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3
**Costs, Methods,
and Facilities
in Packing
South Carolina
PEACHES, 1959** 76



56
UNITED STATES DEPARTMENT OF AGRICULTURE,
Agricultural Marketing Service ;
Marketing Economics Research Division //

in cooperation with
The Clemson Agricultural College
South Carolina Agricultural Experiment Station

PREFACE

This report is fifth in a group of reports on cost of packing peaches for fresh market. Previous reports were: Costs of Packing Arkansas Peaches in 1958, Marketing Research Report No. 361; Costs of Packing Michigan Peaches in 1957, Marketing Research Report No. 290; Costs of Packing Colorado Peaches in 1956, Marketing Research Report No. 179; and Costs of Marketing Carolina Peaches in 1954, Marketing Research Report No. 103. These reports are part of a broad program of research aimed at widening markets for agricultural products. The studies have provided information on the cost of packing peaches for fresh market in several major producing areas. Comparisons of factors affecting costs in different areas should enable packinghouse operators to reduce their costs. A subsequent report is planned, to bring together and compare cost factors of several areas in an effort to point out possibilities of improving operational efficiency and of reducing cost.

The authors are indebted to Spartanburg area peach growers and packers who permitted observation of their packinghouse operations and who made available their records on overhead, operating, and materials cost. Toy A. Hyder, Jr., Horticulturist, South Carolina Peach Growers Association, assisted and advised throughout the study. Daniel A. Buckner of Clemson College helped collect data. Lockwood-Greene Engineers, Inc., Spartanburg, S. C., supplied estimates of replacement costs for 24 packinghouses.

CONTENTS

	<u>Page</u>
Highlights	3
Introduction	4
Background	4
Procedure	7
Description of the packing operation	8
Physical facilities	8
Labor force and wage rates	9
Types of containers	10
Packing operations and job requirements	11
Labor requirements per container	16
Analysis of packing costs	18
Labor costs per container	18
Overhead costs	21
Operating costs	21
Cost of containers and supplies	22
Total packing cost	22
Implications and recommendations	22
Appendix	24

August 1960

HIGHLIGHTS

Total cost of packing a basket of peaches for fresh market in South Carolina during 1959 ranged from 90 cents for small packinghouses packing 3/4-bushel tub baskets to \$1.29 in large packinghouses using 1-bushel tub baskets. The total cost of packing increased as the size of the packing facilities increased, partly because of unutilized labor and lack of sufficient supervision in the larger packinghouses. It was observed that the number of workers employed exceeded the requirements for the volume of fruit handled. This was a deterrent to higher productivity.

Both the cost of the container and the cost of the labor are higher for packing 1-bushel tub baskets than for packing wirebound crates of comparable capacity.

The cost of the container and its components made up about half of the total packing cost for all containers. Overhead costs were the next largest item in small- and medium-size packinghouses. In the large packinghouses, however, the cost of packinghouse labor was found to be the second largest item of expense. Operating cost was fourth in importance in all three size categories.

Assuming the present scale and type of operation and considering all costs involved in packing peaches for fresh market in South Carolina, only labor cost appears to be alterable in the short run. Therefore, the major area for potential reduction in the total cost of packing peaches would be in improving efficiency of packinghouse labor, through use of more supervision throughout the operation and better management planning for maximum utilization of labor.

X COSTS, METHODS, AND FACILITIES IN PACKING
SOUTH CAROLINA PEACHES, 1959 X

by

W. Fred Chapman, Jr., Jerold F. Pittman, and Adger B. Carroll

INTRODUCTION

Peach production in the United States averaged almost 63 million bushels per year during the period 1949-1958. A little over one-third of this production was California clingstone fruit used almost entirely for processing. California also led in freestone peach production with an average annual crop of about 11 million bushels. South Carolina was second with an average annual crop of 3,213,900 and was followed closely by Michigan with 2,907,500 bushels per year.

Considerable cost is incurred in harvesting and packing peaches for fresh market. With the increased emphasis being placed on marketing efficiency and efforts to reduce marketing costs, growers and packers of peaches should attempt to increase efficiencies in packinghouse operations. Observations indicate that seasonal output is the most important factor influencing total packing costs. However, in the short run, for a given operation the cost of labor appears to be the most important alterable cost in packing peaches for fresh market. A reduction in labor costs could increase returns to growers, reduce prices to consumers, or provide for additional services without additional cost. Any of these alternatives, in the long run, would tend to enhance the competitive position of the peach industry in South Carolina and the Southeast.

BACKGROUND 2/

Commercial peach production in South Carolina dates back to the turn of the century, but large-scale production began in the 1920's when cotton farmers had to diversify after the coming of the boll weevil. The peach industry in South Carolina has grown rapidly, and since the mid-forties has been one of the Nation's leading producers of peaches for fresh market.

For the 15-year period 1945-59, production averaged over 3,700,000 bushels annually, and record production was established in 1945 at 5,940,000 bushels. The only complete crop failure registered in 60 years was in 1955 when a late killing frost left less than 500 bushels to be harvested in the State.

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2/ The statistical data presented in this section were developed from information published in South Carolina Peach Statistics--Trends 1899-1958, AE 169, S. C. Crop Rptg. Serv., U. S. Dept. Agr., in cooperation with Dept. Agr. Econ., S. C. Agr. Expt. Sta., May 1959.

Commercial peach production in South Carolina is located in five separate areas (fig. 1). These are the Piedmont, Sandhills, Ridge, Upper Coastal, and Lower Coastal areas.

Spartanburg is the leading peach producing county in South Carolina with 2,549,000 peach trees. These are about one-half of the State's total peach trees, and about three-fourths of the trees in the Piedmont area.

The number of peach trees in the State increased from an estimated 4,375,000 in 1950 to 5,150,000 in 1959. Between 1950 and 1958 the trees in the Piedmont area had increased by 6 percent, in the Ridge area by 67 percent,

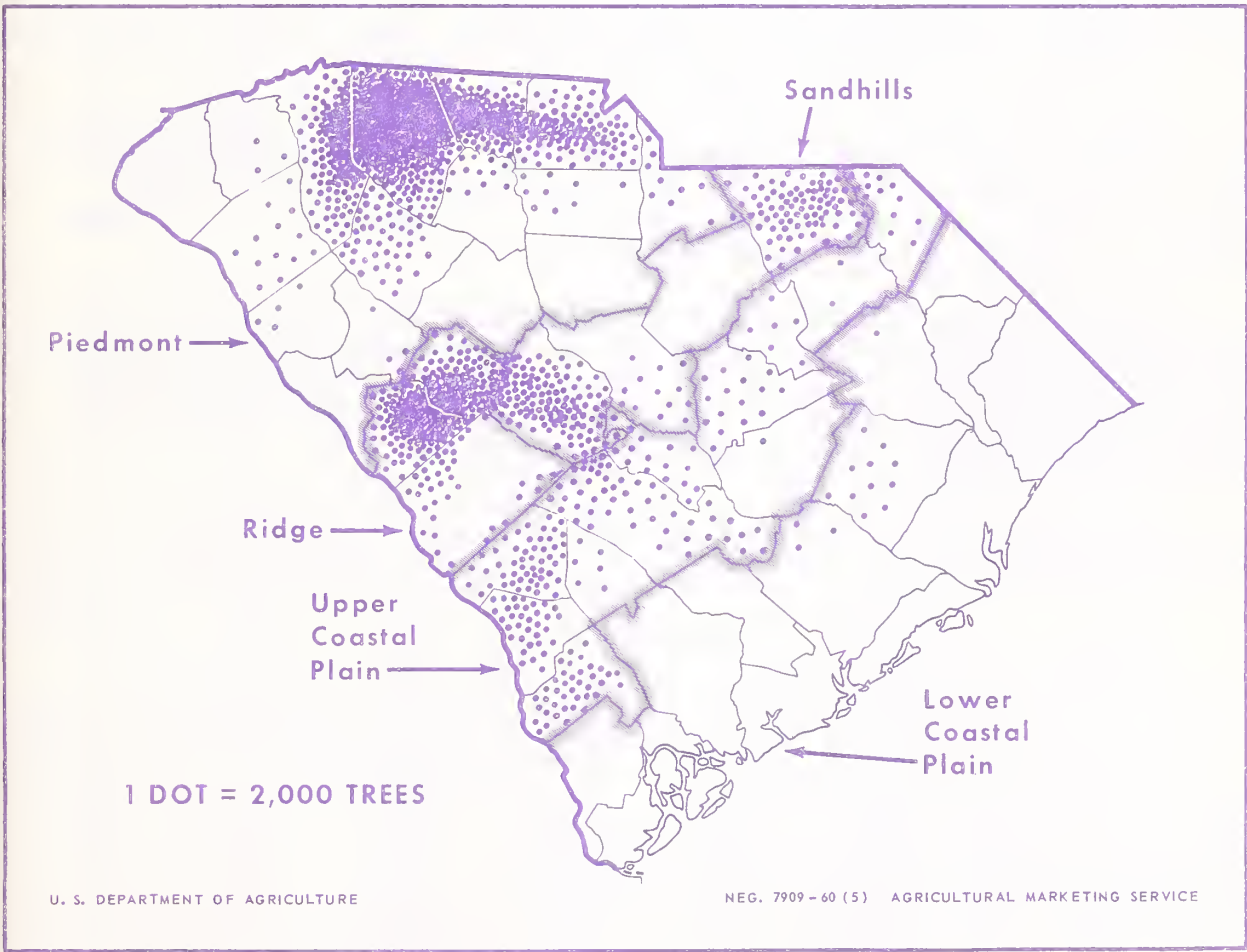


Figure 1.--Areas of Commercial Peach Production, South Carolina, 1958. Data from South Carolina Peach Statistics--Trends 1899-1958, AE 169, South Carolina Crop Reporting Service, USDA, in cooperation with Department of Agricultural Economics, South Carolina Agricultural Experiment Station, Clemson, S. C., May 1959.

and in the Sandhills by 23 percent. The most pronounced increases of tree settings occurred in the Upper and Lower Coastal areas, previously only minor areas. The Upper Coastal area in 1959 had over 387,000 more trees, an increase of over 500 percent, while the lower Coastal area came into production with 34,000 trees. The greater increase in areas other than the Piedmont has not been due to any lessening of interest by Piedmont growers, but rather to the decreasing availability of suitable orchard sites in the more concentrated areas.

About 27.5 percent of the trees in the State were 4 to 8 years old (table 1). Trees not of bearing age made up 44 percent of the total trees while the trees reaching removal age amounted to 13.5 percent.

The Elberta is still the predominant variety in South Carolina. In recent years, however, there has been a considerable shift to newer and earlier varieties. In 1946, the Elberta variety accounted for 60 percent of all peach trees in the State; in 1950 it had dropped to 45 percent, and by 1959 to less than 20 percent. Varieties such as Dixired, Keystone, Southland, Cardinal, and Coronet have come into prominence in recent years. South Carolina had 14 varieties of peaches and produced over 100,000 bushels of each in 1958. This gave a wide selection and continuous supply for well over 2 months.

South Carolina's principal competing States are Georgia, Arkansas, and North Carolina. South Carolina has led these States in production since 1950. The 1958 production of these four States was: South Carolina, 5,300,000 bushels; Georgia, 4,000,000 bushels; Arkansas, 2,100,000 bushels; and North Carolina, 1,157,000 bushels (table 2).

In 1958, South Carolina produced approximately 10 percent of the freestone peaches for fresh market in the Nation. According to a survey of the State Crop Reporting Service, 83 percent of this production was shipped to fresh market, 7 percent was sold to processors, and the remaining 10 percent was sold locally, dumped, or used on farms and given away.

Table 1.--Age distribution of peach trees in South Carolina, by areas, 1958

Area	Under 2 years	2 years	3 years	4-8 years	9-13 years	14 years and over
	Percent	Percent	Percent	Percent	Percent	Percent
Piedmont	18.9	7.1	11.3	28.0	16.2	18.5
Ridge	18.3	12.2	20.0	27.1	17.8	4.6
Sandhills	18.5	15.5	15.9	33.7	13.1	3.3
Upper Coastal	29.8	28.7	14.9	21.0	4.6	1.0
Lower Coastal	45.6	36.8	8.8	8.8	---	---
State total ..	20.0	10.8	13.2	27.5	15.0	13.5

Table 2.--Production of peaches, South Carolina and principal competing States, selected years, 1940-58

Year	South Carolina	Georgia	Arkansas	North Carolina
	<u>1,000 bu.</u>	<u>1,000 bu.</u>	<u>1,000 bu.</u>	<u>1,000 bu.</u>
1940	2,584	5,208	1,938	1,690
1944	2,838	4,200	2,330	2,698
1949	1,844	1,674	2,010	870
1954	3,600	3,000	984	1,110
1955	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>
1956	4,350	1,600	2,250	950
1957	4,400	1,825	1,100	1,500
1958	5,300	4,000	2,100	1,350
Average 1947-56	3,031	2,420	1,534	1,157

1/ Less than 500 bushels.

PROCEDURE

During July 1959, three observations were made of the packing operations in each of 24 peach packinghouses in the Spartanburg area. An observation consisted of recording the activities of each worker and the packing output during a period of not less than 2 hours of operation. The observations ranged in length from 2 to 4 hours and in most instances were terminated with the last container of fruit in a lot or in a packing period. The packinghouses were selected to represent all the facilities used in the Spartanburg area for packing peaches and were stratified into groups on the basis of the hourly capacity of the machinery and the capital investment. Five packinghouses were classified as large, 9 as medium size, and 10 as small.

Overhead and operating cost data were secured after the 1959 packing season was completed. Costs for items such as ice, power, telephone, telegraph, water, packing materials, insurance, and repairs were recorded during personal interviews with each packinghouse owner. Replacement costs for packinghouse machinery were calculated by a representative of one of the major machinery distributing firms in the area on the basis of the items of machinery and equipment available to each of the packing installations included in the analysis. Replacement costs for the packinghouse buildings were estimated by an engineering firm in the Spartanburg area on the basis of costs of labor and materials on December 31, 1959.

Property taxes were assigned to each packinghouse facility at the rate used by the Spartanburg County auditor. Taxes were based upon the assessed value of each facility and the millage rate in force in the particular district in which the house was located.

DESCRIPTION OF THE PACKING OPERATION

Peach packing is an assembly line operation in which the fruit is subjected to various operations as it moves by means of a conveyor system to emerge as packed containers of peaches ready for shipment. Normally, each packing installation makes use of sufficient labor, machinery, and equipment to perform each of the following operations: Receiving, dumping, defuzzing, grading, sizing, filling, ring facing, hydrocooling, lidding, and labeling. Variations between packinghouses in the cost of packing result from differences in physical facilities and labor utilization as well as from the efficiency with which these factors are employed by each packinghouse owner or manager.

Physical Facilities

Packinghouse buildings are generally of open pole construction. The floor usually is concrete in newer packinghouses, and either concrete or wood in the older buildings. A few of the smaller and older packinghouses are operated with earthen floor space.

Floor space in large packinghouses averaged 17,484 square feet (table 3). The medium and small packinghouses had an average of 8,048 and 6,688 square feet of floor space.

Most packinghouses in South Carolina have a second-level loft. This loft is used for storage of baskets, liners, pads, and similar packing supplies, and is also used as a work area for assembling these items during the packing season. Chutes are generally provided to deliver these packing supplies to the proper work station.

The packing machinery and equipment in use in the 24 packing installations varied in type, capacity, and manufacturer, depending upon the size of the operation and the degree of automation incorporated into the packing line. The average replacement cost for machinery and equipment was \$65,723 in large packinghouses, \$25,826 in medium houses, and \$18,281 in small ones. Replacement cost of buildings was estimated at \$58,000 for the large packinghouses, and ranged down to approximately \$17,000 for small packinghouses.

Table 3.--Average replacement cost of building and equipment, by size of packinghouse, 24 fresh peach packinghouses, Spartanburg area, South Carolina, 1959

Packinghouse size	Average space		Replacement cost	
	Floor	Loft	Building ^{1/}	Machinery and equipment
	Square feet	Square feet	Dollars	Dollars
Small	6,688	2,130	16,965	18,281
Medium	8,048	3,459	20,149	25,826
Large	17,484	12,385	58,000	65,723

^{1/} Average cost of replacing existing structures based upon material and labor costs on December 31, 1959. These estimates were developed by Lockwood-Greene Engineers, Inc., Spartanburg, S. C.

Labor Force and Wage Rates

The number of workers employed in packinghouse operations varies considerably with the size of the enterprise. An average of 50 workers was employed in small packing installations (table 4). This compares with an average of 64 workers in the medium-size houses and 116 workers in the large packinghouses. Large houses tended to have the greatest number of workers for each operation as well as the greatest total number.

Grading and facing utilized the largest total number of workers. These operations accounted for about 30 to 40 percent of the total workers in the packinghouses. Tubbing was also important in terms of the number of workers. The larger packinghouses utilized considerable labor in such operations as handling packing materials, lidding, stacking and loading, and miscellaneous operations.

The average hourly wage paid to packinghouse workers was 57 cents in the small houses, 61 cents in the medium houses, and 63 cents in the large houses (table 5). The highest rates of pay were for workers performing tubbing and facing operations and workers in supervisory, administrative, and clerical positions. The average hourly wage for each operation was consistently highest in large packinghouses and lowest in small houses. Thus, both the unit labor requirements and the labor costs were higher in total for large operations than for smaller ones.

Table 4.--Average number of workers performing specified operations, 24 peach packinghouses by size of packinghouse, Spartanburg area, South Carolina, 1959

Operation	Small packinghouses	Medium packinghouses	Large packinghouses
	<u>Workers</u>	<u>Workers</u>	<u>Workers</u>
Supplying dumper	1	2	4
Dumping	1	2	2
Handling empty field boxes ...	2	2	3
Grading	11	12	26
Handling culls	2	2	5
Facing	9	11	17
Tubbing	5	6	9
Handling packing materials ...	2	4	9
Capping	1	1	1
Basket turning	1	1	1
Hydrocooling	2	3	4
Lidding	3	3	6
Labeling and stamping	3	3	4
Stacking and loading	3	3	8
Supervisory	2	2	4
Administrative and clerical ..	2	2	3
Other	---	5	10
Total	50	64	116

Types of Containers

In 1959, most South Carolina peaches were packed in tub-type baskets of 1/2-bushel, 3/4-bushel, and 1-bushel capacities, and in wirebound crates of 3/4-bushel and 1-bushel sizes. In the 24 packinghouses which form the basis for this analysis, data were collected only on operations involving use of 3/4-bushel and 1-bushel tub baskets, and 1-bushel wirebound crates, since these were the predominant containers used for packing peaches.

The tub-type basket is constructed of wood veneer staves with 3/8 to 5/8 inch between staves. A liner of heavy paper with round or slotted holes for ventilation is placed inside the basket. The vents in both the basket and liner permit much more rapid cooling of the container and its contents than would be possible with solid construction.

The lid used with the tub basket is concave, with projections on two sides for handles. These projections or handles are also part of the means of fastening the lid to the basket. The basket is equipped with wire handles on each side through which these projections pass during the lidding operation. There are also two other wire to wire fasteners on the other two sides of both basket and lid. Thus, a packed and lidded basket has four fastening points between the lid and the basket.

Table 5.--Average hourly wages for specified operations, 24 peach packinghouses by size of packinghouse, Spartanburg area, South Carolina, 1959

Operation	Small packinghouses	Medium packinghouses	Large packinghouses
	<u>Cents</u>	<u>Cents</u>	<u>Cents</u>
Supplying dumper	51	53	55
Dumping	54	59	62
Handling empty field boxes ...	50	50	55
Grading	50	52	54
Handling culls	52	53	57
Facing	52	68	60
Tubbing	65	76	87
Handling packing materials ...	50	50	51
Capping	50	53	60
Basket turning	50	50	50
Hydrocooling	50	56	57
Lidding	49	54	57
Labeling and stamping	50	50	53
Stacking and loading	55	55	66
Supervisory	138	152	155
Administrative and clerical ..	71	79	70
Other	---	50	60
Weighted average	57	61	63

The wirebound crate is of wood veneer construction, oblong, and bound on all sides with medium-gage soft metal wire. There are ventilation spaces approximately 1/2 inch wide between the veneer slats on both the sides and the ends. The wirebound crate is packed using paper liners as in the tub basket. The crate is fastened by twisting together, either automatically or manually, the wires provided for this purpose on the lid and body of the container. The wires, which pass completely around the container, act as hinges during the filling of the box and permit knocked-down crates to be received and stored at the packinghouse to conserve space.

Padding materials are commonly used in packing both the tub basket and the wirebound crate. A pad made of kraft paper enclosing an excelsior or macerated-paper filling is used on top of the container between the lid and the first layer of fruit. A bottom pad is not normally used. Pads are available in the proper shape and size to fit each of the standard containers.

Packing Operations and Job Requirements

Operations performed in packing peaches, along with requirements for labor in accomplishing these operations, vary with the type of container into which fruit is packed. Decisions concerning labor requirements must be made by the supervisory personnel in each packinghouse on the basis of sales or anticipated sales of packed fruit.

Packing in Tub Baskets

Receiving

Peaches are brought to the packinghouse in field boxes on trucks or on farm tractor trailers. The boxes are unloaded by hand or conveyor and are stacked on the receiving platform by the orchard crew (fig. 2). The fruit is then moved by packinghouse labor to the dumping table as needed. Most packinghouses use a conveyor system, but some operators use handtrucks or pallets.

Dumping

Manual dumping.--Most of the packinghouses dumped fruit manually. The job consisted of lifting a field box from a nearby stack or conveyor and emptying it onto a conveyor belt leading to the grading line. This operation requires little skill, but some care must be exercised to avoid excessive bruising of the fruit. Usually one man can perform this task for each packing line, but in some installations two men were used to dump on each line.

Automatic dumping.--A few of the newer packinghouses used automatic dumpers (fig. 3). The dumpers are not, however, automatic to the extent that no labor is required. One or two men place the field boxes onto a conveyor where a series of belts tilts and overturns the boxes, allowing the fruit to flow onto the dumping table. One man is stationed at the dumper to remove the empty lugs to a conveyor which carries them outside the packinghouse. This man also must assure that any malfunction of the equipment is corrected immediately.

Sorting Soft Fruit

From the dumping table the fruit moves over a belt conveyor or roller conveyor to the brushing machine. The "soft-graders" are stationed along this conveyor to remove soft peaches as well as leaves and other debris. There are usually four to six soft-graders per packing line.

Brushing

The brushing machine is made up of a series of rotary brushes which remove the fuzz from the peaches and carry it away through a vacuum system. No labor is required for brushing except miscellaneous laborers who clean the collected fuzz from the duct system to prevent clogging.

Grading

Grading is one of the most important functions in the entire packinghouse operation insofar as quality of the packed fruit is concerned (fig. 4). At this point in the packing line six to eight workers remove culls and misshapen fruit and reroute them to a cull bin or outlet.

Sizing

From the grading table the fruit moves to the sizer. This is a completely automatic machine with four to eight rollers which gradually diverge, allowing peaches to drop to a series of conveyor belts according to size (fig. 5). These conveyor belts carry the fruit of each size separately to the packing area. Undersized fruit from the sizing machine moves via conveyor to another area where it is crated and sold to truckers or loaded in bulk.

Ring Facing

When the graded fruit is being packed into tub baskets, ring facers use a metal concave facer to prepare the top layer for each basket (fig. 6). Some packinghouse operators pay workers performing this operation on a piece rate basis.

Tubbing

Once the face is prepared and delivered to the tubbing station, the tubber places on top of the metal facer a metal tub with a paper liner. The tub is then ready for filling. In most packinghouses this is done manually. The tubber places the tub and facer assembly under a trapdoor in the bin containing graded and sized fruit, and opens the door allowing the peaches to spill out into the tub. When the tub is full, the trapdoor is closed. The filled metal tub and facer assembly is then placed onto a conveyor and the metal tub is removed.

Some of the packinghouses observed were equipped with an automatic tubbing device (fig. 7). This machine fills each container to a preselected weight.

Capping and Turning

Capping and turning consists of placing the proper sized tub basket over the inverted liner and face assembly, and turning it either with an automatic



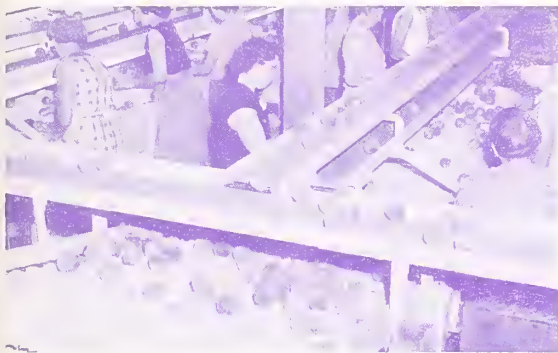
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Figure 2.--Workers unloading field boxes of peaches at packinghouse platform. Boxes move by gravity over roller conveyor toward grading line.



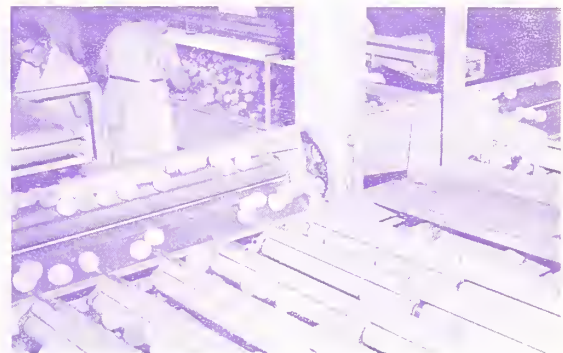
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Figure 3.--Field boxes being emptied onto conveyor belt by automatic dumper.



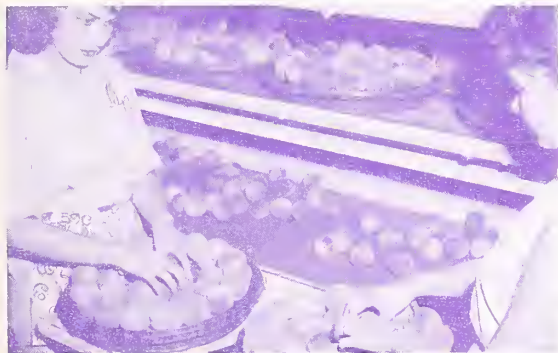
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Figure 4.--Workers at double grading table remove culls and overripe peaches as fruit moves on roller conveyors. Smaller conveyor belts at eye level of workers carry culled fruit away.



N-28051

Figure 5.--Peaches moving onto sizing machine which has turning rollers set at different widths. As peaches move along these rollers the fruit is dropped onto conveyors going to packing stations.



N-28016

Figure 6.--Ring facers preparing "faces" of peaches to go on top of packed tub baskets.



N-28021

Figure 7.--Automatic tubbing device which fills tubs to proper weight. The door at right lets additional peaches drop into form until full weight is reached.

turning machine or with a hand turner. Then the metal facer is removed and returned to the facing stations and the filled baskets of fruit are ready for hydrocooling. One man is employed to turn baskets in packinghouses where this operation is performed manually. The automatic turners require no labor in their operation.

Hydrocooling

Fruit moves through the hydrocooling equipment on a continuous conveyor and requires direct labor only for placing baskets in the hydrocooler and for removing them after cooling is completed, plus one worker to keep the equipment iced (fig. 10). Temperature checks are made by Federal-State inspectors after hydrocooling to assure that the cooler is reducing the temperature to the proper level (fig. 11).

Lidding

Once the fruit comes out of the hydrocooler, the top pad and lid are placed on top of the basket and secured by means of wires attached to the basket in four places. From the lidding area the fruit moves on a conveyor to be labeled, stamped, and loaded.

Labeling and Stamping

Usually one or two workers place the brand label on each basket, and one or two others rubber-stamp the variety, grade, size, and the word "hydrocooled" on the top of the container. After labeling and stamping are completed, the fruit moves up a conveyor to be loaded into a rail car or truck for movement to destination.

Loading

Most operators used from two to four workers in stacking packed baskets of fruit in the rail cars and trucks (figs. 12 and 13). In some houses this crew was also responsible for counting the number of containers loaded. In other houses an automatic tally device was incorporated into the conveyor system to keep a record of the number of containers passing over the conveyor.

Packing in Wirebound Crates

Packing peaches in wirebound boxes or crates is identical in procedure to packing them in tub baskets, from the receiving operation through the sizing operation.

After the peaches are graded and sized, they move by conveyor belt to the filling area. Filling is done in much the same manner as with the tub basket except that fruit is dumped from bins directly into the crates. The fruit can be delivered to the crates directly from the bins used for tubbing baskets, and the use of the paper liner, ring face, and metal tub is eliminated. Once the crate is filled it is placed onto the conveyor system and goes directly to the cooling equipment. Automatic filling equipment may be utilized in filling wirebound crates in the same manner as the automatic tubbing machinery used for filling tub baskets.



N-28020

Figure 8.--Checker in a packinghouse pulls ringfacers' numbered tag from filled baskets of peaches. Checker keeps count on machine of rings filled by individual workers and checks appearance of the top layer.



N-28055

Figure 9.--A Federal-State inspector checks size of peach with official sizing device to determine whether the fruit meets size specifications.



N-28008

Figure 10.--Worker in a peach packinghouse places filled baskets of peaches in hydrocooler. Cold water bath lowers temperature of fruit to as low as 38 degrees Fahrenheit.



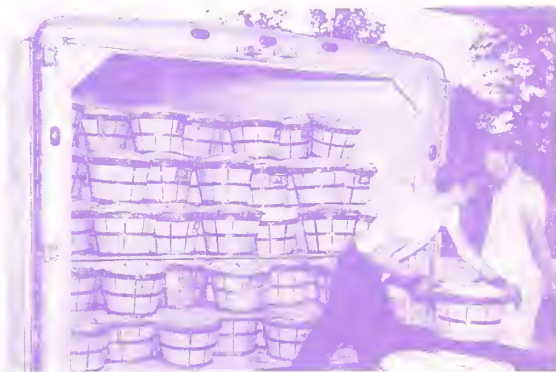
N-28057

Figure 11.--Federal-State inspector checks temperature of peach that has passed through the hydrocooler in background. Hydrocooling helps keep peaches in condition for shipping.



N-28061

Figure 12.--Worker loads filled baskets of peaches into refrigerator car. Filled baskets move by chain conveyor directly from packing floor into car.



N-28042

Figure 13.--Truck trailer being loaded with baskets of peaches for shipment to market. Trailer is cooled with ice, and may be re-iced several times enroute.

From the hydrocooler, the filled and cooled crates move to the lidding area. The lids are fastened by means of wires attached to the crates. They may be fastened either manually with handtools or by a semiautomatic lidding machine. From the lidding area the crates are labeled and stamped and are loaded onto transport vehicles in the same manner as the tub baskets.

Labor Requirements Per Container

The time requirement to perform the functions from receiving bulk peaches through loading packed 1-bushel tub baskets of fruit into a rail car or truck averaged 15 man-minutes in small packinghouses, 20 man-minutes in medium-size ones, and 35 man-minutes in large ones (table 6). Grading required the greatest amount of labor, ranging from $3\frac{1}{2}$ man-minutes in small houses to slightly over 8 man-minutes in large houses. This represented approximately 23 percent of total labor used in packing. Facing took the next largest amount--about 17 percent of total labor. Other functions requiring relatively large portions of the total labor requirements are tubbing, handling packing materials, lidding, and loading (appendix tables 9, 10, and 11).

The average labor requirement for packing a $\frac{3}{4}$ -bushel tub basket was 13 man-minutes in small packinghouses, 17 man-minutes in medium-size houses, and 18 man-minutes in large ones (table 6).

Facing, capping, and basket turning are eliminated in packing the wirebound crate. The average labor requirement for packing this container was 15 man-minutes in small, 21 in medium, and 23 in large houses. Here again, grading required the greatest amount of labor, followed by tubbing and handling packing materials.

In packing all containers, large packinghouses required more time than small or medium-size houses and medium-size houses more than small ones. The large houses had unutilized labor and insufficient managerial assistance. Most packinghouses in the study employed only one supervisor. In a small operation one man can give adequate individual supervision to insure productive labor, whereas in a larger operation he does not have enough time to supervise each worker properly.

Another deterrent to higher productivity was the number of excess workers for a given volume. Some packinghouse owners and operators argue that it is essential to keep the labor required for maximum output on the job at all times. Most of the larger houses had nonproductive labor, especially in dumping, handling culls, handling packing materials, lidding, labeling, and stamping.

Another factor affecting labor requirements per container is the packing of both tub baskets and wirebound crates in a single day's operation. If tub baskets are being packed, labor is required for facing, capping, and basket turning. If the packinghouse shifts to wirebound crates, this labor is not required and the workers may be left with nothing to do. The average number of man-minutes required for packing a 1-bushel wirebound crate was 15 in small packinghouses, 21 in medium-size houses, and 23 in large ones. However, the data on labor requirements include much labor classified as "other." This "other" labor is needed when tub baskets are being packed, but wirebound crates

could be packed by 8 to 12 fewer workers in small houses, 10 to 18 fewer in medium ones, and 12 to 20 fewer in large packinghouses. The general practice observed was to keep these workers on and use some of them to expand other operations and the rest to do nothing, which sometimes reduced the productivity of other workers.

ANALYSIS OF PACKING COSTS

Table 7 shows total costs of packing each of the three kinds of containers in small, medium, and large packinghouses. Total costs comprise labor cost, overhead, operating cost, and cost of the container.

Generally, in packing operations of this nature, the cost per unit decreases as the size of plant increases. However, in this particular study, this was not the case because of unutilized labor and packing capacity and insufficient managerial assistance in the larger packinghouses.

There are rather wide variations in cost among packinghouses. Some of the causes of these variations are readily apparent and previously discussed while others are extraneous factors which would cause variations in cost even in the same facility at different times. These include: Variety, size, and maturity of fruit; proficiency and stability of workers; and consistency of flow of fruit.

Labor Costs Per Container

Direct labor cost for packing 1-bushel tub baskets in 12 packinghouses ranged from 10 to 38 cents and averaged 19 cents (appendix table 12). The average cost in small packinghouses was 15 cents, compared to 20 cents in medium-size houses and 35 cents in large ones (table 8).

Grading required the greatest portion of the cost in packing 1-bushel baskets. The next greatest cost item was facing, followed by tubbing, and supervising.

The 3/4-bushel tub basket cost an average of 17 cents for direct labor in 14 packinghouses in the Spartanburg area (appendix table 13). Labor costs for this container varied less among small, medium, and large houses than for any other container. Labor costs were 12 cents in small houses, 18 cents in medium-size ones, and 19 cents in large ones (table 8).

The wirebound crate required an average of almost 19 cents for labor. However, four of these houses shifted from tub-type baskets to wirebound crates without a reduction in labor force and showed from 2 to 5 cents per container for labor classified as "other." If this labor had not been retained, labor costs would have averaged slightly over 15 cents in the seven packinghouses observed.

A spread of nearly 10 cents in labor costs was found between the small and the large packinghouses using wirebound crates. The cost of labor in small packinghouses was 13 cents compared with 18 cents in medium-size houses, and 23 cents in large installations. Appendix tables 12-14 give labor cost data on individual packinghouses for three containers included in this analysis.

Table 7.---Average total cost of packing a container of peaches for fresh market, by size of packinghouse and type of container, Spartanburg area, South Carolina, 1959

Cost component	Small packinghouses			Medium packinghouses			Large packinghouses		
	1-bushel: : wirebound: : crate :	3/4-bushel: : tub : : basket :	1-bushel: : wirebound: : crate :	1-bushel: : tub : : basket :	3/4-bushel: : tub : : basket :	1-bushel: : wirebound: : crate :	1-bushel: : tub : : basket :	3/4-bushel: : tub : : basket :	1-bushel: : wirebound: : crate :
	<u>Cents</u>	<u>Cents</u>	<u>Cents</u>	<u>Cents</u>	<u>Cents</u>	<u>Cents</u>	<u>Cents</u>	<u>Cents</u>	<u>Cents</u>
Labor cost	13.3	15.0	12.1	18.8	20.2	17.9	22.8	34.7	18.7
Overhead cost ^{1/}	25.1	25.1	18.8	24.0	24.0	18.0	22.9	22.9	17.2
Operating cost ..	8.9	8.9	6.7	10.8	10.8	8.1	16.2	16.2	11.2
Container cost ^{2/}	50.8	55.7	52.6	50.8	55.7	52.6	50.8	55.7	52.6
Total cost ..	98.1	104.7	90.2	104.4	110.7	96.6	112.7	129.5	99.7

^{1/} Based on total seasonal output of packinghouses.

^{2/} Cost of basket includes lid, liner, and top pads; cost of crate includes liner and pads.

Table 8.--Average labor costs per container in packing peaches for fresh market, by size of packinghouse and operation performed, Spartanburg area, South Carolina, 1959

Operation	Small packinghouses			Medium packinghouses			Large packinghouses		
	1-bushel: basket	3/4-bushel: basket	1-bushel: wirebound: crate	1-bushel: basket	3/4-bushel: basket	1-bushel: wirebound: crate	1-bushel: basket	3/4-bushel: basket	1-bushel: wirebound: crate
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
Supplying dumper:	0.33	0.32	0.28	0.59	0.53	0.46	0.84	0.56	0.78
Dumping .....	.30	.52	.34	.65	.53	.57	1.26	.74	.31
Handling empty field boxes ..	.51	.35	.34	.43	.59	.46	.42	.78	.57
Grading	2.93	3.82	2.30	4.00	3.46	3.43	6.74	4.17	3.80
Handling culls ..	.42	.80	.38	.62	.52	.46	1.26	.96	1.09
Facing	2.80	---	2.24	3.46	---	3.19	3.84	---	3.20
Tubbing	1.90	1.56	1.31	1.87	1.95	2.04	2.42	1.71	1.88
Handling packing: materials .....	.40	1.09	.54	.87	1.02	.86	2.95	1.87	.80
Capping .....	.27	---	.23	.30	---	.26	.63	---	.20
Basket turning ..	.28	---	.22	.22	---	.29	---	---	.29
Hydrocooling ....	.60	.64	.46	.75	.84	.68	1.26	.96	.80
Lidding .....	.84	.84	.77	1.23	1.29	.96	1.68	1.20	.94
Labeling and stamping .....	.69	.95	.49	.97	.79	.80	1.26	.69	.64
Stacking and loading .....	.71	.95	.67	1.15	.81	1.26	1.90	1.32	1.03
Supervisory	1.37	1.07	.96	1.81	1.30	1.39	5.19	2.43	1.80
Administrative and clerical ..	.62	.43	.58	1.05	.64	.78	3.08	1.70	.54
Other	---	---	---	.22	4.55	---	---	3.70	---
Total	14.97	13.34	12.11	20.19	18.82	17.89	34.73	22.79	18.67
Packinghouses :	5	2	5	6	3	6	1	2	3

Overhead Costs

Overhead includes depreciation charges for buildings and equipment, personal liability and property insurance premiums, property taxes, and interest on the owner's investment. The dollar amount of each of these items is a fixed cost to the packinghouse owner regardless of the length of the packing season or the total volume of fruit packed. A breakdown of the amounts of each individual component of overhead is shown in appendix table 18 for each of the 24 packing installations studied.

The average total overhead cost per container tended to decrease as the size of the packing operations increased (table 7). Average total overhead for small packinghouses packing 1-bushel tub baskets was 25 cents compared to 24 cents in the medium-size houses. Large packinghouses incurred overhead costs amounting to 23 cents per bushel basket. Charges for overhead assigned to the 1-bushel wirebound crate were the same in each case as for the basket of the same capacity, and these costs were assigned to the 3/4-bushel container on the basis of three-quarters of the full bushel amount.

Unit overhead represents an indication of the scale of operation of an individual packing installation. In some packinghouses, particularly the small ones, the volume of fruit packed during the season was not large enough to reduce the overhead charge per unit to a competitive level. The medium and large packinghouses, although with more overhead, averaged less per unit than the smaller facilities. In many instances, however, the slight advantage in unit overhead enjoyed by the larger packinghouses was more than offset by higher operating and labor costs.

Operating Costs

Operating costs include electric power, telephone and telegraph charges, machinery and equipment repairs, water, hydrocooler ice, and social security payments and workmen's compensation payments. Labor cost, generally listed as a component of operating cost, has been discussed in the preceding section. A breakdown of total operating costs for each of the 24 packinghouses is included as appendix table 16.

Average operating costs per bushel tub basket and wirebound crate were almost 9 cents in small packinghouses. These costs were slightly higher in medium-size operations, and averaged 16 cents per bushel in the large installations. Operating costs for packing 3/4-bushel tub baskets were computed to 6.7 cents in small packinghouses, and 8.1 cents and 11.2 cents in medium and large installations (table 7). Thus, the unit operating costs tend to increase as the size of the operation increases, partly because the higher-volume operations involve larger and more complex equipment and machinery. The larger operations generally had higher total expenditures per unit for ice, power, and telephone and telegraph charges, as well as larger expenditures for social security and workmen's compensation benefits.

Cost of Containers and Supplies

The complete 1-bushel tub basket consists of the basket, a lid, a paper liner, and a top pad. It costs 55.7 cents (table 7). The 3/4-bushel tub basket, complete, costs 52.6 cents. The 1-bushel wirebound crate is the least expensive container.

Total Packing Cost

The average total packing cost ranged from a low of 90 cents for small packinghouses producing 3/4-bushel tub baskets to a high of \$1.29 in large packinghouses using 1-bushel tub baskets. The total cost of packing increased as the size of the packing facilities increased for each container. For example, the total cost of packing the 1-bushel wirebound crate was 98 cents in small packinghouses, \$1.04 in medium installations, and \$1.13 in the large packinghouses. This tendency toward higher total costs in larger facilities is a generally consistent trend throughout this analysis.

The cost of the container and its accessories made up about half of the total packing cost in every case. Overhead costs were the second largest component of total packing costs in the small and medium-size packinghouses. In the large ones, however, packinghouse labor was found to be the second most important item of expense. Labor cost was third in importance to operators of the small and medium-size packinghouses. Operating costs were fourth in importance in houses of all three sizes.

The 1-bushel tub basket is more expensive to pack than the 1-bushel wirebound crate, mostly because of the higher cost of the container itself. Labor cost is slightly higher for packing bushel baskets. The 3/4-bushel tub basket represents the least cost per container; however, because of the larger number of containers required, the cost of packing 1,000 bushels of peaches in 3/4-bushel tub baskets is greater than the cost of packing them in either of the 1-bushel containers. Relative costs, however, probably play only a small part in packinghouse operators' decisions as to which container to use for a given lot of fruit. The desire of the buyers probably is the deciding factor in the selection of a packing container.

IMPLICATIONS AND RECOMMENDATIONS

Supervision

More supervision of workers in the packinghouse is needed to insure maximum labor efficiency in all phases of packing. Observations indicate a lack of needed supervision of some operations such as cull handling, packing-material handling, and grading. In some houses cull handlers and packing-materials handlers went about their tasks with little direct supervision and were idle for a good portion of their worktime. In many instances, if the job performance was lagging, more workers were added, thus increasing the amount of inactive labor. More supervision could have accomplished the same jobs with the original number of laborers or even fewer.

In some packinghouses a great deal of laxity existed among the graders, with a few of them doing most of the work. The quality of the packed fruit could be greatly improved by a supervisor who carefully watches the work that each grader does.

Management Planning

A good indication of relative efficiency is how well management maintains continuous operation during the packing day. Lost time occurs in many packinghouses as a result of poor planning in changing from one lot to another. In several packinghouses the foreman was observed to clean out the facing and dumping area completely before starting a new lot of fruit through. When packinghouse labor costs \$60 to \$100 per hour, a delay of even 6 to 7 minutes occurring a few times a day is expensive.

The average number of workers found in the 24 packinghouses was 77 with an average wage of 61 cents per hour. This amounts to a total cost of 78 cents per minute of packinghouse time on the average. If each operator packed 10 lots of fruit per day and lost 7 minutes per changeover, this lost time would cost \$49.14 for the day's operation. One system to eliminate this problem was placing a tag to mark the end of one lot and the beginning of the next. When this or some similar procedure was used, little time was lost between lots of fruit.

Since labor requirements are different for packing tub baskets and wire-bound crates, costs could be reduced by better planning of the packing day. If possible, baskets should be scheduled for one day and crates for the next. If a sales agency needs to have both tub baskets and wirebound crates to fill an order, it would be much more feasible to have the baskets packed in one packinghouse and the crates in another rather than to shift from one container to the other in the same installation.

Better planning of orchard operations to start packing earlier and to stop at an earlier hour at night will eliminate the problem of a tired packing crew. The workers become tired and their reactions slow down during late operations. An alternative would be to pick less mature peaches in the afternoon for packing the next morning or to refrigerate the peaches through the night for the next morning's packing operations.

More emphasis should be placed on pre-season repairs and afterhours maintenance to reduce stoppages from malfunction of machinery and equipment. A good maintenance program can reduce cost of operations and provide for more constant production.

Operators should use care in selection of machinery and equipment. Automatic or semiautomatic machinery does not necessarily insure a saving of labor. In some cases, more people have been observed operating "automatic" machinery than were used to do the same job the old way. Thus, a greater labor cost as well as an increase in overhead cost results.

Packinghouse owners and operators should always avoid doing anything just because "it has always been done that way." They should be on the lookout constantly for better ways to do jobs and for ways to eliminate unnecessary operations.

APPENDIX

<u>Tables</u>	<u>Page</u>
9.--Labor requirements per 1-bushel tub basket of peaches packed for fresh market, 12 Spartanburg area packinghouses, South Carolina, 1959	25
10.--Labor requirements per 3/4-bushel tub basket of peaches packed for fresh market, 14 Spartanburg area packinghouses, South Carolina, 1959	26
11.--Labor requirements per 1-bushel wirebound crate of peaches packed for fresh market, 7 Spartanburg area packinghouses, South Carolina, 1959	27
12.--Labor cost per 1-bushel tub basket of peaches packed for fresh market, 12 Spartanburg area packinghouses, South Carolina, 1959	28
13.--Labor cost per 3/4-bushel tub basket of peaches packed for fresh market, 14 Spartanburg area packinghouses, South Carolina, 1959	29
14.--Labor cost per 1-bushel wirebound crate of peaches packed for fresh market, 7 Spartanburg area packinghouses, South Carolina, 1959	30
15.--Overhead costs per bushel of peaches packed during the packing season, 24 Spartanburg area packinghouses, South Carolina, 1959	31
16.--Operating costs per bushel of peaches packed, by size of packing-house and item of cost, 24 Spartanburg area packinghouses, South Carolina, 1959	32

Table 9.--Labor requirements per 1-bushel tub basket of peaches packed for fresh market, 12 Spartanburg area packinghouses, South Carolina, 1959

Operation	Packinghouse											Average	
	1	2	4	10	14	15	16	17	18	20	21		22
	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.
Supplying dumper:	0.54	0.36	0.32	1.59	0.69	0.23	0.87	0.16	0.24	0.54	1.01	0.54	0.59
Dumping .....	.27	.36	.32	1.59	.26	.23	---	.16	.73	.27	1.01	.41	.51
Handling empty													
field boxes ..	.54	.73	.64	.79	.61	.46	.58	.33	.49	.27	.51	.70	.55
Grading	3.21	3.64	4.91	11.91	3.72	1.83	4.36	1.31	3.41	2.86	8.09	4.00	4.43
Handling culls ..	.54	.36	.32	1.59	.52	.46	.58	.49	.49	.55	1.52	.82	.69
Facing	1.87	2.55	3.31	6.35	3.88	2.06	2.03	1.96	2.19	4.68	6.06	3.57	3.38
Tubbing	1.07	2.07	2.03	4.76	1.13	.92	1.45	.98	1.22	1.43	2.53	1.35	1.74
Handling packing:													
materials .....	.27	.36	.42	2.38	.69	.46	1.16	.16	.97	.88	3.03	.82	.97
Capping .....	.27	.36	.32	.79	.26	.23	.29	.16	.24	.27	.51	.41	.34
Basket turning ..	.27	---	.32	---	---	---	---	---	.24	.27	---	.41	.30
Hydrocooling .....	.80	.73	.64	1.59	.95	.46	.58	.16	.73	.69	1.52	.98	.82
Lidding .....	.80	1.09	1.17	4.77	.95	1.15	.87	.65	.49	.75	2.02	.82	1.29
Labeling and													
stamping .....	.54	.73	1.17	3.18	.78	.46	1.16	.33	.97	.54	1.52	1.23	1.05
Stacking and													
loading .....	.54	.85	1.17	---	.86	.46	1.45	.49	---	.69	1.52	.82	.88
Supervisory .....	.27	.73	.32	1.59	.52	.69	1.16	.49	.49	.27	2.02	1.23	.82
Administrative													
and clerical ..	.27	---	.32	2.38	.26	.46	1.16	.16	.73	.54	2.02	.82	.83
Other	---	---	---	---	.26	---	---	---	---	---	---	---	.26
Total	12.07	14.92	17.70	45.26	16.34	10.56	17.70	7.99	13.63	15.50	34.89	18.93	19.45

Table 10.--Labor requirements per 3/4-bushel tub basket of peaches packed for fresh market,
14 Spartanburg area packinghouses, South Carolina, 1959

Operation	Packinghouse																							Average									
	1	3	7	8	9	10	12	13	15	16	17	18	19	23																			
	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.	Man- min.										
Supplying dumper:	0.42	0.63	0.30	0.99	0.99	0.53	0.92	0.31	0.25	0.41	0.59	0.33	0.19	0.20	1.41	0.53	0.21	0.32	0.30	0.99	0.99	0.53	0.92	0.31	0.25	0.41	0.59	0.33	0.17	0.57	0.20	1.41	0.53
Dumping	.21	.32	.30	.99	.99	.53	.92	.31	.92	.29	---	.17	.57	.20	.17	.45	.32	.32	.30	.99	.99	.53	.92	.31	.92	.29	---	.17	.57	.20	.17	.45	
Handling empty field boxes	.32	.32	.30	.99	.99	1.24	.46	.31	.50	.57	.59	.33	.38	.59	.44	.52	.32	.32	.30	.99	.99	1.24	.46	.31	.50	.57	.59	.33	.38	.59	.44	.52	
Grading	2.44	5.36	3.95	7.42	3.18	5.04	2.34	2.34	2.77	2.30	5.14	1.49	2.68	1.96	4.09	3.58	2.44	5.36	3.95	7.42	3.18	5.04	2.34	2.34	2.77	2.30	5.14	1.49	2.68	1.96	4.09	3.58	
Handling culls	.42	1.58	.30	.49	1.06	.92	---	---	.42	.70	.59	.33	.38	.39	.67	.63	.42	1.58	.30	.49	1.06	.92	---	---	.42	.70	.59	.33	.38	.39	.67	.63	
Facing	1.59	3.15	3.04	5.93	3.00	3.21	1.72	1.72	2.93	2.46	2.64	2.15	1.72	1.96	2.46	2.71	1.59	3.15	3.04	5.93	3.00	3.21	1.72	1.72	2.93	2.46	2.64	2.15	1.72	1.96	2.46	2.71	
Tubbing	.95	1.26	1.52	2.47	.88	1.83	.94	.94	1.51	.99	1.62	1.16	.96	1.17	1.07	1.31	.95	1.26	1.52	2.47	.88	1.83	.94	.94	1.51	.99	1.62	1.16	.96	1.17	1.07	1.31	
Handling packing: materials	.32	.63	.61	2.47	1.59	1.37	.62	.62	1.09	.57	.44	.17	.77	.98	.67	.88	.32	.63	.61	2.47	1.59	1.37	.62	.62	1.09	.57	.44	.17	.77	.98	.67	.88	
Capping	.21	.32	.30	.49	.18	.46	.31	.31	.25	.29	.29	.17	.19	.20	.17	.27	.21	.32	.30	.49	.18	.46	.31	.31	.25	.29	.29	.17	.19	.20	.17	.27	
Basket turning	.21	---	.30	.49	.35	---	.31	.31	.25	---	---	---	.19	---	---	.30	.21	---	.30	.49	.35	---	.31	.31	.25	---	---	---	.19	---	---	.30	
Hydrocooling	.64	.95	.61	1.48	1.06	.92	.31	.31	.50	.70	.59	.17	.57	.59	.67	.70	.64	.95	.61	1.48	1.06	.92	.31	.31	.50	.70	.59	.17	.57	.59	.67	.70	
Lidding	.64	.95	.91	1.48	1.24	1.83	.78	.78	1.00	1.28	1.32	.66	.38	.78	.84	1.00	.64	.95	.91	1.48	1.24	1.83	.78	.78	1.00	1.28	1.32	.66	.38	.78	.84	1.00	
Labeling and stamping	.42	1.26	.61	.99	.35	1.83	.31	.31	1.00	.57	1.47	.33	.77	.39	.67	.78	.42	1.26	.61	.99	.35	1.83	.31	.31	1.00	.57	1.47	.33	.77	.39	.67	.78	
Stacking and loading	.63	.95	.91	1.48	1.77	---	.62	.62	1.26	.57	1.61	.50	---	.78	.50	.97	.63	.95	.91	1.48	1.77	---	.62	.62	1.26	.57	1.61	.50	---	.78	.50	.97	
Supervisory	.21	1.26	.61	.49	.18	.92	.31	.31	.25	.86	1.18	.50	.38	.20	1.01	.60	.21	1.26	.61	.49	.18	.92	.31	.31	.25	.86	1.18	.50	.38	.20	1.01	.60	
Administrative and clerical	.21	.32	.61	.49	1.06	1.37	.31	.31	.75	.70	1.03	.17	.57	.39	.50	.61	.21	.32	.61	.49	1.06	1.37	.31	.31	.75	.70	1.03	.17	.57	.39	.50	.61	
Other	---	.32	---	---	---	---	---	---	---	---	---	---	---	---	2.41	1.37	---	.32	---	---	---	---	---	---	---	---	---	---	---	2.41	1.37		
Total	9.84	19.58	15.18	29.14	18.20	22.00	9.81	15.65	13.26	19.10	8.63	10.70	10.78	17.75	17.21	9.84	19.58	15.18	29.14	18.20	22.00	9.81	15.65	13.26	19.10	8.63	10.70	10.78	17.75	17.21			

Table 11.--Labor requirements per 1-bushel wirebound crate of peaches packed for fresh market, 7 Spartanburg area packinghouses, South Carolina, 1959

Operation	Packinghouse							Average
	5	6	8	9	17	21	24	
	Man- minutes	Man- minutes	Man- minutes	Man- minutes	Man- minutes	Man- minutes	Man- minutes	Man- minutes
Supplying dumper	0.73	0.49	0.96	0.52	0.22	0.83	0.27	0.57
Dumping .....	.73	.99	.96	.52	.22	.83	.27	.65
Handling empty field boxes :	.73	.49	.96	1.45	.43	.41	.35	.69
Grading	3.66	5.64	5.98	3.26	2.80	6.64	3.52	4.50
Handling culls .....	.73	.99	.48	1.05	.65	1.24	.81	.85
Facing	---	---	---	---	---	---	---	---
Tubbing	1.83	2.47	1.85	.87	1.29	2.07	1.26	1.66
Handling packing materials :	.73	.99	1.85	1.57	1.08	2.49	1.64	1.48
Capping	---	---	---	---	---	---	---	---
Basket turning	---	---	---	---	---	---	---	---
Hydrocooling .....	.73	.99	1.44	1.05	.86	1.24	.54	.98
Lidding	1.83	.99	1.72	1.22	1.08	1.66	.89	1.34
Labeling and stamping	1.47	1.48	.96	.41	.43	1.24	.81	.97
Stacking and loading	1.10	1.48	1.17	1.30	.43	1.24	.81	1.08
Supervisory .....	.37	.49	.48	.17	.65	1.66	.27	.58
Administrative and clerical:	1.10	.49	.48	1.05	.22	1.66	.27	.75
Other	2.93	---	6.39	3.49	1.94	5.39	---	4.03
Total	18.67	17.98	25.68	17.93	12.30	28.60	11.71	20.13

Table 12.--Labor cost per 1-bushel tub basket of peaches packed for fresh market,
12 Spartanburg area packinghouses, South Carolina, 1959

Operation	Packinghouse												Average
	1	2	4	10	14	15	16	17	18	20	21	22	
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
Supplying dumper:	0.45	0.30	0.27	1.32	0.58	0.19	0.73	0.14	0.30	0.45	0.84	0.45	0.50
Dumping .....	.22	.46	.27	1.32	.22	.19	---	.14	1.22	.34	1.26	.34	.54
Handling empty field boxes ..	.45	.61	.53	.66	.51	.38	.48	.27	.41	.23	.42	.58	.46
Grading	2.68	3.04	4.09	9.93	3.10	1.53	3.63	1.09	3.85	2.39	6.74	3.33	3.78
Handling culls ..	.45	.30	.27	1.32	.43	.38	.48	.41	.61	.46	1.26	.69	.59
Facing	1.56	3.30	2.76	3.66	3.23	3.38	3.48	3.27	3.20	3.90	3.84	2.97	3.21
Tubbing .....	.89	3.61	1.69	2.66	.94	2.19	2.24	2.00	2.20	1.19	2.42	1.12	1.93
Handling packing materials .....	.22	.30	.35	1.99	.58	.38	.97	.14	.81	.73	2.95	.69	.84
Capping .....	.22	.30	.27	.66	.22	.19	.24	.14	.30	.23	.63	.34	.31
Basket turning ..	.22	---	.27	---	---	---	---	---	.20	.23	1.26	.34	.42
Hydrocooling .....	.67	.61	.53	1.32	.79	.38	.48	.14	1.22	.57	1.68	.82	.77
Lidding .....	.67	.91	.97	3.97	.79	.96	.87	.54	.61	.63	1.26	.69	1.07
Labeling and stamping .....	.45	.61	.98	2.65	.65	.38	.97	.27	.81	.45	1.90	1.03	.93
Stacking and loading .....	.45	1.06	.98	---	.72	.38	1.82	.41	2.25	.57	5.19	.69	1.32
Supervisory .....	.45	1.06	.80	3.63	1.40	1.15	2.00	1.59	1.35	.91	3.08	3.08	1.71
Administrative and clerical ..	.22	---	.40	2.65	.32	.57	.97	.45	1.22	.68	---	.86	.83
Other	---	---	---	---	.22	---	---	---	---	---	---	---	.22
Total	10.27	16.47	15.43	37.74	14.70	12.63	19.36	11.00	20.56	13.96	34.73	18.02	19.43

Table 13.--Labor cost per 3/4-bushel tub basket of peaches packed for fresh market, 14 Spartanburg area packinghouses, South Carolina, 1959

Operation	Packinghouse																							Average					
	1	3	7	8	9	10	12	13	15	16	17	18	19	23	Cents		Cents		Cents		Cents		Cents						
Supplying dumper:	0.35	0.74	0.25	0.82	0.44	0.76	0.26	0.21	0.35	0.49	0.28	0.24	0.16	1.18	0.35	0.74	0.25	0.82	0.44	0.76	0.26	0.21	0.35	0.49	0.28	0.24	0.16	1.18	0.47
Dumping .....	.18	.32	.25	.82	.44	.76	.26	.77	.24	---	.14	.96	.16	.17	.18	.32	.25	.82	.44	.76	.26	.77	.24	---	.14	.96	.16	.17	.42
Handling empty field boxes ..	.27	.32	.25	.82	1.03	.38	.26	.42	.48	.49	.28	.32	.49	.37	.27	.32	.25	.82	1.03	.38	.26	.42	.48	.49	.28	.32	.49	.37	.44
Grading	2.03	5.36	3.30	6.18	2.65	4.20	1.95	2.31	1.91	4.28	1.24	3.03	1.63	3.41	2.03	5.36	3.30	6.18	2.65	4.20	1.95	2.31	1.91	4.28	1.24	3.03	1.63	3.41	3.11
Handling culls ..	.35	1.84	.25	.41	.88	.76	---	.35	.58	.49	.28	.48	.33	.56	.35	1.84	.25	.41	.88	.76	---	.35	.58	.49	.28	.48	.33	.56	.58
Facing	1.32	3.63	2.53	4.94	3.04	2.88	1.43	2.92	2.98	2.99	2.91	2.66	2.74	2.92	1.32	3.63	2.53	4.94	3.04	2.88	1.43	2.92	2.98	2.99	2.91	2.66	2.74	2.92	2.85
Tubbing .....	.79	2.00	1.27	2.06	1.75	2.13	.78	1.71	1.99	2.00	1.75	1.91	2.41	1.89	.79	2.00	1.27	2.06	1.75	2.13	.78	1.71	1.99	2.00	1.75	1.91	2.41	1.89	1.75
Handling packing materials .....	.26	.53	.51	2.06	1.32	1.14	.52	.91	.48	.37	.14	.64	.82	.56	.26	.53	.51	2.06	1.32	1.14	.52	.91	.48	.37	.14	.64	.82	.56	.73
Capping .....	.18	.32	.25	.41	.15	.38	.26	.21	.24	.24	.14	.24	.16	.14	.18	.32	.25	.41	.15	.38	.26	.21	.24	.24	.14	.24	.16	.14	.24
Basket turning ..	.18	---	.25	.41	.29	---	.26	.21	---	---	---	.16	---	---	.18	---	.25	.41	.29	---	.26	.21	---	---	.16	---	---	---	.25
Hydrocooling .....	.53	.95	.51	1.24	.88	.76	.26	.42	.58	.49	.14	.96	.49	.56	.53	.95	.51	1.24	.88	.76	.26	.42	.58	.49	.14	.96	.49	.56	.63
Lidding .....	.53	.95	.76	1.24	1.03	1.53	.65	.84	1.06	1.32	.55	.48	.65	.84	.53	.95	.76	1.24	1.03	1.53	.65	.84	1.06	1.32	.55	.48	.65	.84	.89
Labeling and stamping .....	.35	1.05	.51	.82	.29	1.53	.26	.84	.48	1.22	.28	.64	.33	.56	.35	1.05	.51	.82	.29	1.53	.26	.84	.48	1.22	.28	.64	.33	.56	.65
Stacking and loading .....	.53	1.10	.76	1.24	1.47	---	.52	1.05	.48	2.02	.41	2.00	.65	.50	.53	1.10	.76	1.24	1.47	---	.52	1.05	.48	2.02	.41	2.00	.65	.50	.98
Supervisory .....	.35	2.50	1.52	1.24	.61	2.09	.78	.70	1.43	1.84	1.60	1.06	.49	2.28	.35	2.50	1.52	1.24	.61	2.09	.78	.70	1.43	1.84	1.60	1.06	.49	2.28	1.32
Administrative and clerical ..	.18	.32	.63	.41	.88	1.53	.39	.89	.82	.86	.46	.96	.49	.42	.18	.32	.63	.41	.88	1.53	.39	.89	.82	.86	.46	.96	.49	.42	.66
Other	---	.32	---	---	---	---	---	---	---	---	---	---	---	2.01	---	.32	---	---	---	---	---	---	---	---	---	---	---	2.01	1.16
Total	8.38	22.25	13.80	25.12	17.15	20.83	8.84	14.76	14.10	19.10	10.60	16.74	12.00	18.37	8.38	22.25	13.80	25.12	17.15	20.83	8.84	14.76	14.10	19.10	10.60	16.74	12.00	18.37	17.13

Table 14.--Labor cost per 1-bushel wirebound crate of peaches packed for fresh market,
7 Spartanburg area packinghouses, South Carolina, 1959

Operation	Packinghouse							Average
	5	6	8	9	17	21	24	
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
Supplying dumper	0.61	0.41	0.80	0.44	0.18	0.69	0.22	0.48
Dumping .....	.61	.82	.80	.44	.18	1.04	.22	.59
Handling empty field boxes .....	.61	.41	.80	1.21	.36	.35	.29	.58
Grading	3.05	4.70	4.98	2.81	2.33	5.53	2.93	3.76
Handling culls .....	.61	.82	.40	.87	.54	1.04	.78	.72
Facing	---	---	---	---	---	---	---	---
Tubbing	2.31	2.06	1.54	.73	2.00	2.69	1.05	1.77
Handling packing materials .....	.61	.82	1.54	1.31	.90	2.42	1.37	1.28
Capping	---	---	---	---	---	---	---	---
Basket turning	---	---	---	---	---	---	---	---
Hydrocooling .....	.61	.82	1.23	.87	.72	1.04	.45	.82
Lidding	1.53	.82	1.44	1.02	.90	1.38	.85	1.13
Labeling and stamping	1.22	1.24	.80	.34	.36	1.04	.67	.81
Stacking and loading	1.10	1.24	.97	1.08	.36	1.56	.67	1.00
Supervisory .....	.61	1.24	1.20	.61	2.09	4.26	.90	1.56
Administrative and clerical .....	.92	.41	.40	.87	.60	2.53	.45	.88
Other	2.44	---	5.32	2.91	1.62	4.50	---	3.36
Total	16.84	15.81	22.22	15.51	13.14	30.07	10.85	18.74

Table 15.--Overhead costs per bushel of peaches packed during the packing season,
24 Spartanburg area packinghouses, South Carolina, 1959

Size and number of packinghouses	Insurance on : buildings and : equipment		Depreciation : on buildings : and equipment		Interest on : investment : at 4 percent		Property tax		Personal : liability : insurance		Total
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	
Small:											
1	0.6	12.9	9.7	0.7	0.3	24.2					
2	2.4	21.9	19.6	.8	---	44.7					
4	1.1	15.7	11.4	.9	.9	30.0					
6	.3	12.5	9.9	.6	1.1	24.4					
7	.7	4.8	3.9	.2	.8	10.4					
12	2.5	15.1	12.1	.1	.2	31.0					
13	1.0	7.7	5.9	.6	.2	15.4					
15	1.0	8.7	7.4	.3	.2	17.6					
22	1.8	15.3	11.0	.8	.3	29.2					
24	1.2	12.2	8.6	.6	.7	23.3					
Weighted average	1.1	10.8	8.5	.6	.4	21.4					
Medium:											
5	.7	11.9	10.0	.4	.1	23.0					
8	---	10.8	8.5	.5	---	19.8					
10	2.6	28.7	20.7	1.1	.4	53.5					
14	.5	8.6	6.4	.3	---	15.8					
16	2.1	8.7	6.5	.4	.3	18.0					
17	1.4	5.9	4.4	.2	---	11.9					
18	1.2	4.1	3.5	.2	---	9.0					
19	1.8	27.9	20.2	1.1	.7	51.7					
20	.9	6.2	4.6	.3	.3	12.3					
Weighted average	1.2	8.4	6.5	.4	.1	16.6					
Large:											
3	1.3	14.1	11.1	.6	1.4	28.5					
9	2.8	6.1	4.6	.2	---	13.7					
11	2.1	13.2	9.8	.1	.1	25.3					
21	1.6	15.7	13.8	.3	---	31.4					
23	3.4	11.5	9.5	.3	.1	24.8					
Weighted average	2.3	11.9	9.3	.2	.2	24.0					
Weighted average, all houses	1.6	10.4	8.1	.4	.2	20.6					

Table 16.--Operating costs per bushel of peaches packed, by size of packinghouse and item of cost,
24 Spartanburg area packinghouses, South Carolina, 1959

Size and number of packinghouses	Ice	Power	Tele- phone	Repairs	Social security	Workmen's compensation	Water	Other	Total
	Cents	Cents	Cents	Cents	1/	2/	Cents	Cents	Cents
Small:									
1	5.1	0.8	0.3	---	---	---	---	---	6.2
2	4.9	2.5	.3	1.2	---	---	---	---	8.9
4	5.9	.2	---	---	---	---	---	---	6.3
6	5.7	.6	.2	.2	---	---	---	---	6.7
7	6.0	.5	.2	5.6	0.4	0.3	---	---	13.0
12	5.6	.8	.4	.2	---	---	0.1	---	7.1
13	7.1	.7	.2	2.9	---	---	---	---	10.9
15	9.1	.4	.2	---	1.0	---	.1	---	10.8
22	6.8	1.1	.2	---	---	---	---	---	8.1
24	7.3	.4	.3	2.3	---	---	---	0.3	11.4
Total	63.5	8.0	2.5	12.4	2.2	.3	.2	.3	89.4
Average	6.4	.8	.2	1.8	.7	.3	.1	.3	8.9
Medium:									
5	7.3	.6	.2	.6	---	.5	.1	---	9.3
8	8.5	.5	.2	9.7	---	---	---	---	18.9
10	8.5	1.0	.4	---	---	---	---	---	9.9
14	5.8	.3	1.1	.3	---	.2	---	---	7.7
16	9.4	.8	1.1	3.5	.4	---	---	---	15.2
17	7.0	1.2	.2	---	---	.5	---	---	8.9
18	8.4	.6	.8	---	.7	.3	---	---	10.8
19	8.3	.4	.2	---	---	---	---	8.7	17.6
20	7.9	.6	.8	.3	.4	---	---	---	10.0
Total	71.1	6.0	5.0	14.4	1.5	1.5	.1	8.7	108.3
Average	7.9	.7	.6	2.9	.5	.4	.1	8.7	10.8
Large:									
3	9.2	1.4	.9	---	2.1	---	.4	---	14.0
9	7.4	.6	.3	5.3	7.8	3.9	---	---	25.3
11	---	2.3	1.8	1.8	2.2	.5	.4	.5	13.0
21	8.5	.7	.9	.7	1.0	.4	---	1.4	13.6
23	8.5	.8	.1	.7	---	---	---	5.1	15.2
Total	33.6	5.8	4.0	8.5	13.1	4.8	.8	7.0	81.1
Average	8.4	1.2	.8	2.1	3.3	1.6	.4	2.3	16.2
All houses:									
Total	168.2	19.8	11.5	35.3	16.8	6.6	1.1	16.0	278.8
Average	7.3	.8	.5	2.1	1.3	.8	.2	2.7	11.6

1/ Some packinghouses did not operate long enough to fall under Social Security requirements.
2/ Workmen's compensation payments constitute voluntary coverage of packinghouse labor.

