

UNIVERSITY OF TENNESSEE

August, 1926.

Upon the request of the Committee on Graduate Study the undersigned
have examined a thesis entitled
THE STANDARDIZATION OF CONTAINERS FOR HORTICULTURAL PRODUCTS

presented by HERMAN FULSCHE HELFENBEIN
candidate for the degree of Master of SCIENCE IN AGRICULTURE

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acceptance.

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THE UNIVERSITY OF TENNESSEE

33^{1st}

THE STANDARDIZATION OF CONTAINERS FOR HORTICULTURAL PRODUCTS

A THESIS

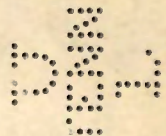
SUBMITTED TO THE COMMITTEE ON GRADUATE STUDY

IN CANDIDACY FOR THE DEGREE OF

MASTER OF SCIENCE

IN AGRICULTURE

DEPARTMENT OF HORTICULTURE



BY

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KNOXVILLE, TENNESSEE

AUGUST, 1926

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MADE IN U.S.A.

BOND

W.W. WEBB WIFT

Preface

In this thesis an attempt has been made to present the subject of standardization of packages for fruits and vegetables as it applies to the average citizen, and to give a basis for the selection of standard containers to be used in marketing. The information was collected from many sources and covers the use of packages in the United States. Observations were made for two years and a thorough study was made of the types, styles and sizes of containers used in the marketing of fruits and vegetables.

The problem of standardizing containers for horticultural products is not easily solved. The solution will not be obtained until the general public is educated to the fact that they are the losers. When the consuming public realizes that they are losing many dollars every year, due to the manufacture of large numbers of unnecessary styles and sizes of containers and that they are defrauded many times in not being able to recognize the exact amount in certain packages, then this vital problem will be solved.

Acknowledgements are due to Professor N. D. Peacock, under whose direction this study was made, for his valuable suggestions and criticisms; to those

commission men in Knoxville who gave of their time in answering questions and allowing the writer to collect data at their places of business; to the United States Department of Agriculture through their representative, Mr. H. A. Spillman, for valuable information and the use of pictures in this thesis; and to many other persons and organizations for their whole hearted cooperation and information which they gave so freely.

H. F. Helfenbein

University of Tennessee
August 1936.

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THE STANDARDIZATION OF CONTAINERS FOR
HORTICULTURAL PRODUCTS

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IMPORTANCE

The standardization of containers for Horticultural products is a subject which has received a great deal of consideration during the past ten years. It is a subject which is of vital interest to growers, transportation agencies and selling organizations. It is also a subject which should be of more interest to the consuming public. Such standardization is of interest to the average citizen because the wide variation in the styles and sizes of containers now on the market makes it very easy to misrepresent the volume of a package. Not only is the average citizen defrauded frequently by the substitution of short-measure for full-measure packages, but he must pay for the manufacture of a large variety of packages.

The large number of containers in general use causes a great expense in marketing and handling them at the commission house. It causes the railroads large losses due to the poorly-packed cars that are shipped. Frequently the odd sizes and types of packages do not allow the proper packing and stripping of cars, consequently there is breakage and general waste in transportation. Such loss and expense and the chance for

fraud are entirely unnecessary. Proper legislation by Congress could establish containers which would meet the needs. Packages of certain styles and sizes could be adopted that would easily do away with the excessive expense of manufacturing needless types and would reduce the chances for fraud.

This paper includes observations and data which will aid in the general standardization of containers for horticultural products. It is intended to bring all the available information together and draw some conclusions as to the best containers for fruits and vegetables.

HAMMERMILL
BOND

HISTORY

The use of packages for gathering or harvesting products of the soil date from the earliest times. Amos, (11) a Biblical character and prophet of about 750 B.C., mentioned the use of the basket as a container for summer fruit in the following words, "And behold a basket of summer fruit." Containers for the marketing of horticultural products have developed during the past seventy-five years, but it has been only during the past ten years that any steps have been taken to establish certain standard containers.

Dr. J. A. Warder (20) in his book entitled "American Pomology" mentioned the use of barrels and boxes. He states that barrels were used in 1867, the time at which his volume was published, and further adds that they were used by many large orchardists. In 1886 Peter Henderson (15) wrote that in shipping vegetables from the South to the North packages should be used which allowed the free circulation of air. For shipping from North to South he believed that closed or tight packages should be used. He also wrote that baskets and boxes were better than barrels for shipping perishable vegetables.

Dr. A. Oemler (17) in 1886, wrote of the packages which a vegetable association of Georgia were using for shipping vegetables. This was one of the first

indications that containers of definite sizes might be developed for marketing purposes. He also gave specifications in regard to the dimensions and materials which were used in these packages.

The early history of the manufacture of containers in this country is very obscure. The following extracts from a letter from Dr. H. A. Spilman (18) of the Department of Agriculture brings out this fact:

"Information as to the history and early use of packages, is extremely difficult to obtain. I have made several efforts to trace the origin of different types, but have been almost entirely unsuccessful. I believe the round stave basket was originally made at Dowagiac, Michigan, in 1867. This was really a splint basket, the splint being $5/8$ inch wide and $1/16$ inch thick, often in the bottom the staves standing up straight. These staves were 2 inches wide and 8 inches apart. Two years later a firm was organized in St. Joseph, Michigan, which made a package very similar to the present bushel, but the hoops and staves were cut from planks. Apparently the first factory to make round stave baskets, using rotary cut veneer was established in St. Joseph in 1870.

Hampers have been made by hand for a great many years. The first hamper machine, it is claimed, was built and operated in Bridgeport, Alabama, some thirty years ago.....

The Climax basket was developed in the State of New York and was made exclusively by hand for a great many years. Many hand made baskets are still turned out, but the tendency these days is to their being made by machinery. The first machine for this purpose was developed about thirty years ago in Dundee, New York. This original machine was a very crude affair, but was operated at least during one season, and several thousand baskets were made on it. It may at present be seen in the National Museum here in Washington."

Until the last decade the development of containers was not a national question. Local conditions

influenced entirely the development of the types, which seemed best suited to the need of a particular locality.

With the advent of the ventilator and refrigerator cars these packages which had been developed for local conditions began to arrive on the large central markets.

It was then that attention was centered on the matter of ^{their} of standardization.

PACKAGES IN USE AT THE PRESENT

The rate at which packages have developed since the advent of ventilator and refrigerator cars has been surprisingly rapid. It seems as if each locality has tried to out do the other in developing packages in which to ship fruits and vegetables.

The question of uniform packages has been before the public so long now that inevitably certain containers have been standardized. The barrel was the first fruit and vegetable package that was standardized and this was followed by certain baskets and berry boxes. This has come about as the result of both Federal and state legislation, but there are still many other styles and sizes of packages in use that should be standardized. There are in common use today about forty sizes of cabbage crates, twenty styles of celery crates, thirty lettuce crates or boxes, fifty styles and sizes of hampers, fifteen styles and sizes of round-stave baskets and market baskets varying in size from one quart to twenty-four quarts;(14) while it is obvious that a few standard sizes would satisfy all the demands of the trade.

Table I indicates the number of packages that are manufactured in the United States. This table represents the production of packages for 1935. It also gives the number of firms making these various types of packages.

HAMMERMILL
PAPER

TABLE I. Packages Manufactured in the United States
1925. (16).

Size, Type and Style	No. of factories reporting	Number produced
<u>Hampers</u>		
Under 8 quarts	4	455,230
8 "	4	72,550
10 "	1	9,875
12 "	1	33,900
14 "	6	2,284,350
16 "	12	1,049,543
5/8 bushel	27	4,568,323
7/8 "	15	2,820,500
1 "	50	10,721,178
5 peck	9	1,587,813
1 1/2 bushel	18	2,108,149

(109 factories listed with U. S. Bur. Markets,
74 reporting)

Market Baskets

2 quart	1	10,615
4 "	12	914,274
6 "	1	1,164
8 "	33	2,735,375
10 "	7	903,036
12 "	14	808,420
13 "	1	21,500
14 "	9	299,168
16 "	35	8,030,921
18 "	1	6,672
20 "	1	3,936
22 "	5	1,430,400
24 "	6	103,274
32 "	3	12,048
Grate Baskets	3	28,451

(66 factories listed,
50 reporting)

Till Baskets

1 quart (Wood Rim)	16	8,706,755
2 " " "	21	4,898,790
3 " " "	30	21,210,408
4 " " "	41	69,770,509
1 " Metal	-	-
2 " " "	2	1,082,900
3 " " "	5	60,433,800
4 " " "	2	780,920

(95 factories listed,
71 reporting)

TABLE I. con'td.

Size, Type and Style	Number factories reporting	Number produced
<u>Berry Boxes</u>		
1/2 pt. American	2	49,000
1 " "	21	16,438,600
1 qt. "	61	206,195,405
1/2 pt. Hallock	2	494,000
1 pt. "	33	31,301,051
1 qt. "	31	24,673,406
1/2 pt. Leslie	1	278,000
1 pt. "	1	1,400,000
1/2 pt. Metal Rim	2	13,646,380
1 pt. " "	6	47,542,370
1 qt. " "	3	22,080,850
1/2 pt. Stitched Tray	1	450,000
1 pt. " "	4	7,110,900
1 qt. " "	1	6,320,000
1 pt. Oblong	1	624,000

(121 factories listed with U. S. Bur. Markets, 102 reporting)

<u>Berry Crates</u>		
12 pt. Leslie	1	10,200
24 " "	2	40,620
12 " American	1	38,550
15 " "	2	6,515
24 pt. "	9	370,775
30 pt. "	3	22,525
16 qt. "	5	123,570
24 qt. "	17	2,774,050
32 qt. "	29	1,313,636
60 qt. "	3	114,848
24 pt. Oblong	1	35,000
12 pt. Hallock	1	212
16 pt. "	3	11,137
24 pt. "	24	820,723
12 qt. "	1	140
16 qt. "	12	588,753
24 qt. "	8	79,023
12 pt. Metal Rim	1	8,000
15 pt. Metal "	1	49,768
24 pt. Metal "	1	2,000
30 pt. Metal "	1	11,531

(238 factories listed, 186 reporting)

TABLE I. CON'T.

Size, Type and Style	Number of factories reporting	Number produced
<u>Climax Baskets</u>		
3 quart	29	4,072,625
4 "	42	11,036,166
12 "	54	11,365,677
(71 factories listed, 65 reporting)		
<u>Round Stave Baskets</u>		
1/4 bushel	3	41,528
1/2 "	16	544,266
3/4 "	3	25,732
7/8 "	1	5,000
1 " (regular)	66	38,850,227
1 " (str. side)	14	2,310,452
1-1/2 "	3	4,390
2 "	1	234
3 "	1	54
4 "	1	19
Picking Baskets	8	159,108
(92 factories listed, 73 reporting)		
<u>Boxes</u>		
Apple	57	18,852,939
Apricot	1	15,000
Artichoke	1	6,200
Bushel	1	25,000
Celery	8	975,386
Cherry	18	442,186
Cranberry	1	28,000
Cucumber	1	100,000
Grape lug	11	572,300
Lettuce	2	5,525
Los Angeles lug	14	983,743
Other lugs	6	178,837
Orchard	1	7,650
Peach	33	1,811,176
Pear	35	1,003,383
Picking	1	12,250
Potato	1	42,500
Prune	20	1,119,570
Rhubarb	5	50,531
Tomato	1	42,000
Vegetable	2	70,000
(92 factories listed, 65 reporting)		

TABLE I. con't.

Size, Type and Style	Number of factories reporting	Number produced
<u>Grates</u>		
Asparagus (flat)	9	67,655
Asparagus (pyramid)	12	139,418
Asparagus (compartment)	3	41,000
Cabbage	37	840,653
Cantaloupe	47	4,010,557
Cauliflower	22	1,254,050
Celery	35	3,707,954
Corn	1	15,000
Avocado	1	2,500
Bushel	3	10,712
Honey Dew	7	185,000
Lemon	2	866,254
Lettuce	46	5,401,205
Onion	10	2,673,834
Orange	28	23,163,575
1/2 Orange	1	1,393
1/4 Orange	1	3,264
Baby Orange	1	1,074
28 qt. Orange	1	1,582
Pea	5	37,800
Pepper	19	1,217,453
Pineapple	9	330,718
Potato	31	917,724
Potato (sweet)	2	389,300
Rhubarb	1	10,900
Tomato	6	37,140
Tomato (Jersey)	11	334,472
Tangerine	11	606,632
Vegetable	9	205,125
3 basket	1	16,000
4 basket	22	4,345,367
6 basket square	9	188,252
6 basket	30	7,474,945
5 peck	-	-
1/2 bbl. Utility	1	1,735

At a glance one can get an idea of the need of standardization. There are eleven different sizes of hampers given and of course this does not give the total number of styles. There are one hundred and nine factories listed with the Bureau of Economics. Anyone dealing with manufacturing concerns knows that there always is competition which causes one concern to try to outdo the other. This competition would encourage a large number of styles to be designed and put on the market. It may be noted that in the case of climax baskets the kinds are few. This package was standardized by the federal laws in 1917. Before that time there were in general use about thirty-one types of climax baskets.

Federal Recommendations

The national standard barrel law (1) went into effect July 1, 1916. It is, in part, as follows:

"Be it enacted by the senate and House of Representatives of the United States of America in Congress assembled, That the standard barrel for fruits, vegetables, and other dry commodities other than cranberries shall be of the following dimensions when measured without distention of its parts: the Length of stave, twenty-eight and one-half inches; diameter of heads, seventeen and one-eighth inches; distance between heads, twenty-six inches; circumference of bulge, sixty-four inches outside measurements; and the thickness of the stave not greater than four-tenths of an inch; provided, that any barrel of a different form having a capacity of seven-thousand and fifty-six cubic inches shall be a standard barrel. The standard barrel for cranberries when measured without distension of its parts; the length of stave twenty-eight and one-half inches; diameter of head, fifteen and one-fourth inches; distance between head, twenty-five and one-fourth inches; circumference of the bulge, fifty-

eight and one-half inches outside measurements; and the thickness of the stave not greater than four-tenths of an inch.

Sec. 2. That it shall be unlawful to sell, offer, or expose for sale in any State, Territory, or District of Columbia, or to ship from any State, Territory, or the District of Columbia, or to a foreign country a barrel containing fruits or vegetables or any other dry commodity of less capacity than the standard barrel defined in the first section of this act or subdivisions thereof known as the third, half, and three-quarters barrel, and any person guilty of a wilful violation of this Act shall be deemed guilty of a misdemeanor and be liable to a fine not to exceed five hundred dollars or imprisonment not to exceed six months in the courts of the United States having jurisdiction, Provided, however, That no barrel shall be deemed below the standard of this Act when shipped to a foreign country and constructed according to the specifications or directions of the foreign purchaser if not constructed to conflict with the laws of the foreign country to which the same is intended to be shipped."

The Act also provided for a reasonable variation from the above specifications and stated that the Act was to go into effect July 1, 1916.

In accordance with the provisions of the above Act the Bureau of Standards in September, 1917, issued Circular No. 71 of the Bureau of Standards (2) which gave the contents of a standard barrel and the tolerances allowed. The capacity of the standard barrel for fruits, vegetables and other dry commodities except lime and cranberries and its subdivisions are as follows:

Size	Cubic inches	Bushels <u>a</u>	Quarts <u>a</u>
Barrel	7056	3.281	105
3/4 barrel	5292	2.461	78 3/4
1/2 "	3528	1.641	52 1/3
1/3 "	2352	1.094	35

a Struck Measure

The capacity of the standard cranberry barrel and its subdivisions (3) areas follows:

Size	Cubic inches	Bushels <u>a</u>	Quarts <u>a</u>
Cranberry barrel	5286	2.709	86 45/64
3/4 cranberry barrel	4369.5	2.032	65 1/64
1/2 cranberry barrel	2913	1.355	43 11/32
1/3 cranberry barrel	1942	0.903	28 29/32

a Struck Measure

The standard dimensions of a barrel for fruit and vegetables and other dry commodities other than lime and cranberries and of a barrel for cranberries (2) are given in the following table:

Dimensions	Barrel for fruits, vegetables, other than cranberries	Barrel for cranberries
	Inches	Inches
Diameter of head	17 1/8	16 1/4
Effective diameter of head	16 3/4	15 7/8
Distance between heads	26	25 1/4
Circumference of bulge, ^a	64	58 1/2
Length of stave	28 1/3	28 1/2

Subdivisions of barrel for fruits, vegetables,
and other dry commodities other than cranberries:

Dimensions	3/4 barrel	1/2 barrel	1/3 barrel
	Inches	Inches	Inches
Effective diameter of head	15 1/4	13 3/8	11 5/8
Distance between heads	23 1/3	20 1/3	18
Circumference of bulge, outside measurement-	58 1/3	51 1/3	45 1/4

Subdivision of barrel for cranberries:

Dimensions	3/4 barrel	1/2 barrel	1/3 barrel
	Inches	Inches	Inches
Effective diameter of head	14 3/8	13 5/8	11
Distance between heads	23	20	17 1/3
Circumference of bulge, outside measurement -	53 3/8	47	41 3/8

It is interesting to note after a study of the above act and tables that the United States standard Barrel Law also declares illegal the short barrel regardless of whether or not it is marked. An act which corresponds to the Standard Barrel Law has been enacted for the standardization of climax baskets. These baskets are used for grapes, other fruits and vegetables. The Act also provides for baskets and other containers of small fruits, berries and vegetables and for other purposes. The Act (3) is as follows:

United States Standard Container Act

"An act to fix standards for climax baskets for grapes and other fruits and vegetables, and to fix stand-

ards for baskets and other containers for small fruits, berries, and vegetables, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled: That standards for Climax baskets for grapes, and other fruits and vegetables shall be the two-quart basket, four-quart basket, and twelve-quart basket, respectively:

(a) The standard two-quart Climax basket shall be of the following dimensions: Length of bottom piece, nine and one-half inches; thickness of bottom piece, three-eighths of an inch; height of basket, three and seven-eighths inches, outside measurement; top of basket, length eleven inches and width five inches, outside measurement. Basket to have a cover five by eleven inches, when a cover is used.

(b) The standard four-quart Climax basket shall be of the following dimensions: Length of bottom piece, twelve inches; width of bottom piece, four and one-half inches; thickness of bottom piece, three-eighths of an inch; height of basket, four and eleven-sixteenths inches, outside measurement; top of basket, length fourteen inches, width six and one-fourth inches, outside measurement. Basket to have cover six and one-fourth inches by fourteen inches, when cover is used.

(c) The standard twelve-quart Climax basket shall be of the following dimensions; Length of bottom piece, sixteen inches; width of bottom piece, six and one-half inches; thickness of bottom piece, seven-sixteenths of an inch; height of basket, seven and one-sixteenth inches, outside measurement; top of basket, length nineteen inches, width nine inches, outside measurement. Basket to have cover nine inches by nineteen inches, when cover is used.

Sec. 2. That the standard or other container for small fruits, berries, and vegetables shall be of the following capacities, namely, dry one-half pint, dry pint, dry quart, or multiples of the dry quart.

(a) The dry half-pint shall contain sixteen and eight-tenths cubic inches.

(b) The dry pint shall contain thirty-three and six-tenths cubic inches.

(c) The dry quart shall contain sixty-seven and two-tenths cubic inches.

Sec.3. That it shall be unlawful to manufacture for shipment, or to sell for shipment, or to ship from any State or Territory of the United States or the District of Columbia to any other State or Territory of the United States or the District of Columbia, any Climax baskets or other containers for small fruits, berries or vegetables, whether filled or unfilled, which do not conform to the provisions of this Act; and any person guilty of a wilful violation or any of the provisions of this Act shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined in any sum not exceeding \$25; Provided, That nothing herein contained shall apply to the manufacture, sale or shipment of Climax baskets, baskets, or other containers for small fruits, berries, and vegetables when intended for export to foreign countries when such Climax baskets, baskets or other containers for small fruits, berries and vegetables accord with the specifications of the foreign purchasers or comply with the law of the country to which shipment is made or to be made.

Sec. 4. That the examination and test of Climax baskets, baskets, or other containers for small fruits, berries and vegetables, for the purpose of determining whether such baskets or other containers comply with the provisions of this Act, shall be made by the Department of Agriculture, and the Secretary of Agriculture shall establish and promulgate rules and regulations allowing such reasonable tolerances and variations as may be found necessary.

Sec. 5. That it shall be the duty of each district attorney, to whom satisfactory evidence of any violation of the Act is presented, to cause appropriate proceedings to be commenced and prosecuted in the proper court of the United States for the enforcement of the penalties as in such case herein provided.

Sec.6. That no dealer shall be prosecuted under the provisions of this Act when he can establish a guaranty signed by the manufacturer, wholesaler, jobber, or other party residing within the United States from whom such Climax baskets, baskets, or other containers as defined in this Act, were purchased, to the effect that said Climax baskets, baskets, or other containers, are correct within the meaning of the Act. Said guaranty, to afford protection, shall contain the name and address of the party or parties making the sale of Climax baskets, baskets, or other containers to such dealer, and in such case said party or parties shall be amenable to the prosecutions, fines, and other penalties which would attach in due course to the dealer under the provisions of this Act.

Sec.7. That this Act shall be in force and effect from and after the first day of November, nineteen hundred and seventeen."

State Laws and Regulations

Most of the States have some laws which deal with the standardization of products and about thirty-seven have laws which deal directly with the standardization of grades and containers for fruits and vegetables. There are however, very few states which have laws regulating the use of packages for fruits and vegetables. The outstanding states are Indiana, Ohio, Texas and Michigan. The Indiana law (4) on standardization deals entirely with the packages. The law reads as follows:

Indiana Standard Container Act -

"An Act to fix standards for hampers, round stave baskets, climax baskets and splint baskets for fruits and vegetables, and for baskets and other containers for berries and other small fruits and vegetables; authorizing the state food and drug commissioner to establish regulations and tolerances in connection therewith; providing for the enforcement thereof and fixing penalties.

Standard Hampers for Fruits and Vegetables.

Sec.1. Be it enacted by the general assembly of the State of Indiana that the standard hamper for fruits and vegetables shall be the one-peck hamper, one-half bushel hamper, five -eights bushel hamper, one bushel hamper, and one and one-half bushel hamper, which respectively, shall be of the capacity and conform to the specifications set forth in this section.

(a) The standard one peck hamper shall contain five hundred and thirty-seven and six-tenths cubic inches and conform to the following specifications; The inside diameter between staves at the upper edge of the top inside hoop shall be ten and three-eights inches; the inside diameter of the bottom shall be six and one-half inches the inside length of the staves, shall be nine and

five-eighths inches; the inside hoop shall be one-tenth of an inch thick and set with its upper edge even with the upper ends of the staves; each stave shall be not less than one-tenth of an inch thick and ten and one-eighth inches long; and the bottom piece shall be one-half of an inch thick.

(b) The Standard one-half bushel hamper shall contain one thousand and seventy-five and twenty-one hundredths cubic inches and conform to the following specifications. The inside diameter between staves at the upper edge of the top inside hoop shall be thirteen inches; the inside diameter of the bottom shall be eight and one-half inches; the inside length of the staves shall be twelve inches; the inside top hoop shall be one-ninth of an inch thick and set with its upper edge even with the upper ends of the staves; each stave shall be not less than one-tenth of an inch thick and twelve and five-eighths inches long; and the bottom piece shall be five-eighths of an inch thick.

(c) The standard five-eighths bushel hamper shall contain one thousand, three hundred forty-four cubic inches and conform to the following specifications: The inside diameter between staves at the upper edge of the top inside hoop shall be fourteen and one-fourth inches, the inside diameter of the bottom shall be nine inches; the inside length of the staves shall be twelve and seven eighths inches; the inside top hoop shall be one-eighth of an inch thick and set with its upper edge even with the upper ends of the staves; each stave shall be not less than one-ninth of an inch thick and thirteen and one-half inches long; and the bottom piece shall be five-eighths of an inch thick.

(d) The standard one bushel hamper shall contain two thousand one hundred and fifty and forty-two one hundredths cubic inches, and conform to the following specifications: The inside diameter, between staves at the upper edge of the top inside hoop shall be fifteen and one-eighth inches; the inside diameter of the bottom shall be nine inches; the inside length of the staves to the upper edge of the top, inside hoop shall be nineteen inches; the inside hoop shall be one-eighth of an inch thick and set with its upper edge three-eighths of an inch below the upper ends of the staves; each stave shall be not less than one-eighth of an inch thick and twenty inches long; and the bottom piece shall be five-eighths of an inch thick.

(e) The standard one and one-half bushel hamper shall contain three thousand two hundred and twenty five and sixty-three one hundredths cubic inches, and conform to either of the following specifications:

(1) The inside diameter between staves at the upper edge of the top, inside hoop shall be sixteen

and one-fourth inches; the inside diameter of the bottom shall be nine inches; the inside length of the staves to the upper edge of the top inside hoop shall be twenty-six inches; the inside top hoop shall be one-eighth of an inch thick and set with its upper edge three-eighths of an inch below the upper ends of the staves; each stave shall be not less than one-sixth of an inch thick and twenty-seven inches long, and the bottom piece shall be five-eighths of an inch thick.

(2) The inside diameter between staves at the upper edge of the top inside hoop shall be sixteen and three-fourths inches; the inside diameter of the bottom shall be ten inches; the inside length of the staves to the upper edge of the top inside hoop shall be twenty-three inches; the inside top hoop shall be one-eighth of an inch thick and set with its upper edge three eighths of an inch below the upper ends of the staves, each stave shall be not less than one-eighth of an inch thick and twenty-four inches long; and the bottom shall be five-eighths of an inch thick.

Standard Round Stave Baskets

Sec.2. That the standard round stave basket for fruits and vegetables shall be one-fourth bushel basket, one-half bushel basket, five-eighths bushel basket, one bushel basket, one and one-half bushel basket, and two bushel basket, which respectively shall be of the capacity and conform to the specifications set forth in this section.

(a) The one-fourth bushel round stave basket shall contain five hundred thirty-seven and six-tenths cubic inches, and conform to the following specifications: The inside diameter at the upper inner edge of the top inside hoop shall be ten and seven-eighths inches; the average inside depth shall be not less than six and three-fourths inches; the web shall consist of twenty-intersecting staves of such length that they will form the side and bottom of a basket which shall contain eight quarts standard dry measure.

(b) The one-half bushel round stave basket shall contain one thousand and seventy-five and twenty-one one hundredths cubic inches and conform to the following specifications: The inside diameter at the upper inner edge of the top inside hoop shall be thirteen and one-half inches; the average inside depth shall be not less than eight and one-half inches; the web shall consist of twenty intersecting staves, each not less than one-eighteenth of an inch thick and of such length that they will form the sides and bottom of a basket which shall contain sixteen quarts, standard dry measure.

(c) The five-eighths bushel round stave

basket shall contain one thousand and three hundred and forty-four cubic inches and conform to the following specifications: The inside diameter of the upper inner edge of the top inside hoop shall be thirteen and one-half inches; the average inside depth shall be no less than ten and one-fourth inches; the web shall consist of twenty intersecting staves, each not less than one-eighteenth of an inch thick and of such length that they will form the sides and bottom of a basket which shall contain twenty quarts, standard dry measure.

(d) The one bushel round stave basket shall contain two thousand one hundred and fifty and forty-two one hundredths cubic inches and conform to the following specifications: The inside diameter at the upper inner edge of the top inside hoop shall be seventeen inches; the average inside depth shall be not less than ten and three-fourths inches; the web shall consist of twenty intersecting staves, each not less than one-eighteenth of an inch thick and of such length that they will form the sides and bottom of a basket which shall contain thirty-two quarts, standard dry measure.

(e) The one and one-half bushel round stave basket shall contain three thousand two hundred and twenty-five and sixty-three one hundredths cubic inches and conform to the following specifications: The inside diameter at the upper inner edge of the top inside hoop shall be nineteen and three-eighths inches; the average inside depth shall be not less than twelve and three-fourths inches; the web shall consist of twenty-four intersecting staves, each not less than one-sixteenth of an inch thick and of such length that they will form the sides and bottom of a basket which shall contain forty-eight quarts, standard dry measure.

(f) The two bushel round stave basket shall contain four thousand, three hundred and eighty-four one hundredths cubic inches and conform to the following specifications: The inside diameter at the upper inner edge of the top inside hoop shall be twenty-one inches; the average inside depth shall be not less than fourteen inches; the web shall consist of twenty-four intersecting staves, each not less than one-sixteenth of an inch thick and of such length that they will form the sides and bottom of a basket which shall contain sixty-four quarts, standard dry measure.

Standard Splint Baskets.

Section 3. That the standard splint basket for fruits and vegetables shall be the four quart basket, eight quart basket, twelve quart basket, sixteen quart basket and twenty-four quart basket, standard dry measure.

(A) The four quart splint basket shall contain two hundred and sixty-eight and eight-tenths cubic inches and conform to the specifications in one of the two following numbered subdivisions:

(1) The approximate inside dimensions of the top across the center shall be seven inches by twelve inches. The approximate inside dimensions of the bottom at the corners shall be five and three-fourths inches by ten and one-half inches. The inside depth at the corners shall be four inches.

(2) The inside dimensions of the square cornered splint basket at the top shall be six inches by twelve inches, the inside dimensions of the bottom shall be five and one-half inches by eleven and one-half inches, the inside depth at the corners shall be four inches.

(B) The eight quart splint basket shall contain five hundred and thirty-seven and six-tenths cubic inches and conform to the specifications in one of the three following numbered subdivisions:

(1) The approximate inside dimensions of the top across the center shall be eight inches by fourteen inches. The approximate inside dimensions of the bottom at the corners shall be seven inches by twelve inches. The inside depth at the corners shall be five inches.

(2) The approximate inside dimensions of the top across the center shall be nine and one-half inches by sixteen and one-half inches. The approximate inside dimensions of the bottom at the corners shall be seven and one-half inches by fourteen and one-half inches. The inside depth at the corners shall be four inches.

(3) The inside dimensions of the square cornered splint basket at the top shall be seven and three-eighths inches by fifteen and one-half inches. The inside dimensions of the bottom shall be seven inches by fourteen and one-half inches. The inside depth at the corners shall be five inches.

(C) The twelve quart splint basket shall contain eight hundred and six and four-tenths cubic inches and conform to the specifications in one of the three following numbered subdivisions:

(1) The approximate inside dimensions of the top across the center shall be nine and one-half inches by sixteen inches. The approximate inside dimensions of the bottom at the corners shall be eight and one-half inches by fourteen inches. The inside depth at the corners shall be five and one-half

inches.

(2) The approximate inside dimensions of the top across the center shall be eleven and one-half inches by seventeen and one-half inches. The approximate inside dimensions of the bottom at the corners shall be eight and one-half inches by fourteen and one-half inches. The inside depth of the basket at the corners shall be five inches.

(3) The inside dimensions of the square corner splint basket at the top shall be eight and five eighths inches by seventeen and one-half inches. The inside dimensions of the bottom shall be eight inches by sixteen and three-eighths inches. The inside depth at the corners shall be five and three fourths inches.

(D) The sixteen quart splint basket shall contain one thousand and seventy-five and twenty-one one hundredths cubic inches and conform to the specifications in one of the three following numbered subdivisions:

(1) The approximate inside dimensions of the top across the center shall be ten and one-half inches by eighteen and one-half inches. The approximate inside dimensions of the bottom at the corners shall be eight and one-half inches by sixteen inches. The inside depth at the corners shall be six and one-half inches.

(2) The approximate inside dimensions of the top across the center shall be eleven and one-half inches by nineteen and one-half inches. The approximate inside dimensions of the bottom at the corners shall be eight and one-half inches by sixteen and one-half inches. The inside depth at the corners shall be six inches.

(3) The inside dimensions of the square cornered splint basket at the top shall be nine inches by nineteen inches. The inside dimensions of the bottom shall be eight and one-half inches by eighteen inches. The inside depth at the corners shall be six and five-eighths inches.

(E) The twenty-four quart splint basket shall contain one thousand six hundred and twelve and eight tenths cubic inches, and conform to the specifications in one of the three following numbered subdivisions:

(1) The approximate inside dimensions of the top across the center shall be twelve inches by twenty inches. The approximate inside dimensions of the bottom at the corners shall be ten inches by seventeen and one-half inches. The inside depth of the basket at the corners shall be seven and one-half inches.

(2) The approximate inside dimensions of the top across the center shall be twelve inches by twenty-three inches. The approximate inside dimensions of the bottom at the corners shall be nine inches by nineteen inches. The inside depth of the basket at the corners shall be seven inches.

(3) The inside dimensions of the square-cornered splint basket at the top shall be ten and five-eighths inches by twenty-two and one-fourth inches. The inside dimensions of the bottom shall be nine and five-eighths inches by twenty and one-half inches. The inside depth of the basket at the corners shall be seven and one-half inches.

Standard Climax Baskets.

Sec. 4. That standards for climax baskets for grapes and other fruits and vegetables shall be the two quart basket, four quart basket and twelve quart basket respectively:

(a) The standard two quart climax basket shall be of the following dimensions: Length of bottom piece, nine and one-half inches; width of bottom piece, three and one-half inches, thickness of bottom piece, three-eighths of an inch, height of basket, three and seven-eighths inches, outside measurement; top of basket, length eleven inches and width five inches outside measurement. Basket to have a cover of five by eleven inches, when a cover is used.

(b) The standard four quart climax basket shall be of the following dimensions: Length of bottom piece, twelve inches; width of bottom piece four and one-half inches; thickness of bottom piece three eighths of an inch; height of basket, four and eleven-sixteenths inches outside measurement; top of basket, length fourteen inches, width, six and one-fourth inches, outside measurement. Basket to have cover six and one-fourth inches by fourteen inches, when cover is used.

(c) The standard twelve-quart climax baskets shall be of the following dimensions: Length of bottom piece, sixteen inches, width of bottom piece six and one-half inches, thickness of bottom piece seven-sixteenths of an inch, height of basket, seven and one-sixteenth inches, outside measurement; top of basket, length nineteen inches, width nine inches, outside measurement, basket to have cover nine inches by nineteen inches when cover is used.

Standard Containers For Small Fruits.

Sec. 5. That standard basket or other container for berries and other small fruits and vegetables shall be of the following capacities; namely, dry one-half pint, dry pint, dry quart, or multiples of the dry quart.

(a) The dry half pint shall contain sixteen and eight-tenths cubic inches.

(b) The dry pint shall contain thirty-three and six-tenths cubic inches.

(c) The dry quart shall contain sixty-seven and two-tenths cubic inches.

Provided that the provisions of this section shall

not be construed to permit the manufacture, sale or use of hampers, round stave baskets, climax baskets or pint baskets in any other multiples of a quart than those enumerated in section 1,2,3,4 hereof.

The Ohio law establishes the same grade for fruits and vegetables as the U. S. grade. The Ohio container act (5) follows:

**Ohio Standards For Climax Baskets, Small
Fruit Baskets, Hampers and Round Stave
Baskets For Fruits and Vegetables.**

Be it enacted by the General Assembly of the State of Ohio:

Section 1. That standards for climax baskets for grapes and other fruits and vegetables shall be the two-quart basket, four-quart basket and twelve-quart basket respectively:

(a) The standard two-quart climax basket shall be of the following dimensions: Length of bottom piece, nine and one-half inches; width of bottom piece, three and one-half inches; thickness of bottom piece, three-eighths of an inch; height of basket, three and seven-eighths inches, outside measurement; top of basket, length eleven inches and width five inches outside measurement. Basket to have a cover of five by eleven inches, when a cover is used.

(b) The standard four-quart Climax basket shall be of the following dimensions: Length of bottom piece, twelve inches; width of bottom piece, four and one-half inches; thickness of bottom piece, three-eighths of an inch; height of basket, four and eleven-sixteenths inches, outside measurement; top of basket, length fourteen inches, width six and one-fourth inches, outside measurement. Basket to have cover six and one-fourth inches by fourteen inches, when cover is used.

(c) The standard twelve-quart Climax basket shall be of the following dimensions; Length of bottom piece, sixteen inches; width of bottom piece, six and one-half inches; thickness of bottom piece, seven-sixteenths of an inch; height of basket, seven and one-sixteenth inches, outside measurement; top of basket, length nineteen inches, width nine inches, outside measurement. Basket to have cover nine inches by nineteen inches, when cover is used.

Sec. 2. That standard basket or rather container for small fruits, berries and vegetables shall be of the following capacities; namely, dry one-half pint,

dry pint, dry quart, or multiples of the dry quart.

(a) The dry half pint shall contain sixteen and eight-tenths cubic inches.

(b) The dry pint shall contain thirty-three and six-tenths cubic inches.

(c) The dry quart shall contain sixty-seven and two-tenths cubic inches.

The dimensions of the one-quart box used in the sale of berries or other small fruits shall be as follows: five and one-tenth inches square on top, four and three-tenths inches square on the bottom and three inches in depth.

Sec.3. That the standard hampers for fruits and vegetables shall be the one peck hamper, one-half bushel hamper, one-bushel hamper and one and one-half bushel hamper respectively.

(a) The standard one peck hamper shall contain five hundred thirty-seven and six-tenths cubic inches, and conform to the following specifications: The inside diameter between staves at upper edge of the top inside hoop shall be ten and three-eighths inches; the inside diameter of the bottom shall be six and one-half inches; the inside length of the staves shall be nine and five-eighths inches; the inside top hoop shall be one-tenth inch thick and set with its upper edge even with the upper ends of the staves; there shall be ten staves, each not less than one-tenth inch thick and ten and one-eighth inches long; and the bottom piece shall be one-half inch thick.

(b) The standard one-half bushel hamper shall contain one thousand, seventy-five and twenty-one-hundredths cubic inches, and conform to the following specifications: The inside diameter between staves at upper edge of the top inside hoop shall be thirteen inches; the inside diameter of the bottom shall be eight inches; the inside length of staves shall be twelve and one-half inches; the inside top hoop shall be one-ninth of an inch thick and set with its upper edge even with the upper ends of the staves; there shall be ten staves, each not less than one-tenth of an inch thick and thirteen and one-eighth inches long; and the bottom piece shall be five-eighths of an inch thick.

(c) The standard one-bushel hamper shall contain two thousand, one hundred fifty and forty-two one-hundredths cubic inches, and conform to the following specifications: The inside diameter between staves at upper edge of the top inside hoop shall be fifteen and one-eighth inches; the inside diameter of the bottom shall be nine inches; the inside length of the staves

to the upper edge of the top inside hoop shall be nineteen inches; the inside top hoop shall be one-eighth of an inch thick and set with its upper edge three-eighths of an inch below the upper ends of the staves; there shall be either ten or twelve staves, each not less than one-eighth of an inch thick and twenty inches long; and the bottom piece shall be five-eighths of an inch thick.

(d) The standard one and one-half bushel hamper shall contain three thousand, two hundred twenty-five and sixty-three one-hundredths cubic inches, and conform to either of the following specifications:

(1) The inside diameter between staves at upper edge of the top inside hoop shall be sixteen and one-fourth inches; the inside diameter of the bottom shall be nine inches; the inside length of the staves to the upper edge of the top inside hoop shall be twenty-five and thirteen-sixteenths inches; the inside top hoop shall be one eighth of an inch thick and set with its upper edge three-eighths of an inch below the upper ends of the staves; there shall be ten staves, each not less than one-sixth of an inch thick and twenty-seven inches long; and the bottom piece shall be five-eighths of an inch thick.

(2) The inside diameter between staves at upper edge of the top inside hoop shall be sixteen and three-fourths inches; the inside diameter of the bottom shall be ten inches; the inside length of the staves to the upper edge of the top inside hoop shall be twenty-three inches; the inside top hoop shall be one-eighth of an inch thick and set with its upper edge three-eighths of an inch below the upper ends of the staves; there shall be ten staves, each not less than one-eighth of an inch thick and twenty-four inches long, and the bottom piece shall be five-eighths of an inch thick.

Sec. 4. That the standard round stave baskets for fruits and vegetables shall be the one-half bushel basket, one bushel basket, one and one-half bushel basket and two bushel basket respectively.

(a) The one-half bushel round stave basket shall contain one thousand seventy-five and twenty-one hundredths cubic inches, and conform to the following specifications: The inside diameter at the upper inner edge of the top inside hoop shall be thirteen and one-half inches; the average inside depth shall be not less than eight and one-half inches; the web shall consist of twenty intersecting staves, each not less than one-eighteenth of an inch thick and of such length that they will form the sides and bottom of a basket which shall contain sixteen quarts, standard dry measure.

(b) The one bushel round stave basket shall

contain two thousand, one-hundred fifty, and forty-two one hundredths cubic inches, and conform to the following specifications: The inside diameter at the upper inner edge of the top inside hoop shall be seventeen inches; the average inside depth shall be not less than ten and three-fourths inches; the web shall consist of twenty intersecting staves, each not less than one-eighteenth of an inch thick and of such length that they will form the sides and bottom of a basket which shall contain thirty-two quarts standard dry measure.

(c) The one and one-half bushel round stave basket shall contain three thousand two hundred twenty-five and sixty-three one-hundredths cubic inches, and conform to the following specifications: The inside diameter at upper inner edge of the top inside hoop shall be nineteen inches; the average inside depth shall be not less than twelve, and three-fourths inches; the web shall consist of twenty-four intersecting staves, each not less than one-eighteenth of an inch thick and of such length that they will form the sides and bottom of a basket which shall contain forty-eight quarts standard dry measure.

(d) The two bushel round stave basket shall contain four thousand, three hundred and eighty-four one-hundredths cubic inches, and conform to the following specifications: the inside diameter at upper inner edge of the top inside hoop shall be twenty and three-fourths inches; the average inside depth shall be not less than thirteen and three-fourths; the web shall consist of twenty-four intersecting staves, each not less than one-sixteenth of an inch thick and of such length that they will form the sides and bottom of a basket which shall contain sixty-four quarts, standard dry measure.

Sec. 5. That it shall be unlawful to ship or deliver for shipment within the State of Ohio, Climax baskets, small fruit baskets, hampers, or round stave baskets for fruits or vegetables, either filled or unfilled or parts of such Climax baskets, small fruit baskets, hampers or round stave baskets, that do not comply with this act; or fruits or vegetables in Climax baskets, small fruit baskets, hampers or round stave baskets, that at the time of such shipment, delivery for shipment or offer for sale, are not filled to the full capacity thereof, stricken measure. Any individual, partnership, association or corporation, that wilfully violates this section shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not exceeding \$100.00 or imprisonment not exceeding sixty days or both.

Section 6. That the secretary of agriculture is authorized to prescribe such regulations as he may find necessary for carrying into effect the provisions of this act, and to cause such examinations and tests to be made as may be necessary in order to determine whether Climax baskets, small fruit baskets, hampers and round stave baskets or parts thereof subject to this act, meet its requirements. For said purpose the authorized officers and agents of the secretary of agriculture may visit factories, stock rooms, and other places of business where such hampers or baskets or parts thereof are manufactured or held for sale or shipment or offered for sale, may enter cars, vessels, other vehicles and places under the control of carriers engaged in the transportation of such hampers or baskets or parts, the cost of which samples, upon request, shall be paid to the person entitled thereto.

Section 7. It shall be the duty of the secretary of agriculture to enforce all the provisions of this act, and to prescribe such rules and regulations not otherwise herein provided, as he may deem necessary, for the efficient execution of the provisions of the same, including the amount of tolerance necessary in the enforcement of this act, because of the impossibility of perfect scientific exactitude in the manufacture of such Climax baskets, small fruit baskets, hampers and round stave baskets; and which regulations and tolerances shall be in conformity with those from time to time promulgated by the United States department of agriculture.

Section 8. The secretary of agriculture for good and sufficient reasons may permit the use of Climax baskets, small fruit baskets, hampers and round stave baskets of a different form from the baskets prescribed in this act but of the same capacity.

Section 9. That no dealer shall be prosecuted under the provisions of this act when he can establish a guaranty signed by the manufacturer, wholesaler, jobber, or other party residing within the United States from whom such Climax basket, baskets, or other containers as defined in this act, were purchased, to the effect that said Climax basket, baskets, or other containers are correct within the meaning of this act. Said guaranty, to afford protection, shall contain the name and address of the party or parties making the sale of Climax basket, baskets, or other containers, hampers or round stave baskets, to such dealer, and in such case said guarantor shall be amenable to the prosecution, fines, and other penalties which would attach in due course to the dealer under the provisions of this act.

Section 10. That this act shall be in force and effect from and after the first day of November, nineteen hundred and twenty.

Section 11. Section 13108 of the General Code be, and the same is hereby repealed.

Passed April 17, 1919

Approved May 10, 1919.

The Texas law in dealing with grades of fruit is most explicit with special attention given to containers. The extract regarding packages from the Texas law (6) is as follows:

Texas Standard Containers

(a) The Standard Four Basket Crate shall have a capacity to hold four standard three-quart baskets. The heads of said crates shall be four and one-half ($4\frac{1}{2}$) inches wide by eleven (11) inches at the bottom, and thirteen (13) inches at the top in length, and seven-sixteenths ($\frac{7}{16}$) of an inch thick. The veneer or boards for the bottoms, sides and top shall be four and one-half ($4\frac{1}{2}$), four (4) and five and one-half ($5\frac{1}{2}$) inches, respectively, one-seventh ($\frac{1}{7}$) of an inch thick and twenty-two (22) inches long. The baskets for said four basket crate shall hold three (3) quarts standard dry measure, and conform to the following specifications:

The dimensions shall be five (5) inches wide by eight (8) inches long, at the bottom, and four (4) inches deep and the top band approximately twenty-nine and three-fourths ($29\frac{3}{4}$) inches long, inside measurements, and contain two hundred and one and six-tenths (201.6) cubic inches.

(b) The Standard Six Basket Crate shall have a capacity to hold six (6) standard four quart baskets. The heads of said crate shall be ten (10) inches high, eleven (11) inches wide, and seven-eighths ($\frac{7}{8}$) of an inch thick. The veneer or boards for the sides and top shall be approximately three-sixteenths ($\frac{3}{16}$) of an inch thick, ten (10) and eleven (11) inches wide (including panel spaces) respectively, and twenty-three and three-eighths ($23\frac{3}{8}$) inches long. The veneer or boards for the bottom shall be approximately ($\frac{1}{4}$) inch thick, three and seven-eighths ($3\frac{7}{8}$) inches wide, and twenty-three and three-eighths ($23\frac{3}{8}$) inches long.

The baskets for said six (6) basket crate shall hold four (4) quarts standard dry measure, and conform to either one of the following specifications:

(1) The dimensions shall be five and one-fourth ($5\frac{1}{4}$) inches wide by nine and one-half ($9\frac{1}{2}$) inches long, at the bottom, and four and one-half ($4\frac{1}{2}$) inches deep, and the top band approximately thirty-one and one-half ($31\frac{1}{2}$) inches long, inside measurements, and contain two hundred sixty-eight and eight-tenths (268.8) cubic inches.

(2) The dimensions shall be five and one-half ($5\frac{1}{2}$) inches wide by nine and one-half ($9\frac{1}{2}$) inches long, at the bottom, and four and one-fourth ($4\frac{1}{4}$) inches deep, and the top band approximately thirty-one and one-half ($31\frac{1}{2}$) inches long, inside measurements, and contain two hundred sixty-eight and eight-tenths (268.8) cubic inches.

(c) The Standard Folding Onion Crate shall have a capacity to hold thirty-two (32) quarts standard dry measure. The dimensions shall be nineteen and five-eighths ($19\frac{5}{8}$) inches long, eleven and three-sixteenths ($11\frac{3}{16}$) inches wide and nine and thirteen-sixteenths ($9\frac{13}{16}$) inches deep, inside measurements, and contain two thousand one hundred fifty and forty-two one-hundredths (2150.42) cubic inches.

(d) The Standard Orange Box shall have a capacity to hold approximately fifty-one (51) quarts standard dry measure. The dimensions of the standard orange box shall be twelve (12) by twelve (12) by twelve (12) inches for each one-half of box, inside measurements, and the dimensions of a one-half (or strap box) shall be twelve (12) by twelve (12) by six (6) inches for each one-half box, inside measurements, and contain three thousand four hundred fifty-six (3456) and one thousand seven hundred twenty-eight (1728) cubic inches, respectively.

(e) The Standard Quart Berry Box or Crate shall have the capacity to hold twenty-four (24) standard quart berry baskets containing sixty-seven and two-tenths (67.2) cubic inches each, dry measure; and the standard pint berry box or crate shall have the capacity to hold twenty-four (24) standard pint berry baskets, containing thirty-three and six-tenths (33.6) cubic inches, dry measure.)

Texas Standard Hamper

The standard hampers shall be the one-peck hamper, one-half bushel hamper, five-eighths bushel hamper, one-bushel hamper, and one and one-half bushel hamper, which, respectively, shall be of the capacity to conform to the following specifications:

(a) The standard one-peck hamper shall contain five hundred thirty-seven and six-tenths (537.6) cubic inches, and conform to the following specifications: The inside diameter between staves at the upper edge of the top inside hoop shall be ten and three-eighths ($10\frac{3}{8}$) inches; the inside diameter of the bottom shall be six and one-half ($6\frac{1}{2}$) inches; the inside length of the staves shall be nine and five-eighths ($9\frac{5}{8}$) inches; the inside top hoop shall be set with its upper edge even with the upper ends of the staves; and the bottom shall be set with its lower edge even with the lower ends of the staves.

(b) The standard one-half bushel hamper shall contain one thousand seventy-five and twenty-one one hundredths (1075.21) cubic inches, and conform to the following specifications: The inside diameter between the staves at the upper edge of the top inside hoop shall be thirteen (13) inches; the inside diameter of the bottom shall be eight and one-half ($8\frac{1}{2}$) inches; the inside length of the staves shall be twelve (12) inches; the inside top hoop shall be set with its upper edge even with the upper ends of the staves; and the bottom shall be set with the lower edge even with the lower ends of the staves.

(c) The standard five-eighths bushel hamper shall contain one thousand three hundred and forty-four (1344) cubic inches and conform to the following specifications: the inside diameter between staves at the upper edge of the top inside hoop shall be fourteen and one-fourth ($14\frac{1}{4}$) inches; the inside diameter of the bottom shall be nine (9) inches; the inside length of the staves shall be twelve and seven-eighths ($12\frac{7}{8}$) inches; the inside top hoop shall be set with its upper edge even with the upper ends of the staves; and the bottom shall be set with its lower edge even with the lower ends of the staves.

(d) The standard one bushel hamper shall contain two thousand one hundred fifty and forty-two one hundredths (2150.42) cubic inches and conform to the following specifications: The inside diameter between staves at the upper edge of the top inside hoop shall be fifteen and one-eighth ($15\frac{1}{8}$) inches; the inside diameter of the bottom shall be nine (9) inches; the inside length of the staves to the upper edge of the top inside hoop shall be nineteen inches (19); the top inside hoop shall be set with its upper edge three-eighths ($\frac{3}{8}$) of an inch below the upper ends of the staves; and the bottom shall be set with its lower

edge even with the lower ends of the staves.

(e) The standard one and one-half bushel hamper shall contain three thousand two hundred twenty-five and sixty-three one hundredths (3225.63) cubic inches, and conform to either of the following specifications:

(1) The inside diameter between staves at the upper edge of the top inside hoop shall be sixteen and one-fourth ($16\frac{1}{4}$) inches; the inside diameter of the bottom shall be nine (9) inches; the inside length of the staves to the upper edge of the top inside hoop shall be twenty-six (26) inches; the inside top hoop shall be set with its upper edge three-eighths ($\frac{3}{8}$) of an inch below the upper ends of the staves; and the bottom shall be set with its lower edge even with the lower ends of the staves.

(2) The inside diameter between staves at the upper edge of the top inside hoop shall be sixteen and three-fourths ($16\frac{3}{4}$) inches; the inside diameter of the bottom shall be ten (10) inches; the inside length of the staves to the upper edge of the top inside hoop shall be twenty-three (23) inches; the inside top hoop shall be set with its upper edge three-eighths ($\frac{3}{8}$) of an inch below the upper ends of the staves; and the bottom shall be set with its lower edge even with the lower ends of the staves.

The standard round stave basket for fruits and vegetables shall be the one-half bushel basket, five-eighths bushel basket, one bushel basket, one and one-half bushel basket, and two-bushel basket, which respectively, shall be of the capacity and conform to the specifications set forth as follows:

(a) The one-half bushel round stave basket shall contain one thousand seventy-five and twenty-one one hundredths (1075.21) cubic inches, and conform to the following specifications: The inside diameter at the upper inner edge of the top inside hoop shall be thirteen and one-half ($13\frac{1}{2}$) inches; the average inside depth shall not be less than eight and one-half ($8\frac{1}{2}$) inches; the web shall consist of twenty (20) intersecting staves, of such length that they will form the sides and bottom of a basket which shall contain sixteen (16) quarts standard dry measure.

(b) The five-eighths bushel round stave basket shall contain one thousand three hundred and forty-four (1344) cubic inches and conform to the following specifications: The inside diameter at the upper inner edge of the top inside hoop shall be thirteen and one-half ($13\frac{1}{2}$) inches; the average inside depth shall not be less than ten and one-fourth ($10\frac{1}{4}$) inches; the web shall

consist of twenty (20) intersecting staves, of such length that they will form the sides and bottom of a basket which shall contain twenty (20) quarts, standard dry measure.

(c) The one-bushel round stave basket shall contain two thousand one hundred fifty and forty-two one-hundredths (2150.42) cubic inches and conform to the following specifications: The inside diameter at the upper inner edge of the top inside hoop shall be seventeen (17) inches; the average inside depth shall not be less than ten and three-fourths (10-3/4) inches; the web shall consist of twenty (20) intersecting staves, of such length that they will form the sides and bottom of a basket which shall contain thirty-two (32) quarts, standard dry measure.

(d) The one and one-half bushel round stave basket shall contain three thousand two hundred twenty-five and sixty-three one hundredths (3225.63) cubic inches and conform to the following specifications: The inside diameter at the upper inner edge of the top inside hoop shall be nineteen and three-eighths (19-3/8) inches; the average inside depth shall not be less than twelve and three-fourths (12-3/4) inches; the web shall consist of twenty-four intersecting staves, of such length that they will form the sides and bottom of a basket, which shall contain forty-eight (48) quarts, standard dry measure.

(e) The two bushel round stave basket shall contain four thousand three hundred and eight-four one-hundredths (4300.84) cubic inches and conform to following specifications: The inside diameter at the upper inner edge of the top inside hoop shall be twenty-one (21) inches; the average inside depth shall not be less than fourteen (14) inches; the web shall consist of twenty-four (24) intersecting staves, of such length that they will form the sides and bottom of a basket which shall contain sixty-four (64) quarts, standard dry measure.

Texas Splint Baskets

The standard splint baskets for fruits and vegetables shall be the four-quart basket, eight-quart basket, twelve quart basket and sixteen quart basket, standard dry measure.

(a) The four quart splint basket shall contain two hundred sixty-eight and eight-tenths (268.8) cubic inches and conform to the specifications in one of the two following numbered subdivisions:

(1) The approximate inside dimensions of the top across the center shall be seven (7) inches by

twelve (12) inches. The approximate inside dimensions of the bottom at the corners shall be five and three-fourths ($5\frac{3}{4}$) inches by ten and one-half ($10\frac{1}{2}$) inches. The inside depth at the corners shall be four (4) inches.

(2) The inside dimensions of the square-cornered splint basket at the top shall be six (6) inches by twelve (12) inches. The inside dimensions of the bottom shall be five and one-half ($5\frac{1}{2}$) inches by eleven and one-half ($11\frac{1}{2}$) inches. The inside depth at the corners shall be four (4) inches.

(b) The eight-quart splint basket shall contain five hundred thirty-seven and six-tenths (537.6) cubic inches and conform to the specifications in one of the three following numbered subdivisions:

(1) The approximate inside dimensions of the top across the center shall be eight (8) inches by fourteen (14) inches. The approximate inside dimensions of the bottom at the corners shall be seven (7) inches by twelve (12) inches. The inside depth at the corners shall be five inches.

(2) The approximate inside dimensions of the top across the center shall be nine and one-half ($9\frac{1}{2}$) inches by sixteen and one-half ($16\frac{1}{2}$) inches. The approximate inside dimensions of the bottom at the corners shall be seven and one-half ($7\frac{1}{2}$) inches by fourteen and one-half ($14\frac{1}{2}$) inches. The inside depth at the corners shall be four inches.

(3) The inside dimensions of the square-cornered splint basket at the top shall be seven and three-eighths ($7\frac{3}{8}$) inches by fifteen and one-half ($15\frac{1}{2}$) inches. The inside dimensions of the bottom shall be seven (7) inches by fourteen and one-half ($14\frac{1}{2}$) inches. The inside depth at the corner shall be five inches.

(c) The twelve-quart splint basket shall contain eight hundred six and four-tenths (806.4) cubic inches and conform to the specifications in one of the following numbered subdivisions:

(1) The approximate inside dimensions of the top across the center shall be nine and one-half ($9\frac{1}{2}$) inches by sixteen (16) inches. The approximate inside dimensions of the bottom at the corners shall be eight and one-half ($8\frac{1}{2}$) inches by fourteen ($14\frac{1}{2}$) inches. The inside depth at the corners shall be five and one-half ($5\frac{1}{2}$) inches.

(2) The approximate inside dimensions of the top across the center shall be eleven and one-half ($11\frac{1}{2}$) inches by seventeen and one-half ($17\frac{1}{2}$) inches. The approximate inside dimensions of the bottom at the corners

shall be eight and one-half ($8\frac{1}{2}$) inches by sixteen and one-half ($16\frac{1}{2}$) inches. The inside depth at the corner shall be six (6) inches.

(3) The inside dimensions of the square cornered splint basket at the top shall be nine (9) inches by nineteen (19) inches. The inside dimensions of the bottom shall be eight and one-half ($8\frac{1}{2}$) inches by eighteen inches. The inside depth at the bottom corners shall be six and five-eighths ($6\frac{5}{8}$) inches.

(e) The twenty-four quart splint basket shall contain one thousand six hundred twelve and eight-tenths (1612.8) cubic inches, and conform to the specifications in one of the three following numbered sub-divisions:

(1) The approximate inside dimensions of the top across the center shall be twelve (12) inches by twenty (20) inches. The approximate inside dimensions of the bottom at the corners shall be ten (10) inches by seventeen and one-half ($17\frac{1}{2}$) inches. The inside depth of the basket at the corners shall be seven and one-half ($7\frac{1}{2}$) inches.

(2) The approximate inside dimensions of the top across the center shall be twelve (12) inches by twenty-three (23) inches. The approximate inside dimensions of the bottom at the corners shall be nine (9) inches by nineteen (19) inches. The inside depth of the basket at the corners shall be seven (7) inches.

(3) The inside dimensions of the square cornered splint basket at the top shall be ten and five-eighths ($10\frac{5}{8}$) inches by twenty-two and one fourth ($22\frac{1}{4}$) inches. The inside dimensions of the bottom of square-cornered splint basket shall be nine and five-eighths ($9\frac{5}{8}$) inches by twenty and one-half ($20\frac{1}{2}$) inches. The inside depth of the basket at the corners shall be seven and one-half ($7\frac{1}{2}$) inches."

Reasonable tolerances and variations are allowed in all cases.

In addition to those mentioned the following states have enacted laws for the standardization of containers for fruits and vegetables: California, Connecticut, Florida, Idaho, Illinois, Iowa, Kansas, Kentucky, Maine, Maryland, Massachusetts, Minnesota, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New

York, North Carolina, North Dakota, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Utah, Vermont, Washington, West Virginia and Wisconsin.

The California law standardizes apple boxes; apricot, plum and grape basket; berry boxes; pear boxes; half-pear boxes; peach; lettuce, grape and canteloupe crates; cherry boxes and lug boxes. Sizes for the various California packages are given in the following extract from the California Fruit and Vegetable Standardization Act (7):

"Section 7, Standard packages are hereby established as follows:

(1) Standard apricot, plum and grape basket, approximately eight inches square on top, six and one-half inches on bottom, and four inches deep, inside measurements.

(3) Standard berry baskets, dry pint containing an interior capacity of approximately thirty-three and six-tenths cubic inches and dry one-half pint containing interior capacity of approximately sixteen and eight-tenths cubic inches, provided, that the standard basket for strawberries shall be the dry pint.

	Depth inside in inches	Width inside in inches	Length outside in in.
(3) Standard pear box	8 1/2	11 1/2	19 3/4
Half pear box	4 1/2	11 1/2	19 3/4
Standard peach box	4 1/4	11 1/2	19 3/4
Standard Peach box	4 1/2	11 1/2	19 3/4
Standard Peach box	4 3/4	11 1/2	19 3/4
Standard crates	4 1/4	16	17 1/2
Standard crates	4 1/2	16	17 1/2
Standard crates	4 3/4	16	17 1/2
(4) Standard grape crates	4 1/4	16	17 1/2
With heavy cleat			
11/16 of an inch by			
11/16 of an inch.			
(5) Standard grape drum	14	15 1/2	
Containing 2642 cu.in.			
(6) Standard grape keg	...		
Containing 2642 cu.in.			
minimum			

	Depth inside in in.	Width inside in in.	Length outside in in.
(7) California lug box	5 3/4	14	17 1/2
(8) Peach size cherry lug	4	11 1/2	19 3/4
(9) Standard Cherry lug	4 1/2	9	19 3/4
(10) Special cherry lug	3	9 3/4	19 3/4
(11) Special cherry lug	3	11 1/2	19 3/4
(12) Standard cherry box	2 1/4	9	19 3/4
(13) Special fruit lug	4	14	17 1/2

(14) Standard lettuce crate, depth, inside in inches, thirteen; width, inside in inches, eighteen; length, inside in inches, not less than twenty-one and three-fourths; length, outside in inches not more than twenty-four and one-half.

(15) Standard cantaloupe crates, twelve inches by twelve inches by twenty-two and one-half inches, to be packed with thirty-six or forty-five cantaloupes, four inches by twelve inches by twenty-two and one-half inches to be packed with nine, twelve or fifteen cantaloupes; eleven inches by eleven inches by twenty-two and one-half inches, to be packed with forty-five or fifty-four cantaloupes; thirteen inches by thirteen inches by twenty-two and one-half inches, to be packed with thirty-six or forty-five cantaloupes; four and one-half by thirteen and one-half by twenty-two and one-half inches, containing nine, twelve or fifteen cantaloupes. All cantaloupe packs other than those provided in this section shall be conspicuously marked in letters not less than one-half inch in height, "irregular pack". As amended Stats. 1933, Chap. 315.)"

The recommendations and laws enacted by various states to standardize containers are so different that the question can never be settled by state standardization laws alone. What will have to be done is for a federal law to be enacted which will establish packages for the entire country. This has been done in Canada and the law is so worded that the government has control over the manufacturing of packages for sale throughout the Dominion. The Canadian law (8) is as follows:

Canadian Standard Package Regulations.
(Published in Canada Gazette
of June 30, 1923)

By virtue of the provisions of section 10 (5) of the Fruit Act, 1923, His Excellency the Governor General in Council, on the recommendation of the Minister of Agriculture has made the following regulations dealing with fruit packages:-

The following shall be the dimensions, as nearly as practicable, of the packages specified herein:-

(1) a. All packages specified in section 10 of the Fruit Act shall be manufactured of good and strong material;

b. All packages specified in subsections 1 and 3 of section 10 of the Fruit Act shall be manufactured of seasoned wood and shall be free from material defects;

c. "Diameter of head" shall be applied to the diameter of the head over all including the part which fits into the croze ring of the completed barrel;

d. "Distance between heads" shall be applied to the inside surfaces of the heads and perpendicular to them;

e. The dimensions for barrels and half barrels apply to barrels and half-barrels made from hardwood and, when made from softwood, where the thickness of the head is increased, it is necessary to lengthen the stave so as to insure the prescribed distance between heads and circumference at bulge;

f. Every manufacturer of apple or pear barrels or half-barrels shall cause each barrel or half-barrel to be marked in a plain and indelible manner in letters of less than one-quarter of an inch in length, on the side of the barrel, with the words "manufactured by" and with the initials of his Christian names and his full surname and address.

(2) Apple and pear Barrels, Section 10 - a- Length of stave 28 1/2 inches, diameter of head 17 1/8 inches, distance between heads 26 inches, circumference at bulge, outside measurements 64 inches.

(3) Apple and Pear Half-barrels, Section 10 -1-b- Length of stave 18 inches, diameter of head 15 1/2 inches, distance between heads 26 inches, circumference at bulge, outside measurement 58 inches.

(4) Apple Box, Section 10-1-d. Length, inside measurement, 18 inches, width, inside measurement 11 1/2 inches, depth, inside measurement 10 1/3 inches.

(5) Apple Crate, Section 10-1-f. Length, inside measurement 18 inches, width, inside measurement 11 1/2

inches, depth, inside measurement 10 1/2 inches, slats at least 3/4 inches apart.

(6) Pear and Crabapple Box, Section 10-1-g.- Length, inside measurement 18 inches, width, inside measurement, 11 1/3 inches, depth, inside measurement 8 1/3 inches.

(7) Peach Boxes, Section 10-1-h. shall be one or other of the following dimensions (inside measurement) - (1) Length 18 inches, width 11 1/2 inches, depth 4 1/3 inches; (2) Length 18 inches, width 11 1/2 inches, depth 4 inches; (3) Length 8 inches, width 11 1/2 inches, depth 3 1/3 inches.

(8) Plum or Prune Box, Section 10-1-(i)- Length, inside measurement 18 inches, width, inside measurement 11 1/2 inches, depth, inside measurements 3 1/4 inches.

(9) Cherry Boxes, Section 10-1-(j) shall be one or other of the following dimensions (inside measurement) - (1) Length, 18 inches, width 9 inches, depth 4 1/2 inches; (2) Length 18 inches, width 9 inches, depth 3 1/4 inches.

10. Four basket crate, Section 10-1-(k) Baskets 7 1/2 x 7 1/2 (at the top) by 6 1/2 by 6 1/2 (at the bottom) 3 3/4 inches deep (measured perpendicularly). Crates are 15 3/4 inches by 15 3/4 inches by 4 1/4 inches.

11. Twenty-quart Wood Veneer Fruit Baskets, Section 10-3-(b)- The bottom of which shall be of the following dimensions and specifications, as nearly exactly as practicable: 16 5/8 inches in length and 6 5/8 inches in width and 3/8 inches in thickness, minimum, with a corner radius of 1 3/4 inches; the basket to be constructed over a form measuring 17 5/16 inches in length and 7 5/16 inches in width at the top, with a corner radius of 1 3/4 inches and of such depth including brads as shall insure a basket 8 1/2 inches deep perpendicularly, the depth of such form, exclusive of brads to be not less than 5 13/16 inches. The veneer to be cut 16 to the inch, minimum; top band to be 3/4 inches in width, minimum; cut sixteen to the inch, minimum, and securely tacked; bottom bands to one-half inch in width, minimum, cut sixteen to the inch, minimum, and securely nailed; all bands to be drawn tight so as to fit snugly over top of form and bottom of basket; the handles to be 33 inches in length, maximum, and 1 1/4 inches in width, minimum, cut seven to the inch, minimum, and securely attached with one tack in each side of the handle at top band, and two nails in each end of the handle at bottom band, and to be so shaped that pinching of the basket when handles are attached will be avoided; the veneer for lene

center covers to be two inches in width, minimum out ten to the inch, minimum, the cleats securing lene to veneer to be approximately one-half inch in width and 10 inches in length and securely attached; the covers to be constructed so as to fit baskets properly, and all material in covers and baskets to be sound and free from material defects.

12. Eleven-quart Wood Veneer Fruit Basket, Section 10-3-(c)- The bottom of which shall be the following dimensions and specifications, as nearly exactly as practicable; 16 $\frac{5}{8}$ inches in length and 6 $\frac{5}{8}$ inches in width and $\frac{3}{8}$ inches in thickness, minimum, with a corner radius of 1 $\frac{3}{4}$ inches; the basket to be constructed over a form measuring 17 $\frac{5}{16}$ inches in length and 7 $\frac{5}{16}$ inches in width at top, with a corner radius of 1 $\frac{3}{4}$ inches, and of such depth including brads as shall ensure a basket six inches deep perpendicularly, the depth of such form, exclusive of brads, to be not less than 5 $\frac{13}{16}$ inches. The veneer to be cut sixteen to the inch, minimum, top bands to be $\frac{3}{4}$ inches in width, minimum, cut sixteen to the inch, minimum, and securely tacked; bottom bands to be $\frac{1}{3}$ inch in width, minimum, cut 16 to the inch, minimum, and securely nailed; all bands to be drawn tight so as to fit snugly over top of form and bottom of basket; the handles to be 25 $\frac{1}{2}$ inches in length, maximum, and 1 $\frac{1}{4}$ inches in width, minimum, cut seven to the inch, minimum, and securely attached with one tack in each side of the handle at the top band, and two nails in each end of the handle at bottom band, and to be so shaped that pinching of the basket when handles are attached will be avoided; the veneer for lene center covers to be 2 inches in width, minimum, cut ten to the inch, minimum, the cleats securing the lene to veneer to be approximately one-half inch in width and ten inches in length and securely attached; the covers to be constructed so as to fit baskets properly, and all material in covers and baskets to be sound and free from material defects.

13. Six-quart Wood Veneer Fruit Basket, Section 10-3-(d)- The bottom of which shall be of the following dimensions and specifications, as nearly as practicable; 13 $\frac{3}{4}$ inches in length and 5 $\frac{7}{8}$ inches in width and $\frac{3}{8}$ inches in thickness, minimum, with a corner radius of 1 $\frac{3}{4}$ inches; the basket to be constructed over a form measuring 14 $\frac{1}{2}$ inches in length and 6 $\frac{5}{7}$ inches at top, with a corner radius of 1 $\frac{3}{4}$ and of such depth including brads, as shall insure a basket 4 $\frac{1}{2}$ inches deep perpendicularly, the depth of such form exclusive of brads to be not less than 4 $\frac{5}{16}$ inches. The veneer to

be cut sixteen to the inch, minimum, top bands to be $3/4$ inches in width, minimum, cut 16 to the inch, minimum, and securely tacked; bottom bands to be $1/2$ inch in width, minimum, cut 16 to the inch, minimum, and securely nailed; all bands to be drawn tight so as to fit snugly over top of form and bottom of basket; the handles to be $21\ 1/2$ inches in length, maximum, cut eight to the inch, minimum and securely attached with one tack in each side of the handle at top band, and one nail in each end of the handle at bottom band; the veneer lino center covers to be two inches in width, minimum, cut ten to the inch, minimum, the cleats securing lino to veneer to be approximately one-half inch in width and 8 inches in length and securely attached; the covers to be constructed so as to fit baskets properly, and all materials in covers and baskets to be sound and free from material defects.

Provided that when wire stitching machines are used in the construction of the baskets described in Section 11- 12- 13, a reasonable variance in corner radius and top dimensions will be allowed where it is not practicable to adjust machines to meet, in all respect, the provisions of this section, but all machines-stitched baskets shall be securely constructed as if made by hand.

14. Any person who violates any regulations made under provisions of section 10 of the Fruit Act shall be guilty of an offense and liable upon summary conviction under Part XV of the Criminal Code, to a fine not exceeding \$50.00, together with cost of prosecution, and in default of payment of such fine and cost shall be liable to imprisonment for any term not exceeding one month unless such fine and costs, and the cost of enforcing them are sooner paid.

Mr. J. E. Croeland, (13) the agent and attorney for the organization which takes care of the traffic matters of railroads in Florida, Georgia, North Carolina, South Carolina, and Virginia, has through that organization established certain containers known as standard railroad containers. This organization has done some very important work in standardizing certain containers used in these five southern states. It is of benefit not to the railroad alone but to the producer and consumer to have their fruits and vegetables packed and shipped in containers which meet the requirements of all concerned. Packages stamped with the words "Standard Railroad Container" have been selected with the idea of getting a package that will fill the requirements of the products of that section and which will pack properly in both ventilator and refrigerator cars. These packages will naturally arrive on the market in better condition than would packages which are not constructed to fit the dimensions of the car.

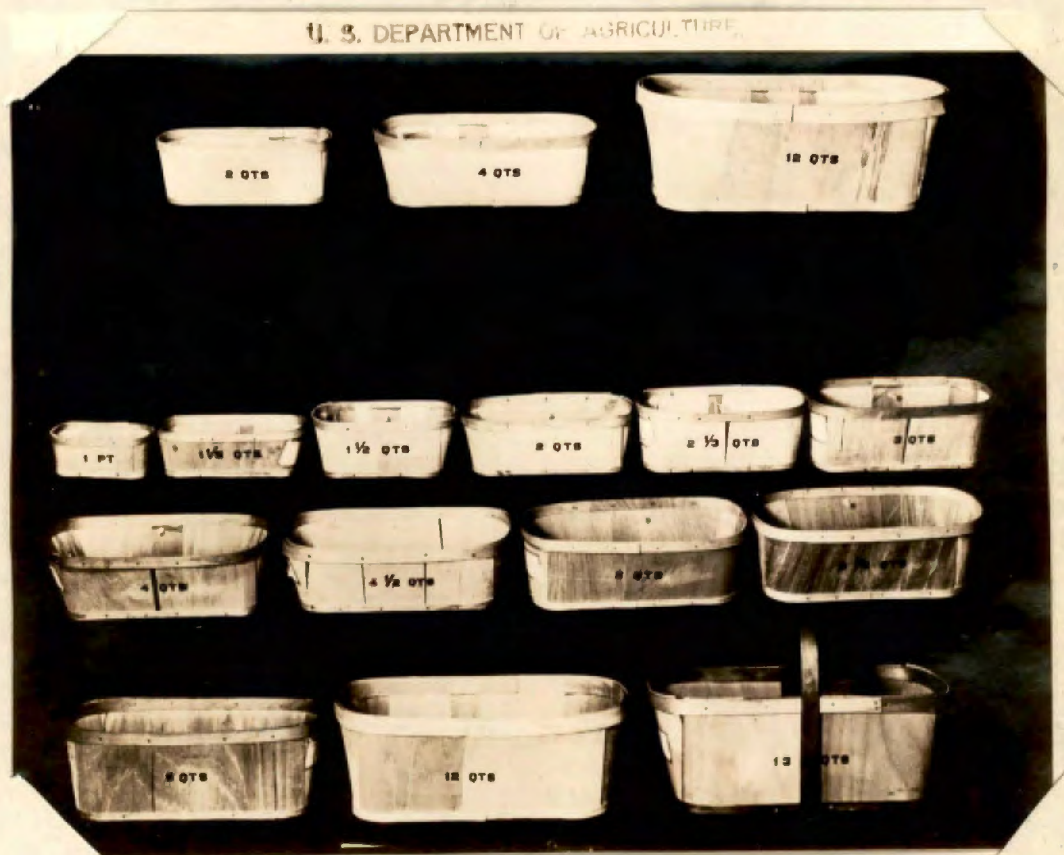
The packages which are manufactured with the title "Standard Railroad Containers" are numerous enough to take care of practically all the fruits and vegetables produced in the five states over which this traffic commission has authority. The packages have been standardized to care for more than forty kinds of vegetables and fruits. The surprising part of this work after one has viewed the number of different

packages used in this country, is that there are relatively few packages to take care of this large group of different commodities. There is only one size of lettuce crate recognized as standard. This may be made according to two specifications, but both specifications call for the same outside and inside measurements. There is but one pineapple crate. There are two sizes of cabbage crates and these may be had in three types. The cabbage crate is also used for squash, egg plant, beets and cauliflower. There is but one size and style of asparagus crate. There is a five-peck crate for sweet potatoes and a bushel crate for white potatoes, sweet potatoes, cucumbers, onions and other fruits and vegetables.

The six basket crate is one of the standards and in it may be shipped tomatoes, peaches, plums, peppers, okra, persimmons, guavas and avocado pears. There are two styles of citrus crate but they are the same size. In the case of celery there are two different sizes but the same style of crate. Besides these packages there are the pepper crate, one size and style and cantaloupe crates, two sizes in three styles. There is also the cabbage and potato half-barrel crate, one bushel and one and one-half bushel hampers and the bushel basket. The barrel

used in the standard barrel as to size but is constructed in three different styles. The bulletin which gives the specification for these packages also gives diagrams for loading both in ventilator and refrigerator cars. (13)

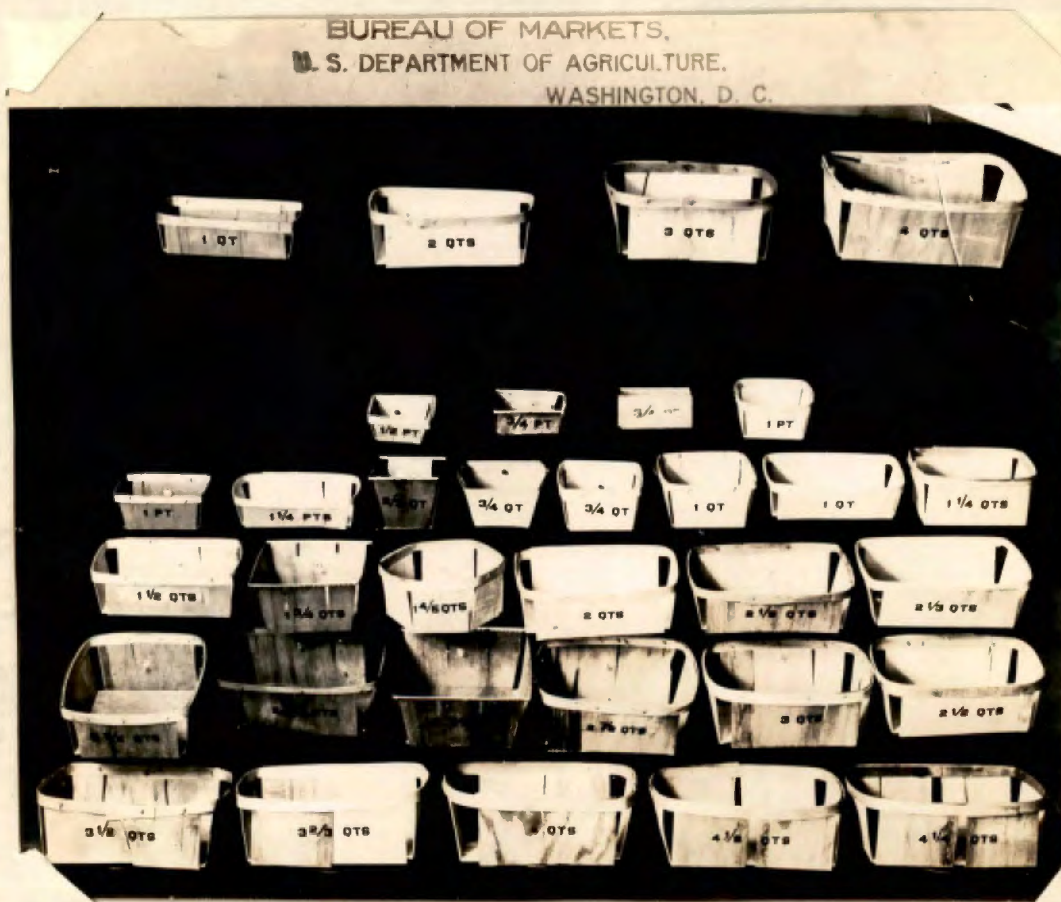
Other organizations are doing some valuable work in standardizing packages to be used for various purposes. The Illinois Central railroad has standardized certain containers for fruit and vegetables to be used on their lines; The Freight Container Bureau of The American Railroad Association (9) is doing much work on the size and construction of packages, and the International Apple Shipper's Association has done some very valuable work in collecting all the grade and standardization laws and compiling a special pamphlet of these laws (31).



Top: Two, four and twelve quart "Climax" or Grape baskets.

Present Federal legislation prohibits shipment in interstate commerce of all other sizes.

Bottom: A few of the total number of sizes of Climax or Grape baskets in general use in 1917 before standardization.



Top: Sizes of Till or Small Fruit baskets now standardized by Federal legislation.

Bottom: Some of the sizes of Berry boxes and Till baskets in common use before the passage of the Standard Container Act.

U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS



**PROPOSED STANDARD SIZES
OF HAMPERS**

These six sizes of hampers will take care of all needs. Their adoption will do away with much of the confusion now found in markets. The 1½-bushel hamper is made in two styles.



Illustration shows 75 odd sizes of hampers that now confuse both buyers and sellers. Note the variation in shape of many hampers of the same capacity.



The Florida style of celery crate, which has proven very popular since it was adopted as a Standard Railroad Container.



Crates properly stripped and packed in a ventilator car. This method of packing allows free circulation of air and still prevents excessive breakage in transit.



Top: Two styles of potato barrels commonly found at the Knoxville commission houses.

Bottom: Two views of a bushel crate used for shipping potatoes, sweet potatoes and other vegetables.



Top and Middle: Three hampers which appear to be the same size.

	<u>27 quarts</u>	<u>32 quarts</u>	<u>27 quarts</u>
Diameter of top	15 in.	16 in.	14 in.
Diameter of bottom	9 1/2 in.	10 in.	9 in. (raised)
Length of staves	16 1/2 in.	17 in.	17 in.

Bottom: Showing the need of standardizing the dimensions of the bushel hampers. The height of the six bushel hampers varies from 17 inches to 22 1/2 inches.



Top: E-Z-Pak, a new style of the bushel round stave basket.

Second row from top: Left; 4 and 8 quart round stave basket for road-side markets. Right; Leigh-Way hamper, a new style hamper with oval shaped bottom.

Bottom two rows: Two styles of the new straight side basket, now on the market. Trade names; Kwik-Pak, Ideal and Sturdi-Pak.

OBSERVATIONS

Observations in Knoxville

To get a general idea of the conditions under which the commission houses work with this large assortment of packages, trips were made at regular intervals of three times per week to one of the largest commission houses in Knoxville, Tennessee. These observations were made over a period from October 6, 1924 to November 28, 1925. Information as to the number of packages and the conditions in which they arrived was the object of these trips.

It was not practicable to examine every package or even every shipment which arrived on the market. The company's record gave the exact amount of the fruits and vegetables that was handled so that a great deal of the information which is to follow was obtained from these records. The fruits and vegetables and their containers that arrived are recorded in table II.

Table II. The Fruits and Vegetables, the Number of Cars and the Containers Arriving at a Commission House in Knoxville from October 6, 1934 to November 28, 1935.

Fruit or Vegetable	Cars	Containers	Source
Apple	131	Barrels	Va., N. Y., & N. C.
		Boxes	Northwest & Georgia
		Baskets	East, Central & South
		Bulk	N. C. and S. C.
Potatoes	101	Bags	Mich., & Wisc.
		Boxes	Georgia. (Hampers Fla.)
		Barrels	Florida
Bananas	77	Bunches	Via. New Orleans & Mobile
Oranges	52	Boxes (crates)	Fla. & California
		Bulk	Florida.
Tomatoes	38	6 basket crates	Florida, South, East Tenn.
		4 " "	Florida South
		Hampers	Local
Onions	27	Bags	Mich., N. Y., Ind.
		Boxes	Bermuda
		Folding crates	Texas
Celery	25	Crates	Fla. Calif., N. Y., Mich.
Watermelons	23	Bulk	Texas, Colo.
Green Beans	19 &	Hampers	South
		Bags	Local
		Bushel Baskets	"
		Barrels	South
		Crates	Local
Peaches	18	Baskets	Ga. Tenn. and North
		6 " crates	Ga.
Lettuce	16	Crates	Fla., Calif. Colo. N. Y. Ohio
		Barrels	North
Grapes	15	Climax baskets	Mich., N. Y.
		Kegs	Calif.
		Lugs	"
Cantaloupes	14	Crates	Texas, Colo.
S. Potatoes	11	Hampers	South
		Crates	"
		Barrels	"
Grape Fruit	8	Boxes	Florida
Pears	7	Baskets	North
		Boxes	Northwest
Cranberries	6	Boxes	N. J.
		Barrels	N.J.
Raisins	5	Boxes (cartons)	Calif.
Coconuts	3	Bags	via. N. Y. City

TABLE II. Con't.

Fruit or Vegetable	Cars	Containers	Source
Lemons	2 & 3 part	Boxes	Florida
Peanuts	2	Bags	
Mixed Vegetables	2	Barrels Hampers	Alabama "
Figs	Part	Boxes	Pacific Coast
Quinces	"	BASKETS	North
Dates	"	Cartons	
Brussel Sprouts	"	Crates	Via Cincinnati
Pomegranate	"	"	
Cauliflower	"	Crates	via Cincinnati
Turnips	"	Hampers	Maryland
Eggplant	"	Crates Hampers	via Louisville
Mangos	"	Crates Barrels	
Limes	"	Boxes	Florida
Parsnips	"	Hampers Barrels	South "
Beets	"	Barrels Hampers	Louisiana
Asparagus	"	Crates	Florida
Parsley	"	Hampers	
Peas	"	Barrels Hampers	
Cucumbers	"	Hampers Bushel Crates	
Okra	"	Hampers Barrels	
Radishes	"	Barrels	
Mustard	"	Barrels Baskets	Local
Peppers	"	Hampers	Fla.
Spinach	"	Hampers Baskets Barrels	South Tenn. South
Kale	"	Hampers	
Strawberries	"	24 qt. crate 80 qr. ref.	South Fla.
Carrots	"	Hampers Barrels	
Cherries		Boxes	

It was interesting to find that containers arriving on the Knoxville market were practically uniform in size and style. This might be accounted for by the fact that practically all the produce comes from limited sections. It is the practice of those in the same section to use similar packages. Only in the case of hampers was there a wide variation in the size and style used. This wide variation in hampers can be accounted for mainly by the large number of commodities which were shipped in hampers. The two prevailing sizes of hampers were the thirty-two and twenty-eight quart sizes. The use of these two on the same market is very confusing, as the twenty-eight quart hamper is very often taken for the thirty-two quart or bushel hamper. One very striking incident of the confusing of the two sizes was in a shipment of beans. Two types of hampers were found and it appeared that they contained different amounts. One was a hamper sixteen inches high and with an inside bottom measure of nine inches. The other was four ~~quanta~~ inches higher and the bottom was of the same size. They both contained twenty-eight quarts of beans but it appeared that the taller held a great deal more than the shorter one.

During the time that the trips were being made to the commission house about one-fifth of the fruits and vegetables that arrived on the Knoxville market were being handled by this house. ^{gives the amount} Table II

barrels and a few in bushel boxes. The barrels are usually from the South and are used for the first crop of potatoes in that section. There was one car-load of potatoes from Florida, which was packed in hampers. The package for potatoes needs no standardization as use has established the bag as the standard package.

Cabbage: Cabbage is important on this market and most of it is shipped in bulk. A special bunker is built lengthwise through the center of the car. The ventilator is generally used and this has sub-floors and side walls which allow air to circulate around the floors and walls. The bunker in the center gives air circulation through the center of the car. The cabbage is then placed on each side of the bunker and this allows for air spaces on all sides and through the center of the load. When the cabbage arrives at the commission house it is unloaded into crates. At the commission house mentioned these crates are especially built and hold about four bushels.

A few shipments of cabbage were in crates and with these packages there was some difference in style and size. The crates containing cabbage from Florida were the Standard Railroad Container for cabbage. The crates from New York and Alabama were different and neither was similar to the Florida crate. This difference was greatly in evidence as cabbage in crates

came mainly from Florida and a different style or size package on the market was readily noticed.

Tropical Fruits: The tropical fruit on the Knoxville market comes in packages which are uniform for each kind of fruit. Oranges arrive in the Florida or California orange box. Lemons, grape fruit, limes, and pomegranates are shipped in the same type of box as are oranges. Pineapple boxes are of uniform size and the box which is used for Florida pineapples is the Standard Railroad Container. Bananas are shipped in refrigerator or ventilator cars from the gulf coast, in bunches and without a package. On the market they are put into banana crates for distribution to various retail houses in this section. During the Christmas holidays there are usually a few cars of oranges shipped in bulk. This method of shipping is being practiced considerably at the present time. It is not uncommon practice for some local dealer to receive a few cars of oranges and sell them by the bushel. There are about eight hundred bushels in a car of bulk oranges.

At the present time laws to establish uniform packages for citrus fruits are not needed. There are only two sizes of orange boxes now in use. A law establishing one box and giving specifications for its construction might be enacted but this seems hardly necessary.

Tomatoes: Tomatoes usually arrive on the Knoxville market either in six-basket carriers or in four-basket flats. They are wrapped and shipped green, and sold when they ripen. The packages seem to be satisfactory, as the six-basket carriers are uniform in size. There is some difference in construction but all styles seem to be strong enough to stand shipment when they are properly packed and stripped in the cars. The four-basket flat is just as satisfactory for the shipment of tomatoes. This package is usually stronger than the six-basket carrier due to the method of construction. The main disadvantage seems to be in its size as it requires too many packages, which are expensive, to pack the same quantity of fruit as contained in the six-basket carriers. The six-basket carrier contains six till baskets of four quarts each, a total of twenty-four quarts. The four-basket flat contains four till baskets of three quarts each, a total of twelve quarts. The four quart and three quart till basket used have been standardized by Federal laws.

Onions: The Knoxville market receives practically all the onions used in bags. These bags are made of wrapped paper strands and are woven with large spaces between the strands. These bags have a capacity of one hundred pounds. The onions usually arrive in first-class condition unless some injury ^{occurs} ~~results~~ such

as freezing. The ordinary ventilator car is loaded with about two hundred and fifty bags. Sometimes the common burlap bag is used as a container for onions but this is not as satisfactory as the more net-like bags, which allows the air to circulate freely. Bermuda onions are shipped in flat crates with the numerical count of the contents marked on the outside.

The State of Texas has a law which standardizes the bushel folding-crate (10) as a standard container for onions. This package is very good for the shipment of onions. There is less bruising of the vegetable and the package is more attractive than the bag. From all observations it appears that the folding crate is the better container for the shipment of onions.

Celery: The crate is the proper package for celery. From observations on the Knoxville market the container for this vegetable needs to be standardized. There was observed on this market celery from Florida, California, New York and Colorado each in a different size and style of package. The majority of the celery came from Florida and was shipped in the standard Florida celery crate. This celery arriving in standardized crates and other shipments in different styles and sizes of containers cause confusion on the market. The retail houses in buying celery have to consider different sizes of packages when ordering from the commission houses.

This difference complicates the keeping of records and also confuses the salesman in selling the product.

Watermelons: Watermelons need no special containers due to the nature of the commodity. They are always shipped in bulk and the container problem need not be considered.

Green beans: Green beans are used very widely and the containers that are used are many and varied. There were observed on the Knoxville market hampers, bags, crates, boxes, baskets and barrels as containers for green beans. The hamper is the most popular container, but even with this container there is confusion because of the various sizes and styles used. There was observed four sizes of hampers for beans - the five-eighths bushel, the twenty-four quart, the twenty-eight quart, and the thirty-two quart. Each of these sizes came in two or more styles. This is a very confusing. For example, it is very hard to distinguish between certain styles of the twenty-eight and the thirty-two quart hampers.

Aside from the hampers most of the other containers were used for local shipments. With this large assortment of containers for beans it is very evident that some action should be taken to standardize not only the size but also the type and style of con-

tainer used for this commodity.

Peaches: The bushel basket is the common package used for peaches on the Knoxville market. There is more than one style but the size of the baskets used is very uniform. The common round-stave basket is commonly used with the E-Z-Pak and a few other specially constructed baskets used with some shipments. The six-basket carrier is also used. This package is used mainly for early peaches from Georgia.

Lettuce: Lettuce is shipped to this market in two types of containers. The crate is used for head lettuce and the barrel for leaf lettuce. It was observed that the head-lettuce in greatest demand came from California, Florida, Colorado, Ohio and New York. The crates from these different states varied in size and style. The greater part of the head-lettuce came from California and this was shipped in the California lettuce crate, which appeared to be a very satisfactory package.

Grapes: The American grape from the eastern part of the United States is shipped in the climax basket; either two or four quarts are the sizes used on this market. The climax basket for grapes has been standardized by an act (3) of Congress. The European grapes from California are used extensively during the winter months. The common containers used are the grape box or lug, the keg, and drum. These containers

have been standardized by California laws (7).

Cantaloupes: The cantaloupes arrive on the Knoxville market in crates. The crates used are from Texas and other southern states and appear to be very uniform in size.

Sweet Potatoes: The sweet potato is a southern crop and the type of container varies with the section from which the potatoes are shipped. There were observed three types of containers, hampers, crates and barrels. Hampers are the most widely used and the size of these range from twenty-four quarts to thirty-two quarts, the latter being the most popular. There were many styles of the thirty-two quart hamper varying from seventeen inches to twenty-two and a half inches in height. This is also true of the sizes in hampers. The crate that was used was a bushel crate which is the Standard Railroad Container used by the Florida shippers. The barrel was used in a few instances but this package did not seem to be as popular as the crate and the hamper.

Other fruits and vegetables: According to Table II it will be noted that a number of different containers used for fruits and vegetables were not discussed in the preceding paragraphs.

From observations made here at Knoxville it is obvious that standard containers should be adopted for use in the United States. The size and style of the

various types of packages also should be standardized. Furthermore, packages should be adopted for use with each particular commodity, so that commodities such as sweet potatoes or green beans would be shipped in only one type of package.

Preferable Packages In Eastern United States

To obtain data relative to the packages used in various parts of the United States, the following methods of procedure was followed: Letters were mailed to one hundred commission houses in the larger cities of the eastern part of the United States. The letter asked for information as to the kind of containers used in shipping ten fruits and vegetables to their respective markets. Also, the question was asked, "Which package do you consider the best for each product listed?" The letter that was mailed to the commission houses was as follows:

April 9, 1925

Gentlemen:

I am doing some research work on the different types of containers for horticultural products. Through the commission houses in the different cities I hope to get some definite information as to the types of containers considered the best by producers and commission men.

Will you please answer the following?

In what types of containers do the following fruits and vegetables arrive on your market, and which do you consider best for each product?

Check the containers 1st, 2nd, 3rd, etc., as to the number of arrivals.

Varieties		Containers		Remarks
Apples	Boxes	Barrels	Baskets	Bulk
		4 basket	6 basket	
Peaches	Baskets	carrier	carrier	
American	Climax			4 basket
grapes	baskets	Boxes	Kegs	crates
Straw-	24 pint	24 qt.	32 qt.	
berries	carrier	carrier	carrier	
Rasp-	24 pint	24 qt.		
berries	carrier	carrier		
Sweet				
potatoes	Hampers	Baskets	Barrels	
Irish				
potatoes	Bags	Bulk	Crates	
	Baskets	4 basket	6 basket	5/8 truck
Tomatoes	round stave	carrier	carrier	baskets
Cabbage	Crates	Bulk	Barrel	
Black-	24 pint	24 quart		
berries	CARRIER	CARRIER		

Please return to the address given below.

Thank you.

Yours very truly,

H. F. Helfensein
Hort. Dept.

HFH*BG

Table III gives a summary of this questionnaire.

Table III. Popularity of Packages for Ten Fruits and Vegetables on the Markets of Eastern United States

Fruit or Vegetable		Placings given in the letters																						Final						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Average	1st	2nd	3rd	4th	Placing	
Apples	Box	2	1	1	1	1	2	1	2	4	1	3	2	1	2	3	1	2	2	1	1	1	1	1.636	12	7	2	1	1	
	Barrel	1	2	2	2	3	1	2	1	2	3	2	1	2	1	1	1	1	1	2	2	2	2	1.636	9	12	1	0	1	
	Basket		3	3	3	3	3	3	3	1	2	1	3	3	3	2	2	3	3	4	3	3	3	2.6	2	3	15	1	3	
	Bulk			4		4	4	4	4	3		4		4	4	4	3	4	4	3	4	4	4	3.7	0	0	3	14	4	
Peaches	Basket		3	3	1	2	2	2		2	1	1	1	1	1	1	1	1	1	1	1	3	4	2	1.62	11	5	3	1	1
	4basket crate		2	1	3	3		3		3		3	2						3	2	2	3	3	2.57	1	4	9	0	3	
	6basket crate		1	2	2	1	1	1		1	2	2	2	2	3	2	2	2	2	3		2	1	1.79	6	11	2	0	2	
	Box																				1	1		****	* * * (not counted) * *					
American Grapes	Climax basket					1	2		4	1	1	1	2	1	2	1	1	1	1	3	2	1		1.56	10	4	1	1	1	
	lug (Box)			3	3	2	3		2			2		2	1		4		2					2.40	1	5	3	1	3	
	lug			2	2	3	4		3			3		4	4	2	3	3		4		2	3.00	0	4	5	3	4		
	4basket crate	1		1	1		1		1			4	1	3	3		2	2		1	1		1	1.643	9	2	3	1	2	
Strawberries	24 pt. crate		3	3	3	3	3	3		3	2	2	2	3	3		2	2	2	2	2	2	2	2	2.47	0	10	9	0	3
	24 qt. crate		2	2	2	2	2	2		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.30	14	6	0	0	1	
	32 qt. crate		1	1	1	1	1	1	1	2	3	3		2	2	2	3	3		3		3	3	2.00	7	4	7	0	2	
Raspberries	24 pt. crate			2	2		2	2		1	1	1	1				2			1	1	1	2	1.46	7	6	0	0	1	
	24 qt. crate		1	1	1		3		2	2	2	2			1	1			2		2	1	1.61	6	6	1	0	2		
	60 pt. crate					1	1	1																****	* * * (not counted) **					
Sweet Potatoes	Hamper		2	2	2	1	1	1	2	1	1	1	2	1		1	1	1	1	2	1	1	1	1.30	14	6	0	0	1	
	Basket		1		1	2	2	3	3			2	3	3		2	2	2	2	1	3	2	3	2.17	3	3	6	0	2	
	Barrel		3		3	3	3	2	1			3	1	2		3	3	3		3	2	3	2	2.50	2	4	10	0	3	
	Box			1																				****	* * * (not counted) * *					
Irish Potatoes	Bag	1	1	1	1	1	2	2	1	1	2	1	1	1		1	1	1	1	1	1	1	1	1.14	18	3	0	0	1	
	Bulk		3	3	2	3	3	1	2	2	3	2		2		2		2		2	2	3		2.31	1	4	6	0	2	
	Crate		2	2	3		4	3	3			3		3		3	2	3				2	2	2.7	0	5	7	1	3	
	Barrel					2	1				1													****	2	1			4	
Tomatoes	Basket		3					3				3				3	3					3		3.00	0	0	6	0	4	
	4basket crate	1	2	1	2			4	2	1	1	1	2	2		1	1	2	2	1	2	2	2	1.68	8	10	0	1	2	
	6basket crate		1	2	1	2	2	1	1	2	2	2	1	1		2	1	1	1	2	1	1	1	1.40	12	8	0	0	1	
	5/8 bu. basket				3	1	1	2	3		3	4					2			3				2.44	2	2	4	1	3	
Cabbage	Crate		1	1	1	2	1	1	1	1	1	1	2	2		1	1	2	2	2	1	1	1	1.30	14	6	0	0	1	
	Bulk	1	2	2	2	1	2	2	2	2	3	3	1	1		2	3	1	1	1	2	2	2	1.71	7	13	0	0	2	
	Barrel		3		3		4	3			3	3	3			3	2					3	3	3.00	0	1	9	1	3	
	Hamper					3																		****	* * * (not counted) **					
Blackberries	24 pt. crate		2	2	2			3		2	1	2	1	2			2			2	1	1	2	1.78	4	9	1	0	2	
	24 qt. crate		1	1	1			2		1	2	1	2	1		1	1			1		2	1	1.28	10	4	0	0	1	
	32 qt. crate					1	1	1																****	* * * (not counted) * *					

Only in twenty-two of the letters were the numerical numbers used consequently they were the only ones included in the table. In general the letters not used contained the same data as the letters included in the table. Of the hundred letters mailed, only thirty-three replies were received. In answering the second question in the letter very few of the commission men gave any preference. From the few replies to this question therefore, no conclusion could be drawn.

Some very interesting observations can be made from the table. First, that there is no uniform package for any one commodity. Second, packages for each commodity vary in each section of the country, and third, that packages for given commodities vary in each city.

The first interesting observation can best be shown in the case of the apple. The packages used are the box, barrel, and basket, with some apples shipped in bulk. The barrel and the box are the two leading containers. The box is used by the growers in the Northwest for shipment to the eastern markets. The Northwest is the largest apple producing section of the country. Therefore one would expect the box to be the leading package. In the eastern apple section of the country the barrel and the basket are the leading con-

tainers. It is shown in the table that the barrel and box had the same average. Note: This average was obtained by adding all the placings for the type of containers and dividing the number of placings which allotted for this container.

The table also shows that the box received twelve first placings, and the barrel nine, and the basket two. There is an interesting point in the column nine and ten. These two columns represent two commission houses in Cleveland, Ohio. The placings for boxes in one was fourth, while in the other it was first. This is the greatest difference shown in the table. In the same two commission houses, packages for cabbages and potatoes received the same placings. This difference in Cleveland clearly emphasizes the second observation, that packages vary for a given commodity in the same section of the country and even in the same city.

A third observation that is readily made from the table III is that certain containers used in the United States are more popular than others. This is clearly shown in the case of sweet potatoes. The hamper is by far the most popular. Fourteen commission houses reported that hampers were in the greatest numbers on their market. Only six reported that some other

container was first and in each one of the six instances, the hamper was placed second. This shows that the hamper is the most popular package for sweet potatoes.

From observations and counts made from the letters the packages used in these cities, which are representative of the United States, are ranked according to popularity in the column headed final placing.

HAMMERMILL
BOND

THE UNIT OF MEASURE

The standardization of fruit and vegetable packages for use in the United States must be approached from more than one angle. The packages now in use can not be entirely done away with and new ones adopted as standard. What is needed therefore is a selection of those that meet the requirements of our large variety of products.

There are certain commodities that naturally fall into the same class. For example, spinach, kale, and the greens. These could be grouped and a few containers established to meet their requirements. One of the first things to do in the establishing of standard containers is to group fruits and vegetables that can use the same package or packages.

Nothing can be done toward a unified package until some standard of measuring is established. The state laws are different and conflicting in their recommendations. Some of the states give the weight of a bushel of fruit or vegetables as so much; others give the same commodity an entirely different weight. In case of a bushel of apples, no two measures holding the same amount by volume will weigh the same. There are some state laws that give a bushel of apples at forty pounds. Others range all the way to fifty

pounds. This difference in weight is very confusing in inter-state commerce.

The Bureau of Economics (14) recommends for small packages that the dry quart and its subdivision be used as a standard. They recommend for larger measures that the unit of measure should be the Winchester bushel or struck bushel, containing two thousand, one hundred and fifty, and forty-two one-hundredths cubic inches. If this were established as standard for all measures above the peck or fourth-bushel, there would have to be many changes. If the standard barrel which has been standardized by the varrel law had to contain just three bushels as is commonly thought, it would have to be reduced. As it has been standardized it contains nine quarts over three bushels.

Now this leads up to the question whether weight should be the standard of all commodities or whether volume should be the basis. It is certain that in either case, no matter what was the unit of measure, there would still be chances for fraud.

The unit of measure, then, should be one that combines all these methods of measuring. A unit that takes into consideration weight, volume, and numerical count would be the logical one. This is not practical but what is practical is to use each of these three in establishing all the units of measuring. For example,

the count for oranges, cantaloupes, celery, etc., should be the standard. For the apple, berries, peaches, etc., the volume measure should be used as the standard. For commodities which are shipped in bulk the standard should be by weight. Also for all commodities that are sold by measure, there should be a minimum weight or numerical count attached to the package.

HAMMERMILL
BOND

MADE IN U.S.A.

CONSTRUCTION

The type, style, and size of packages should be standardized. Another feature which will follow this standardization is the standardization of the construction of the package. Some very important steps are being taken along this line. The start was made in 1919 after the container companies of Florida and other southern states recognized their needs. The South, especially Georgia and Florida, had developed rapidly since 1900 as fruit and vegetable states. It required many packages to ship their produce to the northern markets. Through all this rapid expansion from 1900 to 1919 the package manufacturing companies had increased with the fruit and vegetables industry. Many types and styles of packages were developed and the competition which resulted was very keen. The practice was for each local factory to manufacture a type of container to suit the ideas of the growers of that community. Naturally with this cumbersome and uneconomical practice there was bound to be a halt. In 1919 a group of manufacturers met and organized an association known as the Southern Crate Manufacturers' Association. This was really an outgrowth of an old organization which had never functioned properly due to its having no suitable leader. In 1919 they elected Mr. R. U. Bennett as manager. Under Mr. Bennet's direction standard types of containers were

developed for all companies in the association. The size, style, and construction of packages was made uniform in all the factories under Mr. Bennett's supervision.(12).

This reorganization and putting of standard containers on the market was no easy task. Many types of containers were still being manufactured and these were dumped on the market by unscrupulous dealers to get rid of them. This caused many hardships at first but now the containers adopted by this association have been adopted by the railroads of the South as the Standard Railroad Containers. All fruits shipped in containers under this standard are shipped at a lower rate, due to the fact that the grower show by their use that he wants to cooperate with the transportation companies and get his product to the market in the best condition.

At the present time the federal government in laboratories in the United States Forest Products Laboratory, Madison, Wisconsin are investigating strength of different types of packages to be standardized. The American Railroad Association Freight Container Bureau is doing some valuable work in the standardization of the construction of packages.

The standardization of the construction of packages is for the purpose of saving some of the waste which occurs in shipment. This waste is due mainly to

the breaking of packages in shipment. The breaking of packages is due to weak material and improper nailing. The weakly constructed packages break easily and fruit and vegetables are lost.

The railroad traffics bulletin (13) issued by J. E. Grosland, Agent, specifies the dimensions, capacity, materials, and construction of packages that are to be used as standard railroad containers. It also gives the commodity to be shipped in that particular package.

For example: the specifications in this bulletin for a lettuce crate is as follows:

There is also another lettuce crate which is a standard. This is the same size but has cleats on the outside of the slats. The exact specifications are given for this package also. To aid in the identification and construction of Standard Railroad Containers, pictures of the standard packages are included in the specifications.

The Railroad Association, Freight Container Bureau, is carrying on some very valuable work toward standardization of packages and their construction. Mr. E. W. Dunn, the chief engineer, writes this as the introduction to each of the freight container bureau circular (9):

"Standardization is an active subject in all branches of engineering work and 'packing engineering' represents a new sub-division in the profession.

"Economical and efficient packing of goods is necessary to help minimize transportation losses, which are paid ultimately by the shipper.

"Many shippers are disposed to consider favorably reasonable suggestions which they would oppose being forced to adopt by tariff amendments.

"The Freight Container Bureau studies the packing of a commodity for shipment and makes recommendations based upon what it considers a reasonable combination of cost and efficiency.

"As a result of the work done to date, the specifications in this bulletin are presented, not as a finished product, but tentatively for the approval of constructive criticism of all concerned. It is hoped, from criticism of these specifications as well as practical suggestions from all the interests involved, that a set of standards can be built up which will enlist the earnest cooperation of everyone."

Freight Bureau Container Circulars Nos. 13,

16, 18 and 19 deal with packages for fruit. The main causes for broken packages as given in these four bulletins are; first, improper nailing and kinds of nails used. The use of cement coated nails is recommended. Second, the use of weak materials or improper use of materials, such as placing the materials so that it is easily broken with the grain. Third, is improper loading, due to the difference in size of the packages.

The Illinois Central Railroad is also doing some very important work on the standardization of packages for fruits and vegetables to be used on their lines. There are a few states which give specifications for construction of packages in their standard container laws. The State of Texas is foremost in this movement. The thickness of material in the six-basket carrier and the four-basket crate is specified in the Texas Container Law(6).

Federal, State and private investigations to standardize the construction of packages will eventually bring about many changes in the packages which are now in use; the standardization of construction will limit the number of packages in use. The building of packages for certain commodities will establish specific containers for each commodity. This standardization of packages will be of great value to manufacturers and also to the shipper and consumer, one of whom eventually pays for

the cost of manufacturing. The use of standard size parts will save time and expense. Parts that are interchangeable between crates and parts of such dimensions that they can be cut readily for the ordinary run of stock will save a great expense in manufacturing. The manufacturers in the Southwest under the Southern Crate Manufacturers' Association have standardized their parts for packages. The following table from an article by H. A. Spilman and Robert W. Davis shows the changeability of parts between packages manufactured by a concern in Georgia.

TABLE Containers with Interchangeable Parts

Type	Inside Dimensions	Length of Slat
24-quart American Berry Crate	11x11x22 x	24
Lettuce Crate, cleated	7 1/3x16x19	21
Pineapple Crate	10 1/3x13x33	36
Cabbage Barrel Crate	18x13x33	36
Standard Bushel Crate	12x12x15	17
Five Peck Crate	12x12x18 3/4	20 3/4
Six-Basket Crate	10 1/3x11x22	24
Three Basket Crate	6 1/3x11/22	24
Citrus Fruit Crate	12x12x24	27
Tangerine Crate	6x12x24	27
Celery Crate	20x10x22	24
Pepper Crate	14x11x22	24
Cantaloupe Crate	12x12x22	24
Pony Cantaloupe Crate	11x11x22	24
32-quart Berry Crate	14 3/4x11x22	24

The head sticks of these packages are cut thirteen-sixteenths by one and one-fourth inches and four lengths are used for all the crates. Furthermore the same size heads are used for several different crates. The twelve-by-twelve inch head is used for the bushel, five-peck, citrus and standard cantaloupe crate. The eleven by eleven inch head is used for the twenty-four quart American berry crate and pony cantaloupe crate. Six lengths of slats are used for these crates. The twenty-four inch slat is used for eight crates. The thirty-six and twenty-seven inch slats are used for two crates each, leaving only three lengths of slats that are not interchangeable. The twenty-four inch slat is not interchangeable between all eight crates, as there must necessarily be a difference in the thickness of the slats. This does not prevent the interchangeability among the pepper crate, the twenty-four quart American berry crate and the thirty-two quart American berry crate.

CONCLUSIONS

Need for Standardization

At present the only standardization which applies to the entire country in reference to the uniformity of packages is in the size of the barrel, grape baskets, berry boxes and small till baskets. In the case of hampers, round-stave baskets, boxes, and crates there is a great difference in size, shape and construction. This difference causes injury, losses, disagreements and fraud. It is an expense to the producer as the cost of manufacturing so many different containers is much greater than if only a few were used. The great difference in size and shape causes loss in transportation and confusion on the markets. The odd size containers do not pack readily in railways cars, consequently cars are shipped improperly packed and when they arrive on the market there is often a great deal of breakage. The many sizes and shapes are confusing to the purchaser as it is impossible to estimate the extra amount contained from the size.

Procedure to be Followed in Standardizing

The different types, sizes, and styles of package in use today have been shown in this paper. From the general discussion it is evident that there is need for standardization. The procedure that should be followed in the standardization of containers for horticultural

products must necessarily be varied. Its main trend as drawn from the observations made is outlined as follows:

- I. A study of packages now in use.
- II. Elimination of those packages that are not needed.
- III. Establishment of uniform types, sizes and dimensions of packages to be used for each fruit and vegetable.
- IV. Establishment of uniform specifications to be used in the construction of packages.

Under the first method of procedure a study of the packages in use is necessary to determine which package or packages meet all the needs of any particular fruit or vegetable. It is not practical to disregard all the containers now in use and establish new types and sizes for the products. A study then is necessary to eliminate the packages which are not really needed in the trade.

Under the third head, packages of certain types, sizes and dimensions should be established as standards to meet many requirements. The type of package should be selected that would best suit the fruit or vegetable it would contain. The size of the package should be based on a unit of measure such as the barrel holding a certain number of cubic inches of dry measure. The containers that hold a bushel should be based on some standard such as the Winchester bushel containing two thousand, one hundred fifty and forty-two hundredths cubic inches. The dry quart and its subdivisions and multiples is a satisfactory basis for small containers. The

unit either divided or multiplied by two should be the basis for all sub-division or multiplies.

The dimensions of the packages should be such that they are convenient to handle in packing and shipping the commodities in them. The packages should be of such dimensions that grades of fruit for which they are intended can readily be packed in an neat, orderly manner. The dimensions that will readily pack in standard size ventilator and refrigerator cars should be used for the specification of packages.

A uniform method of construction should be established especially as to size and strength of material and the amount and method of nailing. The size and strength of material is very important. Some packages now on the market are very weak due to the using of light materials. The strength of the material should be strong enough to withstand the pressure exerted by the commodity in the package. The strength of the material is important especially the method of using the material to take advantage of its full strength.

It has been found that cement-coated nails hold better than common or barred nails.

Uniform methods of construction would save expense in manufacturing and therefore a cheaper package would be the result.

Container for the United States

The containers that are necessary, to handle adequately all the Horticultural Products which are sold in the United States, need not be as varied as they are at present. The few types of packages that now take care of all the shipments are the barrel, box, crate, round stave basket, berry box, climax basket, hamper, till basket, splint basket, keg, drum and bags. The number of types cannot be satisfactorily reduced, but the number of different sizes and styles of each type can be greatly reduced. The barrel, climax basket and berry boxes have been standardized by Federal legislation, and the remaining sizes and styles still take care of all the needs. Every container that is used in marketing fruits and vegetables should be standardized.

About twenty-seven States have laws that standardizes the use of packages. These laws are varied, and consequently there are a large number of so called Standard Containers in the United States. A Federal law is necessary to standardize the containers used in the United States. The logical procedure in enacting a law that would meet the needs of marketing is to adopt the packages which are most widely standardized by state laws.

With State Container laws and observations made as a basis the following packages and the fruits and

Containers for Fruits and Vegetables.

- I.
- (a) Barrel (standard).....Apples, Potatoes, Pears, Cabbages, Cucumbers and other fruits and vegetables not otherwise provided for.
 - (b) Open stave barrel.....Apples, Pears, Cabbages, Cucumbers and other fruits and vegetables not otherwise provided for.
 - (c) Basket (woven stave) BarrelKale, Spinach and vegetables and fruits not weighing over one hundred pounds to the barrel.
 - (d) Cranberry Barrel Cranberries.

Capacity and Dimensions shall be as provided for the United States Standard Barrel.

II. Round Stave Basket

- (a) 1/4 bushel.....Road side markets
- (b) 1/3 " Road side markets
- (c) 3/4 " Apples, Peaches, Kale, Spinach and other fruits and vegetables, never to be used for Berries.
- (d) 1 bushel Apples, Peaches, Kale, Spinach and other fruits and vegetables but not for berries.
- (e) 1-1/3 Vegetables
- (f) 2 bushel Vegetables

Capacity and dimensions of the round stave basket.

				Inside measurements.		
				Top.dia.	Bottom dia.	Depth
a.	1/4 bu.	8 qts.		10-1/2 in.	8-1/2 in.	7 inches
b.	1/3 "	16 "		13-1/2 in.	11-5/8 "	8-1/2 "
c.	3/4 "	24 "		15-1/4 in.	13-1/4 "	9-3/4 "
d.	1 "	32 "		17 in.	15 "	10-3/4 "
e.	1-1/3 "	48 "		19 in.	17 "	12-3/4 "
f.	2 "	64 "		20-3/4 in.	19-1/8 "	13-3/4 "

III. Berry Boxes

- a. 1/3 pt.....Raspberry, Strawberries and other perishable berries
- b. 1 pt.....Raspberries, Strawberries and other perishable berries
- c. 1qt.....Strawberries, Raspberries, cherries and other fruits and berries of a similar nature.

Capacity and dimensions shall be as provided for in the United States Standard Container Act. The American and Metal Rim Styles shall be the standard style, all other styles shall be declared illegal.

IV. Berry Crates:

- a. 24 pt.
- b. 24 qt.
- c. 32 qt.
- d. 60 pt.
- e. 60 qt.

To be used as a container for berry boxes.

To be of such dimensions that they will contain 24 pt., 24 qt., 32 qt., 60 pt. or 60 qt. berry boxes.

V. Climax Baskets:

- | | |
|-----------|--------------------------------------|
| a. 2 qt. | Grapes and other fruits & vegetables |
| b. 4 qt. | " " " " " |
| c. 12 qt. | " " " " " |

Capacity and dimensions shall be as provided in the United States Container Act.

VI. Till Baskets

Wood Rim

- a. 1 qt.....Cherries, Strawberries and other fruits
- b. 2 "Grapes, Cherries, Plums, Apricot and other fruits
- c. 3 "Tomatoes, peaches, plums
- d. 4 "Tomatoes, peaches, pears, Avocado pears

Metal Rim

- a. 1qt.....
- b. 2 qt..... Same as the Wood Rim Tills
- c. 3 qt.....
- d. 4 qt.....

Capacity shall be the 1 quart, 2 quart, 3 quart and four quart sizes as provided by the United States Container Act.

VII. Hampers:

- a. 1 peck ...Tomatoes, Peaches, etc.
- b. 1/2 bushel..Tomatoes, Peaches, Onions, Etc.
- c. 3/4 " ..Tomatoes, Onions, Potatoes, Sweet Potatoes
- d. 1 bushel...Beans, Beets, Onions, Radishes, Okra, Peppers.
- e. 1-1/3 bu..Lettuce, Kale, Spinach, and similar light weight commodities; also Cucumbers, Cabbage when staves are not less than 1/6 inch thick.

Capacity and Dimensions shall be:

Inside Measurements.

Size	Cubic inches	Top Dia.	Bottom Dia.	Length stave	No. Stave
1 peck	537.6	10-3/8 in.	6-1/2 in.	9-5/8 in.	10
1/2 bu.	1075.21	13 "	8 "	12-1/2 "	10
3/4 bu.	1613.81	14-1/2 "	8-1/2 "	15-1/2 "	10
1 bu.	2150.42	15-1/8 "	9 "	19 "	10 or 12
1-1/3 bu.	3225.63	16-1/4 "	9 "	25-13/16 "	10
	or:	16-3/4 "	10 "	23 "	10

VIII. Market (splint) Baskets:

- a. 4 qts.....Road side markets
- b. 8 qts.....Road side markets
- c. 12 qts.....Apples, peaches, used for
heavy commodities
- d. 16 qts.....Apples, peaches
- e. 24 qts.....Lettuce, Spinach etc.

Capacity and dimensions shall be as provided
by Texas Standard Containers:

IX. Boxes

- a. Apple.....Apples
- b. Cherry Cherries, Apricots, Plums
- c. Cranberry..... Cranberries
- d. Lugs..... Grapes, Plums, Prunes, Cherries
Peaches, Apricots
- e. Peach..... Peaches, Cherries
- f. Pear..... Pears
- g. Produce Vegetables and fruits at curb
markets.

Capacities and dimensions shall be:

Style	Capacity	Inside Measurements.		
		Depth	Width	Length
		Inches.....		
a. Apple	2173 cu.in.	10-1/3	11-1/3	18
b. Cherry	(1) 10 pounds	2-1/4	9	18
	(2) 20 "	4-1/3	9	18
c. Cranberry	(1) 50 "	11-1/3	13	20
	N.J. (2) 1980 Cu.in.	12	7-1/3	22
d. Lugs.....	A.....	3	11-1/3	18
	B.....	3-1/4	11-1/3	18
	C.....	3-1/3	11-1/3	18
	E.....	4-1/3	11-1/3	18
e. Peach.....	A.....	4-1/4	11-1/3	18
	B.....	4-1/3	11-1/3	18
	C.....	4-3/4	11-1/3	18
f. Pear	1759.5 cu.in.	8-1/3	11-1/3	18
g. Produce.	a. 2150.42 cu.in.	10-3/8	11-1/3	18
	b. 2160 " "	12	12	15
	c. 3240 " "	12	12	22 1/3

Crates: con'td.

XI. Kegs, Drums and Grapes.

Capacity and dimensions shall be as provided
by California Standardization Law.

XII. Sacks Potatoes Onions Beans

Capacity shall be	a. 150 lbs. for potato sacks		
	b. 100 lbs. " onion "		
	c. 100 lbs. " bean "		

Packages were selected for the above list of suitable containers, from those packages most commonly used in the United States, and especially those packages which have been standardized by either Federal or State Laws. In selecting sizes of hampers, round stave baskets and some other packages certain sizes were omitted because they did not conform to the Unit of Measure, that should be adopted. The five-eighths and seven-eighths bushel were the sizes commonly omitted and the three-fourths bushel size was selected because it is an even subdivision of the Struck bushel.

Packages that are not standardized either by Federal or State Laws, were selected according to their popularity and size. In this case a size was always selected that conformed to one of the following units of measure: First, the cubical capacity based on the standard barrel, Struck bushel. and the dry quart. Even Sub-divisions and multiples of the bushel and dry quart were always used; second, the numerical count; and third, the weight.

This list is not the minimum number of packages that will satisfactorily meet the needs of our country, but if these containers for Horticultural Products were standardized a large part ^{of} the confusion, fraud and loss that now exists would be eliminated.

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