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# Structural characteristics of the West Virginia peach industry

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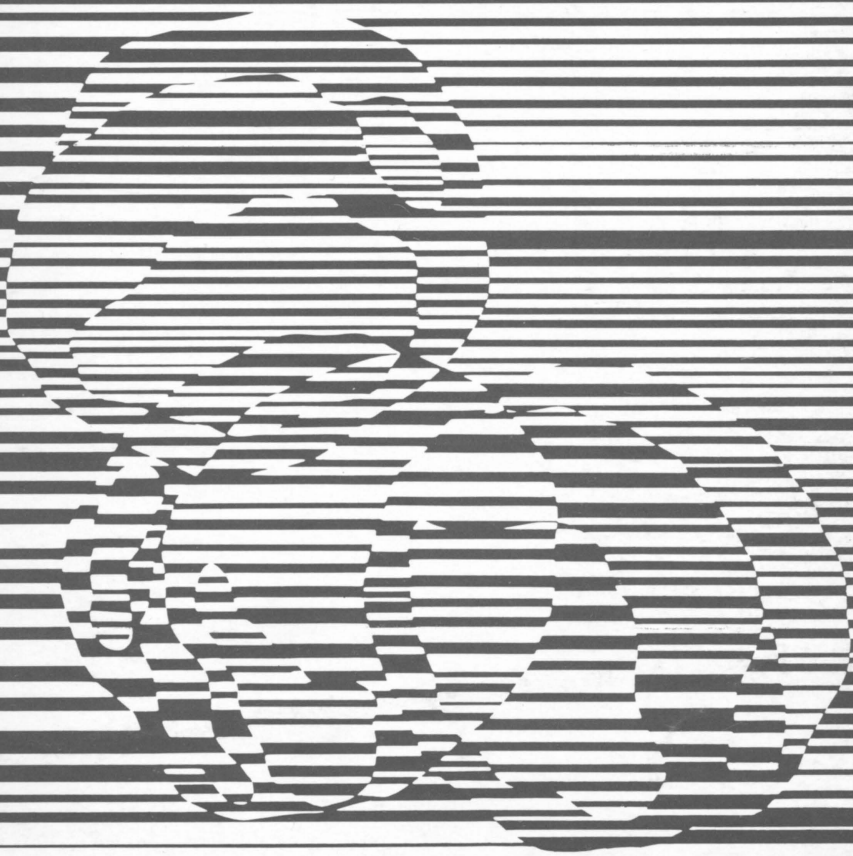
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# MARKET STRUCTURE ANALYSIS OF THE WEST VIRGINIA PEACH INDUSTRY



BULLETIN 586

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WEST VIRGINIA UNIVERSITY AGRICULTURAL EXPERIMENT STATION

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**STRUCTURAL CHARACTERISTICS  
OF THE WEST VIRGINIA  
PEACH INDUSTRY**

VICTOR W. ZANOTTI and ROBERT L. JACK

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# SUMMARY

The peach industry, an important segment of the economy of the Eastern Panhandle of West Virginia, has been faced with declining numbers of orchards and trees for several years. Production has been highly variable, costs have been increasing, and price has not shown much change over the past 15 or 20 years. The problem of this study was to analyze the market structure and to determine if a relationship exists between the changes occurring in the West Virginia peach industry and the market structure in which the growers must operate.

The objectives of the study were (1) to describe the peach industry in the State so that trends could be established and projections made in order to anticipate future production, (2) to describe and evaluate the market structure existing in the State, (3) to evaluate the effects of the market structure on peach production. The above objectives were to be achieved by answering several questions dealing with current trends, changes in varieties, variation in production, changes in orchard size, restrictions faced by the grower, grower control over price, and possible alternatives which could be employed to improve the competitive position of West Virginia peach growers.

Five counties (Berkeley, Hampshire, Jefferson, Morgan, and Mineral), located in the Eastern Panhandle of West Virginia, were selected as the Study Area. These counties accounted for over 95 per cent of the peaches produced in the State in 1964. Data were collected from as many individual growers as possible. A list of 142 names was obtained from a mailing list supplied by the State Statistician. The list was reported to contain the names of all known peach growers in the five counties. Personal interviews were conducted and 112 completed interview schedules were obtained.

Chi-square, simple regression and correlation, and curvilinear regression were used to test for significant relationships in responses to certain questions, production and size trends, and price and production responses. The decisions based on the results of these tests were made by using the .05 or lower level of probability.

There were approximately 114 orchards in actual production in 1966. This represented a 41.5 per cent decrease in orchard numbers from 1953 to 1966. Although the number of orchards showed a marked decrease during this time period, there was an 88.9 per cent increase in the average number of trees and an 87.5 per cent increase in acreage per orchard.

The growers have made numerous changes in the varieties of peaches produced. The basic reason for variety changes was to produce a dual-purpose peach which has more market alternatives. Elberta, Hale, and Hale Haven were the varieties which most growers were abandoning. To replace these varieties, growers are shifting to Sun High, Blake, Loring, and Red



Haven. No one variety accounts for more than 12 per cent of the total number of trees. Over one-third of the growers indicated they plan to make additional changes in varieties.

The ratio of bearing to non-bearing trees, an indication of age of orchard as well as potential for future production, decreased from 1954 to 1964. During the period from 1964 to 1966 the ratio increased 36 per cent and the number of trees increased 9 per cent. This indicated that future production potential should increase over the next five to ten years.

Production in West Virginia has been highly variable since 1949 probably because of unfavorable weather conditions. The trend for West Virginia indicates production will decline but does not take into account the bearing to non-bearing tree ratio. In contrast, the production trend for the U. S. was positive and suggests increased production levels in the near future. A comparison of production and total number of trees showed the U. S. to have a downward trend in tree numbers coupled with an increasing or positive production trend. West Virginia, on the other hand, had a similar downward trend in tree numbers but also had a decreasing or negative production trend. It was decided that factors other than the number of bearing trees have a large influence on peach production.

The study revealed that some growers are planning to expand orchard size and facilities used in production, harvesting, and marketing peaches. Twenty-one per cent of the growers are planning to increase the number of trees in their orchards while 17 per cent plan to reduce the number of trees. The net effect of these plans, if carried out, will be to increase the total number of trees in the Study Area. Six per cent of the growers indicated that they plan to discontinue production and sell or push out their existing peach orchard.

Over 69 per cent of the growers did not prepare their fruit for market in any manner other than by placing it in shipping containers. The remaining growers made use of their own or custom-hired facilities to grade, size, wash, brush, cool, and/or package fresh fruit for market. The growers that performed some type of pre-marketing function accounted for 59 per cent of the Study Area's total peach production. An additional 8.1 per cent of the growers owned some type of facility for pre-marketing preparation of peaches but did not make use of it. These growers accounted for 11.9 per cent of total production reported.

Grower concentration, measured in terms of trees owned, was shown to be increasing in the large orchard group (over 2,500 trees). There was a 32 per cent increase in the number of orchards with more than 2,500 trees from 1953 to 1966. In 1966, 30.6 per cent of the growers had more than 2,500 trees and owned 75 per cent of the total number of trees in the Study Area, while in 1953 the figures were 12.8 per cent and 46.8 per cent, respectively.

Grower concentration, measured in terms of production, was shown to be increasing in the Study Area. In 1965, 10 per cent of the total number of growers accounted for 49.7 per cent of total production. This figure

represented a slightly oligopolistic industry according to the Census Bureau system of measuring concentration. The next four largest firms controlled 17.5 per cent of total production. A large competitive fringe of growers was indicated by the above measures of concentration.

Grower concentration was increasing on the basis of number of firms operating within the industry. The number of orchards has declined each census year since 1949. The results of this study showed that this decline continued through 1966.

Buyer concentration was discussed in terms of relative quantities purchased in each channel and the number of buyers in each channel. The growers indicated that the number of buyers in most channels was decreasing each year. The largest decline in number was said to be occurring in the truck channel. The number of commission merchants, wholesalers, and central market buyers used was also said to be decreasing. Concentration was high on the buyers' side as four brokers accounted for 48.9 per cent of total volume handled. The four largest individual buyers, other than brokers, accounted for only 10.7 per cent of total volume purchased. Purchases through brokers accounted for 57.2 per cent of total volume purchased with the remaining 42.8 per cent being divided among the other ten listed channels. No one channel, other than brokers, accounted for over eight per cent of the total volume purchased.

The rate of entry of new producing firms has been slow in West Virginia's peach industry. There were only 11 cases in which the grower had less than five years experience. Of the 11, it was estimated, on the basis of grower responses, that only six had developed new orchards. The problems facing new growers and potential entrants were basically the result of the trends in concentration. The size of firm necessary for competitive and successful operation was increasing, making the amount of capital necessary a prohibitive factor. The rate of exit of existing firms has been decreasing in the Study Area and the State since 1950.

Growers were aware that little natural product differentiation existed. Many of the larger growers are attempting to differentiate their peaches by improving packaging and marketing techniques and the use of brand names. These practices have met with some success. Small-volume growers did not feel that they could improve their competitive position enough to cover the additional pre-marketing preparations necessary.

Changes in channels of distribution used by the grower have occurred the past five years. The increasing seller concentration seems to be related to the changes in method of selling. There has been an increased use of brokers and a less intensive use of all other types of channels of distribution. Growers said that brokers were the most reliable source of price information. Growers had no real price policies and were in the position of having to take the best price offered.

Promotional policies, exclusionary and collusive tactics were not evident in the Study Area. Only 17 growers were members of formal peach growers associations. There was no active promotional campaign in

progress or being planned at the time of this study. Exclusionary tactics were not discovered in use by any of the growers. Policies used were apparently an attempt to keep competitors at a disadvantage but not to force them out of business.

Mostly mature ripe peaches were purchased by 109 buyers. Only 29.7 per cent of the purchases were for other than ripe peaches. Seventy-six per cent of all buying transactions were for tree-run peaches. Brokers accounted for 22.9 per cent of all transactions and 57.2 per cent of the total volume purchased. These figures suggested that the large volume buyers were not dealing directly with the grower. In 58.5 per cent of the sales transactions, the buyers came to the orchard for the fruit. The growers said that none of the buyers added a transportation allowance to the delivered price offered. There was no evidence of buyer collusion taking place within the market system.

The average price received by growers in the Study Area was \$2.37 per bushel. This average was for all varieties and quality levels of peaches sold and is exclusive of selling fees. Sales through brokers and commission merchants yielded the highest prices for the growers, \$2.57 and \$2.96 respectively. Truckers, processors, and institutional buyers paid the lowest prices received by the grower. Processors seemed to have the only real price setting power within the market system. Buyers in most channels were price takers as were the sellers (growers).

The average yearly price in West Virginia was more responsive to fluctuations in yearly production than was the case in the U. S. Regression analysis of production on price showed that the West Virginia coefficient was significantly different from the U. S. coefficient.

Prior to 1959 the price for West Virginia peaches varied considerably in relation to the U. S. average price. Since 1959 the price for West Virginia peaches has been higher than the U. S. average price.

The West Virginia peach industry's performance was found to be similar to that of firms or industries operating in a competitive market system because (1) price received is largely dependent on grade and/or quality, (2) both buyer and seller are price takers, (3) price is influenced considerably by production fluctuations, (4) Study Area peaches are sold in a geographically concentrated market, (5) the firms exhibit the knowledge of and use of expanding technology.

# **STRUCTURAL CHARACTERISTICS OF THE WEST VIRGINIA PEACH INDUSTRY**

## **THE STUDY PROBLEM**

Since 1948 West Virginia has ranked thirteenth in peach production among the 35 states reporting commercial peach production.<sup>1</sup> West Virginia growers produce about one per cent of the nation's total peach production, with 90 per cent or more of the State's total production coming from Berkeley, Hampshire, Jefferson, Mineral, and Morgan counties.<sup>2</sup> Production of peaches in these counties represents nearly a million dollars in farm sales, or approximately one per cent of the State's total receipts from farm sales.<sup>3</sup>

Census of Agriculture data show that the number of peach trees in West Virginia declined from 1.2 million in 1945 to 0.3 million in 1964. The number of peach farms in the State declined from 43,842 in 1945 to 1,750 in 1964 and peach production fell from 41.6 million pounds in 1945 to 23.1 million pounds in 1964.<sup>4</sup> These downward movements have caused concern for the future of the West Virginia peach industry.

Many explanations may be offered for the changes which have occurred. It is possible that competition among growers in the United States has increased, forcing the smaller, inefficient growers out of production. Changes in consumer preferences may have occurred, decreasing the demand for the major peach varieties grown in West Virginia, or the existing market structure in which West Virginia growers must operate may not be favorable.

## **PURPOSE AND OBJECTIVES OF THE STUDY**

The major purpose of this study was to analyze the market structure of the peach industry in West Virginia.

The objectives of the study were:

1. To describe the peach industry in the State and establish trends so that future production can be anticipated.
2. To describe and evaluate the market structure existing in the State.
3. To evaluate the effects of the market structure on peach production.

## **METHODOLOGY**

### **Selection of the Area**

Berkeley, Hampshire, Jefferson, Mineral, and Morgan counties were selected as the study area from which data were collected. These five counties accounted for 95.5 per cent of the peaches produced in the State

1—Compiled from Fruit Situation, June 1950 through June 1966.

2—Computed from West Virginia Census of Agriculture 1959 and 1964 Preliminary, p. 26.

3—U.S.D.C., Census of Agriculture: 1959, Volume 1, Part 25, Chapter A. Table 8, p. 14.

4—U.S.D.C., Census of Agriculture: 1964, Volume 1, Part 25, p. 16.

in 1964 while accounting for about 10 per cent of the total number of farms reporting peaches as a source of income.<sup>5</sup>

### **Selection of the Sample**

A list containing 142 names of peach growers was obtained from the State Statistician, West Virginia Department of Agriculture. This list represented all known peach producers operating in the five-county area. The list was later found to be incomplete due to the time span between its assembly and its use as a guide for contacting growers. After completion of each interview, names were added to or deleted from the list based upon the knowledge of each respondent interviewed. The list was also adjusted with the mailing list of the West Virginia chapter of the National Peach Council.

All producers whose names appeared on the final list were included in the study.

### **Limitations**

This study was limited because some of the respondents had to rely on memory rather than records. Some producers were reluctant or unable to give exact figures on prices received, quantities sold to each type of buyer, and other information. The sample was intended to include 100 per cent of the peach producers in the Study Area. However, this was not possible due to omissions from the list. Also, some growers refused to provide information.

## **DEFINITIONS OF TERMS**

### **Market**

The word market when used as a noun refers to the place where goods are exchanged. It includes the people and facilities involved in the exchange. When used as a verb, market refers to selling activity.

### **Market Structure**

Market structure will include the physical dimensions of the industry or market. The physical dimensions will include the number of firms, concentration of firms, volume produced, channels of distribution, mode of transportation, and scale of plant.

### **Market Conduct**

This will be considered as the behavioral characteristics of the firm and industry. These characteristics will include price policies, promotional policies, market communication, and other policies employed by the individual firm or the industry.

### **Market Channel**

The term market channel is used to indicate the direction or path a product follows from producer to consumer; this may include facilities involved and mode of transportation.

5—Computed from West Virginia Census of Agriculture 1959 and 1964 Preliminary.

## Product

A product is any salable good, in this case peaches, which enters the market channel.

## SOCIOECONOMIC

The average West Virginia peach grower as found in this study can be described as follows: He is slightly over 51 years of age, married, has about 10 years of formal schooling, and three children, none of whom seems interested in following his father's occupation. He has over 19 years of experience in peach growing, owns and manages his own orchard containing approximately 2,460 trees of at least four varieties on about 32 acres. He may not work off the farm but does have other agricultural interests such as apples, dairy, or general farming.

While the above describes the average peach grower it does not accurately depict the wide variations which exist in the characteristics of the peach growers found in the Study Area. Of the growers interviewed, 79.8 per cent were over 40 years of age (Table 1). There was an indication that the number of young men entering the industry has been small. Only 9.9 per cent of all growers have five years or less experience in producing peaches (Table 2).

West Virginia orchards are mainly owner-operated. Of the 111 growers interviewed 86 (77.5 per cent) owned their orchards. The remaining 25 (22.5 per cent) were either corporate owned (12.6 per cent) or partnerships (9.9 per cent).

The younger men, under age 50, have more formal schooling. Of those with more than a high school education, 60.0 per cent were under

**TABLE 1**  
**West Virginia Peach Growers Distributed**  
**by Age (Five-County Study Area)**

<b>Age of Growers</b>	<b>Number of Growers (111)*</b>	<b>Per Cent of Total Growers Reporting (109)</b>
30 and under	3	2.8
31-35	7	6.4
36-40	12	11.0
41-45	19	17.4
46-50	8	7.3
51-55	15	13.8
56-60	18	16.5
61-65	11	10.1
66-70	9	8.2
71-75	3	2.8
76 and over	4	3.7
<b>TOTAL</b>	<b>109</b>	<b>100.0</b>

\*Two growers did not respond to this inquiry.

age 50. Of those with no high school education, 70.7 per cent were over age 50 (Table 3).

It was found that 29.7 per cent of the growers work off the farm. Fifty per cent of those who worked off the farm had done so for less than five years. Only one man had off-farm employment which was of a farming nature (Table 4).

### PHYSICAL CHARACTERISTICS

The overall number of commercial peach orchards in the Study Area declined considerably from 1945 to 1959. However, decline in the Study Area was not as rapid as the decline in the entire State, or in the United States. During this period the number of orchards declined 87.7 per cent in the Study Area, 92.4 per cent in the State, and 89.8 per cent in the United States (Table 5).

Orchard size in the Study Area also showed considerable change. The average orchard, in 1953, contained about 1,377 trees and covered 16 acres.

**TABLE 2**  
**West Virginia Peach Growers Distributed by Years**  
**of Experience (Five-County Study Area)**

Years of Experience	Number of Growers	Per Cent of Total
1 through 5	11	9.9
6 through 10	23	20.7
11 through 15	20	18.0
16 through 20	17	15.3
21 through 25	13	11.7
26 through 30	11	9.9
31 through 35	7	6.3
36 through 40	4	3.6
41 and over	5	4.5
<b>TOTAL</b>	<b>111</b>	<b>99.9*</b>

\*Does not add to 100.00 per cent because of rounding.

**TABLE 3**  
**Number of West Virginia Peach Growers Distributed by Age**  
**and Years of Formal Education (Five-County Study Area)**

Age	Years of Formal Education					Total
	1-6	7-9	10-12	13-18	19 and over	
40 and under	0	6	8	8	0	22
41-50	0	11	9	6	1*	27
51-60	5	14	7	6	0	32
61 and over	10	12	1	2	2*	27
No Report**						3
<b>TOTAL</b>	<b>15</b>	<b>43</b>	<b>25</b>	<b>22</b>	<b>3</b>	<b>111</b>

\*These individuals included trade school education.

\*\*Three growers either refused to answer or question was omitted by enumerator.

**TABLE 4**  
**West Virginia Peach Growers Distributed by Type**  
**of Off-Farm Employment (Five County Study Area)**

Job Classification	Number* of Responses	Per Cent With Off-Farm Employment
Professional	2	6.1
Farmer and Farm Manager	1	3.0
Managers, Officials, and Proprietors	4	12.1
Sales Workers	3	9.1
Craftsmen	5	15.2
Operatives	18	54.5
<b>TOTAL</b>	<b>33</b>	<b>100.0</b>

\*There were 77 cases in which this question did not apply and one no response.

**TABLE 5**  
**Number of Peach Orchards in Study Area, State,**  
**and United States for Selected Years**

Area	1945	1950	1954	1959	1964	1966*
Berkeley County	324	162	115	79	51	46
Hampshire County	399	230	141	79	64	46
Jefferson County	310	75	21	21	14	12
Mineral County	430	111	47	12	15	2
Morgan County	221	158	16	16	18	8
STUDY AREA TOTAL	1,684	736	340	207	162	114
STATE TOTAL	43,842	23,608	8,623	3,324	1,750	NA**
U. S. TOTAL	1,418,726	1,102,250	254,523	144,417	NA	NA

\*All 1965 and 1966 data for the Study Area are based on the results of the survey.

\*\*Data not available.

Source: U. S. Census of Agriculture 1945, 1950, 1954, 1959, and 1964.

In 1966 the average orchard contained approximately 2,616 trees and covered 30 acres. This represents an 88.9 per cent increase in number of trees per orchard and an 87.5 per cent increase in acreage per orchard. Excluding Mineral County,<sup>6</sup> the number of orchards in the Study Area decreased 42.6 per cent from 195 orchards in 1953 to 114 orchards in 1966 (Table 6). The impression gained, while interviewing growers, was that many of the growers who retired from peach production sold their orchards to other growers in the area.

Since 1957 there has been a rapid shift in the varieties of peaches produced in the Study Area. The growers are changing from a peach that can be termed single-purpose to a peach that can be termed dual- or multi-purpose. A dual-purpose peach can be sold in either the fresh or processor market. The old favorites such as Elberta, Hale Haven, and Hales have given way to Sun High, Blake, Loring, and Red Haven. There are more varieties being planted now than prior to 1957. Table 7 shows the

<sup>6</sup>—Data for Mineral County has been deleted from the above discussion so that data collected in the 1966 survey could be compared on a similar base with available secondary data.



**TABLE 6**  
**Acres in Trees, Number of Orchards, and Total Number of Trees,**  
**by County, in the Study Area for 1953, 1957, and 1966**

County	Acres			Orchards			Trees		
	1953	1957	1966	1953	1957	1966	1953	1957	1966
Berkeley	1,265	1,120	1,645	65	52	46	86,200	82,900	128,664
Hampshire	1,550	1,460	1,278	105	93	46	154,300	128,900	105,363
Jefferson & Morgan	354	560	483	25	32	20	28,000	42,200	38,940
Mineral*	N.A.	N.A.	4	N.A.	N.A.	2	N.A.	N.A.	330
<b>TOTAL</b>	<b>3,160</b>	<b>3,140</b>	<b>3,410</b>	<b>195</b>	<b>177</b>	<b>114</b>	<b>268,500</b>	<b>254,000</b>	<b>273,297</b>

\*Mineral County was not included in 1953 and 1957 survey.

Source: West Virginia Commercial Apple and Peach Survey, Federal-State Crop Reporting Service, West Virginia Department of Agriculture, 1953 and 1957.

**TABLE 7**  
**Number of Peach Trees Distributed by Age and Variety, 1957 and 1966**  
**(Five-County Study Area)**

Variety	Age of Tree									
	2 Yrs. and Under		3-7 Years		8-12 Years		13 Yrs. and Over		Total Trees	
	1957	1966	1957	1966	1957	1966	1957	1966	1957	1966
Blake	N.A.*	9,607	N.A.	20,564	N.A.	575	N.A.	N.R.	N.A.	30,746
Early Elberta	4,980	N.R.**	5,820	20	4,400	3,025	4,030	4,650	19,230	7,695
Elberta	9,770	1,425	16,030	1,675	43,670	4,544	58,860	25,031	128,330	32,685
Gimmer	N.A.	N.R.	N.A.	500	N.A.	N.R.	N.A.	2,950	N.A.	3,450
Hale	1,350	1,316	1,170	1,420	7,890	1,120	6,930	2,875	17,340	6,731
Hale Haven	2,960	15	3,460	1,572	8,090	2,144	12,740	4,713	27,250	8,444
Hale Harrison	N.A.	N.R.	N.A.	3,400	N.A.	220	N.A.	N.R.	N.A.	3,620
Jersey Land	N.A.	1,276	N.A.	1,323	N.A.	2,100	N.A.	1,784	N.A.	6,483
Loring	N.A.	7,045	N.A.	13,561	N.A.	N.R.	N.A.	N.R.	N.A.	20,606
Red Haven	5,730	6,670	2,840	9,602	960	14,572	30	419	9,560	31,263
Red Skin	N.A.	1,760	N.A.	8,301	N.A.	993	N.A.	5,000	N.A.	16,054
Rich Haven	N.A.	250	N.A.	3,930	N.A.	1,688	N.A.	N.R.	N.A.	5,868
Sun Haven	N.A.	700	N.A.	4,261	N.A.	2,976	N.A.	N.R.	N.A.	7,937
Sun High	N.A.	6,595	N.A.	6,291	N.A.	12,111	N.A.	5,572	N.A.	30,569
Trio Gem	N.A.	2,800	N.A.	500	N.A.	N.R.	N.A.	94	N.A.	3,394
All Other	15,060	20,538	11,680	18,227	12,710	6,960	12,840	12,027	52,290	57,752
<b>TOTAL</b>	<b>39,850</b>	<b>59,997</b>	<b>41,000</b>	<b>95,147</b>	<b>77,720</b>	<b>53,038</b>	<b>95,430</b>	<b>65,115</b>	<b>254,000†</b>	<b>273,297‡</b>

\*N. A.—Not available by count for these varieties.

\*\*N. R.—No report in 1966 survey for these varieties in respective age groups.

†The data above do not reflect a downward trend (in number of trees) as mentioned earlier; this is partially due to the omission of Mineral County data from 1957 figures and estimates based on number of responses in 1957 and the expanding of data received.

Source: W. Va. Commercial Apple and Peach Survey, W. Va. Department of Agriculture, 1957 and this study.

number of trees found in each age group by individual variety for the Study Area in 1966 and compares the distribution with that found in 1957. In 1957, Elberta accounted for slightly more than 50 per cent of all trees. In 1966 no single variety accounted for more than 12 per cent of the total number of trees. Elberta was the leading variety in terms of tree numbers, but accounted for only 11.9 per cent of the total number of trees. A rather important point was the average age of the Elberta trees in the Study Area. Most of the trees were over 13 years old, and the number of young Elberta trees has declined rapidly since 1957. In 1957, 54.1 per cent of the Elbertas were under 13 years of age compared to 23.4 per cent in 1966.

When they were asked about planned changes in varieties, 38.2 per cent of the growers said they planned major changes in their orchard. Blake, Loring, and Sun High were most frequently mentioned as varieties to be added. Elberta and Hale Haven were most frequently mentioned as varieties to be pushed out. The reasons for these changes were many, the most important being that the growers want varieties that (1) have more consumer appeal, (2) have better quality, (3) will spread the harvest season, and (4) have improved market characteristics such as handling and appearance.

#### **CURRENT TRENDS IN THE PEACH INDUSTRY**

Based on U. S. Census data, the total number of peach trees in the Study Area and West Virginia declined each census year since 1949. However, the downward trend in total number of trees is not the best indicator of potential production. The ratio of bearing to non-bearing trees is a better indicator of potential production when related to total number of trees (Table 8). When this ratio is known relative to the total number of trees and projected number of trees, more accurate estimates of future production can be made. A large bearing to non-bearing tree ratio, accompanied by a decline in number of total trees, would suggest that future production will decline if all other factors remain constant. On the other hand, if the ratio is small and the total tree number remains constant or increases, future production would be expected to increase. Thus, by knowing the current ratio of bearing to non-bearing trees and total number of trees and the projected number of trees, future production can be estimated fairly accurately, assuming other factors remain constant.

In West Virginia and the Study Area, the ratio of bearing to non-bearing trees decreased 23 and 50 per cent, respectively, from 1949 to 1964. The Study Area ratio increased 36 per cent from 1964 to 1966, but was 51.8 per cent lower than in 1949. Sufficient data are not available for the United States to permit determination of current changes in the national ratio for the same period. However, the national ratio for 1949 to 1959 increased only seven per cent, from 4.1 to 4.4. The point is, assuming a given number of total trees, the higher the ratio, the greater the immediate production. Conversely, the lower the ratio, the smaller the im-

**TABLE 8**  
**Ratio of Bearing to Non-Bearing Peach Trees, Study Area,**  
**West Virginia and United States for Selected Years**

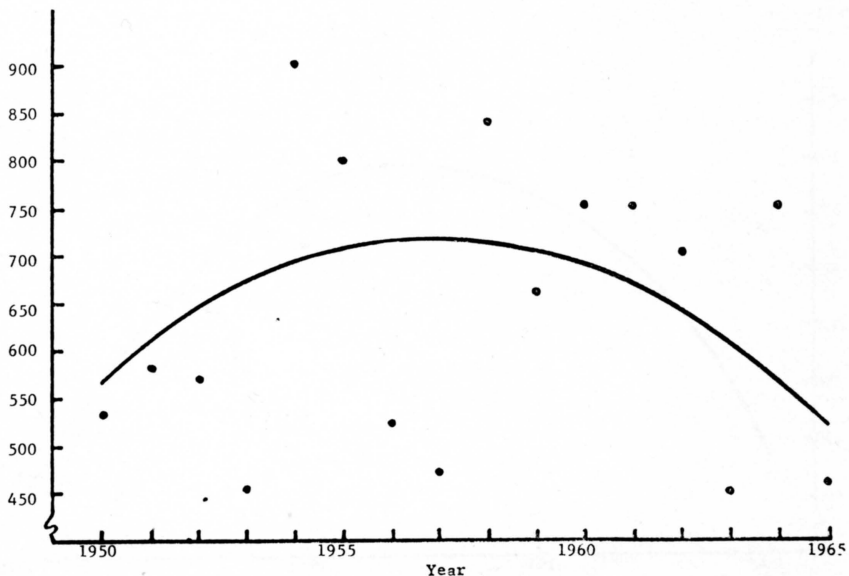
Area	1949	1954	1959	1964	1966
Study Area	4.4	9.3	4.5	2.2	3.0
West Virginia	3.0	6.4	4.0	2.3	N.A.
United States	4.1	5.1	4.4	N.A.	N.A.

Source: Ratios for 1949, 1954, 1959, and 1964 were computed from U. S. Censuses of Agriculture.

mediate production but the potential for future production will be greater. A high ratio indicates an older orchard on the average than does a low ratio. This means that, with a given number of trees, a high ratio would indicate a slow rate of growth and a low ratio would indicate a rapid rate of growth in future production. Production, therefore, is the third element which must be observed over the same time period. The reason for this is that changes in production reflect, or should be closely correlated with, changes in total trees and the bearing to non-bearing tree ratio.

Peach production in West Virginia, the Study Area, and the United States has fluctuated greatly since 1949. The production trend in West Virginia increased from 1950 to 1957, at which point it started to decline (Figure 1). As expected, a similar trend existed for the Study Area (Figure 2),

Production  
(1,000 bu.)



**FIGURE 1. Yearly Production of Peaches in West Virginia, and Second Degree Estimating Equation Line**

which accounts for over 90 per cent of total State production. The trend for the United States is upward sloping with no decreasing range within the scope of the data (Figure 3).

The Study Area showed a nine per cent increase in the number of bearing trees from 1964 to 1966 (Table 9). Although production, as stated earlier, has not followed the national trend, the Study Area does perhaps have the potential for increased yields. In 1960, 1961, 1962, and 1964, West Virginia and the Study Area had a level peach production which was above the average for the 1950 to 1965 period. This indicates a similar situation may exist in West Virginia and the Study Area as that in the United States. It, therefore, seems that factors other than the number of bearing trees have a high level of influence on peach production.

When asked about future changes in orchard size, growers were hesitant in making any definite statement about their future plans. Only 21 growers stated that they definitely planned to increase orchard size within the next five years. Nineteen growers stated that they intended to reduce orchard size over the next five years. The majority of the growers were very conservative and displayed a follow-the-leader type attitude. These growers were of the opinion that the next five years would be a critical period for peach growers. They would not increase orchard size unless convinced a gain in net income would result in the long run.

Seven of the 19 growers planning a reduction in orchard size stated that they were going to retire their entire orchard and discontinue peach

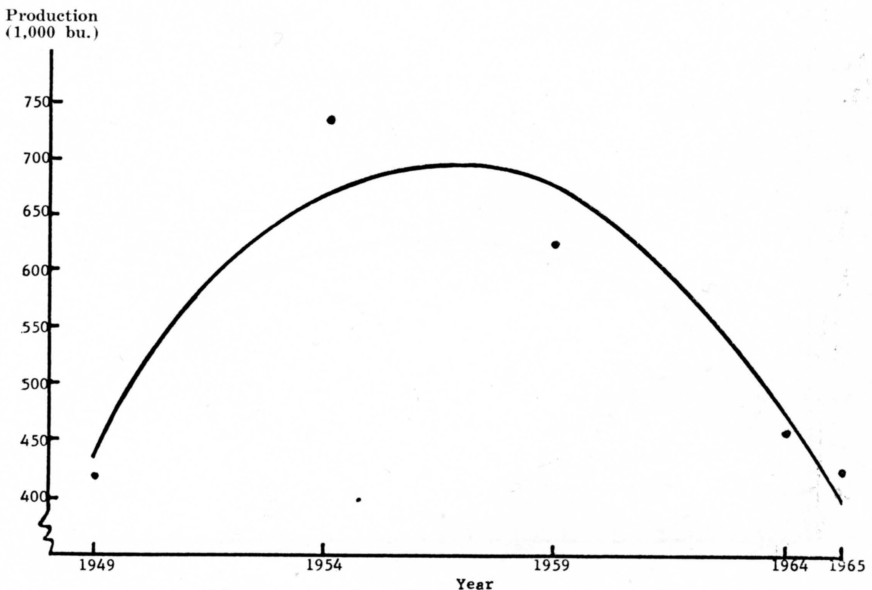


FIGURE 2. Yearly Production of Peaches in the Study Area, and Second Degree Estimating Equation Line

production. Unfavorable production conditions, such as high costs of labor and production, were cited as reasons for leaving the industry. Uncertainty about future prices and costs was also mentioned by the growers as a major reason for leaving the industry. Orchard size was an important factor in future plans of those planning to discontinue production as none of these growers had over 600 trees. The exit of small-volume growers (producers) points out a trend which is occurring in all fields of agriculture. Evidently small operations in many agricultural sectors are unable to compete with larger, more productive operations on a cost-price basis.

Those growers planning an increase in orchard size stated that their primary objective was to increase the efficiency of their operations. These growers felt that a lower per unit cost was attainable with increased orchard size and production. More than half of the growers planning increases had over 2,500 trees. The net result of the planning expansions and contractions, if implemented, will be a decrease in orchard numbers, an increase in orchard size, and an increase in total number of peach trees in the Study Area. The effect of an increase in orchard size, of this nature, should be to reduce the bearing to non-bearing tree ratio and to lead to increased future potential. It is possible that over the next five years production in the Study Area and the State will increase. This should have the effect of reversing the downward trend in production if uncontrollable factors influencing production are favorable.

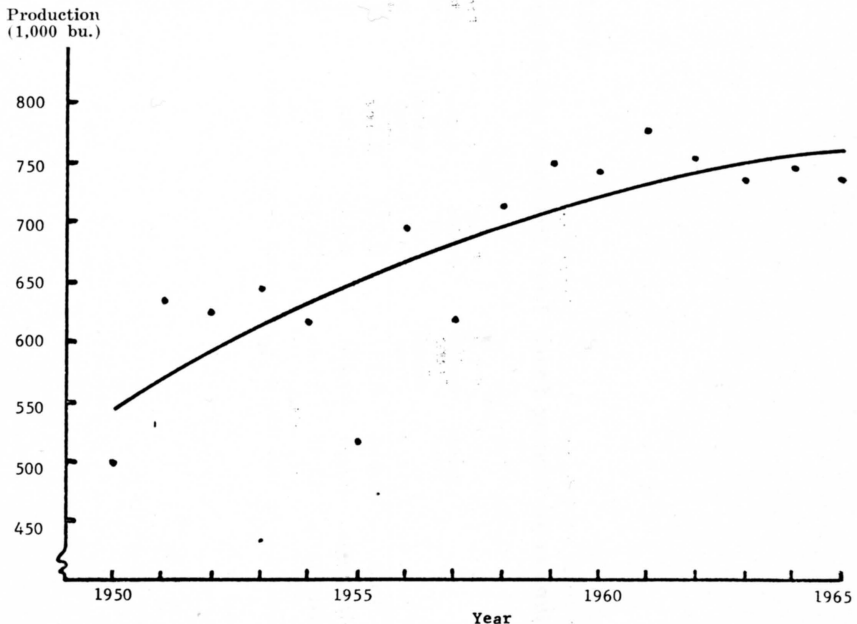


FIGURE 3. Yearly Production of Peaches in the United States, and Second Degree Estimating Equation Line

**TABLE 9**  
**Number of Bearing Peach Trees (Millions) and Production by Area (Million Bushels), for Selected Years**

	1949		1954		1959		1964		1966	
	Production	Number of Bearing Trees	Production	Number of Bearing Trees	Production	Number of Bearing Trees	Production	Number of Bearing Trees	Production	Number of Bearing Trees
Study Area	0.414	0.337	0.734	0.275	0.627	0.239	0.459	0.188	0.427	0.205
West Virginia	0.505	0.573	0.835	0.386	0.642	0.271	0.481	0.210	N.A.	N.A.
United States	55.48	54.46	55.13	39.91	68.75	40.22	74.5	N.A.	N.A.	N.A.

Source: Data for 1949, 1954, and 1964 collected from U. S. Censuses of Agriculture.

The growers interviewed foresaw increasing difficulty, in the near future, in obtaining sufficient quantity and quality of labor for harvesting. Less than 30 per cent stated that they have been faced with labor problems to date. Contrary to what might be expected, size of orchard (firm) seemed to have no effect on the ability of the growers to obtain sufficient quantities of desirable labor. Seemingly, the larger the labor requirement the more difficulty encountered in fulfilling the requirement. This was not the case as those growers faced with labor shortages were well distributed in all size groups of orchards. Responses indicated that large volume growers have no more difficulty in obtaining labor than small volume growers. A Chi-square test showed that no significant difference existed for the relationship between size of orchard and difficulty in obtaining labor.<sup>7</sup>

## Structure: Concept of Concentration

"If concentration is viewed as a structural determinant of competition, it is the degree of concentration within each group of competing firms which will presumably be the strategic influence."<sup>8</sup> Competition occurs when a group of firms offer a group of products which are close substitutes for each other to a common group of buyers. If a selling firm, in this situation, attempts to raise its price the effects will be a shift, on the part of the buyers, to a substitute product of a competing firm.

The higher the degree of seller concentration the more price determining power realized by the individual firm, or the greater is its ability to establish a uniform market price for all buyers. This will result in the adjustment, on the part of the buyer, to the prices set, allowing him little, if any, influence on pricing policies of the selling firms. The buyer is in this instance a "price taker."

With a low degree of seller concentration there is much less price determining power on the part of the seller. Since he offers such a small part of the total supply or product, his actions or price policies will have little or no effect on industry price. If in conjunction with low seller concentration there is a high degree of buyer concentration the buyers will have increased bargaining power because of the large volume of purchases. This, in effect, allows a buyer to negotiate a lower price. When there exists equal degrees of both buyer and seller concentration prices are determined or established by market forces uncontrollable by either the buyer or seller. The buyer will then adjust purchases on the assumption that he cannot influence price. Price is accepted as a given factor of the market system. The seller will be in a similar position, having no influence on price, and he will be a price taker also.

Agriculture has many industries in which there is a low degree of

7—A Chi-square value of 5.139 with five degrees of freedom was obtained and found not to be significant at 0.05 alpha level.

8—Joe S. Bain, *Industrial Organization*, New York: John Wiley and Sons, Inc., 1959, p. 7.



seller concentration. No one farmer contributes a significant amount of the product in question to influence total supply or price. Therefore, agriculture comes the closest of any industry to being competitive from the standpoint of the producer in the terms set forth above.

In a study<sup>9</sup> of competition among apple processors in the Appalachian Area, which also examined the fresh market sector, the power-relationship among both growers and buyers was found to be atomistic. Each grower and each buyer was a price taker in the fresh market. (In other words, there was a low degree of seller-buyer concentration.)

The fruit industry in the United States has been undergoing marked structural change in the past 15 years. This is evidenced by the fact that during the period of 1949 through 1959 the number of fruit farms in the nation decreased 47 per cent. This substantial decrease is not isolated in one or two geographic regions but is being experienced in all regions of the country. Each region was in nearly the same relative position in 1959 as in 1949. The average size of the fruit farms in the United States, in terms of acreage devoted to fruit, increased 65 per cent during the same time period.<sup>10</sup> These figures imply that the fruit industry, in general, is becoming more concentrated in terms of size and number of fruit growers.

Using the findings of the Appalachian Area study and the general trends in fruit production in the United States one may assume that the five counties in West Virginia would exhibit the same general characteristics. One reason for this assumption is that the Appalachian Area study on apples encompassed some of the same counties used in this study. Another reason is that many of the apple growers (sellers) and buyers are also sellers and buyers of peaches. A third reason is that one would expect the West Virginia peach industry to be a follower, not a leader, in production trends. The latter reason is based on the fact that West Virginia supplies such a small percentage of the total United States peach production.

In recent years the importance of terminal wholesale markets, commission merchants, jobbers, brokers, and shipping point firms has decreased. The trend is toward direct buying from the growers. Grower-shippers are becoming more important in the marketing of fresh fruit. In some regions of the United States selling brokers are increasing more than grower-shippers in number, but the brokers still handle about twice as much total volume as the grower-shippers.<sup>11</sup> There is, however, a trend toward geographic concentration of buyers in major fruit producing areas. These facts indicate an increase in concentration on the part of the buyers of fresh fruit.

9—Homer C. Evans, *The Nature of Competition Among Apple Processors in the Appalachian Area*, W. Va. Agr. Exp. Sta. Bull. 405, June 1957, pp. 42-44.

10—Computed from *Organization and Competition in the Fruit and Vegetable Industry*, Tech. Study No. 4, Nat. Comm. on Food Marketing, July 1966.

11—*Ibid.*, p. 58.

## CONCENTRATION AS RELATED TO STRUCTURE

### Seller Concentration

The changes in orchard size and number as noted earlier did not describe the changes that have taken place as far as concentration is concerned. Concentration refers "to the ownership or control of a large proportion of some aggregate of economic resources or activity either by a small proportion of the units which own or control the aggregate or by a small absolute number of such units."<sup>12</sup> It is the degree of concentration within an industry which has a more valuable and usable meaning and application. The degree of concentration refers to the size and number distribution of firms which own or control the aggregate. This measure of concentration can have different meanings depending on the point of reference. It is a relative measure to be used in comparing one industry to another or changes over time within a given industry. Concentration will be used to measure change over time within the Study Area peach industry.

The peach industry has undergone a considerable change in concentration over the past 13 years. The first indication of this change was found when the number of orchards in each size group was compared over a given time span (Table 10). The number of orchards in all size groups with less than 2,500 trees decreased from 1953 to 1966. The only increase in number of orchards with less than 2,500 trees was during the period from 1953 to 1957 and was in the group with less than 200 trees. The decrease in number of orchards with less than 2,500 trees coupled with an increase in the number of orchards with over 2,500 trees indicates an increase in concentration toward the larger orchard groups. From 1953 to 1966 there was a 32 per cent increase in the number of orchards with more than 2,500 trees.

In Table 11 the percentage of orchards and percentage of trees by orchard size are presented. This table permits a comparison of the degree of concentration within the industry, at different time periods. Although the actual number of orchards in all size groups under 2,500 trees decreased from 1953 to 1966 the proportion of total orchards in the groups with 200 to 499 and 500 to 999 increased from 1949 to 1966. The most impressive increase in proportion occurred in the groups with 2,500 or more trees. In 1957, only 16.9 per cent of the orchards contained 2,500 or more trees, but these orchards controlled 53.9 per cent of the total number of trees in the Study Area. In 1966, 30.6 per cent of the orchards had more than 2,500 trees and controlled 75.0 per cent of the total number of peach trees in the Study Area (Figure 4). The changes, from 1957 to 1966, in proportions of orchards and total trees controlled indicated that the rate of increase in number of orchards in the 2,500 trees and over class was greater than the rate of increase in the proportion of total trees controlled by this group. The net effect was an increase in the degree of concentration,

<sup>12</sup>—Bain *op. cit.*, p. 85.

**TABLE 10**  
**Study Area Orchards by Size, Number, and**  
**Change (Per Cent) for Selected Years**

Number of Trees	Number of Orchards			% Change 1953-57	% Change 1957-66
	1953	1957	1966		
100-199	8	15	3	+87.5	- 80.0
200-499	27	27	20	0	- 25.9
500-999	71	57	29	- 19.7	- 49.1
1000-2499	64	48	23	- 25.0	- 52.1
2500 or over	25	30	33	+20.0	+10.0
TOTAL	195	177	108	- 9.2	- 39.0

Source: West Virginia Commercial Apple and Peach Survey, 1957, Federal-State Crop Reporting Service.

when measured by control of total trees. However, in the group having more than 2,500 trees, each orchard controlled a smaller proportion of the trees in 1966 than in 1957. For example, each orchard controlled 3.2 units of the 53.9 per cent of total trees in 1957. The ratio of percentage of trees controlled to the percentage of total orchards decreased from 3.7:1 in 1953 to 3.2:1 in 1957 and decreased still further to 2.5:1 in 1966.

The degree of concentration can also be measured by determining the number of firms which own or control a majority of the production in the industry. There were no secondary data available which permit a comparison of concentration, on a production base, to the findings of this study. In 1965 10 per cent of the growers accounted for 50.7 per cent of the Study Area's total production. Concentration measured in terms of

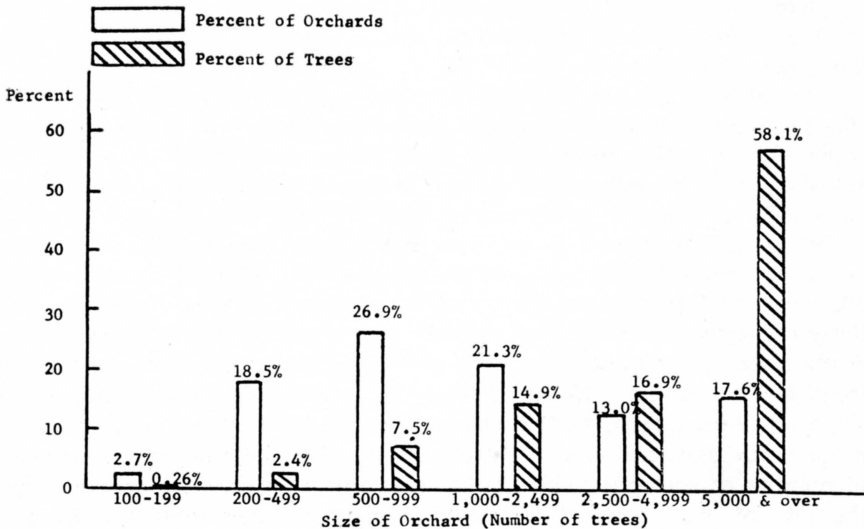


FIGURE 4. Percent of Orchards and Trees in Various Size Groups, Study Area, 1966

**TABLE 11**

**Per Cent of Orchards and Trees by Size Groups for Study Area for Selected Years**

Number of Trees	% of Orchards				% of Trees			
	1949*	1953*	1957*	1966	1949	1953	1957	1966
100- 199	11.8	4.1	8.5	2.7	1.0	0.4	0.8	0.2
200- 499	17.8	13.9	15.3	18.5	3.5	3.2	3.3	2.4
500- 999	23.7	36.4	32.2	26.9	10.6	17.1	14.3	7.5
1000-2499	26.3	32.8	27.1	21.3	24.6	32.5	27.7	14.7
2500-4999	11.8	7.7	11.3	13.0	27.9	19.3	25.4	16.9
5000 and over	8.6	5.1	5.6	17.6	32.4	27.5	28.5	58.1
<b>TOTAL</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

\*Source: West Virginia Commercial Apple and Peach Survey, 1957, Federal-State Crop Reporting Service.

control of production was more intense than if measured on a tree control basis because of the variation in the ratio of bearing to nonbearing trees among orchards. Total production is probably a better base from which to measure the degree of concentration since it is more closely related to total revenue of the industry, and in terms of the share of the market commanded by an individual firm or group of firms within the industry.

The top 30 per cent of the growers reporting had over three-fourths of the Study Area's production in 1965. This leaves a large number of small growers faced with a highly competitive situation. Competition was also present among the top 30 per cent as no one grower controls enough production to influence the action of his nearest competitor. In relationship to smaller firms, however, the large firms in the top 10 per cent should have considerably more price bargaining power. The effect of this advantage cannot be measured until the relative power of the buyers in the market system is determined and the degrees of buyer and seller concentration are compared.

The following tabulation lists the decile rankings on a production basis and the per cent of 1965 total production of each group.

<b>Decile</b>	<b>Range of Production (Bushels)</b>	<b>% Total Production</b>
Bottom 10 per cent	Under 200	0.4
2nd	200 to 449	0.8
3rd	450 to 749	1.4
4th	750 to 1199	2.3
5th	1200 to 1599	3.5
6th	1600 to 2499	5.0
7th	2500 to 3999	8.5
8th	4000 to 5099	11.4
9th	5100 to 10,000	17.0
Top 10 per cent	Over 10,000	49.7
		<b>Total 100.00</b>

According to Bain, the Census Bureau uses a four-way classification<sup>13</sup> for measuring concentration and determining the degree of competition in an industry. Assuming this classification system to be applicable to agricultural industries as well as non-agricultural industries, it was used in this study to present another measure of concentration in the peach industry in the Study Area. The four-way classification used by the Census Bureau is as follows:

1. Highly concentrated oligopoly; the top four firms control from 75 to 100 per cent of total industry production.
2. Moderately concentrated oligopoly; the top four firms control from 50 to 75 per cent of total industry production.

<sup>13</sup>—Bain, *op. cit.*, p. 110-124.

3. Slightly concentrated oligopoly; the top four firms control from 25 to 50 per cent of total industry production.

4. Atomistically competitive; the top four firms control less than 25 per cent of total industry production.

One problem arising from the use of this classification is that the top four firms may control just enough of total production to be classed in a particular group. The point of distinction is not exact but rather it is arbitrary. In the case of the Study Area, the top four firms controlled 25.9 per cent of total peach industry production. This places the industry in the Study Area in group three or a slightly concentrated oligopoly, which suggests that the top four producers should have more bargaining power than the smaller firms in the industry. Theoretically this advantage in bargaining power should lead to a better price for the top four firms' peaches. It seems improbable, at this point, that such an advantage exists. Peaches are very perishable. It is difficult to create an artificial deficit in supply to increase prices. Another reason why such an advantage may not exist for the top four firms or producers is that the next four largest firms controlled 17.5 per cent of total industry production. This control would have the effect of increasing the competition among the larger-volume growers and reducing the relative power of each of the large firms.

In this discussion, concentration in the Study Area has been shown to be:

1. Increasing on the basis of number of firms in the industry over the past 13 years.

2. Decreasing on the basis of number of firms controlling the resources (trees) of production.

3. Increasing on the basis of number of firms relative to output or production of peaches.

4. Oligopolistically competitive with a large competitive fringe of firms, according to decile rankings and the Census Bureau classification.

The net effects of the changes in concentration appear to be in the direction of increased concentration and decreased competitive ability among the small-volume growers. The power advantage mentioned above is not thought to be effective. Size of firm probably has the greatest influence on the competitive position of individual growers.

### **Buyer Concentration**

Buyer concentration will be discussed in general terms and on the basis of different types of buyers. Each type of buyer represents a different marketing channel through which peaches move enroute to the consumer. In the peach industry in the Study Area there were several marketing channels having varying degrees of concentration.

According to the peach growers, the number of buyers in the Study Area has decreased since 1960. The growers believed that this reduction in the number of buyers had concentrated the bargaining power of buyers while the various types of available sales channels had remained relatively

fixed. The number of buyers of each type to whom sales were made, as listed by the growers, in 1965 were as follows:

Truckers .....	undeterminable
Local Sales and/or Door to Door .....	undeterminable
Small Grocery Stores .....	undeterminable
Roadside Markets .....	12
Brokers .....	8
Processors .....	7
Produce Markets .....	7
Commission Merchants .....	4
Wholesalers .....	3
Chain Stores .....	3
Central Market Auctions .....	1
Institutions .....	1

The largest decline was in the number of truckers. There were fewer trucks coming directly to the orchards than in previous years. The number of wholesalers had declined as the use of brokers and direct sale methods increased. The number of processing plants and/or canneries remained relatively stable with only one or two new firms entering the market in the past five years.

In 1965, a large proportion of peaches moved to fresh markets of one type or another. Only 8.5 per cent of the Study Area's total peach production was reported as being sold to processors in 1965. The following tabulation shows the per cent of total production that was sold through each type of fresh market channel in 1965.

Fresh Market	Per Cent
Brokers .....	57.2
Commission Merchants .....	7.8
Truckers .....	6.4
Wholesalers .....	6.2
Local Sales or Door to Door .....	5.2
Roadside Markets .....	2.4
Chain Stores .....	2.2
Produce Markets .....	2.1
Small Grocery Stores .....	1.1
Institutions .....	0.5
Central Market Auctions .....	0.4
<b>Processing Market</b> .....	<b>8.5</b>
Total .....	100.0

In comparison to the distribution of the Study Area's peaches, production in the South Atlantic Region, a larger area encompassing the Study Area as a part, sold an average of 78.5 per cent of total peach production on the fresh fruit market during the 1964 and 1965 season.<sup>14</sup>

<sup>14</sup>—Fruits: Non Citrus By States 1954-1959; Production, Use, Value, Statistical Bulletin No. 292, USDA, SRS-CRB, Aug., 1961 (May 64).

Prices for West Virginia and Study Area peaches have been relatively stable since 1950. There were only three years since 1950 in which price showed any sizeable fluctuation. The meaning conveyed is that with a decline in production and a relatively stable price, any increase in volume taken on the part of an individual buyer represents an increase in the demand of that buyer. One specific example of increase in demand was displayed by truckers. The growers stated that truckers who dealt in terms of 50 to 100 bushels five or six years ago are now dealing in terms of hundreds of bushels. These grower observations indicate an increased level of buyer concentration on a number basis as well as on a proportion-of-the-market-volume basis.

The four largest-volume brokers in the Study Area accounted for 48.9 per cent of total volume sold. The four largest-volume individual buyers who bought directly from the growers accounted for only 10.7 per cent of the total volume sold. This 10.7 per cent represents a low degree of concentration and high degree of competition according to the Census Bureau classification system listed earlier. Direct sales channels were, therefore, characterized by low buyer concentration. The high degree of concentration indicated by the 48.9 per cent of sales to brokers is not a valid measure of concentration of buyers since brokers are not buyers but middlemen, whose responsibility it is to find buyers for their clients' products. The degree of concentration on the buyers' side of the market appears to be lower than on the sellers' side. This is true if the assumption that each broker deals with more than one buyer is correct and since there are a limited number of sellers in the Study Area.

The lower degree of buyer concentration suggests that the sellers have an advantage in price bargaining power when selling through a broker. This advantage is dependent on the number of buyers available or known to the broker and also on the volume demanded by the buyer. A large volume buyer would have relatively more bargaining power than smaller buyers through a broker.

The buyers' side of the market seems to be increasing in concentration, based on grower's observations and the Census Bureau classification system, but it still is highly competitive.

### **Ease of Entry**

The relative ease of entry of a new firm into the industry is another indicator of market structure. The barriers to entry which face new firms have a definite effect on the decisions of potential entrants. If there is a high degree of concentration in the production (seller) segment, there may be considerable entry-difficulty encountered by a potential entrant. The scale of plant necessary to become competitive may be large and require substantial amounts of capital. The share of the market obtainable may be small and may make it difficult to operate at a profitable level for the first few years.

If, on the other hand, the degree of concentration is small, one might



enter the industry with relative ease. The size of an optimum plant may be small and require significantly less capital outlay to enter at a competitive level.

Another factor influencing ease of entry is the rate of profit enjoyed by existing firms within the industry. If profits are "normal," entry into the industry will not appear as attractive as when excess profits exist. Price may be regulated by the existing firms so as to obtain more than normal profits but still not enough to attract new entrants or competitors. This type of behavior would be expected in an industry of relatively high concentration.

In the agricultural industry, there is generally a low degree of seller (producer) concentration. Each individual has no control over the price he receives; theoretically at least, normal profits exist in the industry. If one sector of agriculture is experiencing excess profit, entry in that sector would be attractive to potential entrants. There is, however, a trend toward fewer farms and larger farms in the United States. Fewer, larger farms are having the effect of increasing the amount of capital required to enter the industry at a competitive level.

#### **Ease of Exit**

In a specialized industry, exit is sometimes slow. Individuals or firms may be reluctant to curtail production until the life of their physical plant is depleted. The fact that the capital investment is specialized prohibits a change or application to production in another industry.

The agricultural industry is, in most respects, specialized. A tractor has very little value or use for production in any other non-agricultural industry. The reluctance on the part of a farmer to leave the agricultural industry is evidenced by the fact that many farmers resort to employment in other industries while maintaining a part-time farm operation.

#### **CONDITIONS OF ENTRY AND EXIT**

Entry of new growers into the Study Area's peach industry has been slow in recent years. The number of new orchards has been over-shadowed by the number of growers leaving the industry. As pointed out in Table 2, there were only 11 cases in which the grower had five years or less experience. Of these growers, four had less than 1,000 trees, five had from 1,000 to 2,500 trees, and only two had over 2,500 trees. With little prior experience, six of the 11 growers planted or purchased young orchards. These young orchards had not yet reached peak production. The remaining five growers had taken over orchards which were near their peak or had passed peak production levels. Most of these older orchards were inherited or were being taken over by a son of the original owner. Based on observations made while conducting the survey and information given by the owners, there have been relatively few new growers or orchards in the Study Area since 1959.

The slow entry rate of new growers suggests that the conditions

influencing the rate of entry were not attractive to potential entrants. The current trend in concentration indicates the size of orchard necessary for competitive participation within the market system is large, probably over 1,000 trees. It is becoming extremely difficult for small firms to compete economically with large firms. Evidence of the increasing difficulty, which makes entry of small growers unattractive, was found in the trend towards large capital investments on the part of large, well entrenched growers. The large investments represent increased fixed costs. A large fixed cost when spread over a large number of production units can effectively reduce average costs. The per cent of fixed costs for a small volume grower represents a larger proportion of capital outlay than for the large volume grower, making it more difficult for the small grower to compete. Thus, the rate of attraction of new growers to the industry has been slow and appears to be a function of scale of plant necessary to be competitive.

Uncertainty is another factor which is making entry more and more unattractive. Time is one of the most important sources of uncertainty facing a new grower in the peach industry. There is a three or four year lag between time of initial investment in land, trees, and capital equipment and the first realized return. Time also introduces price uncertainty. It is extremely difficult to weigh all factors influencing price and predict price within one season. The uncertainty is compounded when attempting to predict price three or four years in the future. Uncertainty of weather conditions, disease, and other factors influencing production and maturation of peach trees are additional reasons why entry has been slow.

The small number of new growers entering the industry, the increased competition from large firms, and the many kinds of uncertainty combined appear to make the peach industry in the Study Area unattractive to potential growers.

The factors which make entry into the peach industry in the Study Area unattractive can also be pointed out as the reason for small firms leaving the industry. Size of orchard is closely related to the exit of growers from the industry. This statement is supported by the fact that the per cent decrease in number of orchards was more rapid than the per cent decline in number of trees over the same time period (Table 12). The per cent decrease in orchard numbers suggests that the growers leaving are, in general, the small-volume growers. Evidence of this departure of the small-volume growers is also found in the changing degree of concentration, as noted earlier in this section. The number of small orchards and the number of total trees controlled when compared to the changes in total number of orchards indicates an exodus of small orchards and/or their consolidation into larger orchards. The rate of decline in orchard numbers has slowed considerably in the Study Area and also shows signs of slowing in the State (Table 13). The United States has been experiencing a similar movement downward in number of orchards but at varying rates.

**TABLE 12**  
**Change in Number of Orchards and Number of Trees for Selected Time Periods for the Study Area and West Virginia**

Time Period	Study Area % Change		West Virginia % Change	
	Orchards	Trees	Orchards	Trees
1950-1954	- 53.8	- 24.3	- 62.5	- 41.6
1954-1959	- 39.1	- 3.9	-61.5	- 24.4
1959-1964	- 21.7	- 6.1	- 47.4	- 10.7

Source: Computed from U. S. Census of Agriculture 1959 and 1964.

**TABLE 13**  
**Rate of Decline in Number of Orchards for Selected Time Periods for the Study Area, West Virginia, and the United States**

Time Period	Decline in Orchards					
	Study Area		West Virginia		United States	
	No.	%	No.	%	No.	%
1945-1950	948	- 56.3	20,234	- 46.2	316,476	- 22.3
1950-1954	396	- 53.8	14,985	- 62.5	847,727	- 76.9
1954-1959	133	- 39.1	5,299	- 61.5	110,060	- 43.25
1959-1964	45	- 21.7	1,574	- 47.4	N.A.	N.A.

Source: Calculated from data presented in Table 5.

This slowed rate of exit should lead to a continued decline in number of orchards for some time to come, but the future decline cannot be as great in actual number of orchards as in the past. The slowdown of the decline will result primarily because of the reduced number of small orchards and the increased number of large orchards. This means that there are fewer small orchards to be pushed out by the increased competition from the large-volume growers, which in itself should have a slowdown effect on the rate of exit.

## Conduct as Related to Structure

Market conduct as related to market structure is an area in which it is difficult to develop or state any strict criteria for evaluation. Conduct is not easily quantified or measured. The conduct of firms operating in a given market structure may be different from other firms in a different industry operating in a similar market structure. Some broad generalizations or predictions can be made, however, which lend themselves to empirical verification.

A high or very high degree of seller concentration is usually associated with interdependent action on the part of the sellers without evidence of collusion more often than in cases of moderate seller concentration. Instances of obvious and detailed collusive arrangements seem to be more evident or frequent in industries of moderate concentration. When the number of sellers is large and the degree of interdependence small, interde-

pendence cannot be relied on to affect mutually desirable market behavior. With high degrees of product differentiation there is a tendency toward interdependence without collusion. This probably occurs because matching prices on the part of rivals ceases to be prerequisite for exploiting the market. In other words, it is not necessary for rivals with highly differentiated products (products which are not close substitutes) to act collusively in determination of price.<sup>15</sup>

Conditions of entry seem to have little effect on the conduct of the firms within the market, except in the area of pricing policy. The price policy of the firm is a major area in which conditions of entry affect conduct. The height of barriers to entry, however, seems to have no effect on the firms already existing in the market system, but rather on potential entrants.

So far, the discussion of conduct has been centered on the seller. The effect of buyers' conduct is essentially the same as outlined for the seller, with two major differences. First, in the area of profit maximization, the buyer will attempt to establish a lower price than desired by the seller. Second, in consideration of concentration and relative bargaining power, conduct expresses antagonism of the buyer and seller interests. With the above two points in mind, it is possible to predict what effect entry difficulties may have on seller and buyer conduct. It is important to note that the above statements are of a general nature and indicate what usually occurs. Exceptions can and do exist.

Considerations of conduct also include individual firm behavior. Questions arise as to what course a firm may take under certain conditions found in the existing market structure. These questions may be concerned with pricing policies, promotional policies, exclusionary tactics, and predatory policies of the individual firm.

In agriculture, an industry of low seller concentration, one would expect, on the basis of the above generalizations, that collusion would not exist on the part of the sellers (farmers), with the exception of marketing cooperatives. However, the farmer can do little more than discuss price with other farmers in his area. The effect of price discussion on actual price is practically nil because farmers are atomistically competitive. Even a group of farmers in one area, considered as one seller, supply such a small part of the nation's total product as to render it powerless in determining price. In other words, even with collusive action the farmers in a given area cannot effectively influence price.

## **CONDUCT OF FIRMS WITHIN THE MARKET SYSTEM**

### **Seller Conduct**

Product differentiation, while considered a characteristic of structure, is also reflective of the conduct of selling firms within the market system. Concepts of structure and conduct are closely related, making it difficult

<sup>15</sup>—Bain, *op. cit.*, pp. 296-297.

to determine the flow of causation. When possible, in the following discussion of conduct, reference will be made to structural characteristics to show the relationships of structure to conduct.

Peaches are a difficult product to differentiate. This is, of course, true for most products of the agricultural sector. The only real raw product differences are inherent in variety. These differences, which are attributable to different varieties, include size, color, free or cling-stones, and other genetic characteristics. Certain varieties are better suited for one type of market than are others. The choice of varieties grown, therefore, can influence the type of channel or channels of distribution open to the grower. The growers in the Study Area showed no major tendency toward a variety which would limit or restrict the number of alternative sales channels. Growers were planting dual-purpose peach varieties.

Differentiation, on a basis other than variety differences, was being attempted by many of the large-volume growers in the Study Area. The growers realized that the average consumer cannot distinguish between varieties and in making purchasing decisions must rely on seller identification and previous experiences with peaches of a certain type or variety. The professional buyers were thought to be better educated in the distinctive characteristics of varieties and rely primarily on recognition of a certain grower's fruit. The grower was then faced with the problem of making his product known to the buyer. Brand names, different packaging techniques, and quality controls such as grading and sizing were used by large-volume growers in an attempt to differentiate their peaches so that satisfied buyers would become repeat buyers. These brand names ranged from nothing more than the grower's name on the selling or shipping container to rather elaborate labels with orchard name, grower's name, and other information. Growers using these methods indicated that they were experiencing favorable results.

Grower preparation of peaches for marketing varied considerably in the Study Area. Pre-marketing preparation, as performed by the growers, ranged from no preparation other than transferring the peaches from picking containers to shipping containers (tree-run peaches) to elaborate sizing, grading, packaging, and other pre-marketing functions. Over 69 per cent of the growers performed no pre-marketing functions prior to marketing their fruit. The remaining 30.6 per cent of the growers made use of their own or custom-hired facilities to grade, size, wash, brush, and package fresh fruit for market. This group, which made use of pre-marketing techniques or facilities, did so because they believed that such action would: (1) allow them more flexibility in selecting a market, (2) increase price relative to cost, and (3) meet requirements imposed by certain types of buyers.

In 1965, the 34 growers (or 30.6 per cent) who performed some type of pre-marketing function accounted for 59.0 per cent of the Study Area's total production. An additional 8.1 per cent of the growers owned some

type of facilities for preparation of peaches for market but did not make use of them. These growers accounted for 11.9 per cent of total production. The cost of packaging represents a variable cost and can amount to as much as 30 per cent of the price received by the grower. Many of the growers who did not make use of owned or available facilities claimed that their volume of production was too small to justify such expenditures. Lack of capital and insufficient size were the two major reasons given by small-volume growers who did not pre-package their fruit. There were only two cases in which growers with less than 100 trees owned and used pre-marketing facilities. Table 14 shows the number of growers owning and/or using certain types of pre-marketing facilities as well as the number of growers owning but not using their facilities.

Only 18.2 per cent (20 growers) were planning to invest in new or additional pre-marketing facilities in the next five years. Of these growers 75 per cent had over 2,500 trees. The fact that most large-volume growers were performing pre-marketing functions which were not considered to be the responsibility of the growers years ago indicates a tendency toward vertical integration on the part of the grower. In three cases growers owned their orchard, packing facilities, and brokerage firm which handled other growers' peaches as well as their own. The following tabulation shows the number of growers planning to invest in each type of new facility in the next five years:

Packing .....	9
Sizing and Grading .....	5
Washing and Brushing .....	5
Storage .....	5
Cooling .....	6
Total* .....	30

\*Does not add to twenty as stated earlier, because some growers plan to invest in more than one type of new facility.

Since industries with low degrees of concentration are usually characterized by low degrees of product differentiation, the low degree of differentiation in the Study Area was not unexpected. In case of peaches, product differentiation is usually more successful with buyers in wholesale

**TABLE 14**  
**Number of Growers Owning and Using Facilities**  
**for Preparation of Peaches for Market, 1966**

Type of Facility	Own and Use	Own and Don't Use	Custom Hire	Total Using	Total Owning
Packing	19	16	7	26	35
Grading and Sizing	24	13	3	27	37
Washing	15	2	1	16	17
Brushing	26	10	1	27	36
Storage	13	0	13	26	13
Cooling	6	0	3	9	6

channels than with consumers who rarely see any form of differentiation in the retail store.

In general, the small-volume growers were aware of the lack of product differentiation in the peach industry. The failure to differentiate was more noticeable in the truck and processor markets. The small-volume growers believed there was little they could do to improve their competitive position, relative to the large-volume growers, by attempting to differentiate their product. These small-volume growers relied mainly on local sales to individuals, truck sales, and sales to processors. In some instances growers sold their peaches under another grower's brand name and were charged a service fee for packaging, grading, and selling. These growers believed that a better price was obtained as a result of selling under another grower's brand name.

Changes in the methods of distributing peaches have occurred in the Study Area over the past five years. These industry-wide changes were the result of actions of individual growers and indicate a response to the changing structural characteristics. The increasing seller concentration seems to be related to the changes in method of selling or channels used for distribution. As concentration increased, the use of brokers increased. The growers indicated that there was a general trend toward more intensive use of brokers as a sales outlet compared with five years earlier. The relative share of the individual's production moving through a broker has also increased, in the opinion of the growers interviewed.

Another possible explanation for the increased use of brokers was suggested by the price response policies of the individual growers. The sources of price information used by the growers, in determining a price response policy, ranged from none to four or five different sources. Over 87 per cent of the growers used one or more sources of current price information. The remainder of growers claimed to have no sources of price data available or did not make use of the sources available. The daily newspapers within the area and in central market cities were listed most frequently as primary sources of price information. Daily contact with brokers during the harvest season was the second most used source of price information. Growers felt that brokers were the most reliable source of price data because of their close contact with markets and buyers. However, nearly 30 per cent of the growers claimed there was no reliable source.

Those growers who indicated that no source was reliable did so because they felt the price information did not adequately reflect conditions in the local market. The use made of the information also varied considerably. Growers used price information basically to have some idea about the price to be expected on the fresh market for certain quality peaches. The small-volume growers were in the position of being price takers since they did not have sufficient volume to give them bargaining power equal to large-volume growers. The large-volume growers made use of the price information to determine the amount of pre-marketing

preparation necessary for the particular channel of distribution to be used. The basis for most price response policies was consideration of what economists refer to as variable costs. The growers were of the opinion that their peaches should be sold as long as price covered the variable costs of harvesting. In a very few instances growers indicated they would let their crop go unharvested if the desired price could not be obtained. Theoretically, the only time this course of action would be followed is when the price is less than the costs of picking, handling, packaging, and selling.

Promotional policies were, for all practical purposes, non-existent in the Study Area. Only 17 of the 111 growers interviewed were affiliated with a national or state-wide organization of peach growers whose primary purpose is to exchange ideas concerning production techniques. Sales promotion was only a small part of the organizations' objectives. References to promotion were basically concerned with marketing techniques which the growers could practice to improve the attractiveness of their fruit. Very little, if any, direct advertising to the final consumer was present. There was evidence that marketing discussions appearing in these organizations' publications had influenced the marketing techniques used by some of the member growers.

Exclusionary policies were not evident or present in the Study Area. The individual growers did not exhibit any desire to force their competitors out of the industry. Policies used were apparently an attempt to keep competitors at a disadvantage. The competitive advantage of one firm relative to another could best be improved through the use of better production and marketing techniques. As pointed out earlier the large-volume growers were using marketing techniques which give their peaches a greater degree of market attractiveness. These activities increased the competitive position of the large-volume growers and kept small-volume growers at a disadvantage by reducing the number of alternative market outlets available. Thus, such practices were not exclusionary but tend to restrict competition and insure more flexibility in selecting a market outlet.

### **Buyer Conduct**

As was true in the discussion of buyer concentration, difficulty arises in attempting to analyze buyer conduct. The main difficulty arises because the information obtained concerning buyer conduct was obtained only from the growers. The large number of buyers in some channels and the lack of identification of individual buyers adds to the problem of evaluating buyer conduct. It is also difficult to determine if buyer conduct is determined by seller conduct or if the reverse is true. The answer probably lies somewhere between.

Buyers, at the farm level, purchased mostly mature-ripe peaches. Only 29.7 per cent of all sales transactions were for peaches other than mature-ripe. This would be expected, as over 90 per cent of the Study Area's peach crop in 1965 was sold through a fresh market channel of some type. Buyers,



however, showed considerable variation in the market type peach desired. The degree of grower preparation and handling required ranged from picking and shipping to grading, sizing, and packaging. Over 76 per cent of all sales were for tree-run peaches. Twenty-one per cent of the sales involved peaches that were in some manner readied for market by the grower before leaving the orchard. In the remaining three per cent of the transactions growers indicated the buyer was indifferent or did not specify the type of market peach desired. Table 15 shows the number of direct transactions with each type of buyer (or market channel) and the relative proportion of total volume purchased by each group of buyers.

Brokers were divided evenly as to type of peach required or demanded by their clients. Forty-four per cent of the buyers, buying through a broker, specified tree-run peaches while 44 per cent specified peaches that were graded, sized, packaged, or in some manner prepared for market by the grower. The remaining 12 per cent were indifferent and would accept any type market peach. While accounting for less than one-fourth of all sales transactions, brokers were responsible for over one-half of the total volume of peaches sold (Table 15). This fact suggests that the large volume buyers were not dealing directly with the grower.

Over 90 per cent of truck sales were for tree-run peaches. Processors also purchased mainly tree-run peaches but would accept graded, sized, and packaged peaches from the growers. Commission merchants and wholesalers would not accept tree-run peaches. According to the growers, a buyer may accept tree-run peaches and grade and package them himself. This course of action was the exception and not the rule as the grower (seller) was usually responsible for performing these functions.

**TABLE 15**  
**Number of Transactions Between Growers and Various Market Channels with Relative Volume Sold Through Each Channel**

Market Channel Used	Number of Transactions	% of Total Transactions	% of Total Bushels Sold
Brokers	41	22.9	57.2
Truckers	34	19.0	6.4
Local and/or			
Door-to-Door Sales	27	15.1	5.2
Processors	24	13.4	8.5
Roadside Markets	14	7.8	2.4
Retail Merchants	12	6.7	1.1
Commission Merchants	9	5.0	7.8
Fruit Markets	7	3.9	2.1
Chain Stores	4	2.2	2.2
Wholesalers	3	1.7	6.2
Central Markets	1	0.6	0.4
All Others	3	1.7	0.5
<b>TOTAL</b>	<b>179</b>	<b>100.0</b>	<b>100.0</b>

In 58.5 per cent of the transactions the buyer came to the orchard to obtain the fruit purchased. Some buyers, buying through a broker, also came to the orchard, as did truckers, to pick up the fruit. Processors, wholesalers, central market buyers, and retailers required the grower to deliver the fruit. Local consumer buyers either came to the orchard for their fruit purchases or had the fruit delivered to their homes by the grower.

Growers reported that the buyers did not add the cost of transportation to the price paid for grower-delivered fruit. Most of the growers thought they were bearing the entire cost of transportation. There was good reason to believe that some buyers at central markets and those buying through a broker paid a price sufficient to cover the additional cost of transportation.

## Measures of Market Performance

Market performance is an indication of how well the market activities contribute to the general welfare.<sup>16</sup> Performance is difficult to measure and relies heavily on observations of production efficiency, profit rates, effects of concentration, and other characteristics of the market system. For the purpose of this study the discussion will be limited to effects of concentration, product differentiation, and barriers to entry on the performance of the industry.

It has been noted with considerable regularity that industries with a high degree of product differentiation tend to have higher selling costs. There are three basic reasons why this is so.<sup>17</sup> First, if a product is considered a prestige good, price tends to be relatively less important because of product reputation or glamour which can be built by effective promotional programs. Second, consumers are unable to evaluate such products because of their complexity or other qualities. The consumer is, therefore, dependent on product reputation to guide him in purchasing. Third, durable goods offer the consumer little opportunity to experiment since purchases are infrequent. Conversely, low selling costs usually exist in industries having slight product differentiation. This is so because the goods are usually purchased frequently, and are non-durable. These conditions allow the consumer time to experiment and compare alternative products.

It has also been observed that in industries with very high concentration the profit rates tend to be significantly higher than in industries with low concentration. This statement implies that there is a tendency towards monopolistic or excess profit in highly concentrated industries. However, no difference is noted in profit rates in industries with moderate to low

16—Joe S. Bain, *Industrial Organization*, New York: John Wiley and Sons, Inc., 1959, p. 7.  
17—*Ibid.*, pp. 411-416.

concentration.<sup>18</sup> Furthermore, profit rates are usually higher in industries where entry is blocked than where entry is easy.

In agriculture, an industry of low concentration with low barriers to entry and slight product differentiation within product groups, it can be assumed that profit does not exceed normal rates. The products of agriculture are non-durable and non-glamorous which suggest from the above discussion that price is influential in selecting among alternatives. Also the frequency of purchase is high which enables consumers to experiment and compare different brands and different varieties of the same product within a short period of time.

### PERFORMANCE OF STUDY AREA PEACH INDUSTRY

Performance of the peach industry in the Study Area was, to a large degree, the result of the interaction of structural characteristics with the conduct of the individual firm as well as the total industry. As stated earlier, performance should consider the results of price policies and profit, scale and utilization of physical plant, effectiveness of promotional policies, and the degree of progress existing within the market.

#### Price As An Indicator of Performance

The average price received by the peach grower, in the Study Area, was \$2.37 per bushel of peaches in 1965. This is a weighted average price based on total volume sold and total receipts as given by each grower interviewed. It is exclusive of brokers' fees and/or selling costs paid to a selling agent. The average price represents the actual price received by the grower after selling fees were deducted. Since this price was an overall average considering all types of market peaches sold through all available market channels, it does not reflect the performance of the different type channels. The following tabulation shows the average price received by the grower (or paid by the buyer) for a bushel of peaches sold in each market channel during 1965.

Commission Merchants .....	\$2.96
Brokers .....	\$2.57
Retail Merchants .....	\$2.46
Wholesalers .....	\$2.35
Central Market Buyers .....	\$2.25
Chain Stores .....	\$2.11
Roadside Markets .....	\$1.96
Local: Door-to-Door Sales .....	\$1.89
Fresh Produce Markets .....	\$1.82
Truckers .....	\$1.65
Processors .....	\$1.64
Institutions .....	\$1.44

All channels yielding less than \$2.00 per bushel involved primarily tree-run peaches. The channels with a price of over \$2.00, with the

exception of retail merchants and some brokers, consisted of peaches that were prepared for market in some manner by the grower. This difference in price and quality is to be expected as a cost differential exists when marketing tree-run or low quality peaches as opposed to packaged and higher quality fruit. The fact that brokers handled both types of market peaches caused the average price received in this channel to be lower than the price received through commission merchants. With only packaged and/or graded fruit considered, it was found that price received through brokers was comparable to price received for similar quality fruit sold through a commission merchant. In practically all cases where a commission merchant was used the grower was responsible for transportation cost to the market place. Delivery had the effect of increasing costs as well as being more inconvenient for the grower. Selling through a broker reduced the amount of grower transportation but did not eliminate it completely.

The grower was definitely a price taker when selling to processors. Most growers looked upon the processor market or channel as a last resort because processors took low quality fruit or the culls from large producers and fruit from the smaller growers who lacked the means to grade and package their product. When selling through a broker or commission merchant, the grower was also in the position of being a price taker. The only channels in which the grower had any control over price were the local, retail, and roadside markets. The control of price was limited because a price greater than the current market price for a given quality peach was difficult to obtain. An individual grower could not charge or attempt to establish a price greater than the price asked or accepted by his nearest competitor. Neither would he accept a price less than could be obtained in the processor or truck markets. The individual grower was generally a price taker, price being established by forces within the market system over which he had no control.

Buyers were also price takers in most channels. The processor market seemed to be the only channel in which the buyer had a considerable influence on price. Processors were said to have the power to set a price that they were willing to pay and hold it over the harvest season. Truckers were in the position of having to bargain with growers. The net price paid by truckers was just slightly higher than the processors' price. A reason for this is that the grower did not have to haul peaches and could receive a price equivalent to that offered by the processors. This had the effect of lowering handling costs and increasing net return on tree-run peaches. Local buyers and merchants had to pay at least the processors' price plus the additional costs of handling and marketing. If this was not done the growers would shift to the processor or truck channels. The price received through brokers and commission merchants was usually the result of competition among buyers for the available supply. The price obtained through brokers was dependent on quality of the peaches and extent to which peaches were prepared for market by the growers.

A comparison of the average yearly price of peaches in West Virginia to the average yearly price for the United States shows that the West Virginia price fluctuated more than the United States' price during the period from 1950 to 1965 (Figure 5). Prior to 1959 the price in West Virginia was sometimes greater and sometimes less than the average price in the United States. Since 1959, the West Virginia price has been higher than the price in the United States.

The responsiveness of price to yearly changes in production varies when observed for each area. Two separate regressions of production on price were made for the period 1950 to 1965. West Virginia and the United States yearly average price and yearly production data were used to calculate regression coefficients and correlation coefficients. The regression coefficient for West Virginia peaches was significantly different from the regression coefficient of the United States peaches when tested at the .05 confidence level.

The effect on price of fluctuations in production within an area is lessened when production in all producing areas is aggregated. Since each area or state accounts for only a small part of the total United States production and price of peaches, fluctuations in production in one area have little effect on total United States production. The "local" fluctuations in production have a greater effect on price in West Virginia than on the United States average price. The coefficient of determination which explains the amount of variation in price associated with changes in production, was 0.24 for West Virginia and 0.05 for the United States. These figures indicate that price in West Virginia is more responsive to production fluctuations in the State than price in the United States is responsive to

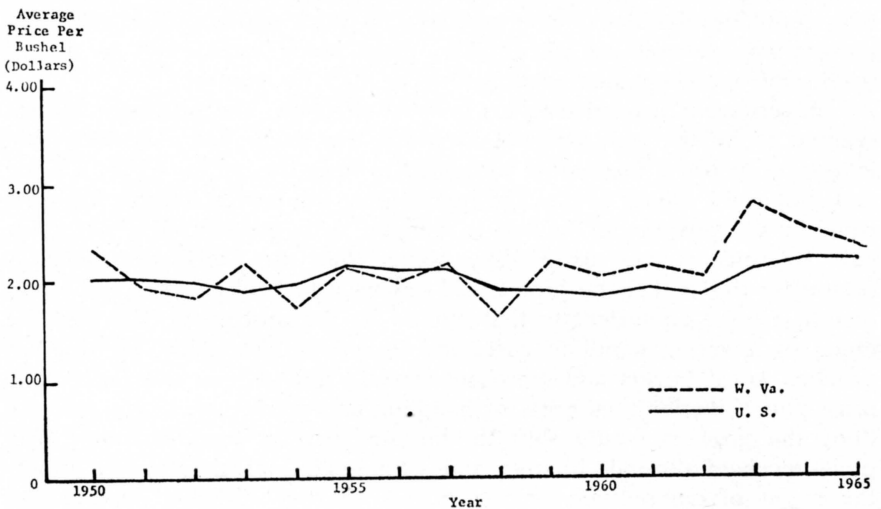


FIGURE 5. Average Price Received per Bushel of Peaches in West Virginia and the United States, 1950 (Source: Agricultural Statistics, 1951-1966)

national production. Furthermore, variables such as freezes, drought, and severe hail storms have considerable effect on West Virginia's average yearly price.

### **Progress Within the Industry**

The scale of plant or physical size of orchard and facilities in the Study Area was shown to be increasing. A basic reason given by growers for this expansion was to increase the efficiency of the factor of production. The expansion was evidenced by the fact that the total number of trees in the Study Area has increased over the past five years. These facts indicated progress only in terms of scale of plant. Additional progress should be made in technology and its employment. Grower responses suggest that West Virginia growers are progressing in the area of applied technology. There has been increased use of new technologies in orchard care and maintenance, picking methods, cooling, packing, storing, and marketing, the end result being a better market "package" than at any other time. The large-volume growers have indicated that future expansions of scale and increased use of new technology are forthcoming.

Since (1) price received for peaches in the Study Area was dependent, in part, on grade and/or quality, (2) both the buyer and seller in West Virginia are basically price takers, (3) West Virginia price is influenced considerably by fluctuations in production, (4) West Virginia peaches are sold in a concentrated area, (5) progress in scale of firm and use of technology is evident in the West Virginia peach industry, one may conclude that the performance of firms functioning in the peach market in West Virginia is similar to that of firms functioning in a competitive market.

## **CONCLUSIONS AND IMPLICATIONS**

Concentration of firms in the peach industry in West Virginia is increasing on both the buyers' and sellers' side of the market. The effect of this increase on the growers (sellers) has been to place the small-volume grower at a competitive disadvantage in the marketing of peaches. A similar effect has been observed on the buyers' side as small-volume buyers are playing a less important part in the market. Competition is now on a larger scale than at any time in the past. The rate of increase in concentration has not been the same for both buyers and sellers. The sellers' side appears more concentrated than the buyers' side. This differential suggests that the sellers have more bargaining power in pricing, although concentration is not sufficient to afford either the buyer or seller an advantage in determining price.

The competitive disadvantage of the small-volume buyers and sellers is evidenced by the decline in numbers of each group. The small scale firms have slowly been forced out of the industry. One reason for the exit of grower firms is the increase in size of orchard, facilities, and the amount of capital required to compete successfully. Small-volume buyers

have also been affected by the increased volume purchased by larger buyers. Size, then, seems to be a critical factor of success for both buyers and sellers.

The conduct of grower firms within the market system showed no signs of rigid policies dealing with price, promotion, collusion, and exclusion. There was no evidence that fresh fruit buyers function in any manner contrary to what would be expected in a competitive market. The peach industry in West Virginia, for the above reasons, is believed to be a competitive market system.

Performance of the industry, as indicated by price levels, saw the broker and commission merchant channels yielding the highest price paid for the growers' peaches. Prices were dependent on the grade and quality of the peaches sold. Prices were also influenced by fluctuations in production and the fact that West Virginia peaches are marketed in a concentrated geographic area. Since both the buyer and seller in the fresh market are price takers, and over 90 per cent of the total volume sold is sold in the fresh market, the performance of the peach industry does not differ greatly from performance of a competitive industry.

It is possible that the changes in structure and selling methods have been responsible, in part, for the increase in West Virginia peach price levels relative to the United States average. It is also possible that the transportation furnished by growers of fresh market peaches has helped to hold price levels up. The changes in structure and selling methods also suggest increased production potential for the State and increased marketing problems. More study is needed in the areas of costs of production, efficiencies of scale, and costs of marketing before total impact of the structural changes can be assessed.

Structural changes in agriculture have occurred rapidly in the United States during the past 10 to 20 years. These changes are reflected in changes of marketing methods in many fields of agriculture. Central markets are no longer the hub of agricultural marketing, especially for fresh fruits and vegetables. The volume of brokerage sales is increasing rapidly. The situation has become one of large buying firms versus many small selling firms. Attempts have been made, in many areas of the United States, to bring about a balance of bargaining power through the formation of grower group marketing organizations. In the U. S. today about one-fourth of all fruits and vegetables move through farmer cooperatives in one or more stages of the marketing process. The importance of the bargaining cooperative or organization is well established for processed fruit.

The changes in agricultural marketing and structure of the industry suggest that the Study Area might benefit in the future from an organization of growers whose primary purpose is to act as a bargaining agent. Such an organization would be successful only if all growers participate and adhere to the grading, packaging, and other policies of such an organization. The effect of such an organization would be to control supply in such a

manner as to increase the bargaining power of the growers. Many problems would be encountered if such an organization were attempted. Additional research is needed to determine the value of such an organization to the growers.

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