom layer is generally faced, then the package is filled by pouring in the fruit. Great care must be used to keep the corners filled, or the cherries will sag badly. While the cover must be nailed on very firmly, to prevent movement of the fruit, it must not be forced on so tight that it will start the juice, as this leads to decay. Only first-class fruit should be packed. All blemished fruit should be used for by-products purposes. Stamp the box so that the bottom as packed will be opened as the top, thus displaying a nicely packed box to the public.

#### PACKING HOUSE.

**Packing House.** If a railroad runs through or bounds the orchard, the problem of locating the packing house is a very simple one. It should then occupy a position as central as possible in the orchard but be contiguous to the railroad. If the fruit must be hauled on wagons to the nearest station, however, it is best to locate the packing house as near as possible to the center of the orchard. The packing house should be large enough to avoid crowding and allow for maximum crops. It should be constructed for the greatest efficiency and should not be so large that moving materials, fruit, etc., cannot be economically done. In so far as possible fruit should always move in the same direction, covering the same floor space but once from receiving room to loading platform. The packing house usually is built high enough from the ground so that the main floor comes at the height of the wagon bed from which the fruit is unloaded. It should be at least two stories high, giving the upper story or loft over to the storage of box materials and a good working room. The interior construction of the packing house will differ somewhat with the kinds of fruit handled. Pears will need no grading room while apples will need such a room fully equipped with tables.

There should be economy of arrangement in every way possible. Receiving, wiping, grading, storage rooms, should be conveniently arranged and well equipped, and the packing room should be separated from these in such a way that a stove provided for cold weather will not



heat the rest of the house. The house should have an abundance of light from many windows or skylights, especially in the packing room.



Fig. 12. Packing House of A. P. Paasch, Hood River, Oregon.  
A Medium Priced Packing and Storage House. Notice the Ventilator and the Chute for Sending Boxes from the Upper Floors.

If there is electricity available in the neighborhood, the building should be wired with drop lights for every packing and grading table.

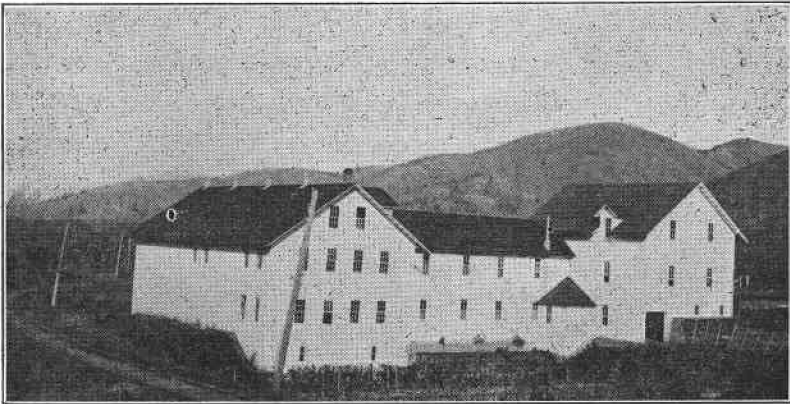


Fig. 13. Packing House of A. I. Mason, Hood River, Ore  
This Might Be Used as a Model Packing and Storage House for Community Ownership but is Too Expensive for the Ordinary Orchard. The Ventilators on the Roof Allow Excellent Control of Temperatures.

A great deal of damage is done by storing fruit, either before packing or afterwards, in low, stuffy, warm rooms, where it becomes overheated and in consequence breaks down quickly. High ceilings should be provided for all the rooms of the packing house, and good ventilation should be obtained either by ventilators in the roof or by the use of what is known as the saw-tooth roof construction, which is coming to be popular in certain sections.

It would hardly seem necessary to emphasize the fact that a packing house should be kept clean, but emphasis will do no harm. Toilets, cloak rooms, and good water should be convenient, for when laborers are supplied with such conveniences they do better work and are more content. Every effort should be made to have work as handy as possible, and all equipment surrounding the place should be designed with this point in view. Fruit must be handled at all times carefully, and as little as possible. It would seem at this time that many more labor saving devices could be put in some packing houses. For instance,

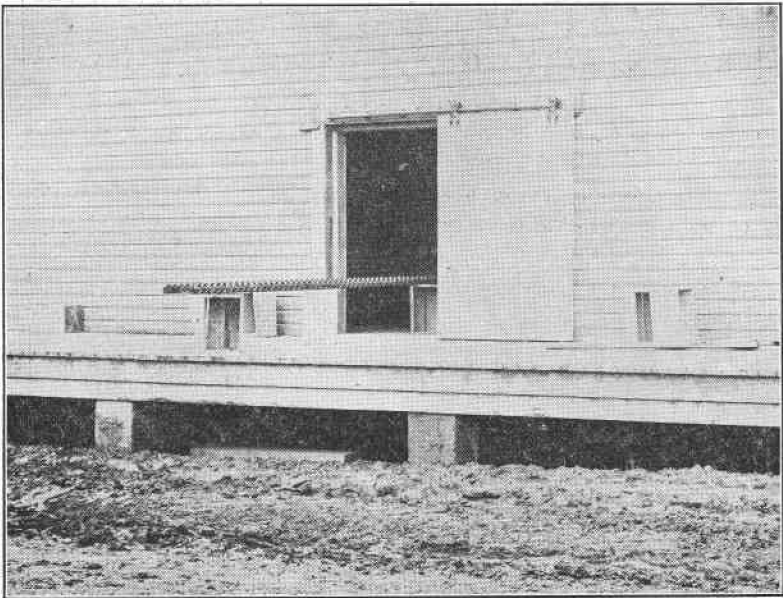


Fig. 14: Showing Rolling Track for Taking Boxes from the Wagon into the Storage House.

automatic box-nailing machine ought to be installed, to cut down the cost of box making to the minimum. In large packing plants roller conveyors are taking the place of trucks to some extent, and in nearly

every plant metal-covered chutes could be used to advantage where boxes are to be slid for some little distance, thus eliminating roustabouts.

**Packing Table.** One of the essential features of a packing house is the packing table. The two most common designs in use for the apple are the table used for one or two packers and the table designed for four packers. The former is better in some ways because less fruit is put on the table; consequently, there is less bruising, and it is more handy for the roustabouts to place the apples upon the table. The small table is light and more easily moved about than the large table. On the other hand the larger table takes up less room in proportion to the number of people working.

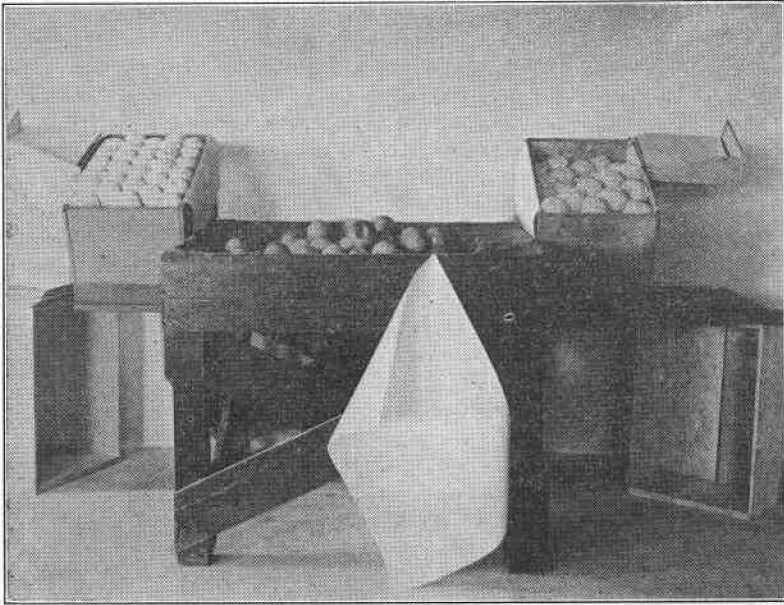


Fig. 15. Small Packing Table.

The small table as illustrated in Fig. 15 is constructed as follows: Take 2x4's for the legs or standards; cut them 3 feet 3 inches long; nail to the top of these standards a frame of 1x8 boards, planed. One frame piece should be 64 inches long and the remaining frame pieces 40 inches long; this will leave a square frame of 40 inches with the end piece projecting one foot on each side. Underneath the frame another board 64 inches long is nailed at such a distance from the

end that the apple box, while leaning against the end piece, will have its lower edge about in the middle of the board underneath the frame. A cleat should be nailed on to this bottom board where the box rests so that it will prevent the box from slipping. Upon this frame heavy burlap is stretched as tightly as it can be drawn by the hand. The edges of the standards should be beveled so that they will not project up through this burlap and bruise the fruit. It is a good plan to have the burlap double and leave the top layer loose so that it may be thrown back and shaken to remove dirt. Around the edge of the frame should be placed either old hose pipe or a wood molding to give a rounded surface so that fruit will not be bruised. The table should be well braced by nailing pieces diagonally from one leg to the other. The larger table is constructed in practically the same way except that it should be 4 feet broad and 6 feet long and should make provision for packing a box at each corner.

Pears, plums, apricots, and cherries are usually taken from boxes or trays for packing. Tables for these fruits are constructed around the walls of the packing house where plenty of light from windows is obtained. They should have a slope of about 4 inches to the foot with a molding board nailed along the edge to prevent the box from slipping. The height of these tables will depend upon whether the packer is to stand or sit at his work.

Peaches may be packed from boxes or poured upon burlap tables for packing, but great care should be taken not to pile deep, or bruise the fruit in any way.

**Nailing Press.** The main essentials of a nailing press are that the nailer shall be able to press down the cover and nail it into place without injuring the fruit and at the same time be far enough from his box that he can do his work easily with a good swinging motion of the hammer. Some presses that are otherwise very well constructed bring the nailer to such close quarters that he cannot do his work freely or quickly. Some presses are still being used that force down one end of the cover at a time. These usually press the fruit too much at one end of the box, and besides are very awkward and slow in operation. In Figs. 16 and 17 is illustrated a good type of press which is now being used quite widely throughout the Northwest. Where the nailer is to handle a large number of boxes in a day's run, it is very important that cleats, tops, and nails should be at the most handy points. In some cases, too, the nailer is supposed to stamp the name of the variety, the number of apples in the box, etc., on the box. This should all be done in the minimum amount of time. It is better, where a large amount of fruit is to be handled, to take this fruit from the back of the press. In other words, the fruit should be piled as it comes from the packing tables upon a chute of very slight slope so that the roustabout can push the boxes down to the nailing press as

fast as he takes them from the table. These chutes can be constructed easily of 2x4's on posts, or of planks on posts, covered with tin, and if it becomes necessary to have a special man for stamping the boxes,

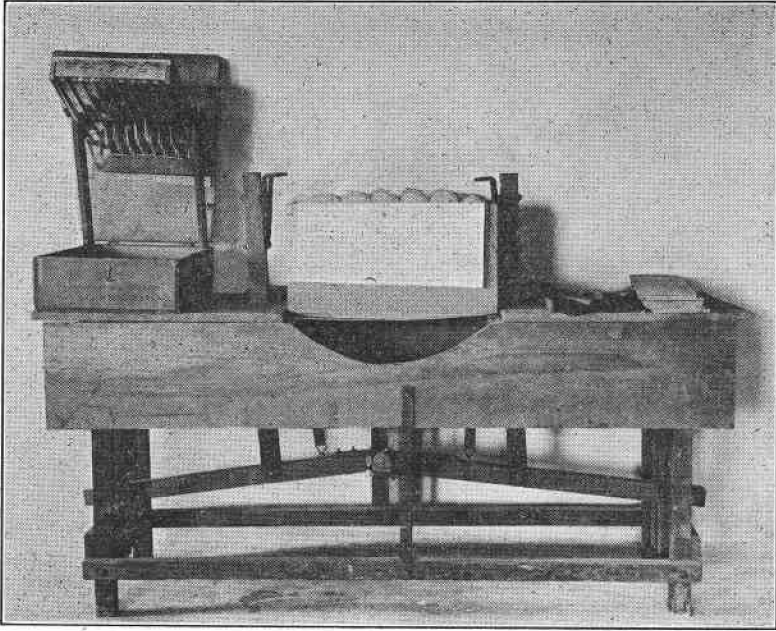


Fig 16. A Box Press Ready for Action.

he can have his stamping outfit near the press and stamp the boxes just before they arrive for nailing. After the box is nailed up, it should be placed on its side convenient for the helper to take it away to the storage room.

Peaches, plums, prunes, and cherries are not stored as a rule, but are handled quickly and are often packed in the open or in the sheds. Since these sheds are rarely arranged with a view to economy of labor, houses of very moderate expense, but suited to packing, would be much better and less costly in the long run.

#### STORAGE.

The subject of storage and pre-cooling is one which is sufficient for a bulletin by itself. We wish, however, to give a few suggestions, at this time, to fruit growers in regard to storage. Mechanical refrigeration and pre-cooling are too expensive for the average grower to tackle. Such buildings will have to be financed by fruit growers'

associations, private corporations, or transportation companies. Already at many of our large shipping points splendid brick cold storage plants have been erected at an expense of thousands of dollars.

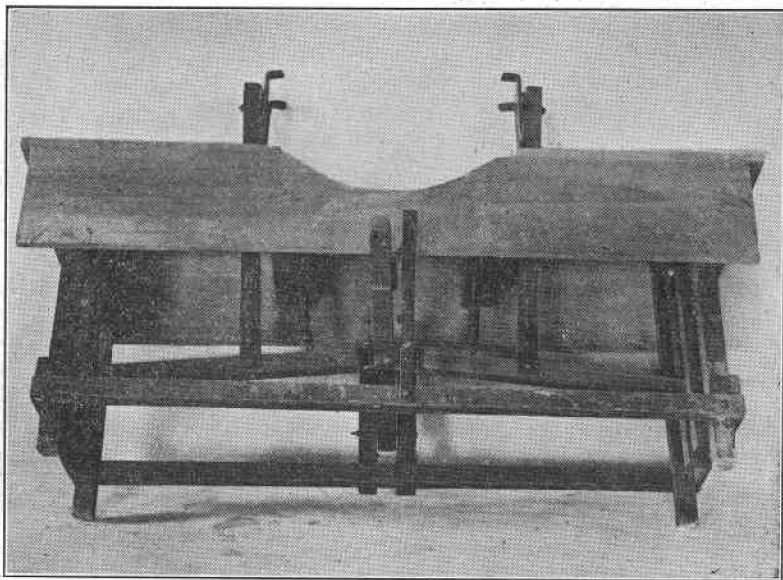


Fig. 17 A View of the Abové Box Press from Below.

In Hood River, for example, three efficient brick buildings have recently been erected, with a capacity which will accommodate a large percentage of the crop of the valley.

What can the small grower do along the line of storage? He can do a great deal. He can take advantage, for instance, of the ventilation system of storage. In a country like the Pacific Northwest, where cool nights prevail, it is very easy to get quite satisfactory results from this system for temporary storage. By a combination of double walls, dead air spaces, and a system of air intakes and outlets, much can be accomplished. In this system of storage the cold air is conducted through conduits, entering the floor and bottom of the sides of the rooms, while the warm, foul, dead air is allowed to escape through the ceiling, or at the top of the sides into chutes which lead to the roof. Trap doors which work by pulleys control the flow of air through these conduits.

In building such a structure, care must be taken to get it tight. Close sheathing and building paper should be used on the outside; inside of this, a dead air space should be supplemented by insulating

substances. Spaces should be allowed for plenty of room for the air intakes and for the air outlets. The inside of the building should be very tightly sheathed so that there is no chance for air to pass through the walls. Do not make the mistake of having the rooms large; a series of small rooms is preferable. If these rooms can be constructed in the form of a cube, they are more efficient than when constructed otherwise. Such rooms can be used to store the fruit until it is graded and packed, and also for keeping it from freezing or from warm temperatures until it can be loaded on the cars, or removed to the cold storage plant.

The rooms are operated by opening the cold air intakes at night, and closing them whenever the temperature outside is warm.

In placing the fruit in these rooms, do not pile it against the walls, nor pile it to the ceiling. If the fruit is piled close to the walls it will not allow good air circulation, while near the ceiling the air is apt to be warmer and to have less circulation than it does at other parts of the room. Do not fill the room solidly full of fruit, but pile the fruit in blocks, allowing paths between the various blocks so that one can wheel trucks easily. This will also allow a better circulation of air.

Such buildings are not an experiment. We have a number of such plants in the state that are working very satisfactorily.

### SHIPPING.

The recommendations given below are for the benefit more especially of growers' associations, but can be very easily modified to suit the needs of the individual grower. After the fruit harvest comes on, the growers' association should have a man in the field, called the field inspector, whose duty it is to examine all fruit, first as it hangs on the tree, and to advise the grower when the proper time for picking arrives, depending upon color and ripeness of the fruit. Over-ripe fruit may look very well as it comes into the packing shed, but en route it will be almost sure to become soft to such a degree that it is practically worthless when it has reached its destination. Such fruit should not be accepted by the inspector under any circumstances. He must not only inspect the fruit but interpret the grade, pack, and package rules to the packers and must be a man with plenty of backbone, as well as no respecter of persons.

After the box of fruit has been packed, certain markings are needed for identification. These are all placed upon one end of the box. They should include the name of the variety, the grade, number in the box, the grower's name, and address, and the packer's number. On the other end of this box there should be the label of the association. This should be put on by the association itself and under no circumstances by the grower.

If it is thought best to place labels on three grades of fruit sent out by the same association the first two grades may have the better label and the third grade should have an entirely different one so that there will be no confusion to the trade. The label should have some striking design or name which will fix itself in the minds of the purchasers, and should be made up of harmonious colors. The Yakima "Y" brand on fruit and the "U-need-a" biscuit are well known examples of what a label will do in introducing an article to the public. A good label, when placed upon fruit that becomes known for its uniformity and quality year after year, is of incalculable value; but a label upon fruit which varies in quality one year with another, is practically money thrown away, because it simply serves to identify this poorly graded, unreliable fruit. A label rightly used, backed up by dependable fruit, will soon build up a reputation which may be of immense value to the concern putting out the goods. Another thing, the label lessens the chances of packing inferior goods into better-grade boxes. Incidentally, it might be well to suggest that it would be better to have a label large enough to reach over the top of the box to some extent, so that if the box were broken into, the label would be disfigured. This would make it exceedingly hard for fruit of inferior grade to be put into boxes marked as superior grades.

**Hauling and Warehousing.** If fruit must be hauled for some little distance to a shipping point after it is packed, great care must be taken to choose an outfit which will get the fruit to its destination without bruising. Spring wagons covered with tarpaulin to keep out dust, rain, and mud, are the outfits commonly used. The fruit is hauled to the association warehouse, where it is examined and shipped out under the direction of the association. This warehouse should be as conveniently arranged for receiving and shipping goods as possible. It should contain ample cold storage facilities, in case fruit has to be held for any length of time. When fruit arrives, the boxes should be placed so that plenty of air space will be left between them, taking care that none of the boxes are piled against the walls of the warehouse. Many associations are now going farther than the mere marketing of fruits for their members, and are buying orchard supplies, such as ladders, box shooks, spray materials, etc., in large lots, with a large attendant saving to the grower.

At the warehouse should be stationed the warehouse inspector whose duty it shall be to examine from 1-10 to 1-5 of each lot of fruit as it comes in. In this way he gets a check upon the packers and is able to aid the field inspector to weed out the poor ones. He also can tell in a short time how efficient the field inspector is, and give him valuable suggestions for his work in the field. He is the man above all others who must have a good square jaw and plenty of backbone; because he will have a great deal of dissatisfaction to face when he



rejects packages of fruit that should not be shipped by the association. It would be better if such a man were not a resident of the community, because he must not seem to favor any particular grower. It should be his duty to reject all packages of fruit which through over-ripeness, blemishes, or slackness do not come up to standard. When such fruit is rejected, the grower of it should have the option of taking back the fruit to his packing house, where it can be re-packed, or of having it packed at the warehouse at his expense, provided, of course, that only good fruit can be so re-packed. Fruit not up to the standard demanded by the association may be either returned to the grower or packed and marketed at his risk.

**Loading and Shipping.** One of the problems of the Northwest is to get cars for shipping when they are needed. Often the grower is most to blame for this shortage, because he does not give the railroads sufficient notice of the number of cars he will need. The railroads must assemble these cars from many different points, and naturally desire to know as far in advance as possible the number of cars that will likely be needed, so they can make arrangements to send them loaded instead of empty, even if they have to leave them on sidings in the Northwest for some time. Estimates should be made by the grower or association as far in advance as possible, and written notice should be given the railroads through the local agent at least 30 days before the cars are to be needed. In case later estimates indicate a larger crop than first anticipated, the railroads should be notified in writing at once of the additional number of cars needed. Carbon copies not only of such notice, but of every other notice should be kept by the shipper to substantiate claims.

All the stone fruits, the pears, and the summer and softer winter varieties of apples, will require icing. Such varieties of apples as the Jonathan, Baldwin, Gravenstein, Grimes Golden, and Spitzenberg may properly come in this class. The harder winter varieties of apples marketed after October first will probably not need icing.

The shipper should find out how long it takes to get refrigerator cars from points where they have been assembled to his local station, and should know, also, what time of the day spotting and pulling are usually done at the warehouse or switch, and how long before the car is pulled the billing must be furnished. He can then govern the ordering of each car accordingly, giving the railroad written notice two or three days in advance.

If the ice bunkers in a refrigerator car are not full, the car mediately file a written remonstrance with the local agent, covering the case.

As soon as the car is set for loading it should be carefully inspected for defects. If these defects are of such a nature that they might cause loss of fruit on the way, call the attention of the railroad

to such defects by a written protest enumerating the defects. In the work of inspection, see that there are no holes or cracks in the car, that the doors close tightly, the gratings are secure, and the drain pipes are working freely. Nails protruding from the lining of the car should be removed and the running gear of the car should be examined carefully.

In case of foul odors in the car, which might taint the fruit, or in case the car is so small as to require piling higher than 6 boxes, for apples, to accomodate a carload, the car should be rejected and another demanded immediately in its place.

If the ice bunkers in a refrigerator car are not full, the car should be loaded and the railroad notified that the loading was done under protest, because the fruit was packed and ready to move.

If, after the car is loaded, the railroad does not pull it promptly, this is just cause for another remonstrance, which should be made in writing.

Too much importance can hardly be attached to these remonstrances made promptly, in due form, and in duplicate, because in case of loss these constitute the most convincing evidence upon which to base claims for damage.

The manifest, which is a bill of fruit in the car, should show the kind of fruit, variety, brand, grade, number in a box or tiers in a box, besides giving number of the car, date and route of shipping, name and address of shipper and consignee, etc. Enough copies of the manifest are made so that one can be tacked in the car, a copy retained by the shipper, one sent to the consignee and perhaps another copy to a broker or other handling agency. Growers' associations have their own forms printed for this purpose.

The ordinary bills of lading furnished by the railroad companies can be used; but when the shipment is not sold in advance but is diverted to some other than the original point of consignment during transit, the bill of lading must be surrendered to the railroad company by the shipper, or bonds deposited to insure the railroad against loss. Often such bonds are deposited by growers' associations and other handling agencies at the beginning of the season to enable them to divert shipments with no delay.

**Loading a Car.** The following description should not be taken as the only method to load a car. The main thing in any method is to brace the car very securely. After the car has been properly inspected, the first step in loading consists of running three 2x4's lengthwise of the bottom of the car. Across these 2x4's should be others reaching from side to side of the car laid at intervals according to the length of the box. Upon these 2x4's the apple boxes are laid on their sides and piled in tiers 9 on each side of the doors. These tiers should be flush with the end of the car but should have air space between

the boxes in each tier and between the side of the car. These tiers are piled 7 boxes across the car and usually 5 boxes high, making a car-load of 630 boxes. This can be added to by increasing the height of the tiers up to 6. After the boxes are placed one upon the other in

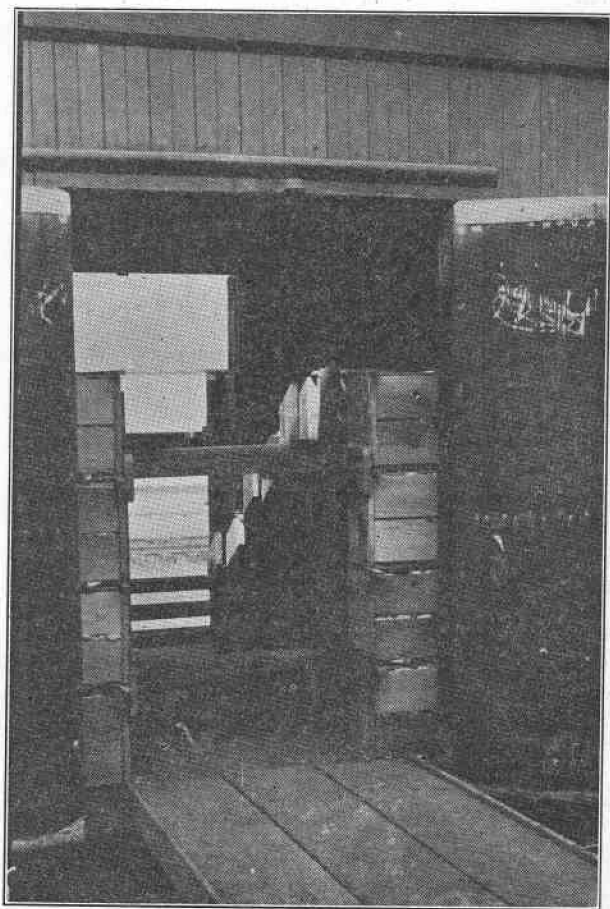


Fig. 18. Apples Loaded and Braced, Ready for Shipment.

the tiers, laths slightly heavier than building lath and especially prepared for this purpose are nailed to the tops of every layer, or every other layer, of boxes, and extended to the sides of the car. One nail through the lath into each box is usually sufficient.

We are now ready for the bracing, which really is the most important part of the operation. As each tier is 7 boxes wide, we shall need gates on either side of the opening which are made of seven 1x6 inch boards as long as the height of the tiers in the car. Three 2x4 cross pieces are then nailed to these 1x6's, one a foot from the bottom, one a foot from the top, and one midway between the ends. These gates are then set up and three 2x4's are fitted tightly between each of the opposite cross pieces on the two gates. From the top 2x4 used as such brace, another 2x4 is run to the roof of the car and nailed fast there so that in case of accident to the car the gate may not be jarred loose. In addition to this bracing, it is well to put 2x4's across the top of every tier of fruit, nailing their ends to the car with a block of wood nailed above each end. In cold weather it often becomes necessary to line the floor and sides of the car. To do this, a false floor must be provided. This is constructed by laying inch boards across the 2x4's. This floor and the sides are then lined with building paper. In shipments during cold weather and through the mountains, some growers have been in the habit of sending a messenger with their car to see that no damage resulted from freezing. This, however, is not advisable, because when it is done the railroads are not liable for damage in transit. A better way is to give directions to the railroads to put the car in the roundhouse when the weather is too cold. That places the risk upon the railroad company.

**Weighing.** When the car is being loaded, 5 packages of each kind of fruit, say apples or pears, should be weighed, and the signature of the freight agent should always be appended to this weight. This not only avoids over-charging at the other end of the line, but also is a matter required by railroad tariffs for fruits in refrigerator cars. If shipped in dry cars, the railroad tariffs do not require that the fruits be weighed before shipping, but to avoid mistakes and over-charging this should be done. If the local agent does not have the time to do the weighing himself the shipper should do it and see that the agent signs the blanks as filled out.

In loading other fruits, as pears, peaches, etc., the same methods are employed varying only with sizes and shapes of boxes, pears in half-boxes, peaches, prunes, and cherries being loaded flat instead of on the sides. The main point is to see that everything is braced securely. If not, your fruit may be ready for a vinegar factory instead of a fancy grocery store when it reaches its destination.

### MARKETING.

It is not within the province of this bulletin to invade the territory of the wholesaler, the jobber, or the commission man, the subject of marketing alone being complex enough for a large volume of

most interesting reading. It is intended, in this connection, simply to point out some of the underlying principles, which, it seems, should be followed with profit by fruit growers.



Fig. 19. Fresh Prunes Being Loaded in Car for Shipment.

One of the weakest spots in the whole fruit industry seems to be the inability of both growers and buyers to get reliable data regarding the amount of fruit of a given variety in sight. Very often this is over-estimated and as a consequence the buyer is afraid to take hold of the market and low prices result to the grower, when, had the true conditions been known, the fruit would have sold much more quickly and at a much better figure. The grower himself is often not a competent party to estimate the yield of his crop. In some cases it might be a very good idea for the growers' association to put out a man skilled in estimating, who should act as a field estimator for the association.

If every association could make such a careful estimate and report to a central bureau of statistics for the Northwest which in turn could report to a central bureau for the United States at Washington, the trade would have an idea of prospective crops that could be depended upon. Accurate estimates of crop would take away a large part of the speculative element in buying, would place the whole fruit industry on a firmer basis, and would be of incalculable benefit to the grower and consumer alike.

Another phase of the marketing problem which is pressing for immediate action is the effective advertising of our goods,—getting the consumer to buy more fruit. To a farmer, it is simply astonishing how ignorant some of his good city cousins are regarding the quality, eating season, and ways of preparing some of our fruits. The way to get people interested in the goods we have for sale is to sell them the fruit at its proper season of ripeness and give them directions for preparing it.

To do this, the co-operation of the wholesaler and retailer must be obtained, and they must be shown that they will make more money by selling a customer fruit at its best eating season rather than when it is as hard as a brick; and they must be shown, also, that when people buy what they suppose is a good eating apple, they are not satisfied with one that may be an excellent cooker but not good eaten fresh.

One of the best plans of getting information first hand to the housewife seems to have been hit upon by the International Apple Shippers' Association. Their plan is to urge retailers to push sales by the box or the barrel instead of in smaller quantities and to charge more moderate prices for what they sell, depending for their profits upon turning a large quantity of goods rather than in making large net returns upon small quantities. Along with this recommendation they send out an attractive little booklet entitled "The Housekeeper's Apple Book," giving 197 recipes for preparing the apple. That this plan is successful seems evidenced by the remarkable call coming in for these booklets and by the great number of favorable reports from retailers having tried the plan.

As the grower is the one most vitally benefitted by this plan it is proposed that the cost of such advertising be met by the sale of stamps, each stamp representing one cent, the grower to place one stamp on every box and two stamps upon each barrel he ships. This plan has met with quite general favor among growers themselves.

There is no reason why pears and peaches, \*prunes and cherries cannot be advertised in the same way and a broader and firmer market established for them.

Closely interwoven with the subject of advertising and logically dependent upon it are the matters of standardizing our output, securing wider distribution, and causing greater consumption of our fruit. The present orchard output of the Northwest is increasing rapidly. What is to be done with the fruit? Sell it in a few cities as has been done in times past? If that course is followed it will go on the auctioneer's block (executioner's block) and must be sold for what it will bring under local conditions. It must be remembered that, after all, the great body of American people who will eat this fruit are not millionaires but are living on modest incomes. To put fruit in the luxury class by placing such enormously high prices upon it as most of our

fruit has brought the past few years will simply curtail consumption to such an extent that not a quarter of our crop will be eaten. What then?

\*Along this line a recent compilation of figures relating to the apple market of New York City may be of interest. These figures and tables show that the quantity of apples consumed in that city during the ten years 1893-4 to 1902-3 was 672,608 bbls.; the quantity consumed from 1903-4 to 1912-13 was 1,517,382 bbls., an increase of about 125 per cent in consumption. (The barrel contains three boxes of fruit). During this period the production of the country decreased between 30 and 40 per cent. This would seem to show two things at least: First, that the public will consume much larger amounts of fruit than they have been getting, provided it is properly advertised and distributed. Second, that New York City has been getting more than its share and other markets of the country have been neglected,—showing an astonishing lack of distribution.

In the face of this seeming glut in the city, the price of fall apples increased 24.8 per cent and that of the winter varieties, 6.7 per cent. The average increase of all varieties handled was 23 cents per bbl., or 8.3 per cent. During this time the cost of operation, including barrels, spray material, and machinery, interest on land at higher valuation, etc., has increased the cost of production to eastern growers about 35 per cents per bbl. In other words they have been making 12 cents a bbl. less than during the former period, on apples sold in this market. Combining the fact of this loss with the disproportionate increase in quantity consumed by New York City during that period, would seem to be ample reason for the active campaign which is now being conducted for wider advertising and distribution.

Another matter of interest brought out these figures is that the Ben Davis decreased 7 per cent in its average price during the second period. It would seem that the public is finally becoming more discriminating regarding the fruit it eats out of hand and that "Old Ben" has seen his best days.

A table of average prices for twenty years, of fruit held in cold storage, shows conclusively that, when fruits are sold in their proper season, the prices obtained from October to May, inclusive, pay enough more than the cost of storage and re-handling to warrant the risk, at the same time avoiding the glut which would come inevitably were all the apples to be dumped upon the market in the autumn.

\*From an article of H. B. Knapp and an editorial in the Tribune Farmer of New York City, issues of Nov. 13th and 20th, 1913.

We must be able to do with the apple and pear, and with our other fruits that stand long shipments, just what the United Fruit Company has done with the banana—place it in every home in the land at a reasonable price. It is a shame that the banana, shipped for the most part from foreign countries, has come to be known as "the poor man's fruit" while the apple, wholesome and delicious in so many different ways of preparation, is regarded as a luxury.

This condition, however, seems to be changing. Low prices in some instances combined with the cost of expensive selling agencies, have made it evident that something must be done very soon to acquaint people with the merits of our fruit, to get them to eat more of it, and to reduce to the minimum the cost of getting this fruit to the people.

To do this, petty jealousies of rival districts must be forgotten; standards of grade and pack must be made as uniform as possible; the selling propaganda must be centralized and simplified as far as possible

to reduce cost of marketing; and the retailer must be shown that it is to his advantage to sell more fruit and charge less profit on his sales. This he will be ready to do when we can guarantee him fruit of uniform quality and pack, placed at his door in good condition at the proper season for eating.

#### APPENDIX I.

##### THE CANADIAN FRUIT MARKS ACT.

In addition to the definitions given below this act provides for the appointment of inspectors and defines their duties, provides fines of from twenty-five cents to one dollar per package in case of violations and gives the details of methods of enforcement.

"Section 4. Every person who, by himself or through the agency of another person, packs fruit in a closed package, intended for sale, shall cause the package to be marked in a plain and indelible manner, in letters not less than half an inch in length, before it is taken from the premises where it is packed:

(a) With the initials of his Christian names, his full surname, and his address, or, in the case of a firm or corporation, with the firm or corporate name and address;

(b) With the name of the variety or varieties; and

(c) With a designation of the grade of fruit, which shall include one of the following four marks, viz: "Fancy," "No. 1," "No. 2," "No. 3," for such mark may be accompanied by any other designation of grade or brand, provided that such designation of grade or brand, is not inconsistent with, or marked more conspicuously than the one of the said four marks which is used on the said package.

Section 5. No person shall sell, or offer, expose or have in his possession for sale, any fruit packed in a closed package and intended for sale, unless such package is marked as required by the next preceding section.

Section 6. No person shall sell, or offer, expose or have in his possession for sale, any fruit packed in a closed package upon which is marked any designation which represents such fruit as of—

(a) "Fancy" quality, unless such fruit consists of well grown specimens of one variety, sound, of uniform and of at least normal size and of good colour for the variety, of normal shape, free from worm holes, bruises, scab, and other defects, and properly packed;

(b) "No. 1" quality, unless such fruit consist of well grown specimens of one variety, sound, of not less than medium size and of good colour for the variety, of normal shape and not less than ninety per cent. free from scab, worm holes, bruises and other defects, and properly packed;

(c) "No. 2" quality, unless such fruit consist of specimens of not less than nearly medium size for the variety, and not less than eighty per cent. free from worm holes and such other defects as cause material waste, and properly packed.

Section 7. No person shall sell, or offer, expose or have in his possession for sale, any fruit packed in any package in which the face or shown surface gives a false representation of the contents of such package; and it shall be considered a false representation when more than fifteen per cent. of such fruit is substantially smaller in size than, or inferior in grade to, or different in variety from, the face or shown surface of such package."

The Inspection and Sales Act, Part Nine, of the Canadian laws and Amendment of 1907-8 "Fruit Packages" provides that:

All apples packed in Canada for export for sale by the barrel in closed barrels shall be packed in good and strong barrels of seasoned wood having dimensions not less than the following, namely: Twenty-six inches and one-fourth between the heads, inside measure, and a head diameter of seventeen inches, and a middle diameter of eighteen inches and one-half, representing as nearly as possible ninety-six quarts.



When apples, pears or quinces are sold by the barrel, as a measure of capacity, such barrel shall not be of lesser dimensions than those specified in this section.

When apples are packed in Canada for export for sale by the box, they shall be packed in good and strong boxes of seasoned wood, the inside dimensions of which shall not be less than ten inches in depth, eleven inches in width and twenty inches in length, representing as nearly as possible two thousand two hundred cubic inches.

When apples are packed in boxes or barrels having trays or fillers wherein it is intended to have a separate compartment for each apple, the provisions of this section as to boxes and barrels shall not apply.

#### APPENDIX II.

November 21, 1912, before the Oregon State Horticultural Society, C. E. Whisler, editor of the Fruit & Produce Distributor, proposed a national law to standardize the apple box and its contents along lines similar to the Sulzer law now in effect concerning the apple barrel and its contents. This measure was unanimously adopted and was afterward approved by the state horticultural societies of Washington, Idaho and Montana. On November 18, 1913, at a conference held during the Spokane Apple Show, some slight changes were proposed and the bill adopted as shown below.

##### A Bill to Establish a Standard Box for Apples and for Other Purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled:

Section 1. That the standard box for apples shall be of the following dimensions when measured without distention of its parts:

Depth of end, ten and one-half inches; width of end, eleven and one-half inches; length of box, eighteen inches, all inside measurements, and representing as nearly as possible two thousand one hundred and seventy-three and one-half cubic inches.

Section 2. That any box in which apples shall be packed and offered for sale, which does not contain the required number of cubical inches as prescribed in section one of this act, shall be plainly marked on one side and one end with the words "Short Box," or with words or figures showing the fractional relation which the actual capacity of the box bears to the capacity of the box prescribed in section one of this act. The marking required by this paragraph shall be in block letters of the size not less than seventy-two point block Gothic.

Section 3. Standard boxes when packed, shipped or delivered for shipment in interstate or foreign commerce, or which shall be sold or offered for sale within the District of Columbia or the territories of the United States of America, shall bear upon one or both ends in plain figures the number of apples contained in the box; also in plain letters the style of pack used, the name of the person, firm or company or organization which first packed or caused the same to be packed; the name of the locality where said apples were grown, and the name of the variety of the apples contained in the box, unless the variety is not known to the packer, in which event the box shall be marked "Unknown." A variation of three apples from the number designated as being in the box, shall be allowed.

Section 4. That the apples contained within the said standard box when so packed and offered for sale, shipment or delivery in interstate or foreign commerce, shall be well grown specimens, of one variety, reasonably uniform in size, properly matured, practically free from dirt, insect pests, diseases, bruises and other defects except such as are necessarily caused in the operation of packing.

Section 5. That standard boxes packed in accordance with the provisions of this act may be marked "Standard."

Section 6. That boxes containing apples marked "Standard" shall be deemed to be misbranded within the meaning of this act,

When the size of the box does not conform to the requirements of section one of this act, and when the markings on the box and the contents thereof do not conform to the requirements of section three and four of this act.

Section 7. That any person, firm, company or organization who shall mark or cause to be marked boxes with apples or sell, or offer for sale, shipment or delivery in interstate or foreign commerce, apples in boxes contrary to the provisions of this

act or in violation hereof, or shall sell or offer for sale or delivery in interstate or foreign commerce in a standard box, apples other than those originally packed therein, without first completely obliterating the original markings and labels on such box, and mark the box to conform to the provisions of this act, shall be liable to a penalty of One Dollar for each box so marked, sold or offered for sale or delivery and costs, to be recovered at the suit of the United States in any Court having jurisdiction; provided that the penalty to be recovered on any one shipment shall not exceed the sum of One Hundred Dollars, exclusive of costs.

Section 8. That this act shall be in force and effect from and after the first day of \_\_\_\_\_ 191—.

#### APPENDIX III.

The following tabulations have been compiled from the latest laws covering these matters, directly through the proper authorities of the several states whenever such information has been obtainable through these channels. Whenever the information was not sent upon such request, however, reference was made to the volume, "State and National Laws concerning the Weights and Measures of the United States," 2nd ed., year 1912. The above work is published by the Bureau of Standards, Department of Commerce and Labor of the United States.

Weight in pounds of 1 bushel of the following fruits in the several states. Where blanks occur no weights are prescribed by state laws.

State	Apples		Peaches		Pears	Cherries	Plums	Quinces	Berries	Gooseberries Currants &	Grapes
	Fresh	Dried	Fresh	Dried							
Alabama	..	24	..	33	..	..	..	..	..	..	..
Arizona	..	..	..	..	..	..	..	..	..	..	..
Arkansas	50	24	..	33	..	..	..	..	..	..	..
California	..	..	..	..	..	..	..	..	..	..	..
Colorado	..	..	..	..	..	..	..	..	..	..	..
Connecticut	48	25	..	33	..	..	..	..	..	..	..
Delaware	..	..	..	..	..	..	..	..	..	..	..
Florida	48	24	54	33	60	..	40	48	..	..	..
Georgia	..	24	..	33	..	..	..	..	..	..	..
Idaho	..	..	..	..	..	..	..	..	..	..	..
Illinois	50	24	48	33	58	..	..	48	..	..	..
Indiana	..	25	..	33	..	..	..	..	..	..	..
Iowa	48	24	48	33	45	40	48	48	..	..	40
Kansas	48	24	48	33	..	..	..	..	..	..	..
Kentucky	..	24	..	39	..	..	..	..	..	..	..
Louisiana	..	..	..	..	..	..	..	..	..	..	..
Maine	44	..	..	..	..	..	..	..	..	..	..
Maryland	..	28	40	..	..	..	..	..	..	..	..
Massachusetts	48	25	48	33	58	..	..	48	..	..	..
Michigan	48	22	..	28	..	..	d-28	..	..	..	..
Minnesota	50	28	48	28	45	..	..	..	..	..	..
Mississippi	..	26	..	33	..	..	..	..	..	..	..
Missouri	48	24	48	33	48	..	..	..	..	..	..
Montana	45	..	..	..	45	..	..	..	..	..	..
Nebraska	48	24	..	33	..	..	..	..	..	..	..
Nevada	48	24	48	33	..	..	..	..	..	..	..
New Hampshire	48	25	48	33	58	..	..	48	..	..	..
New Jersey	50	25	50	33	..	..	..	..	..	..	..
New Mexico	45	24	48	33	48	..	..	48	..	..	..
New York	48	25	..	33	..	..	..	..	..	..	..
North Carolina	48	..	..	..	..	a-56	..	..	..	..	..
North Dakota	50	..	..	..	..	..	..	..	..	..	..
Ohio	48	24	48	33	..	..	50	..	..	..	48
Oklahoma	48	24	48	33	48	..	..	..	..	..	..
Oregon	45	28	..	28	45	..	..	..	..	..	..
Pennsylvania	50	25	48	33	50	a-56 b-64	64	48	s-48 r	40	48
Rhode Island	48	25	48	33	..	..	..	..	..	..	..
South Carolina	..	..	..	..	..	..	..	..	..	..	..
South Dakota	48	24	48	33	..	40	..	48	bl-30 r-32 s-32	40	40
Tennessee	50	24	50	26	56	a-56 b-64	64	48	bl- r-48 s-	48	48
Texas	45	28	50	28	..	..	..	..	..	..	..
Utah	..	..	..	..	..	..	..	..	..	..	..
Vermont	48	..	48	..	58	..	48	48	..	..	..
Virginia	45	28	..	32	..	..	..	..	..	..	..
Washington	45	28	..	28	45	..	..	..	..	..	..

State	Apples		Peaches		Pears	Cherries	Plums	Quinces	Berries	Currants & Gooseberries	Grapes
	Fresh	Dried	Fresh	Dried							
West Virginia .....	..	25	..	33	..	..	..	..	..	..	..
Wisconsin .....	50	25	..	33	..	..	..	..	..	..	..
Wyoming .....	..	..	..	..	..	..	..	..	..	..	..

d—dried  
a—unstemmed  
b—stemmed  
r—raspberries  
s—strawberries  
bl—blackberries

Units of Measure and packages prescribed by the laws of various states. From states not mentioned information has not been obtained.

In 1912 the Sulzer Bill was passed by Congress prescribing the following dimensions for the standard apple barrel for the United States:

“Length of stave, twenty-eight and one-half inches; diameter of head, seventeen and one-eighth inches; distance between heads, twenty-six inches; circumference of bulge, sixty-four inches outside measurement, representing as nearly as possible seven thousand and fifty-six cubic inches, provided that steel barrels containing the interior dimensions provided for in this section shall be construed as a compliance therewith.”

The apple barrels used by the several states will be understood to have the same dimensions as the Standard Barrel unless otherwise specified.

#### APPENDIX IV.

The By-Laws of the North Pacific Fruit Distributors are given here complete, except for the articles relating to officers of the organization, amendments, and corporate seal. Anyone desiring a copy of the Constitution and By-Laws can obtain the same by writing to H. C. Simpson, Chamber of Commerce Bldg., Spokane, Wash.

#### BY-LAWS.

##### ARTICLE I.

##### Membership.

Sec. 1. This corporation is organized to provide a central selling and distributing agency for the apples and other fruits grown in the States of Washington, Oregon, Idaho and Montana. Its membership shall be made up of representatives from the following districts:

Wenatchee District, comprising the counties of Chelan, Okanogan, Ferry, Douglas and Grant, in the State of Washington.

Yakima District, comprising the counties of Yakima, Kittitas, Benton and Franklin, in the State of Washington.

Western Oregon District, comprising all the counties of Oregon west of the Cascade mountains.

Hood River District, comprising the counties of Hood River and Wasco, in the State of Oregon; Klickitat and Skamania counties, in the State of Washington.

Walla Walla District, comprising the counties of Walla Walla and Columbia, in the State of Washington; Umatilla, Union, Baker and Wallowa counties, in the State of Oregon.

Southern Idaho District, comprising the counties of Southern Idaho, and Malheur county, in the State of Oregon.

**Lewiston-Clarkston District**, comprising the counties of Asotin and Garfield, and the Snake River points in Whitman county, in the State of Washington; counties of Nez Perce, Idaho, and Lewis with the portion of Latah county, south of American Ridge, in the State of Idaho.

**Spokane District**, comprising the remaining territory in Eastern Washington and Northern Idaho.

**Montana District**, comprising the State of Montana.

A representative shall be elected or selected from and by each of the districts aforesaid. Such representatives to constitute the members of the corporation who shall adopt by-laws, elect Trustees and control the property and business of the corporation.

Sec. 2. There shall be in each of the districts aforesaid an organization to be known as a "Sub-central," which organization shall select a representative from said district to represent it in this corporation, and such organization shall be the representative for the growers and marketers in said district, to enter into contracts and transact all business for the growers in said district with this corporation. Said organizations in the districts shall each year at such time as may be prescribed by the management of this corporation, furnish to this corporation an estimate of the fruit to be marketed from such districts through this corporation for that year.

## ARTICLE II.

### Agreement.

Sec. 1. The "Sub-central" organization representing each of the districts shall enter into a contract with this corporation whereby it shall agree to market the fruit controlled by it, through this corporation, said contracts to be in such form and under such conditions as may be prescribed by the Executive Committee, or management of this corporation. Said contract to run continuously, provided, however, that the same may be cancelled any year on the first day of April, by either party giving notice in writing of its intention to cancel at least twenty days prior to said date. Upon giving such notice each party, prior to said first day of April, shall pay any indebtedness due from it to the other, and each copy of this contract marked cancelled, and the same shall thereupon be deemed terminated.

Sec. 2. Each district organization shall bind itself and the shippers affiliated therewith, marketing through this corporation, to conform to the rules and regulations of this corporation as to grading and packing fruit to be sold or distributed through this corporation.

Sec. 3. It shall be stipulated in the contracts aforesaid that this corporation is to act only as a selling agent for those marketing through it, and to sell all fruit delivered to it on the general market, at the prices prevailing and obtainable, and shall only charge to the grower such commission for selling his fruit as will pay all the expenses incurred by this corporation in selling and marketing the same, there to be included in such expenses the salaries of all officials and employees, all general expenses and fixed charges, including advertising and seeking and establishing markets and marketing connections, and such additional amount as the Trustees of this corporation may fix for the purpose of establishing a surplus fund for financing this corporation.

Sec. 4. The form of contract to be entered into, and the details thereof, and the rate to be charged for services, to be fixed by the Executive Committee of this corporation. Such penalty may be provided for failure to comply with said agreement as the Trustees of this corporation may deem legal and reasonable.

## ARTICLE III.

### Management.

Sec. 1. For the first six months the affairs of this corporation shall be managed by the nine Trustees named in the Articles of Incorporation, heretofore filed. Thereafter the Board of Trustees shall be comprised of the representatives selected or elected by the several district organizations.

Sec. 2. The present Board of Trustees and each succeeding Board of Trustees shall elect from their number a President and Vice-President of this corporation, and shall appoint or elect a Secretary, Treasurer, and may appoint a General Manager of the corporation. They shall also elect an Executive Committee of three members, in whom shall be vested the management of the business affairs of the corporation.

Sec. 3. The first Board of Trustees chosen by the districts shall divide by lot into three classes; three to hold three years; three to hold for two years, and three to hold for one year, and thereafter three Trustees shall b chosen each year to hold for three years; the three Trustees so chosen to be elected or selected from and by the districts whose Trustees retire in said year.

Sec. 4. There shall also be an auxiliary board to be composed of two representatives chosen from each district, to be known as the "Council of Representatives"; they to be elected at the same time, in the same manner and for the same period as the regular representatives from the district who constitute the members of the corporation.

This auxiliary board shall have no voice and take no part in the general management of the business of the corporation and shall act only at such times as they shall be called together to pass upon some specific question of vital importance to the corporation or the industry which it represents. Such board shall be called together by resolution of the regular Board of Trustees of the corporation at any time upon the demand of two members of the regular board or upon the demand of eight members of said auxiliary board. Notice of the meeting of such auxiliary board shall be mailed to each member thereof at his last known address, as it appears on the books of the corporation, by the Secretary at least twenty days prior to the date of the meeting. When called together the voting strength of each member of said auxiliary board shall be based upon the tonnage of his district; each member to be entitled to one vote for every 100 cars of fruit or major fraction thereof from his district marketed by this corporation the preceding season. If said board is called together before the close of the marketing season for the fruits grown in 1913, the voting strength of each member shall be based upon the estimate of fruit to be marketed furnished by the sub-central of said district. The Secretary of the corporation shall attend the meetings of said auxiliary board and make a record of the proceedings had thereat. Any action determined upon and decision rendered by said auxiliary board to be entered upon the records of the corporation as of the same force and effect as if decided by the Trustees of the corporation in regular session and to the binding upon the regular Board of Trustees and all members and officers of the corporation.

Sec. 5. Any Trustee or member of said auxiliary board, when once elected or selected, to hold office until his successor is elected and qualified, unless he shall forfeit his office or be removed, as hereinafter provided.

#### ARTICLE IV.

##### Annual Meeting.

The annual meeting of the members of the corporation shall be held on the third Monday in May in each year, at the City of Spokane, in the State of Washington, and at said meeting any growers or shippers marketing their fruits through this corporation shall be privileged to be present. There shall be presented at such meeting by the Board of Trustees a full and detailed report of all the business and affairs of the corporation, and the things done by it and its officers during the preceding year.

Notice of the time and place of such meeting shall be mailed to each person marketing through this corporation at his last known address as shown by the books of the corporation, not less than twenty days before such meeting.

A majority of the members shall constitute a quorum at all meetings; less than a quorum may meet and adjourn from day to day.

#### ARTICLE V.

##### Board of Trustees.

Sec. 1. Every member of the board of trustees of this corporation shall be a duly elected representative from one of the districts named in Article I, of these by-laws.

Sec. 2. The board of trustees shall hold an annual meeting immediately after the membership meeting on the third Monday in May of each year, and at said meeting shall elect and appoint officers of the corporation as provided for in section 2 of article II of these by-laws. The offices of secretary and treasurer may be combined in one person. All of such officers shall hold office until the next annual meeting after their election, and until their successors are elected and qualified, unless sooner removed as provided in these by-laws.

The trustees may from time to time employ such other subordinate officers, agents and employees as they may deem necessary or as the business of the corporation may require, and may remove any such officer, agent or subordinate at their discretion. They shall fix the salaries of executive committee, and of all officers, agents and employees of the corporation.

Sec. 3. The board shall require each officer, agent or employee of the corporation handling money to give bond for the faithful performance of his duties in such amount and in such manner as the trustees may determine. Each bond to be executed by a surety company approved by the Executive Committee and be paid for by this corporation.

Sec. 4. The Board of Trustees shall exercise the general powers of the corporation and manage and control the affairs thereof. They may make rules not inconsistent with the laws of the state, or with the by-laws of the corporation, for the guidance of the officers and the management of the corporation and its business; they may, by a majority vote of all the Trustees, remove any officer of the corporation. Demand of any officer of any of the books, papers, documents or records pertaining to the business of the corporation for examination or other purpose, may be made by the Board of Trustees at any time.

Sec. 5. The Board of Trustees shall at the annual meeting appoint an Executive Committee of three members, in whom shall be vested all the powers of the Board of Trustees relating to the immediate management of the business of the corporation. Such Executive Committee shall have power to sell and distribute fruit; make rules for the packing and grading of fruit; make any and all contracts; employ and discharge men, and do each, any and everything necessary for carrying on of the business of the corporation, subject at all times to the control of the Board of Trustees.

If the President of the corporation is not appointed as a member of said Executive Committee, he shall by virtue of his office be ex-officio a member thereof and entitled to meet with said committee, participate in the discussion of questions considered by it, and give the committee such suggestions and advice as he shall deem proper.

The Secretary of the Corporation shall attend all meetings of the Executive Committee and keep a full and complete record of its proceedings.

Sec. 6. The Board of Trustees shall fill all vacancies which may occur in the offices of the corporation, and in case of a vacancy in the Board of Trustees the same shall be filled by the remaining members of the Board until such time as the district from which said member comes shall appoint or elect a member of the Board in his stead. Immediately upon the district electing or selecting a person to fill the vacancy, the person appointed by the Board of Trustees shall retire and his place shall be taken by the person chosen by the district.

Whenever the Board appoints a member to fill a vacancy upon the Board of Trustees, such appointment shall be from the district to which the member belonged, whose place has become vacant.

Sec. 7. All conveyances of property, contracts and other instruments necessary to be executed under the seal of the corporation shall be executed by the President or Vice-President and Secretary of the corporation, but only on the authorization or approval of the majority of the Trustees or of the Executive Committee. All of the property of the corporation may be sold or mortgaged by the authorization of two-thirds of all of the Trustees.

Sec. 8. In addition to the annual meeting above provided for, the Trustees shall hold such other meetings as they shall determine. Meetings of the Board may be called at any time by the President, or, in his absence, or disability, by the Vice-President upon giving due notice thereof to all the Trustees, and such meeting shall be called at any time upon request of three trustees. Notice to be given by mailing a call for such meeting to each Trustee at his address ten days before the date of such meeting. Meetings shall be held at the home office and place of business of the corporation unless otherwise ordered by the board. By agreement in writing of all the Trustees, any action of the Board of Trustees, although not in regularly called meeting, and the record thereof when made, shall be valid and effective in all respects as when passed by the board at a regular session.

All questions before the Board shall be decided viva voce; the names of those voting to be taken down if desired by any member, and the record of the voting and all proceedings of the Board shall be legally kept and verified by the signature of the Secretary. A majority of the members of the Board shall constitute a quorum at all meetings. Less than a quorum may meet and adjourn from day to day.

Sec. 9. The officers and trustees shall be reimbursed from the treasury of the corporation for railroad fares and hotel bills incurred by them in attending any meeting, or while employed in the business of the corporation by the Board or Executive Committee, and shall be allowed such compensation in addition thereto as the Trustees or the Executive Committee may determine.

Sec. 10. The Trustees shall formulate the contracts and agreements under which fruit shall be marketed by this corporation, establish rates of commission to be charged for services rendered and shall make all rules and regulations for the government of the affairs of this corporation, and prescribe the conditions for the delivery and sale or distribution of fruit by this corporation, and shall make and prescribe rules for packing and grading fruits marketed through the corporation.

Sec. 11. No Trustee of this corporation shall be allowed to hold any other office or position in the employ of this corporation than that of President, Vice-President, Secretary, Treasurer or member of the Executive Committee. The General Manager shall not hold any other position.

## ARTICLE X.

### Maintenance and Finance.

Sec. 1. The Board of Trustees shall provide for such charges upon products handled and other means of providing funds for carrying on the business of the corporation, as they shall deem advisable. There shall be charged and deducted from the proceeds of fruit or other products sold or distributed through the corporation such sum as shall be fixed by the Board of Trustees. Such charges to be sufficient to cover the expense of handling and marketing the fruit, and all of the running expenses of the corporation, including fixed charges, salaries, advertising, etc., and such amount as the Trustees shall deem advisable to set aside as a surplus fund.

If a surplus fund is established the moneys belonging to such fund shall be kept separate and apart from the general funds of the corporation, and shall be drawn by the treasurer only upon the order of the Board of Trustees. All checks against said fund to be signed by the Treasurer and countersigned by the President.

Any moneys in excess of operating expenses in the treasury at the end of each year, shall be covered into the surplus fund. Whenever moneys shall accumulate in said surplus fund in excess of the needs of the corporation, they shall be distributed among the districts in proportion to the amount of fruit which has been marketed by them through the corporation.

#### ARTICLE XI.

##### Certificates of Membership.

There shall be issued to the representative from each of the districts named in Article I hereof, a certificate of membership, which shall entitle said district organization and the growers affiliated therewith, to all the privileges of this corporation. Membership in this corporation can only be assigned or transferred to some other district, and the representative thereof, and then only upon approval of the Board of Trustees of this corporation.

If any district fails to elect a representative to this corporation or ceases to maintain an organization or do business through this corporation, its certificate of membership shall be cancelled and all rights in and to this corporation and to its property, assets, etc., shall be at an end, unless its membership shall have been transferred as hereinbefore provided for.

If any representative or the organization in any district shall fail to comply with these by-laws and with the rules and regulations established by the Board of Trustees of this corporation, then, upon vote of two-thirds of its Trustees, this corporation may refuse to longer do business with or for said district organization or its members, and in such event all of the interest of said district and its organization, representatives and members in and to this corporation, its property and assets shall be forfeited, and said district, nor the members or representative thereof, shall have any right title, interest or claim in or to any of the property or assets of this corporation.

Before the Board of Trustees shall have power to refuse to handle business for any district or its members, charges shall be preferred to the Board of Trustees, setting forth fully wherein the district organization or its members have failed to comply with the by-laws of this corporation, and the rules and regulations established by the trustees thereof, and a time shall be appointed by the Board for the hearing of such charges and notice thereof, with a copy of the charges preferred, shall be served upon the representative of such district of this corporation. At the time fixed, said district shall be permitted to appear and file answer to said charges and a full hearing shall be had. Two-thirds of the members of the Board of Trustees shall be necessary to constitute a quorum at a hearing of said charges, and no district organization shall be deprived of its relationship with this corporation, or right to do business through it, except on the vote of two-thirds of the members of the Board of Trustees of this corporation. This provision and penalty shall in no manner restrict or affect any legal remedy or right of action which this corporation may have against any district or individual for breach of contract, indebtedness, or other liability.

If any district representative or organization withdraws or is expelled there shall be no liability on the part of this corporation to account for, return or pay over any money, property or assets to the district organization, representative or anyone.

#### ERRATA.

On page 11, in the legend under Figure 4, omit, "This is the same room as other packing scene from A. P. Paasch."

On page 12, in the legend under Figure 5, substitute the word "Cutler" for the words "Cutter and".

On page 13, in the legend under Figure 6, substitute the word "Cutler" for "Oregon". On the same page, the matter following the caption "Remarks" should appear at the end of the table printed on pages 14 and 15, and the whole inserted on page 44 immediately preceding "Appendix IV."

On page 33, the last complete paragraph on the page should read, "If the car does not come when ordered, the shipper should immediately file a written remonstrance with the local agent, covering the case."

On page 39, the first line of the third paragraph beginning on that page should read, "Another matter brought out by these figures" etc.