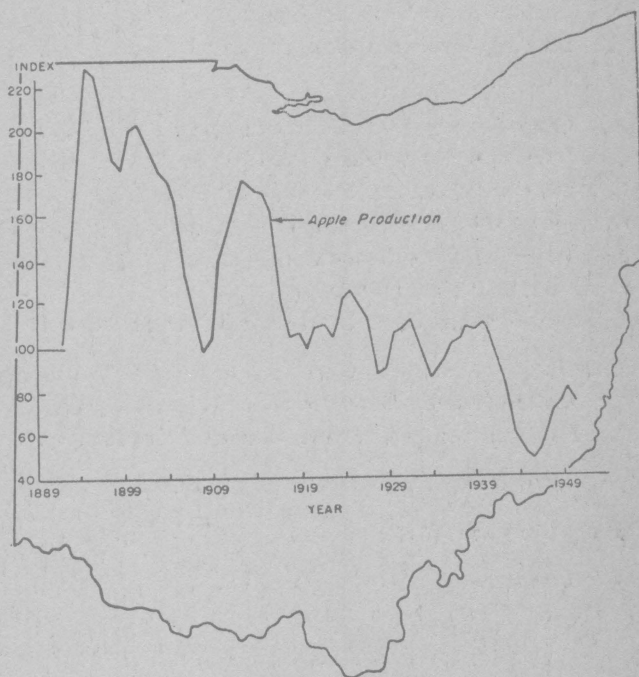


Trends in the Ohio Apple Industry 1889 to 1953

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# TRENDS IN THE OHIO APPLE INDUSTRY 1889 TO 1953

M. E. CRAVENS, Jr. and R. L. BERE

## SUMMARY AND CONCLUSIONS

1. The most striking trend in the apple industry during the past 50 years in Ohio and the United States has been the decline in tree numbers. Bearing trees have declined on an average of 10 percent of previous census tree numbers each five years since 1920 for Ohio and the United States.

2. Production of apples in Ohio has declined from about 12 million bushels for the 1911-14 crops to about 3,300,000 bushels (83 percent drop) during the 1949-53 period. United States production has declined only from 200 million to 105 million bushels (47 percent) during the same period.

3. Yields per bearing tree are lower and have increased less in Ohio than in the United States during the past 35 years. For the United States as a whole, yields have increased from  $1\frac{1}{2}$  bushels per tree to over  $4\frac{1}{2}$  bushels per tree while Ohio yield increases have been from  $1\frac{1}{4}$  bushels to  $2\frac{3}{4}$  bushels per tree for this period. For Ohio there has been a marked tendency for cyclical variations in yields with 3-6 years of sharply increasing yields and 3-6 years of sharply declining yields. A prediction based on this cycle would indicate a decline in Ohio apple yields has already started and will continue for 3-5 years.

4. Both tree plantings and tree removals have fluctuated widely from census to census. The number of non-bearing trees per 100 bearing trees has fluctuated in Ohio from a low of 21 in 1950 to a high of 42 in 1930. The U. S. average ratio of non-bearing to bearing trees has varied from a low of 21 in 1935 to a high of 43 in 1910 and was 28 for the 1950 census.

On the basis of the past six census relationships, about 40 non-bearing per 100 bearing trees appears to be necessary to maintain bearing tree numbers for Ohio and for the United States at any given level. For the eastern states slightly fewer are required while for the central states more are required.

Tree removals for Ohio varied greatly among census periods. Only 17 percent of the bearing trees reported in 1930 had been removed by 1935 (about 3 percent of the 1930 tree numbers each year). At the other extreme, 54 percent of the bearing trees reported in 1935 had been removed by 1940 (about 11 percent of the 1935 tree numbers each year.) Tree removals for the United States showed less census to census variation or 30 percent removals for 1930-34 compared with 45 percent for the period 1935-39.

Both plantings and removals have been highest among the smaller growers (under 100 trees) since 1940 when data became available.

5. Prices of apples in the United States have fluctuated around the level of all farm prices during the past 40 years. All farm prices are now at about  $2\frac{1}{2}$  times the level in 1910-14.

Ohio farm apple prices have generally been above the U. S. average but the advantage in this respect is declining. There has been a tendency for Ohio prices to be high relative to all farm prices and U. S. apple prices during periods which coincide with the low apple yield periods. During periods of high yields the reverse has been true. On this basis, Ohio prices are expected to increase relative to those in the United States for the next three to five years.

Variations in Ohio apple prices are closely associated with the size of the Ohio crop. On the average, an increase in Ohio apple production of 50 percent from one year to the next means a 20 percent decrease in price over the same period. On the other hand, a crop 50 percent smaller than the preceding year would only bring a price 42 percent higher than that for the preceding crop.

The seasonal fluctuation in apple prices has declined markedly since 1940. Prior to that time the average price rise from harvest price low to storage price peak was about 60 percent. For the post-war years the increase for a comparable storage period has been about 22 percent.

6. Apple consumption per person in the United States is about 40 pounds (adjusted for total production) or about half what it was in 1910. Ohio apple production per person in the state is only 20-25 pounds. The difference between this and Ohio consumption (assuming the U. S. average of 40) must be made up by imports from other states and areas. This deficit is increasing.

Apparent fresh apple consumption has fallen from about 90 percent of the total in 1910 to 75 percent at present. Canned apple and applesauce consumption has accounted for most of this change.

7. Marketing margins, in terms of actual dollars, have increased by approximately four cents a pound since pre-war II, while in terms of 1910-14 dollars they have increased by about one-half cent a pound.

On the basis of the above findings the following conclusions appear to be justified:

a. More complete and detailed data are needed on tree plantings, removals and bearing tree numbers if growers are to more successfully prevent cycles of high and low production.

b. Ohio growers need give particular attention to factors limiting apple yields.

c. The larger the Ohio apple crop the larger the gross income to Ohio apple growers.

d. When considering new storage space, emphasis on merchandising advantages rather than on the normal price rise for apples during the storage season will pay Ohio growers.

e. There is need for a careful evaluation of the effect of the increased demand for processed apples and declining demand for fresh apples on Ohio producers and how they can adjust to this trend.

f. In view of the increasing retail price for apples compared with those of major competing fruits, more emphasis on ways of reducing costs of apple production and marketing are desirable.

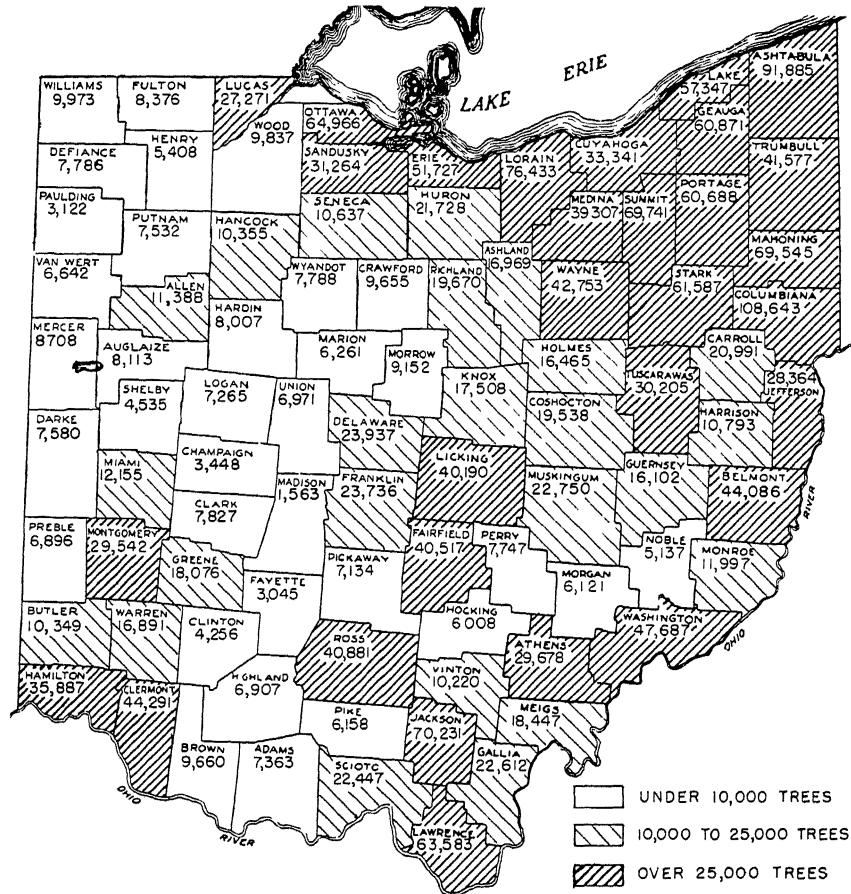
g. The analyses in this report are limited by the fact that there is little or no census separation of the commercial from the non-commercial grower, or of trees by varieties or ages. Such data would seem to be worth any effort that fruit growers could put forth in obtaining these separations in future censuses.

## INTRODUCTION

Apples are the most important fruit produced in Ohio. They accounted for over 60 percent of the total farm value of Ohio fruit in 1944 and 1949 (Table A-Appendix). During the past 60 years, however, the importance of Ohio in the United States apple industry has been declining. In 1889, Ohio was the leading producer of apples while in recent years, it has ranked seventh (Table C-Appendix).

Production in the state is concentrated largely in the Northeast, East and Southern part of the state. Very few commercial apples are produced in the Northwest and Western part of the state. Columbiana county had the largest number of bearing trees in 1950, followed by Ashtabula, Lorain, and Jackson counties (Figure 1).

This report attempts to describe the trends in the apple industry in Ohio and competing areas and to analyze these trends for their significance to Ohio apple growers.



SOURCE Reference 16

Fig. 1.—Apple trees of bearing age, Ohio, by county, 1950 census.

## II. SOURCES AND LIMITATIONS OF DATA

The major sources of data used in this analysis were the Census reports published by the Department of Commerce and the various statistical reports published by the Department of Agriculture. These sources of data are in most instances the only ones available over a long time period and they are subject to some recognizable deficiencies from an analysis of the type made here.

The major weaknesses of the census reports for an analysis of trends follow: These reports are made only every five years with no attempt at covering the intercensal period. (For purposes of this report a census year refers to any year in which an agricultural census was made). The census reports have not always been consistent as to the information obtained. For instance, the definition of a bearing tree was not the same in 1900 as later and is still not entirely satisfactory. The censuses before 1910 did not report non-bearing trees separately and in 1945 no separation of bearing from non-bearing trees was made. Another important source of possible misinterpretation is the fact that no distinction is made between commercial and non-commercial plantings. In the 1940 and 1950 censuses, plantings were classified on the basis of bearing tree numbers per farm. This classification is probably as good a differentiation of commercial from non-commercial plantings as can be made for a census enumeration and its continuance will make later analyses of tree numbers more meaningful. A further classification by age of tree would also aid greatly in an analysis of trends and would assist the industry in gearing plantings to future requirements and preventing in part the cycles of over and under plantings and consequent cycles of surplus and short apple supplies.

It would appear from the census data available that either the tree fruit industries have not been concerned with getting information concerning their industry, that they have not been adequately represented in setting up the questionnaires for such data or possibly a combination of both.

The United States Department of Agriculture reports for apples appear to be as adequate as for other fruits. A principal difficulty in a time analysis results from federal legislation in 1939 which limited the reporting of apple production to commercial areas. This resulted from the feeling by some in the industry that the low prices in the mid and late 30's were due to the effect of the reported larger supplies of apples and that by reporting only commercial supplies, this situation could be alleviated.

In order to comply with the Agricultural Appropriation Act of June 30, 1939, the state crop reporting services in each commercial state designated certain counties as commercial counties and all production in these counties is reported as commercial. Production in other counties is not reported.

Thirty-eight of the states were originally classified as commercial but in 1945 this number was reduced to 35 (Figure A-Appendix). For the period 1934-38 commercial production amounted to slightly over 80 percent of the total apple production in the United States. It appears that the commercial crop is becoming a larger and larger proportion of the unreported total crop in recent years.

In Ohio, 32 of the 88 counties are designated as "commercial" and these counties presently account for from 70-75 percent of total Ohio production (Table B-Appendix). Figure B-Appendix shows the commercial counties and the crop reporting districts in Ohio. Note that Stark County, one of the ten leading apple producing counties in Ohio is not listed as a commercial county and therefore cannot be legally reported in present apple production reports.

There is no indication in the statistics that the change in reporting method affected either the year to year prices or the deviation of these prices from what would be expected on the basis of the reported size of crop.

Due to the tendency towards biennial bearing in apples all grouping or moving averages were for even numbers of years. The four year moving average centered at 1936 was used as the usual base period. Specific sources of data and assumptions made in the calculations are referred to where used.

### **III. PRODUCTION**

#### **A. COMMERCIAL APPLE PRODUCTION**

Commercial apple production in the United States averaged 106 million bushels for the ten years 1943-1952 varying from a low of 67 million in 1945 to a high of 134 million in 1949. Ohio's apple production averaged three million bushels during the same ten year period. It varied from a low of 780 thousand bushels in 1945 to a high of five and one-half million bushels in 1949.

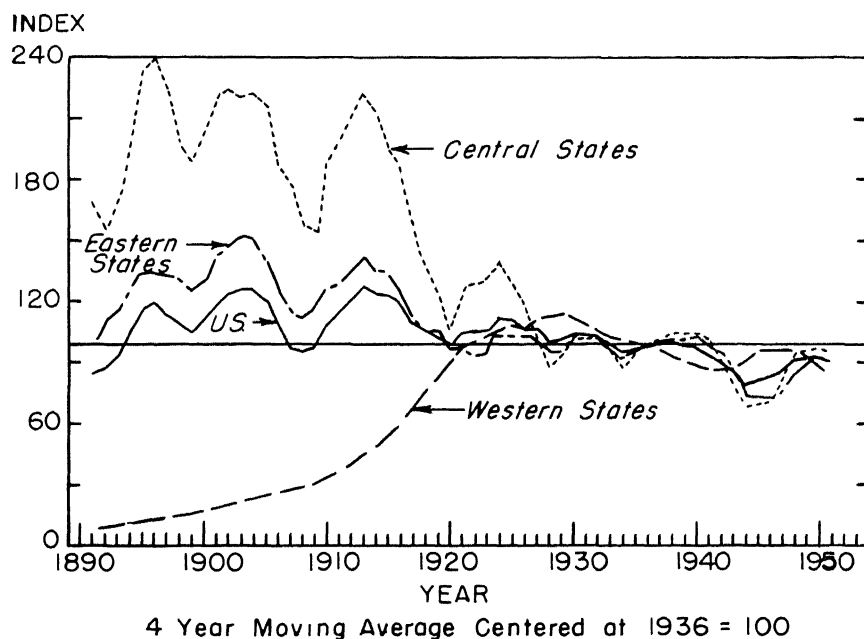
Washington is by far the leading apple producing state followed by New York and Michigan. Ohio, as was mentioned earlier, ranks about seventh.



Apple production tends to have a short two year cyclical variation of high production in one year and low production the next as well as a longer 8-10 year cycle of increasing and decreasing production. This cyclical nature of production is more pronounced in the central and eastern states than in the western states (Figure 2).

### B. TRENDS IN PRODUCTION

Apple production has been declining steadily in the United States since 1889 (Figure 2). The greatest decline has been in the Central States. The Eastern States have declined at a slower rate, while in the Western States, production increased rapidly until 1920 and since has leveled off. In 1890 the Western States accounted for about one percent of total United States production, the Central States over 55 percent, and the Eastern States, around 40 percent of the total apple crop in the country (Figure C-Appendix). At the present time the Central



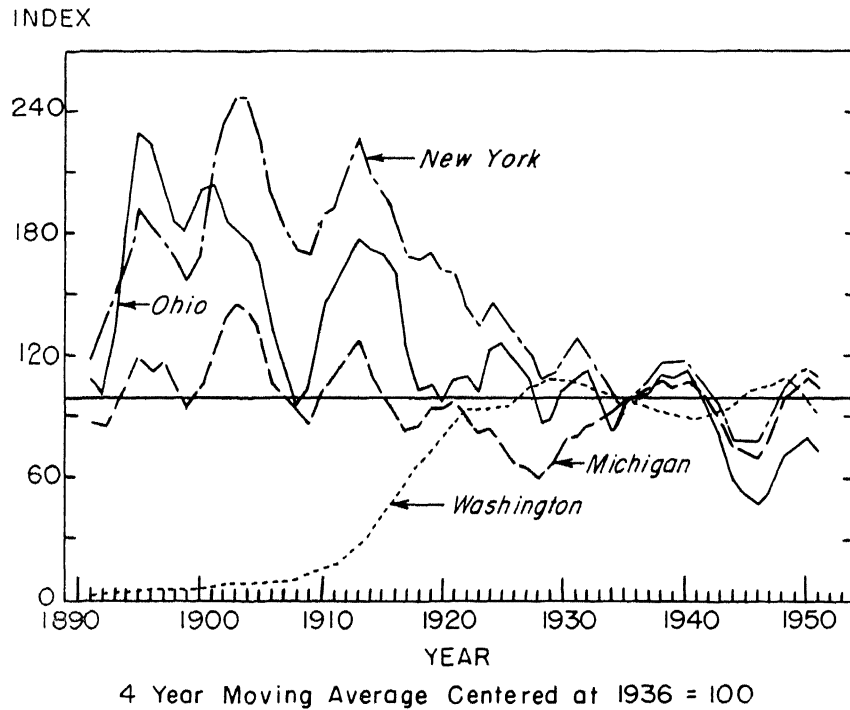
SOURCE: Reference 6

**Fig. 2.—Index of apple production, selected areas, 1889 to 1953.**

The period 1889 to 1920 was characterized by sharply rising production in the western states, sharply declining production in the central states and slowly declining production in the eastern states. Production has declined about the same in all areas since 1920.

States produce only 20 percent of the commercial crop, while the Eastern and the Western States each contribute about 40 percent (80 percent) of the apples produced in the commercial areas in the United States.

The rate of decline of apple production in Ohio has been greater than that for the United States as a whole (Figure 3). From an index of 228 in 1895 production has declined to around 80 at the present time or an average decline of approximately two percent per year. During the same period, Michigan, the largest producer in the Central States has maintained a fairly stable production, while New York, the leading Eastern State has followed much the same trend as Ohio (Figure 3). Washington, the most important apple producing state in the United States has had a trend in production similar to that in all Western States.



SOURCE: Reference 6

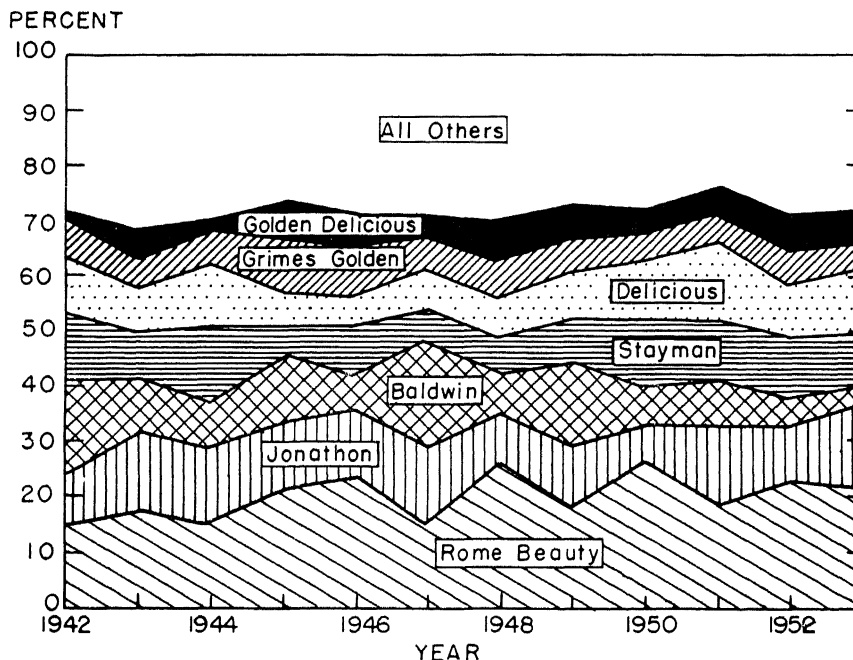
**Fig. 3.—Index of apple production, selected states, 1889 to 1953.**

Production in Ohio and New York has declined considerably since 1889, that in Michigan has remained fairly stable while Washington production increased sharply until 1920 then leveled off.

Prior to 1900, Ohio produced about seven percent of the apples grown in the United States, but since 1950 the state has produced only about three percent of the commercial crop (Figure D-Appendix). Washington produced less than one percent prior to 1900, but at the present time accounts for 20 to 30 percent of the total commercial production. New York produces from 12 to 15 percent and Michigan from six to eight percent of the commercial apples in the United States.

### C. PRODUCTION BY VARIETIES

Fifty percent of Ohio's commercial production is accounted for by four principal varieties: Rome Beauty<sup>2</sup>, Jonathon, Baldwin and Stayman. Of these, Rome Beauty, Gallia Beauty and red strains have



SOURCE: Reference 6

**Fig. 4.—Proportions of Ohio apple production for each of the major varieties, 1942-1953.**

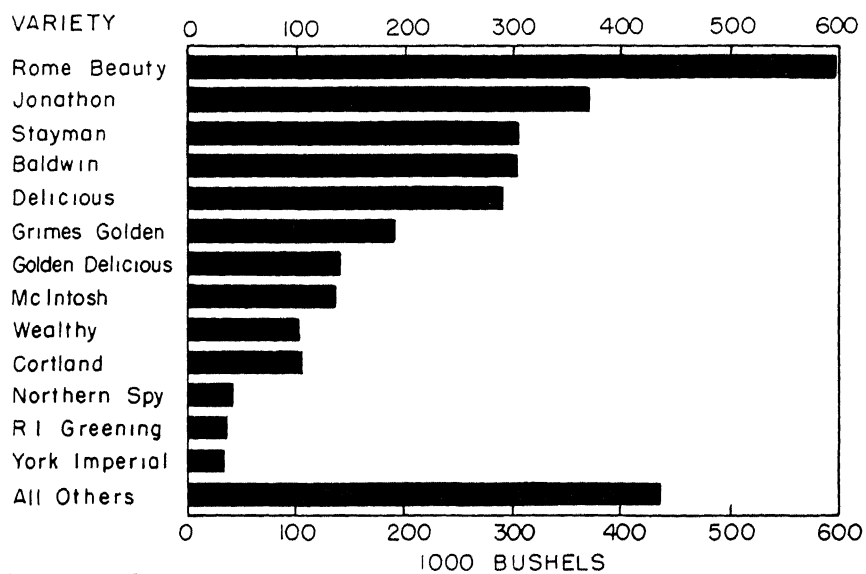
Rome Beauty, the leading variety in Ohio, Delicious and Golden Delicious have increased in importance during the past twelve years. Baldwin has shown the greatest decline.

<sup>2</sup>No distinction has been made of the red strains of Rome Beauty or Gallia Beauty or in Delicious of the Red Strains.

accounted for about 20 percent of the total production during the past ten years and appear to be increasing in importance (Figure 4). Baldwin seems to be decreasing, while of the other major varieties only Delicious, red strains of Delicious and Golden Delicious appear to be increasing in relative importance in Ohio.

Jonathon is by far the leading variety in the Central States (Figure E-Appendix). Michigan is the leading Central State in production of that variety. McIntosh and Golden Delicious are next in importance in the Central States with Rome Beauty, the leading Ohio variety, ranking seventh. Ohio produces two-thirds of all Rome Beauty produced in the Central States and over 10 percent of the United States total.

Delicious is the most important United States apple variety accounting for about 20 percent of total production. (Figure F-Appendix). This variety accounts for 10 percent of Ohio's commercial production as compared with 38 percent of the production in



SOURCE: Reference 6

**Fig. 5.—Ohio apple production by varieties, 1942-1953.**

Ohio Rome Beauty production averaged 600,000 bushels for the 1943 to 1952 crops. This was almost double the production of Stayman, Baldwin, or Delicious.

the Western States. While the Central States lead all areas only in the production of Jonathan, these states are relatively more important in the production of Golden Delicious, Grimes Golden, Northern Spy and "all other varieties" than in total apple production. These states are less important as producers of McIntosh, Rome Beauty, Cortland, York Imperial and Stayman varieties.

#### D. YIELDS

Ohio apple yields have not increased as much as average yields in the United States since 1920. A large part of the increase in the U. S. average yield has been due to the large increases in the Western States. Ohio yields have tended to have a cyclical pattern varying from 8 to 10 years in length and at the present time are in the peak of the cycle (Figure 6). If past history is repeated, yields will decline for the next four to five years.

Yields in this state are below most of the major nearby competing areas (Figure 7). There is no comparison between yields of apples in Ohio (or any of the central and eastern states) and the western states. Yields in Washington are three to four times the yield in any of the Central and Eastern States. Better climatic conditions and irrigation are in part responsible for this difference.

Part of the lower average yield in Ohio as compared to nearby competing areas is due to the relatively large percent of Ohio's growers having less than 25 trees of bearing age. Yields in this group of growers are considerably under state average. About 82 percent of Ohio's growers have less than 25 bearing trees as compared with only 65 percent of New York's growers, 69 percent of Virginia's and 75 percent of Michigan's.

However, this does not account for as much of the difference in yields as one might be expected to believe. Yields in orchards of over 1000 trees are lower in Ohio than in Michigan and New York, although the difference is not as great as in the average yield for these states (Figure G-Appendix). Apparently, soil and climatic factors are less favorable in the apple producing areas in Ohio than in nearby competing states.

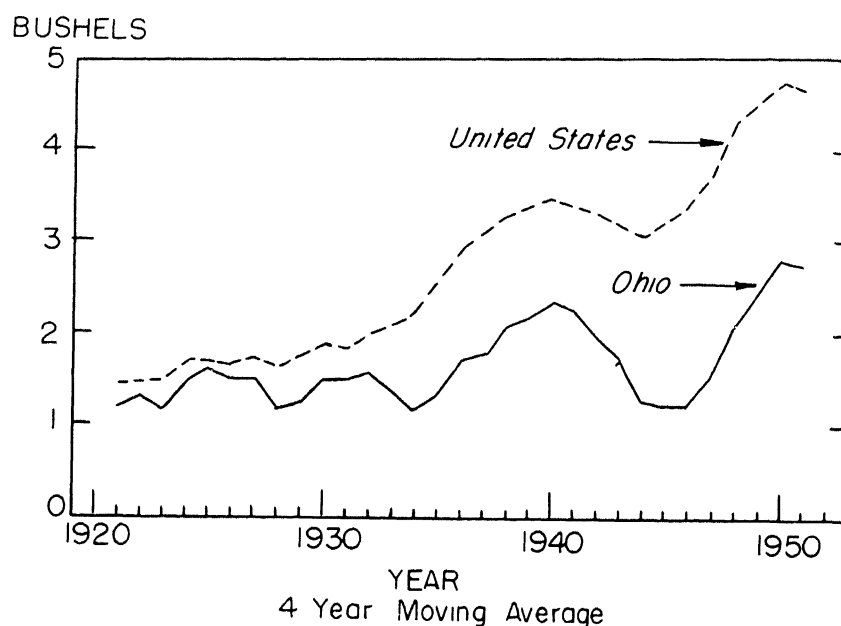
Increase in Ohio apple yields compare favorably with increases per acre of corn. However, this is true at the present time only because yields of apples are at the peak of the cycle. If a comparison was made during the mid-1940's, apple yields would be considerably below yields of corn. Neither corn nor apples have kept pace with potato yields since 1945 (Figure H-Appendix).

#### IV. SIZE OF ORCHARD

Eighty-two percent of all Ohio farms reporting apple trees of bearing age in 1950 had less than 25 bearing trees and only six and one-half percent had more than 100 bearing trees. Ohio has relatively more small growers than either New York or Michigan, but less than either Indiana or Illinois (Table 1).

The important apple producing areas in Ohio (Areas E and I, Figure I-Appendix) have considerably fewer small growers than the less important areas (B and C). Only 65 percent of the farms in Area E have less than 25 trees as compared to 91 percent in Area B.

Apple production in the United States is concentrated in the hands of a relatively small number of the large growers. This concentration increased between the 1940 and the 1950 census.



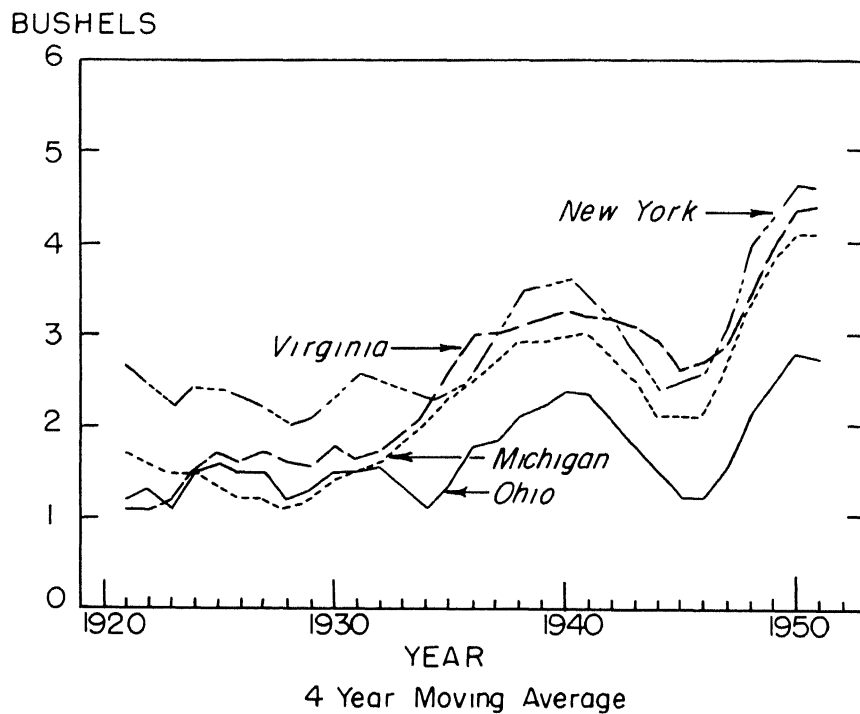
SOURCE Reference 6, 7, and 16

**Fig. 6.—Yields of apples per bearing tree, Ohio and the U. S., 1919-1953.**

Yields of Ohio apples have increased less and have been more variable than those in the United States as a whole.

In 1950, over one-half of total United States apple production was accounted for by the 6000 (0.4 percent) producers having 1000 or more bearing trees (Table D-Appendix). At the other extreme only 10.8 percent of the production was accounted for by the 1,500,000 (97 percent) producers who had fewer than 100 bearing trees. In Ohio the picture was much the same with the small growers slightly more important.

Although the United States small growers accounted for only 11 percent of the production, they had 31 percent of the bearing and 60 percent of the non-bearing trees. The rate of planting in proportion to



SOURCE Reference 6, 7, and 16

**Fig. 7.—Yields of apples per bearing tree, selected states, 1919-1953.**

Ohio yields are below those of New York, Virginia, and Michigan. Yields in all states appear to be near the peak of a cycle at the present time.

bearing trees was about three times as great among the small as among the large growers. At first glance these factors would indicate an increase in the importance of the small grower. A comparison with the 1940 census data, the only other census available showing grower size suggests that the under 100 tree producer is declining in importance in spite of this higher than average rate of plantings. Between 1940 and 1950 the proportion of production by the smallest group of producers declined from 19 to 11 percent of the total. For the same period, the proportion of non-bearing trees for this group of growers declined from 63 to 59 percent of the total, and bearing trees declined from 33 to 31 percent of the total. Between 1925 and 1950 the proportion of total bearing trees from this group of producers apparently declined from approximately 75 percent to the present 31 percent of all bearing trees.<sup>3</sup> The importance of the 100-199 tree grower is declining about as rapidly as that of the smaller growers, while the 200-999 tree producers are about holding their own. The largest group over (1000 trees) is the only one increasing in importance.

Not only are these small producers inefficient in maintaining bearing tree numbers (plantings three times that of the large growers) but they are not obtaining yields comparable with those of the larger producers. In 1950 these small growers were getting only about one-fourth the yield per tree of the over 1000 tree grower. The advantage of the larger grower increased greatly between the two censuses. While the yields of the smaller growers actually declined between 1940 and 1950 those of the larger growers increased by about one-third. The same trend was apparent among growers of different size in Ohio as in the United States, although the changes were smaller.

Apparently the same factors that cause tree mortality in the smaller orchards of approximately three times that of the larger producers also cause low yields. The under 1000 tree producers are at a disadvantage with those larger than this both in yield and tree mortality. In addition to this, modern machinery and equipment favors the larger, efficient producer, over the smaller producer however efficient. It is likely that this trend towards larger production units will continue in apples as in other farm enterprises.

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<sup>3</sup>Reference 20.



**TABLE 1.—Percentage Distribution of Farms Reporting Apple Trees of Bearing Age, By Size of Grower, Selected States, 1949**

|                         | Trees per Farm |          |            |              | Total |
|-------------------------|----------------|----------|------------|--------------|-------|
|                         | Under 25       | 25 to 99 | 100 to 499 | 500 and over |       |
| Illinois . . . . .      | 93.8           | 3.7      | 1.5        | 1.0          | 100.0 |
| Indiana . . . . .       | 89.9           | 6.8      | 2.5        | .8           | 100.0 |
| Ohio . . . . .          | 81.9           | 11.9     | 4.8        | 1.6          | 100.0 |
| Virginia . . . . .      | 76.4           | 17.9     | 3.9        | 1.8          | 100.0 |
| Michigan . . . . .      | 74.7           | 15.7     | 6.9        | 2.7          | 100.0 |
| Pennsylvania . . . . .  | 74.4           | 19.1     | 5.0        | 1.5          | 100.0 |
| West Virginia . . . . . | 69.1           | 26.3     | 3.7        | .9           | 100.0 |
| New York . . . . .      | 65.5           | 15.3     | 12.8       | 6.4          | 100.0 |

Source: United States Census of Agriculture, 1950. Counties and State Economic Areas.

## V. TREE NUMBERS

Tree numbers and their age and condition are of the utmost importance to producers of tree fruits. As has been explained previously, such data as are available on this phase are less than adequate for a complete analysis. At this point however, it seems desirable to point out some of the factors affecting tree numbers and to suggest their use in interpreting such data as are available.

In the first place, bearing tree numbers for a particular year are determined by the ratio of tree plantings to tree removals in previous years. Both tree plantings and removals are affected by many economic as well as biological factors.

**Plantings:** Tree plantings are determined by apple growers on much the same basis as plantings of wheat or corn are determined by growers of these crops. The fact that the first apple crop is not harvested for six to ten years after planting may influence the timing of the growers response but not the over-all influence of basic economic factors. Apple tree planting rates are believed to vary depending on the following factors:

1. Profit outlook to growers. This is largely a result of apple prices in the current and immediate past period.

2. Abnormal removals. Plantings should tend to be higher after any period of abnormal removals whatever the cause.

- a. Due to economic conditions in an immediately preceding period.
- b. Due to weather, insect, disease, or other non-economic causes during the immediate or past period.

3. Time of planting of present orchards and bearing life of trees. The bearing life varies among producing areas from as low as 30 years, in some to 75 or more in other areas.

4. Another factor that is important in the use of census data is that about 60 percent of the plantings are in backyard orchards (under 100 trees). It is likely that the year to year rates of planting of these growers would be affected by somewhat different factors than would the commercial orchard plantings.

Annual data on tree plantings are not available for Ohio or the United States. However, beginning in 1910, bearing and non-bearing trees have been reported separately. By assuming a bearing age of eight years it is possible from these data to approximate plantings for each five year period since then and to estimate from these data what is likely to happen to bearing tree numbers during the immediately succeeding years.

**Removals:** Tree removals may be made because of economic considerations or natural causes.

Trees become marginal from a profit standpoint. Profit may be cut by overproduction of apples and consequent low prices. A decline in consumer acceptance of a particular variety or planting of a variety unsuited to the area may step up removals.

Increased value of orchard sites for other agricultural production or for urban development is a cause of orchard abandonment. Overproduction during several consecutive years appears to be due in part to heavy plantings in a previous period of high prices. While mistakes are constantly being made in the selection of site and variety, these are not believed to cause great differences in year to year removals except as they are influenced by economic factors. Age, climatic factors, insect, disease, and rodent injury are natural causes of tree removal. Such factors as the initial infestation of San Jose Scale or the build-up of the codling moth before adequate controls were available are examples of factors outside the control of growers.

This reasoning suggests that plantings will be low and removals high in periods of low profits while the reverse is true in periods of high profits. Such statistical evidence as is available shows this to be the case.

#### **A. TREES OF BEARING AGE**

The number of bearing trees in the U. S. increased until about 1900. A rapid decline followed from about 200 million trees in 1900 to about 39 million in 1950. (Figure J-Appendix). Ohio tree numbers decline from a high of about 13 million in 1900 to 2 million in 1950.

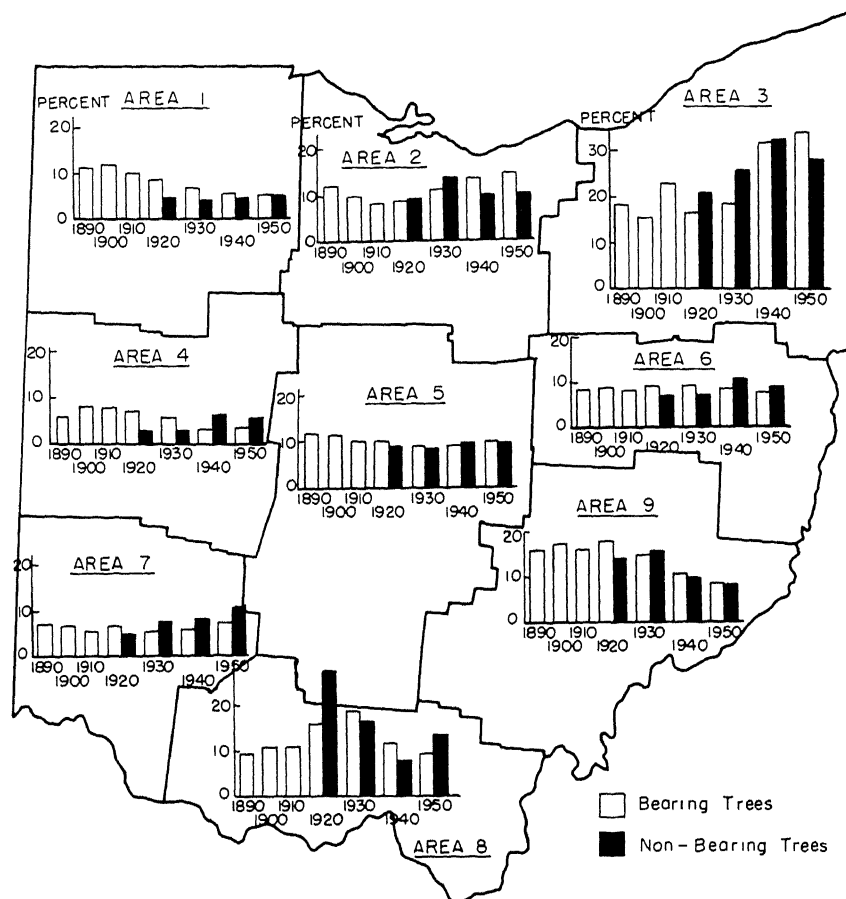
Trends in bearing tree numbers differed between the western and the other areas. In the western states, bearing tree numbers increased until about 1920 after which they declined as rapidly as those in the other areas. Between 1940 and 1950, however, the rate of decline in the Central States was much greater than that in the Western States. The trend in Ohio's bearing tree numbers followed rather closely that of the Central States.

Within Ohio some noticeable shifts have occurred in apple tree numbers among crop reporting districts. District 3 increased from about 16 percent of the state's bearing trees in 1899 to about 34 percent in 1949, while District 1 declined from about 12 percent to 5 percent during the same period (Figure 8). Districts 4 and 9 have also decreased in importance in the state while other areas have maintained about the same position from 1899 to 1949.

#### **B. TREES NOT OF BEARING AGE**

The number of non-bearing trees required for each 100 bearing trees to maintain an orchard at a given size varies among the major areas of production. In the Western States, fewer non-bearing trees are needed for each 100 bearing trees to maintain bearing acreage. Several reasons may help explain this fact. The most important are: (1) Favorable soil and climatic factors for longer tree life. (2) The principal variety planted in the area has continued to increase in market acceptance with consequently low rates of tree removals for varietal reasons. (3) Orchards in the area were planted since 1900 and have not needed replacing because of old age.

The rate of planting has varied widely among areas and years. The highest reported rate of planting in any geographic area was in the Western States before 1910 at which time there were 125 non-bearing



SOURCE: Reference 16

**Fig. 8.—Percentage distribution of apple trees in Ohio, by area, census years, 1890 to 1950.**

Area 3 has been increasing in relative importance of the states total apple trees, while Area 8 and 9 have been decreasing in relative importance.

trees for each 100 bearing trees. Since 1910, however, the rate of planting has been lowest in the western and highest in the central states (Table E-Appendix).

In the Eastern and Central States, including Ohio, approximately 40 non-bearing trees have been required per 100 bearing trees to maintain bearing tree numbers. In the Western States only half this rate of planting has apparently been sufficient to maintain acreage. This

figure includes all non-commercial and backyard growers as well as commercial growers, and as a result is much higher than it would be if only commercial growers were included. The commercial growers needs only about 25 non-bearing trees for each 100 bearing trees to maintain tree numbers at a given level. The under 100 tree grower apparently requires above 60 non-bearing trees for each 100 bearing trees to maintain tree numbers.

Since 1910 the number of non-bearing trees has declined for each succeeding census in each area of the United States, with the exception of the Western states, where more trees not of bearing age were reported in 1950 than in 1940 (Figure K-Appendix). However, the greatest percentage decline in non-bearing trees since 1910 has been in the West and the smallest in the Eastern states.

The ratio of bearing to non-bearing trees at the time of the 1950 census suggests that the non-commercial counties in Ohio and the non-commercial states are increasing their orchards whereas the commercial areas are not maintaining their orchards (Figures L and M-Appendix). However, in the non-commercial areas, the tree mortality rate is so high that even the extremely high rate of planting apparently is not maintaining bearing tree numbers. Since production is concentrated in the commercial areas and in the hands of larger commercial growers, any increases outside these areas will be relatively unimportant in the short run. The larger growers and the commercial areas are apparently increasing as contrasted with the non-commercial grower.

### **C. BEARING TREE ESTIMATES FOR 1955**

It appears that Ohio will have about 1,600,000 bearing trees in 1955 or a 27 percent decline from that in 1950. This estimate is based on past relationships of bearing to non-bearing trees. Similar conclusions are reached either by ignoring all factors other than the ratio of non-bearing to bearing trees in 1950 (Figure N-Appendix), or by the inclusion of estimates for removals as in Table F-Appendix. Removals are believed to have been abnormally high during the low price years 1950-1951 and 1952 and it is possible that not enough allowance has been made for this factor. To the extent that removals have been higher than estimated the estimated 1955 tree numbers are high. If the allowance of removals of 41 percent of 1950 bearing trees between 1950 and 1955 is too large the reverse will be true and the estimate is too low. Of the 1,600,000 million trees expected in 1955, the growers with over 1000 trees are expected to have 600,000 while the small producer with

less than 100 trees is expected to have only 400,000 trees. This is a decline of 18 percent for the commercial grower as compared to a 36 percent decline for the grower with less than 100 trees.

The United States is expected to have approximately 32,000,000 bearing trees in 1955 or 19 percent less than in 1950. All areas will contribute to this decline.

The Central states are expected to decline from the 15,000,000 to about 12,000,000 by 1955, while in the Eastern states a decline from 18,000,000 to about 15,000,000 trees as expected.

On the basis of the ratio of non-bearing to bearing trees in 1950 and assumptions that in 1945 a similar relationship existed, the Western states are expected to have an increase in bearing tree numbers. This increase is not expected until after 1955, however. Bearing trees for 1955 in the Western states are expected to be nearer to 6,000,000 than to 6,404,000 trees reported in 1950.

## **VI. PRICES**

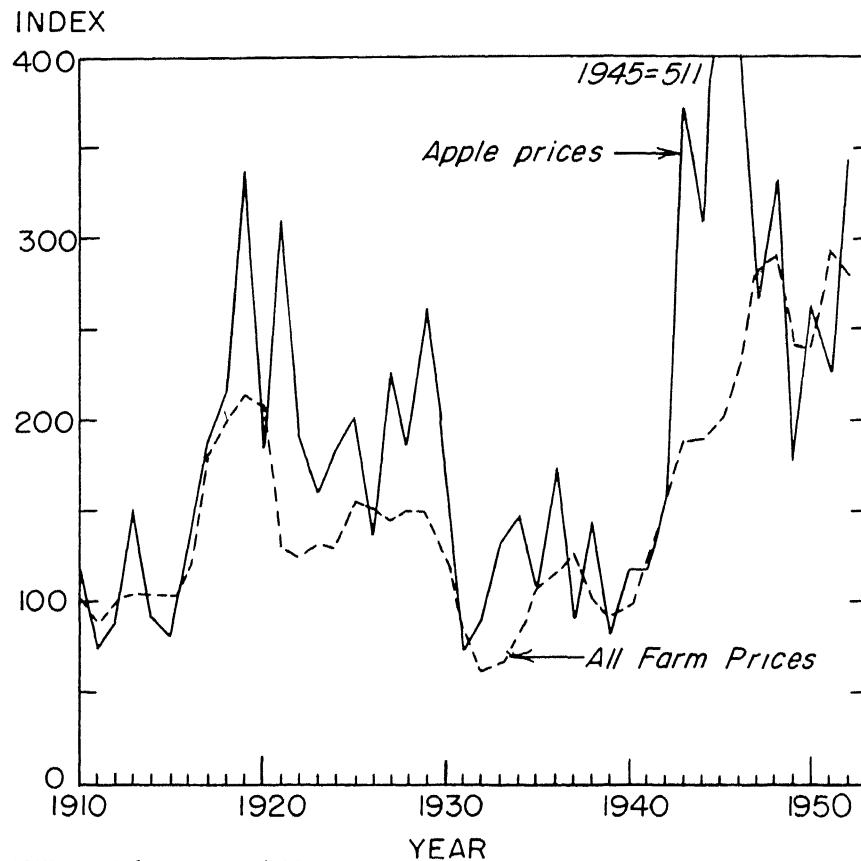
Prices are the most talked about part of the apple marketing process and probably the one about which the least can be done by growers or dealers. The price of apples fluctuates about the level of all farm prices (Figure 9). All farm prices fluctuate around the general level of all prices. Year to year price fluctuations in apple prices are associated very closely with fluctuation in the size of the apple crop. The largest commercial apple crop in Ohio was in 1937 and apple prices that year were the lowest on record when compared to all farm prices. The highest price of apples occurred in 1945 when the smallest commercial crop on record was harvested.

Of the factors affecting Ohio apple prices, the general level of all prices, the supply of apples in Ohio and the supply of apples in the entire United States are by far the most important. The levels of production of competing fruits and of other goods and exports and imports are also of some importance. The following sections will describe Ohio apple prices and various factors of interest and importance in interpreting these prices.

### **A. SUPPLY—PRICE RELATIONSHIPS**

The major factor, other than the general level of prices, affecting apple prices is the supply of apples. In the 44 year period between 1910-1953, there were only four years when a change in Ohio production from the previous year was not accompanied by an opposite change in Ohio apple prices (adjusted for the general price level).

The relationship between Ohio supply and price is shown in Figure O-Appendix).<sup>4</sup> This does not indicate that Ohio's supply of apples is



SOURCE: Reference 1 and 12

**Fig. 9.—Comparison of farm prices of Ohio apples and those of all farm products, 1910-1953, (1910-15-100).**

The major swings in Ohio apple prices have followed very closely the index of all Ohio farm prices. Year to year fluctuations in apple prices from those of all farm products are associated with the variations in the size of the apple crop.

<sup>4</sup>A first difference regression equation and computed by the use of logarithms of the percentage change in supply and price from the preceding year was employed to fit the curve in Figure 15—Appendix. Price was adjusted by wholesale price level.

The estimating equation was:

$$\text{Log } Y_c = \underset{(\log a)}{3.020935} - \underset{(\log b)}{.5136684} (\log X) + \underset{(\log c)}{.00150728} (\log X)^2$$

the only factor other than the level of all prices affecting the Ohio apple price. However, Ohio's production tends to vary in the same direction as does that in the Central and Eastern states and to a large extent the same as for the total United States. No significant improvement in the prediction of Ohio apple prices was obtained by the inclusion of United States supplies.

On the basis of the 43 year relationship of Ohio production to price, a crop of 150 percent of that for the preceding year would be expected to bring a price of about 80 percent of the preceding year (Table 2). A crop 50 percent as large as for the preceding year would bring a price of about 142 percent of that of the previous year. While these are average relationships and cannot be expected with certainty for any year, they do serve for purposes of predicting prices.

#### **B. TRENDS IN OHIO APPLE PRICES**

Farm prices of Ohio apples have generally been above those for the United States. However, there have been periods when the advantage was very small or as in the early 1940's when Ohio prices were below the United States average. At the present time the farm prices of apples in Ohio are just about the same as for the United States.

A major factor of importance in Ohio apple prices is the cyclical variation in prices that correspond with the size of the Ohio apple crop relative to the total United States crop. Only once during the past 42 years has the Ohio farm price of apples declined relative to that in the United States for as long as six years (Figure P-Appendix). If history is to be repeated, the trend in Ohio apple price relative to the national average should turn upward and continue to improve for the next 3-5 years. Whether this will happen depends on the trend in Ohio production as compared to that for the United States.

#### **C. DISTRICT PRICES IN OHIO**

Prices in different areas within Ohio showed variations similar to those observed when different parts of the United States were compared. The average price in a district varied from the state average depending upon production in the counties in each district, compared with the state as a whole.<sup>5</sup> Certain districts because of location,

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<sup>5</sup>Annual data are not available regarding district production. Data from the census from 1929 to date that confirm this relationship within the state are available but are not published because of the space required.



**TABLE 2.—Relationship Between Ohio Apple Price and Production, Expressing Each as a Percent of the Previous Year\***

| Production as a Percent<br>of Previous Year | Price as a Percent<br>of Previous Year |
|---------------------------------------------|----------------------------------------|
| (Percent)                                   | (Percent)                              |
| 30                                          | 184                                    |
| 50                                          | 142                                    |
| 70                                          | 120                                    |
| 90                                          | 106                                    |
| 100                                         | 100                                    |
| 120                                         | 92                                     |
| 140                                         | 85                                     |
| 160                                         | 78                                     |
| 180                                         | 74                                     |
| 200                                         | 70                                     |
| 250                                         | 63                                     |
| 300                                         | 58                                     |
| 350                                         | 53                                     |

\*Values from computed curve in Figure 24.

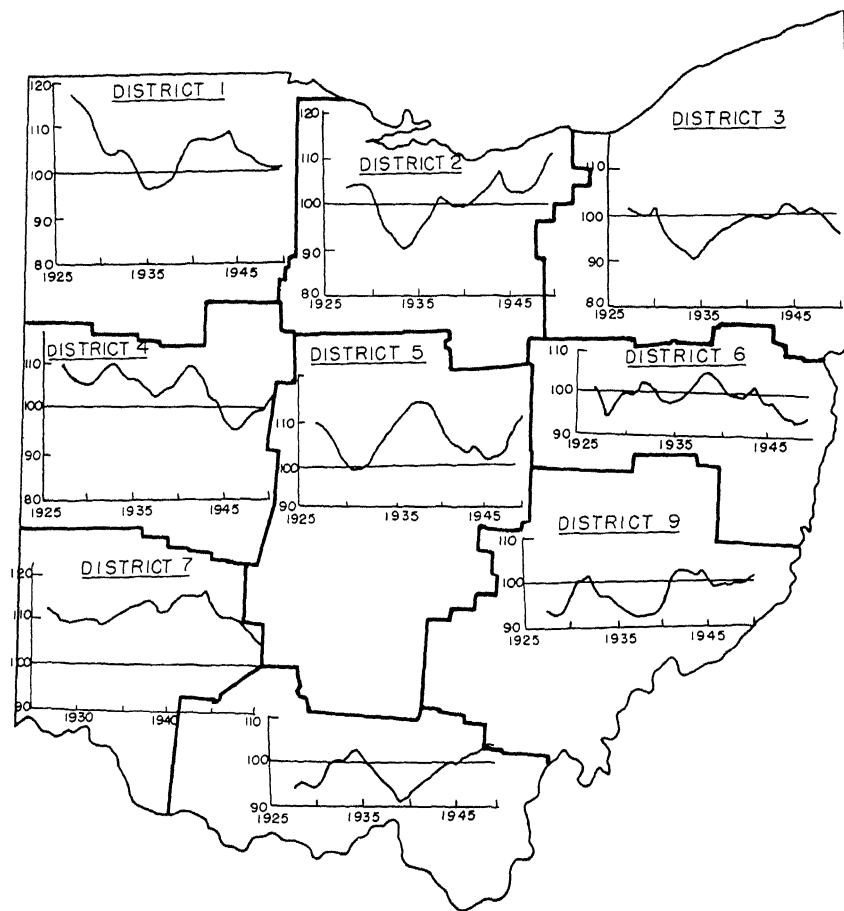
varietal or other conditions normally had higher prices than the average for the state, while other areas because of high production or other conditions had prices below the state average (Figure 10).

The areas whose prices have generally been above the state average are Districts 1, 4, 5, and 7. District 7 has consistently had the largest advantage over state prices. At the other extreme prices in Districts 3 and 9 have generally been below the state average. These are two of the centers of heavy production within the state. Prices in Districts 2, 6, and 8 have tended to fluctuate around the state average.

Besides certain areas being above or below state average there have been some appreciable trends in district prices as compared to state prices. The most noticeable of these has been the downward trend in prices in District 4 and the upward trend in District 2. Since 1935 prices in District 2 have increased from about ten percent below state average to ten percent above.

#### D. REGIONAL PRICE TRENDS

Apple prices in the eastern, central and western regions of the United States generally moved together and show the same trends as wholesale prices of all products (Figures Q and R-Appendix). They



SOURCE: Reference 19

**Fig. 10.—Farm apple prices by crop reporting districts as percent of the state average price, 1925-52.**

Districts 5 and 7 have had prices consistently above the state average while prices in districts 3 and 9 have consistently been below the state average.

reached their peak in 1945 when the level of all prices was high and when one of the smallest apple crops on record was produced. They reached their lowest levels in the 1930's when all United States prices were low and when apple production was large.

During recent years, apple prices in the western states have been increasing relative to those in the central and eastern states (Figure S-Appendix). The Western states fared poorest during depression

periods and best during the periods of high general levels of all prices. The Eastern and Central states have fared relatively better than the western states during the low prices and poorer during periods of high prices.

Ohio apple prices averaged the same as the United States average for the period 1949-52 (Figure T-Appendix). The price advantage of Ohio over several of the states shown is due to a combination of factors including closeness to market, high proportion of favored varieties and the high proportion of use as fresh fruit.

#### E. SEASONAL PRICE TRENDS

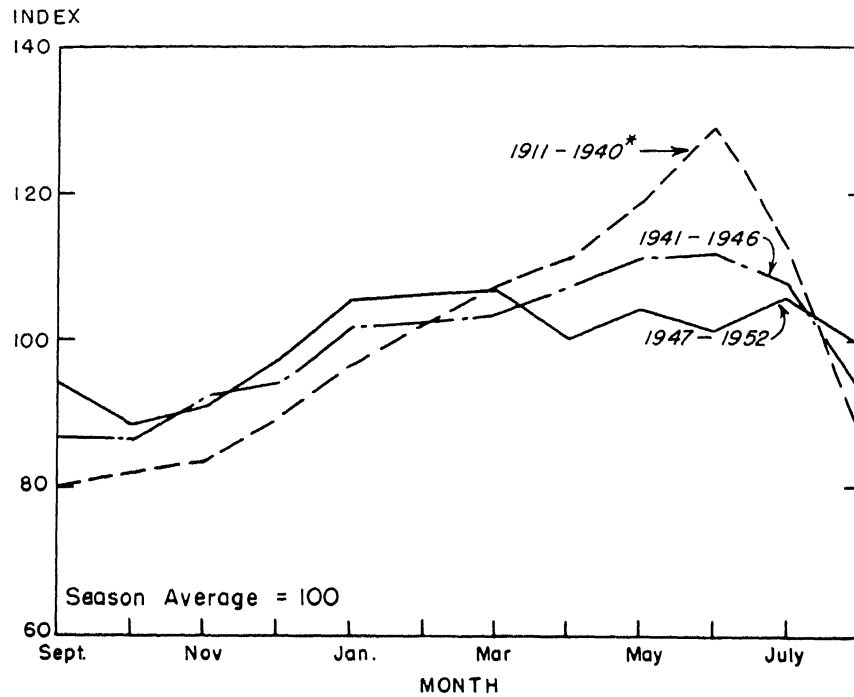
The seasonal variation in the price of apples is much less today than it was prior to 1940. For the period 1947 to 1952, the price rose from about 88 percent of the season average price in October to a peak in March of about 107 percent or a rise of only 19 points. In the 30 year period prior to 1940 the average price rise was from about 80 in October to a peak of 129 in June or a rise of 48 points from the low to high (Figure 11). A major portion of this difference occurs after March. Apparently the increase in the storage capacity relative to the Ohio apple crop has caused this seasonal index to level off. On the average there was little if any profit of a speculative nature from apple storage for the period 1947 to 1953. Any profit from storage under the recent seasonal price movement must come from advantages of more effective merchandising of higher quality apples. There probably is need for more farm cold storage capacity to replace the common storages now used, but building such storage with the expectations of speculative profits from the holding of apples appears unwarranted.

Considerable variation in seasonal apple price trends occurs for individual years (Figure U-Appendix). In two of the last six crops, 1947 and 1950, prices dropped sharply after reaching a peak in December or January. For the 1952 crop the peak was reached in February while for the 1948 and 1949 crops the top price was not reached until May.

The various varieties showed distinct seasonal price trends during the 1951-52 and the 1952-53 marketing season on the Cleveland market (Figure V-Appendix). Week to week variations among individual varieties were great but all tended to follow the "all apple" price trend. The McIntosh price increased more from harvest to December both years than other varieties. Most of this advantage in McIntosh price

increase had come by November 1. Early season sales of Delicious, McIntosh and Jonathan apples, generally offered considerable premiums. The sales of highly colored lots of these varieties very early in the harvest season have in some years brought higher prices than were reached at any period during the storage season. In part, however, this is a comparison of highly colored fruit with fruit having only average color.

From the available data it would appear that except for the very early price advantage of certain varieties, the principal consideration in whether to store or not would be the storing quality of the variety and the merchandising advantages possible through storage. Studies by



SOURCE: Reference 9 and 12

**Fig. 11.—Seasonal price of apples on Ohio farms, 1911-52.**

The seasonal increase in apple prices from harvest through storage has been less since World War II than prior to the war. Each ten year period from 1911 to 1940 showed a seasonal variation similar to that for 1911 to 1940.

Boger at Michigan State indicate that the general level of apple prices in the harvest period relative to the size of the crop and consumer demand is a major consideration for all varieties.<sup>6</sup> If the price in the fall is below that indicated by normal supply and demand considerations, it will generally pay to store. If above, it will generally pay to sell as soon as possible.

#### F. VARIETAL PRICE TRENDS

Since 1929 the price of Western boxed apples sold at auction and since 1934 the price of the principal varieties of eastern apples sold on the New York wholesale market have been reported annually.

Over the 17 year period, Eastern McIntosh averaged about the same in price as Delicious. However, there has been a decided decrease in the price of McIntosh from about 117 percent to 89 percent of the Delicious price (Figure W-Appendix). The prices of Baldwin and Northern Spy apples have both declined relative to the Delicious variety and average about 70 percent as great at the present. Duchess apple prices have shown an increasing trend although they still are considerably below the Delicious price.

While the above prices are comparisons in a market taking almost no Ohio apples, they reflect apple varietal price trend better than other available data.

For western apples on the New York auction, Golden Delicious prices have remained about the same as Delicious prices (Figure W-Appendix). Winesap prices have increased from about 85 percent to about the same level as Delicious. Another variety showing a fairly consistent price gain is the Rome Beauty. Jonathan also gained some on the Delicious price, up until 1944 although at the present time it is enjoying about the same relative position as it did in 1930.

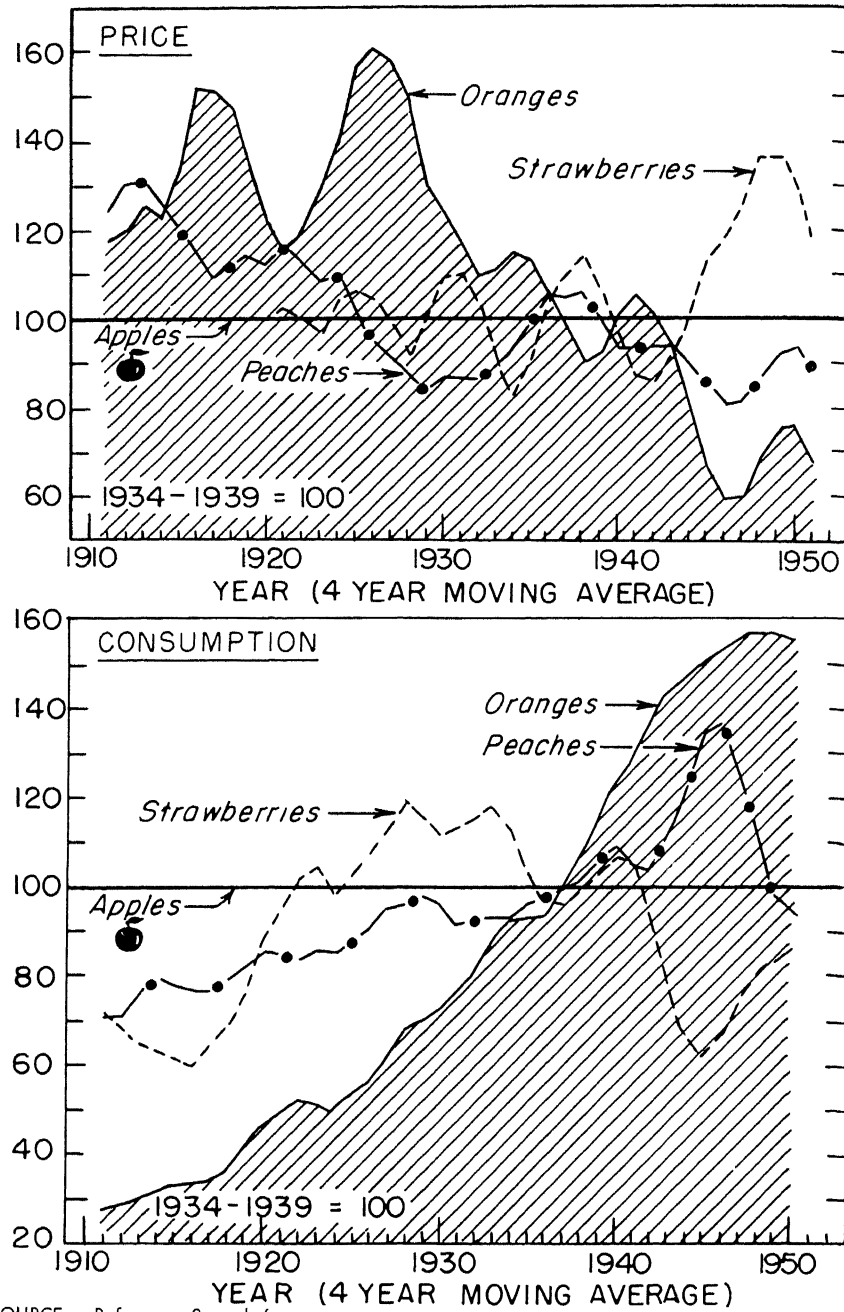
#### G. APPLE PRICES AND PRODUCTION COMPARED WITH THOSE OF SELECTED OTHER FRUITS

Farm prices of two of our most important fruits, oranges and peaches, have declined relative to those of apple during the period 1909 to 1953 (Figure 12). Orange prices have shown the largest decline and at the present time are only 70 percent of apple prices when compared with the 1934-1939 relationship between the two. Peach prices have had a less pronounced decline from 114 percent of apple prices

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<sup>6</sup>Reference 21.

PER CENT



SOURCE Reference 3 and 6

Fig. 12.—Relation of U. S. apple prices and consumption to those of selected competing fruits, 1909-1953.

Apple prices have been increasing relative to peach and orange prices and declining relative to strawberry prices. Consumption trends in these fruits have been just the opposite to those for prices. In other words, fruits whose prices have declined relative to apples have shown increased consumption while those whose prices increased compared with apples have shown a decreased consumption.

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prior to World War II, to 90 percent at the present time. Prices of another fruit, strawberries, have shown a tendency to hold their own or to increase relative to those of apples.

The causes for these different price trends among apples and competing fruits apparently lies in their production and consumption trends. While apples have declined in production and consumption, oranges and peaches have increased relative to apples (Figure 12). The only fruit with a decline in production comparable with that of apples is strawberries and the price of this fruit has not declined relative to apples.

As long as apple production declines relative to that of other fruits, apple prices will probably continue to increase relative to those of other fruits.

## VII. UTILIZATION

### A. UTILIZATION OF PRODUCTION

Per capita consumption of apples in the United States is only about half of what it was in 1910 (Figure 13). Less than 40 pounds of apples per person are consumed in the United States today compared with more than 70 pounds about 1910. This includes processed fruit (on a fresh fruit equivalent) as well as fresh fruit and is based on estimates of total, not commercial production.

About 75 percent of all the apples consumed are purchased as fresh apples (Figure X-Appendix). However, the importance of fresh apples has decreased since 1934 when they accounted for approximately 90 percent of the total consumption. Canned apple consumption has increased from about 5 percent of the total to about 15 percent at the present time. Dried apple consumption has decreased while juices and frozen consumption have increased slightly.

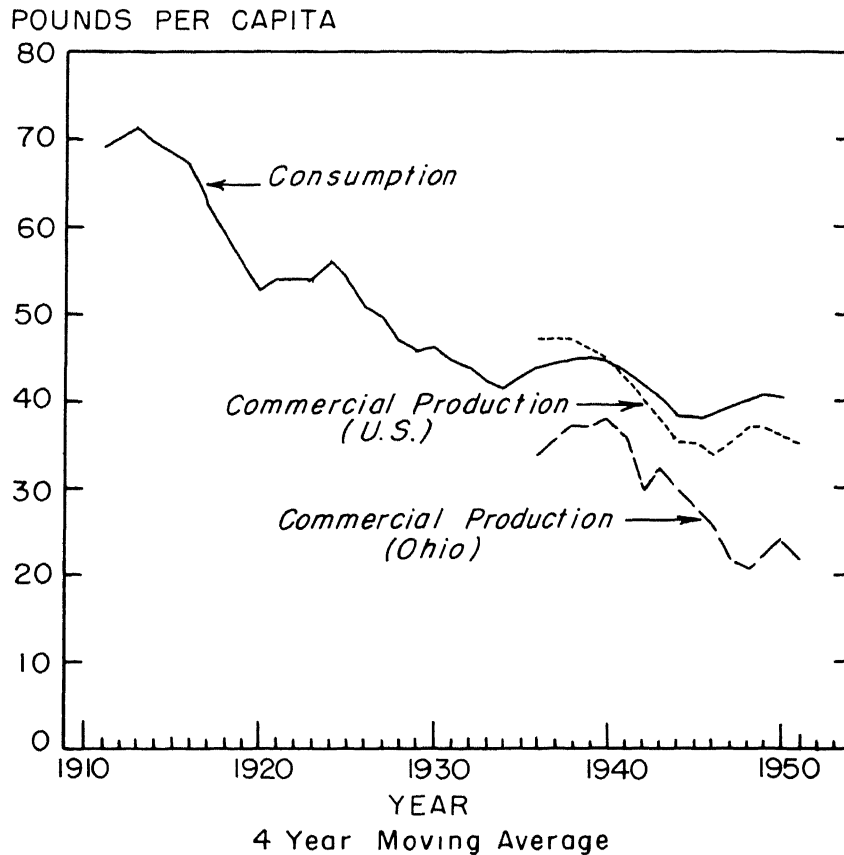
Commercial apple production per capita in the United States is about 35 pounds (Figure 13). The difference between the 38-40 lbs. consumed and the commercial production per capita is made up by non-commercial growers.

The distribution of the utilization of commercial production is much the same as the distribution of consumption into fresh, dried, canned, frozen, etc. About 70-75 percent of commercial production is

sold or used on farms as fresh apples, about 12 percent canned and the remainder going to frozen, or other distribution channels (Figure X-Appendix).

**B. BALANCE BETWEEN PRODUCTION AND CONSUMPTION**

Ohio is a deficit apple producing state with only about 20-25 lbs. of commercial apples produced per person, (Figure 13). This is 10 to 15 pounds less than the average consumption of apples in the United States.



SOURCE: Reference 4 and 6

**Fig. 13.—Per capita apple consumption in the U. S. and commercial apple production, U. S. and Ohio.**

Per capita apple consumption in the United States has declined from about 70 pounds in 1910 to about 40 pounds at the present time. Commercial apple production per capita in Ohio equals less than 25 pounds per person in Ohio.



The percent of Ohio's commercial crop which is sold varies from year to year depending largely upon the size of crop, (Figure Y-Appendix). In years of small crops, only about 70 to 75 percent of the crop is sold and the rest is used on farms where produced. In other years from 85 to 90 percent of the crop is sold. New York and Michigan sell about 95 percent of their commercial crop while practically all of the commercial apples produced in Washington are sold.

The fact that Ohio must annually import at least 10 to 15 pounds of apples per person or a total of 1½ to 2 million bushel (assuming Ohio's per capita consumption is the same as for the United States) indicates that Ohio growers have an advantage over growers in other states because of their proximity to areas of consumption. Effective methods of merchandising and marketing are necessary, however, if Ohio growers are to benefit fully from this advantage.

Unloading reports for the Cleveland market indicate that about 60 percent of the apples unloaded come from Washington, New York, and Michigan, while Ohio accounts for 20-25 percent of the total (Table 3). No other state accounts for more than 5 percent of the total. This gives a fairly good perspective of supplies going through normal retail sales channels. It is likely, however, that the importance of Ohio in supplying Cleveland consumers is much greater than this indicates since a large quantity of apples go directly from grower to retail stores and consumers.

**TABLE 3.—Carlot Unloads of Apples at Cleveland by Source, 1951 and 1952**

|               | 1951      |           | 1952      |           |
|---------------|-----------|-----------|-----------|-----------|
|               | (Carlots) | (Percent) | (Carlots) | (Percent) |
| Washington    | 304       | 32.7      | 213       | 21.0      |
| Ohio          | 223       | 24.1      | 227       | 22.4      |
| New York      | 162       | 17.5      | 178       | 17.6      |
| Michigan      | 73        | 7.9       | 224       | 22.1      |
| Canada        | 73        | 7.9       | 36        | 3.6       |
| West Virginia | 32        | 3.4       | 39        | 3.9       |
| Illinois      | 13        | 1.4       | 8         | .8        |
| Virginia      | 12        | 1.3       | 24        | 2.4       |
| Pennsylvania  | 9         | 1.0       | 23        | 2.3       |
| All others    | 26        | 2.8       | 39        | 3.9       |
| Total         | 927       | 100.0     | 1,011     | 100.0     |

Source: Reference 22

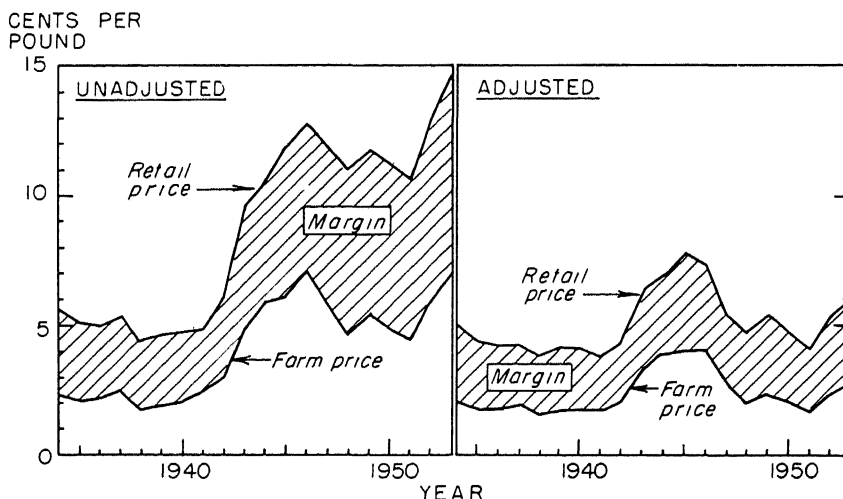
## VIII. FOREIGN TRADE

Exports of apples have fallen considerably since 1938. Prior to World War II, net exports (exports minus imports) amounted to 10 to 15 percent of total production (Figure Z-Appendix). At the present time net exports are only 1 to 2 percent of total production, and in 1948, imports of apples were actually greater than exports. Foreign trade has never regained the important position in the apple industry which it occupied during the 30's.

## IX. MARKETING MARGINS

Beginning with the 1934 season, annual estimates of marketing margins and retail prices of apples have been published by the U. S. Department of Agriculture.

During the period since 1934, farm prices, marketing margins and retail prices have more than doubled, (Figure 14). Most of the increase has been due to the increase in the level of all prices or the lessening value of the dollar (Table G-Appendix). However, comparisons after



SOURCE: Reference 13

**Fig. 14.—Farm prices, retail prices and marketing margin for fresh apples, actual and adjusted for the value of the dollar, 1934-53.**

The retail price of apples, as well as most consumer items, has more than doubled since 1939. If we adjust these prices for the decreased value of the dollar, the retail price is up only about 1 cent a pound or 25 percent. Of this increase about one-half has gone to the farmer and one-half to the marketing agencies.

adjusting for the value of the dollar show that farm apple prices have increased by about one-half cent a pound, marketing margins have increased about one-half cent and the retail apple price by one cent between the Post War II years and the latest five year period, (Figure 14). If we assume that 75 percent of the U. S. apple crop is sold as fresh fruit and that the one-half cent a pound increase applies to all such fresh fruit, the increase is approximately 18 million dollars for performing the apple marketing service.

These increases in farm prices and marketing margins result from increased services performed, failure to keep operating efficiencies abreast of increased labor, material and other costs and probably in part to increased profits to growers and marketers. The causes of these increases and their remedy deserve more study than they have received to date. The most recent study indicating farmer returns and the relative costs of the various operations involved in marketing apples in the Ohio marketing area and comparable to Ohio conditions was made in Pittsburgh during the 1949-50 apple season.<sup>7</sup> Some of the findings from this study which compared Appalachian grown Rome Beauty and Western grown apples follows:

**Growers Return**—The grower received \$0.84 per bushel delivered to the packing shed for Rome Beauty apples (Table 4). The average cost for delivery to the packing shed was \$0.05 per bushel leaving the grower \$0.79 for producing and harvesting the apples.

**Packing and Package**—At the packing shed, the packing charge was 45 cents for apples packed in the Northwestern-type apple box and 42 cents for bushel baskets or an average of 43 cents. Containers cost 33 cents for basket and lid and 43 cents for the Northwestern box with an average of 36 cents.

**Storage**—Cold storage costs, including moving into and out of storage, averaged 20 cents a bushel. These charges varied from 15 cents to 24 cents depending on the volume stored and the length of time held.

**Selling**—Approximately 55 percent of these Rome Beauty apples were sold by selling agents. The average charge was 12 cents a bushel for all eastern apples studied.

Except for container costs, wide variations existed among growers in the cost of the above operations. These variations resulted from

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<sup>7</sup>References 2 and 15.

differences in efficiencies in operations, variations in the amount and type of service performed and variations in the volume and bargaining power of growers.

**Transportation**—Average transportation costs to Pittsburgh were 20 cents a bushel from the Appalachian areas. Most of this shipment was by truck.

**Wholesale Distribution**—The average wholesale margin was 43 cents a bushel. Sixty-two percent of these apples were handled by wholesale merchants on a commission basis. The functions included in the wholesaling operation frequently included delivery to the retail store in addition to the terminal market operations.

**Retail Margins**—The average retail margin taken on Rome Beauty apples after allowing for waste was \$1.32 per bushel. In addition about 18 cents worth of apples were not salable for various reasons. This means that the gross retail margin was approximately \$1.50 per bushel. Much of this waste or unsalable fruit is due to factors beyond the control of the retailer.

These studies leave unanswered a question as to why the retailing and wholesaling charges made for the sale of eastern apples are greater per bushel than for the more costly western apples. This higher charge is found even after slightly larger waste for eastern apples is considered, (Table 4). There may be sound reasons for this higher charge but further analysis of why this occurs appears desirable.

**TABLE 4.—Marketing Margins and Grower Returns for Apples Sold in Pittsburgh, Pennsylvania, December, 1949—May, 1950\***

|                             | Dollars per Unit |              | Percent of Retail Price |             |
|-----------------------------|------------------|--------------|-------------------------|-------------|
|                             | Eastern Bushel†  | Western Box‡ | Eastern Bushel          | Western Box |
| Producing .....             | 0.84             | 1.23         | 22                      | 24          |
| Container .....             | .36              | .43          | 10                      | 8           |
| Shipping point services ... | .75              | .74          | 20                      | 15          |
| Transportation .....        | .20              | 1.12         | 5                       | 21          |
| Wholesaling .....           | .43              | .40          | 9                       | 8           |
| Retailing .....             | 1.32             | 1.20         | 34                      | 24          |
| Retail price .....          | 3.90             | 5.12         | 100                     | 100         |

\*Source: Reference 2 and 15.

†48 pounds gross less waste of 2.4 pounds during marketing. Retail is net cost after removing waste.

‡44 pounds gross less waste of 1.95 pounds during marketing.

## COMPARISONS OF MARGINS FOR EASTERN AND WESTERN APPLES

Western apples retailed for 12.3 cents per pound (\$5.12 per 44 pound box) compared with 8.0 cents a pound (\$3.73 a 48 pound bushel) for eastern apples. This difference in price was the cause of the greatest difference in the marketing of eastern and western apples. The most striking difference between the costs for marketing apples from the two sources was in the amounts of the transportation charges. Western apples required \$1.12 transportation per box while eastern apples required only \$0.20. Despite higher transportation charges the western grower received a higher price and a higher percent of the consumers apple dollar than the eastern grower.

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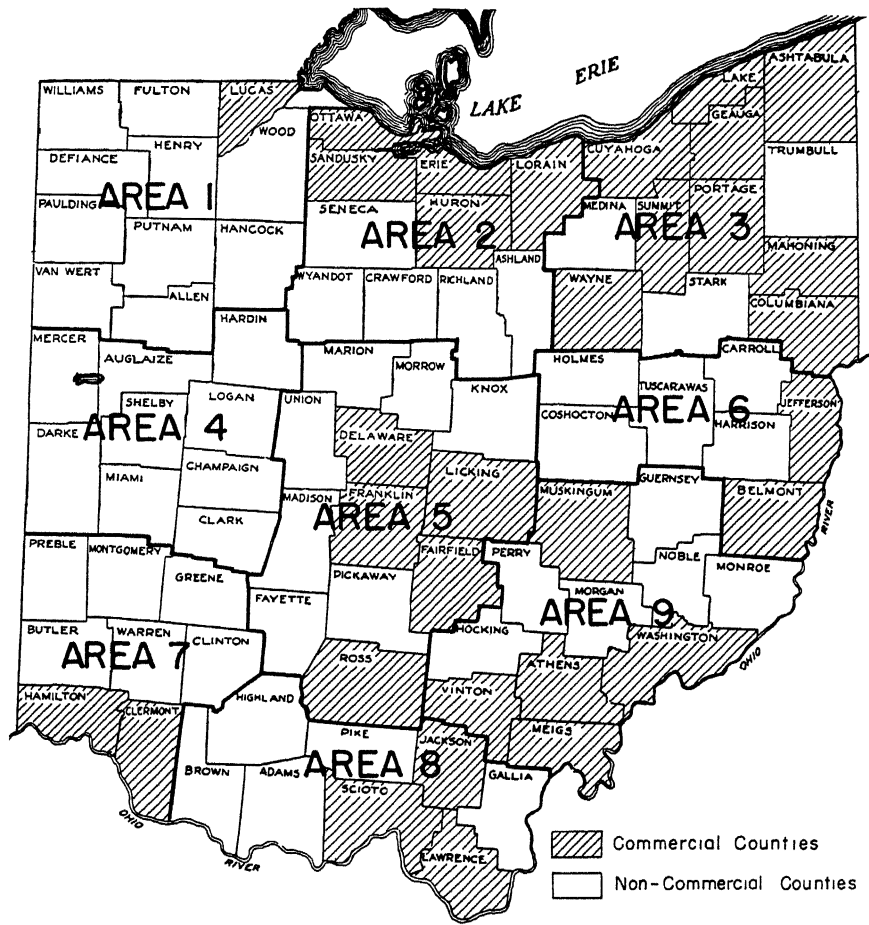
# **A P P E N D I X**

**CHARTS A TO Z (APPENDIX)**

**TABLES A TO M (APPENDIX)**



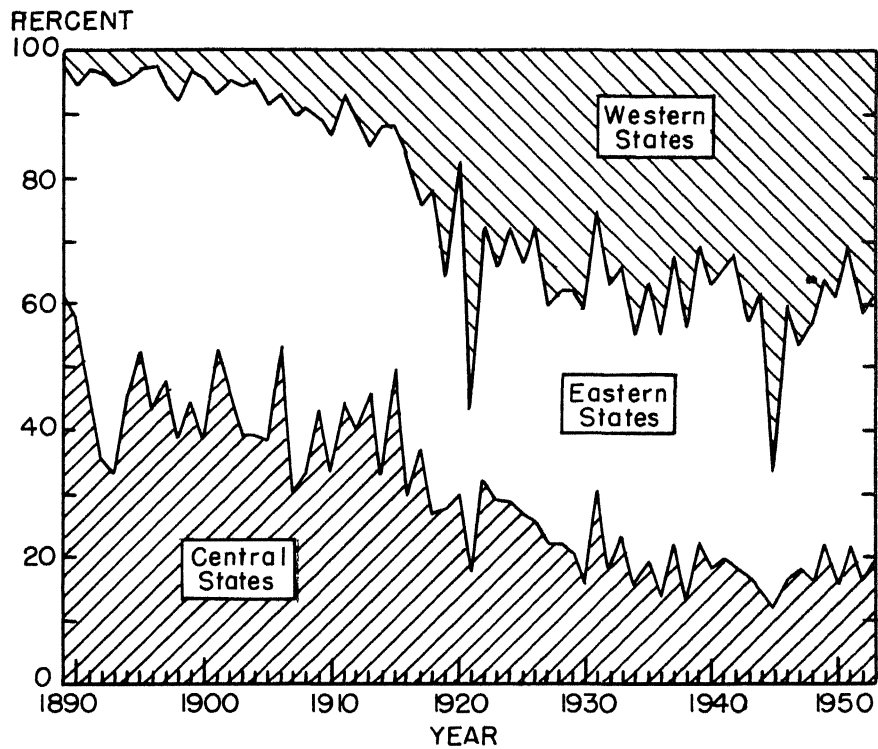




SOURCE: REFERENCE 19

FIGURE B - COMMERCIAL APPLE PRODUCING COUNTIES, OHIO, BY AREAS.

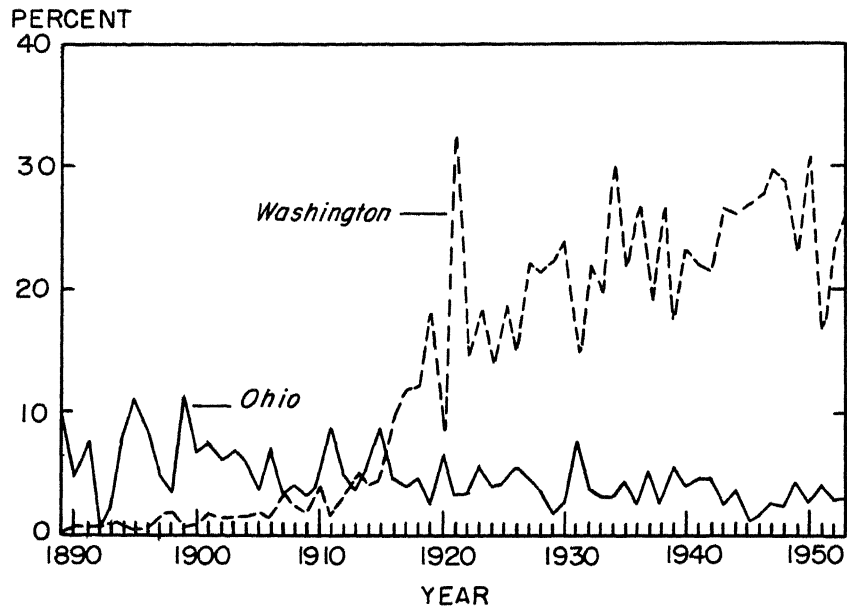
THESE AREAS ARE THE SAME AS THE CROP REPORTING DISTRICTS IN OHIO.



SOURCE: REFERENCE 6

FIGURE C - TRENDS IN THE PERCENT OF THE U.S. APPLE CROP PRODUCED IN EACH AREA, 1889 - 1953.

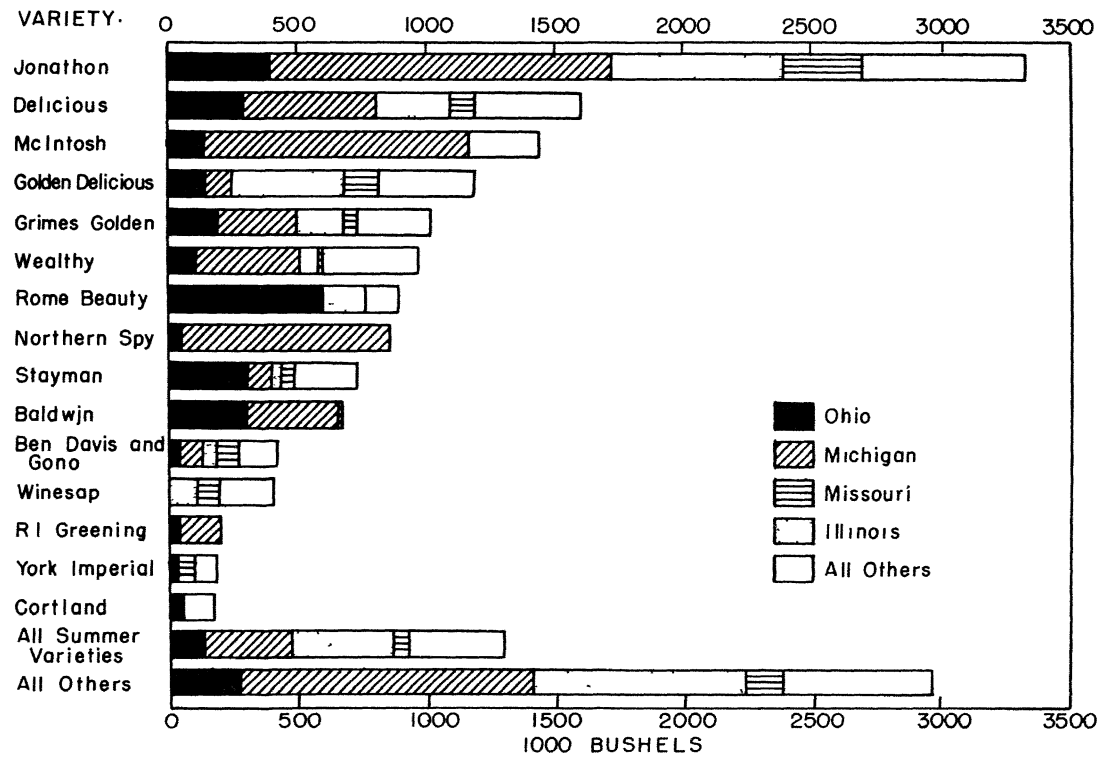
THE CENTRAL STATES HAVE DECREASED IN IMPORTANCE IN UNITED STATES APPLE PRODUCTION WHILE THE WESTERN STATES HAVE INCREASED IN IMPORTANCE AND THE EASTERN STATES HAVE PRETTY MUCH HELD THEIR OWN. VERY LITTLE CHANGE IN THE RELATIVE IMPORTANCE OF THE DIFFERENT AREAS HAS OCCURED SINCE 1930.



SOURCE: REFERENCE 6

FIGURE D - TRENDS IN PERCENT OF U.S. APPLE CROP PRODUCED IN OHIO AND WASHINGTON, 1889 - 1953.

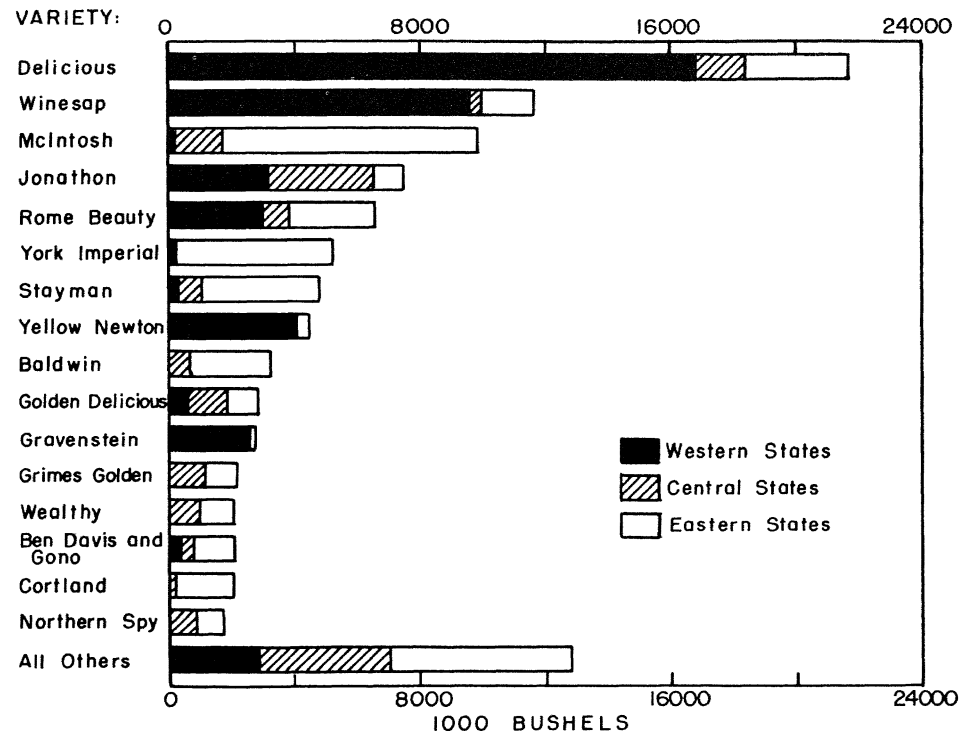
SINCE 1889 OHIO'S APPLE PRODUCTION HAS DECLINED FROM ABOUT SEVEN PERCENT TO ABOUT THREE PERCENT OF THE U.S. TOTAL WHILE THAT IN WASHINGTON HAS INCREASED FROM LESS THAN ONE PERCENT TO OVER 25 PERCENT OF THE U.S. TOTAL.



SOURCE: REFERENCE 6

FIGURE E - COMMERCIAL APPLE PRODUCT IN CENTRAL STATES BY VARIETIES, 1943-52 AVERAGE.

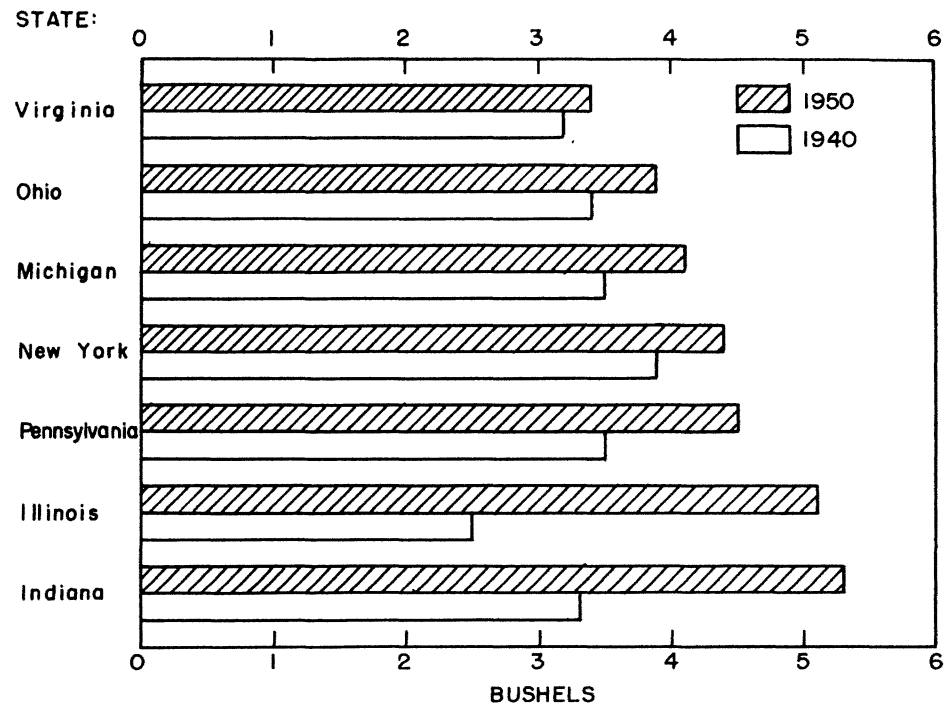
JONATHAN IS BY FAR THE LEADING VARIETY IN THE CENTRAL STATES, WITH MICHIGAN THE LEADING PRODUCER. OHIO PRODUCES TWO-THIRDS OF ALL ROME BEAUTY APPLES COMPARED WITH 17% OF ALL VARIETIES PRODUCED IN THE CENTRAL STATES.



SOURCE: REFERENCE 6

FIGURE F - COMMERCIAL APPLE PRODUCTION, UNITED STATES BY VARIETIES, 10 YEAR AVERAGE, 1943 TO 1952.

DELICIOUS IS THE LEADING APPLE VARIETY IN THE UNITED STATES, WITH THE WESTERN STATES ACCOUNTING FOR OVER THREE-FOURTHS OF ITS PRODUCTION.

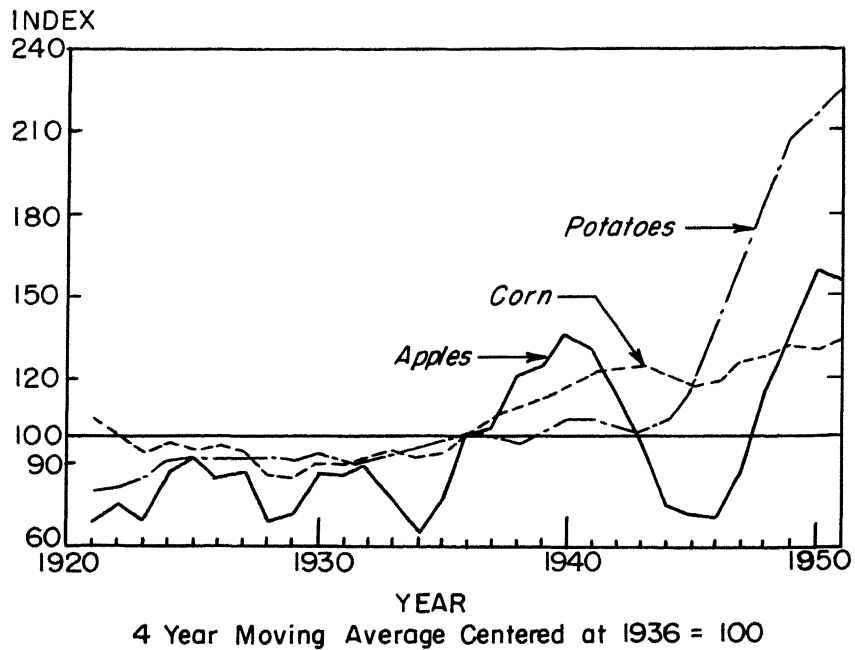


SOURCE: REFERENCE 16

UNITED STATES CENSUS OF AGRICULTURE 1940 AND 1950.

FIGURE G - YIELD PER BEARING TREE FOR GROWERS WITH 1000 TREES OR MORE, SELECTED STATES, CENSUSES OF 1940 AND 1950.

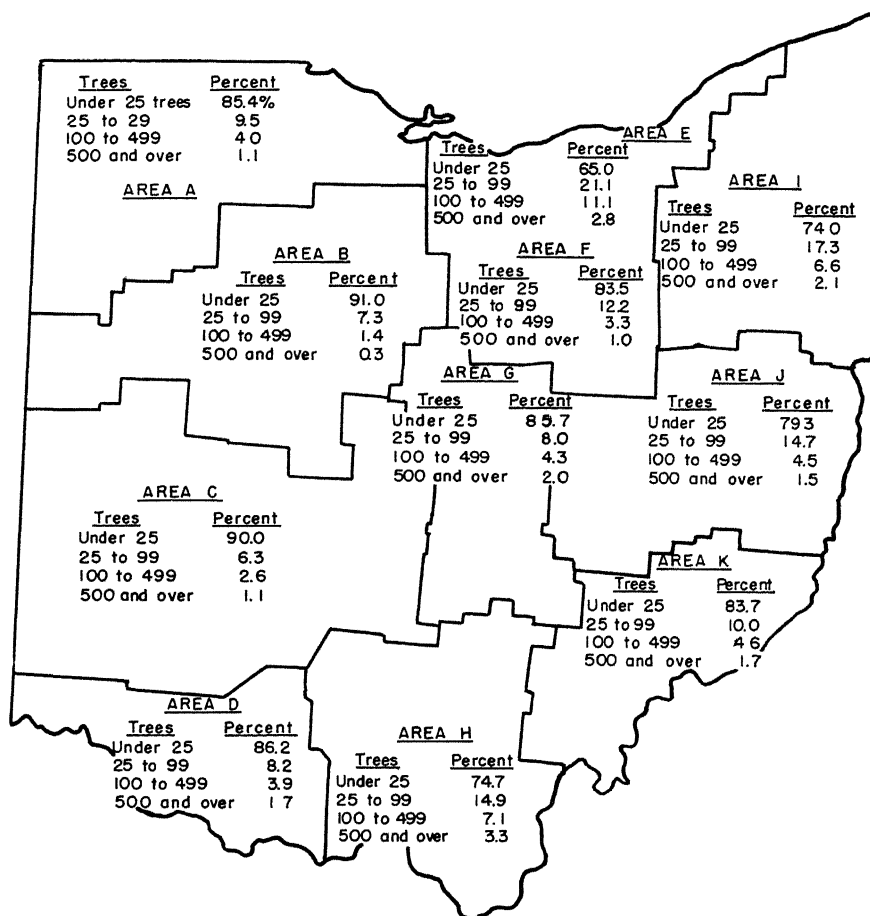
THERE IS LESS DIFFERENCE IN YIELDS OF LARGE GROWERS IN OHIO AND OTHER STATES THAN BETWEEN YIELDS OF AVERAGE GROWERS.



SOURCE: REFERENCE 6, 7, AND 12

FIGURE H - YIELDS OF SELECTED OHIO CROPS, 1919-53.

ALTHOUGH OHIO APPLE YIELDS ARE MORE VARIABLE THAN THOSE OF CORN OR POTATOES, THE APPLE YIELD INCREASES SINCE 1920 COMPARE FAVORABLY WITH THOSE FOR CORN.

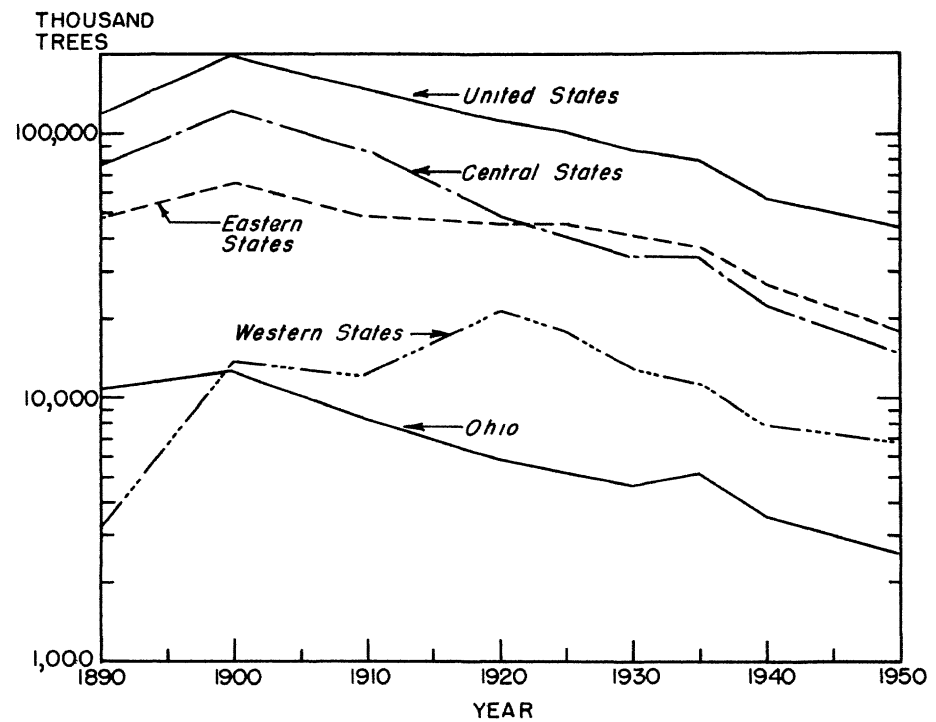


SOURCE: REFERENCE 18

FIGURE 1 - PERCENTAGE OF FARMS REPORTING DIFFERENT NUMBERS OF TREES OF BEARING AGE PER FARM BY CENSUS ECONOMIC AREAS, OHIO 1950.

THE SMALL GROWERS (UNDER 25 TREES) MAKE UP A LARGER PERCENT OF THE TOTAL GROWERS IN THE WESTERN PART OF THE STATE THAN IN THE NORTHEASTERN PART WHERE THE GREATER PART OF OHIO'S APPLE PRODUCTION IS CONCENTRATED.

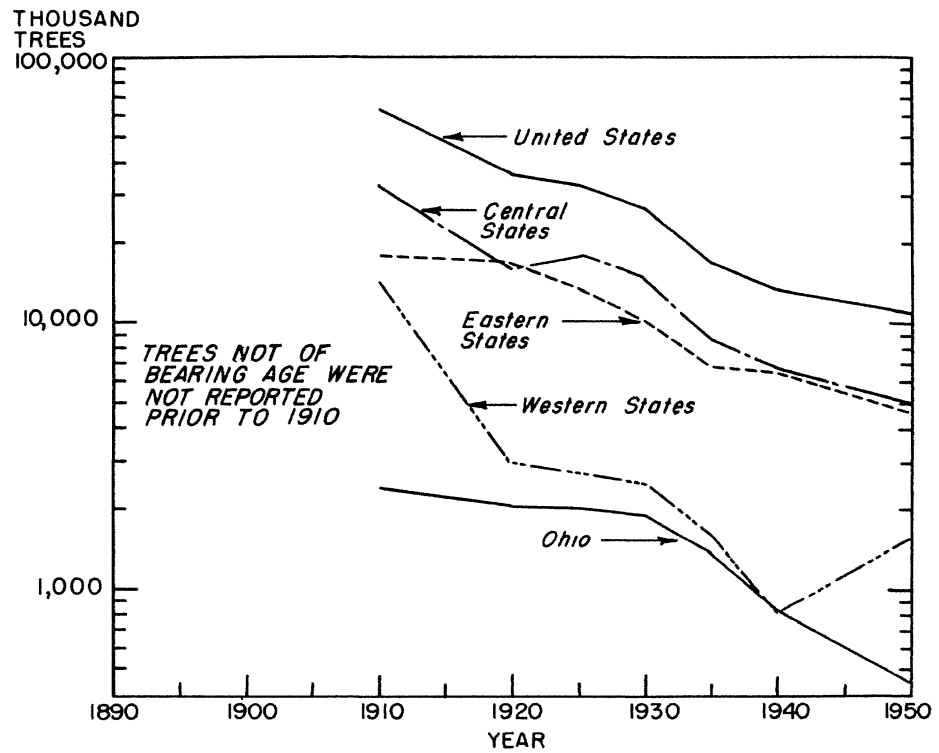




SOURCE: REFERENCE 16

FIGURE J - APPLE TREES OF BEARING AGE, SELECTED AREAS AND OHIO, CENSUS YEARS 1890 - 1950.

BEARING TREE NUMBERS HAVE DECLINED SINCE 1900 IN THE CENTRAL AND EASTERN AREAS OF THE UNITED STATES AND SINCE 1920 IN THE WESTERN STATES.



SOURCE: REFERENCE 16

FIGURE K - APPLE TREES NOT OF BEARING AGE, SELECTED AREAS AND OHIO, CENSUS YEARS 1910 - 50.

NON-BEARING TREE NUMBERS HAVE DECLINED SINCE 1910 IN ALL AREAS OF THE UNITED STATES.

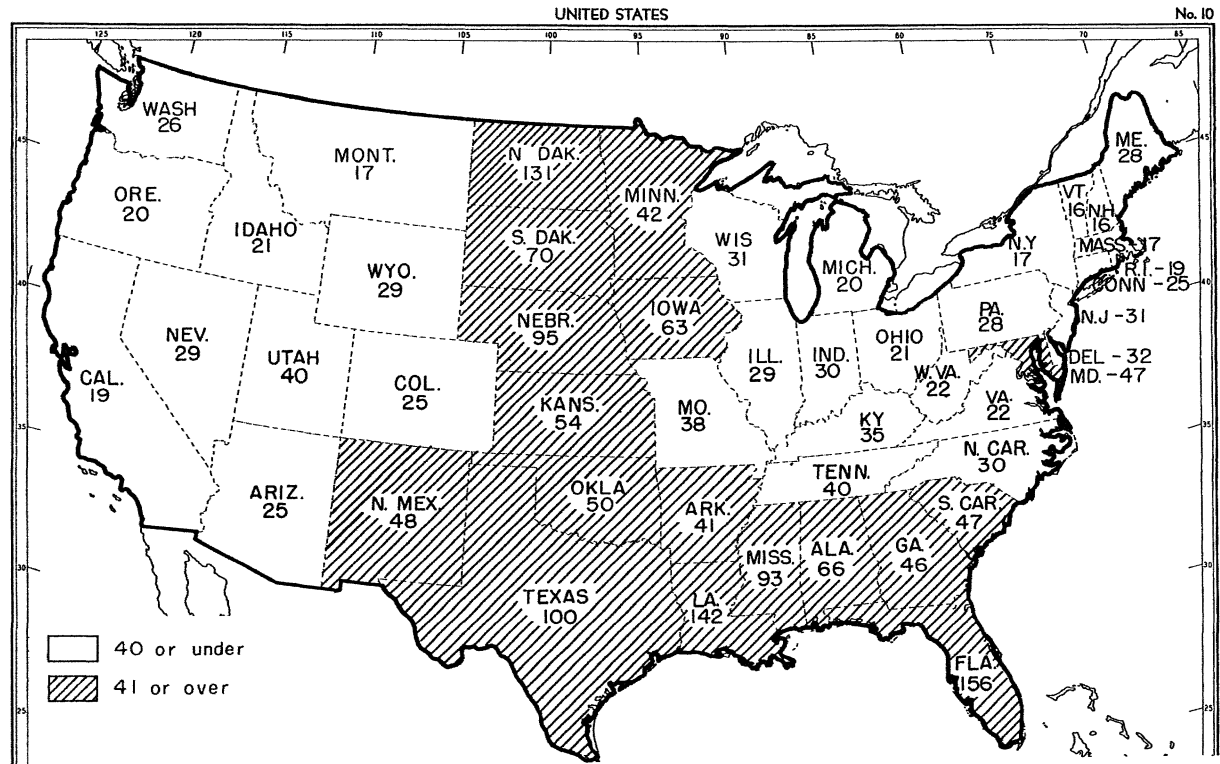
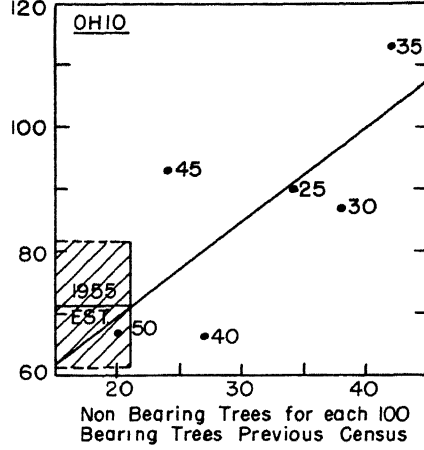


FIGURE L - TREES NOT OF BEARING AGE FOR EACH 100 TREES OF BEARING AGE, 1949 CENSUS.

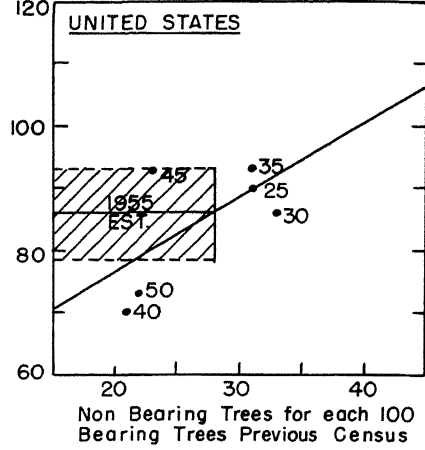
NON-BEARING TREE NUMBERS ARE HIGHER IN THE NON-COMMERCIAL THAN IN MAJOR COMMERCIAL APPLE PRODUCING STATES.



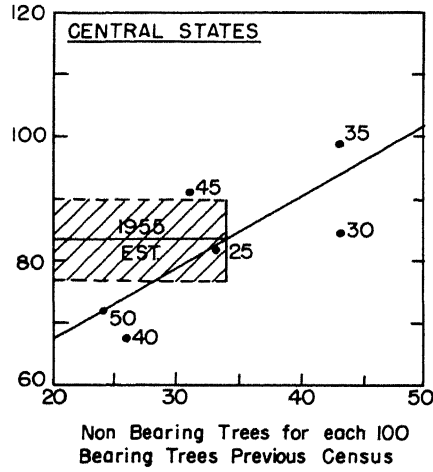
Bearing Trees -% of Previous Census



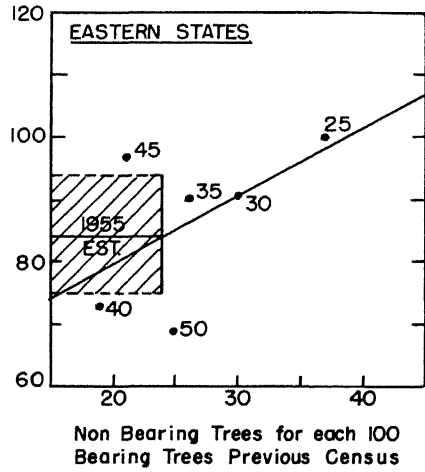
Bearing Trees -% of Previous Census



Bearing Trees -% of Previous Census



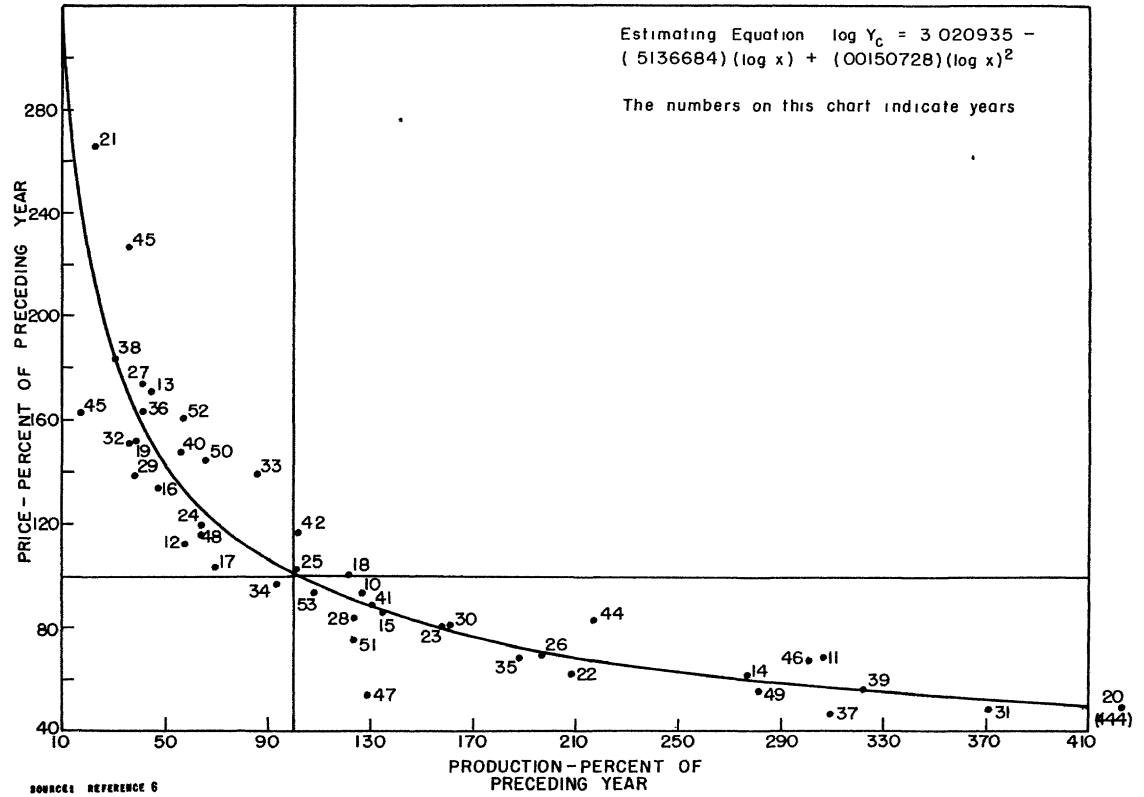
Bearing Trees -% of Previous Census



SOURCE: REFERENCE 16

FIGURE N - ESTIMATED CHANGE IN BEARING TREE NUMBERS BETWEEN 1950 TO 1955 CENSUS IN SELECTED AREAS.

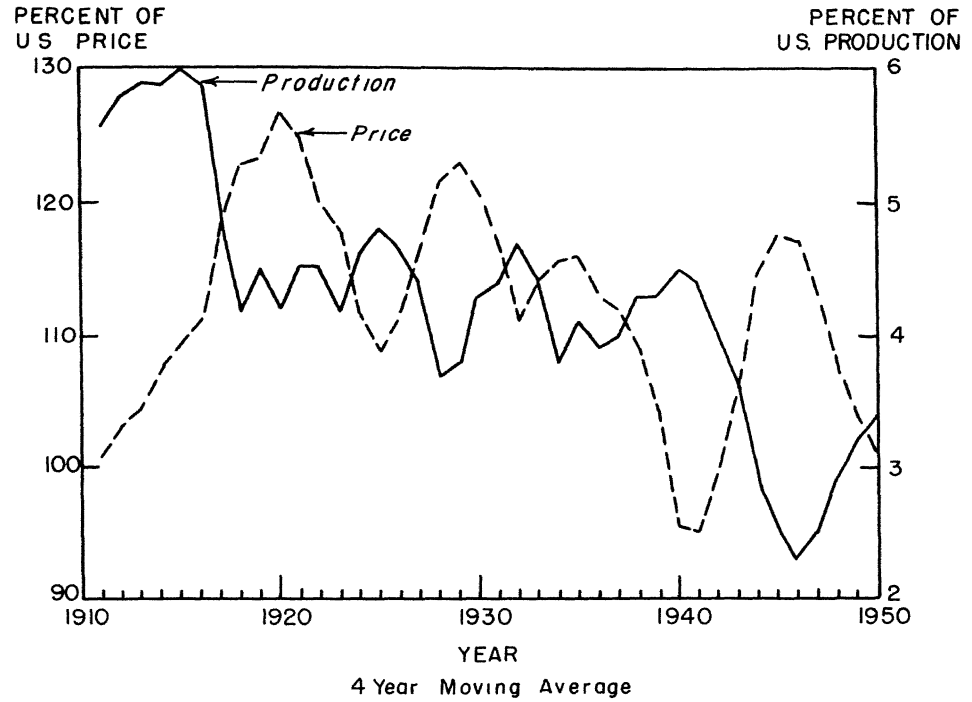
THE RATIO OF BEARING TO NON-BEARING TREES FOR ONE CENSUS IS RELATED TO CHANGES IN BEARING TREE NUMBERS FROM THE CURRENT TO THE FOLLOWING CENSUS.



SOURCE: REFERENCE 6

FIGURE 0 - OHIO APPLE PRODUCTION AND FARM PRICE, EXPRESSED AS A PERCENT OF THE PRECEDING YEAR, 1910 - 1953.

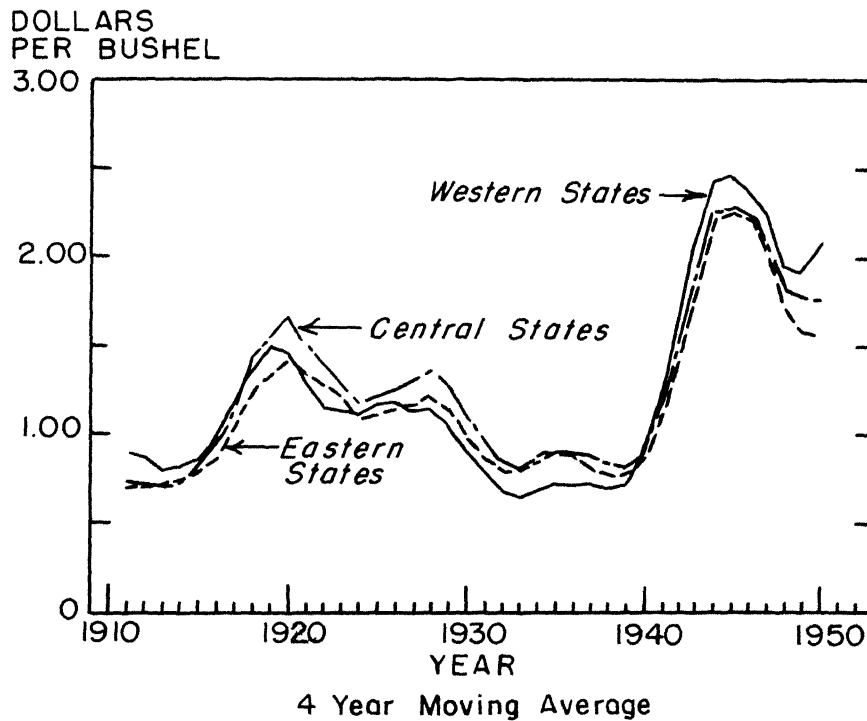
IN 38 OF THE PAST 44 YEARS, A CHANGE IN THE OHIO SUPPLY OF APPLES HAS RESULTED IN AN OPPOSITE CHANGE IN PRICE.



SOURCE: REFERENCE 6

FIGURE P - OHIO FARM PRICE OF APPLES AND PRODUCTION OF APPLES AS A PERCENTAGE OF U. S. PRICE AND PRODUCTION, 1909-52.

THERE IS A CYCLICAL VARIATION IN OHIO APPLE PRODUCTION OF 6-10 YEARS IN LENGTH COMPARED WITH U.S. PRODUCTION. THE OHIO PRICE COMPARED WITH U.S. PRICE VARIES INVERSELY WITH PRODUCTION. AT THE PRESENT TIME, OHIO PRODUCTION IS RELATIVELY HIGH AND PRICE LOW COMPARED WITH THE U.S.



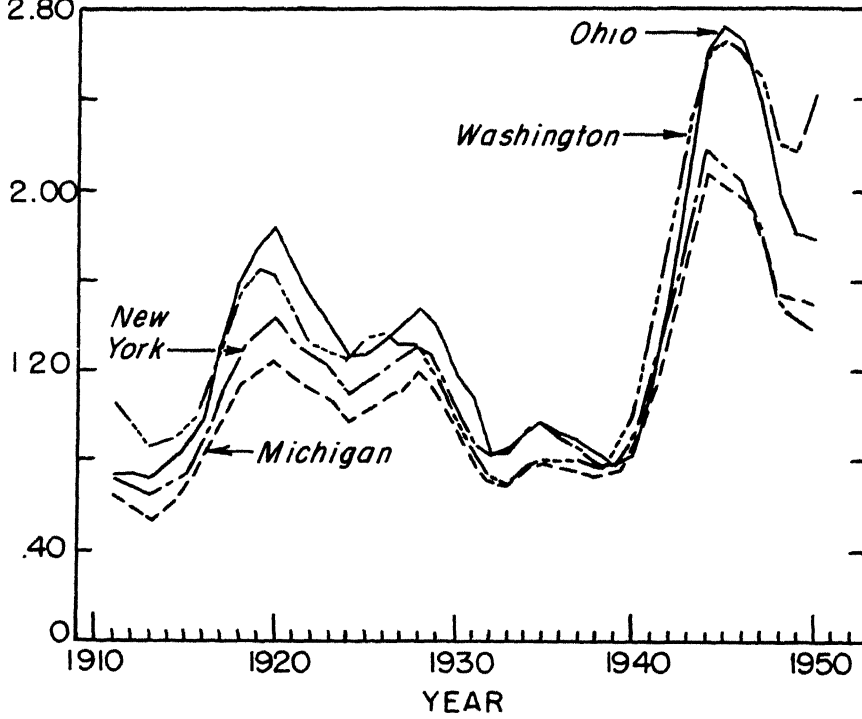
SOURCE: REFERENCE 6

FIGURE Q - FARM PRICES OF APPLES IN SELECTED AREAS, 1909 - 53.

PRICES IN ALL AREAS HAVE FOLLOWED THE LEVEL OF ALL FARM PRICES IN THE UNITED STATES. IN RECENT YEARS PRICES IN THE WESTERN STATES HAVE BEEN RELATIVELY FAVORABLE.



DOLLARS  
PER BUSHEL  
2.80

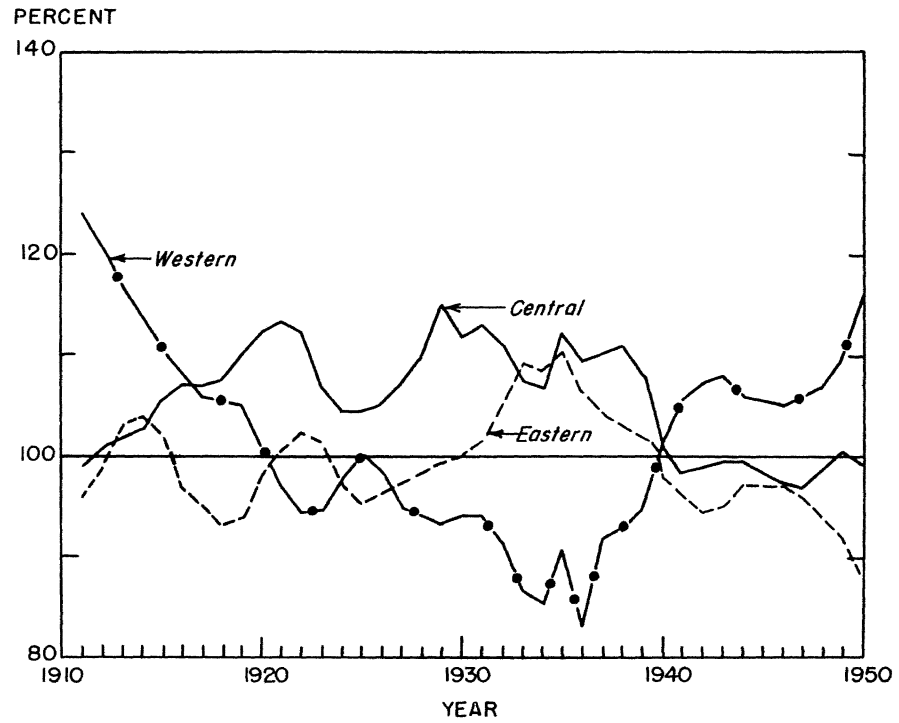


4 Year Moving Average

SOURCE: REFERENCE 6

FIGURE R - FARM PRICES OF APPLES IN OHIO AND  
SELECTED STATES, 1909 -53.

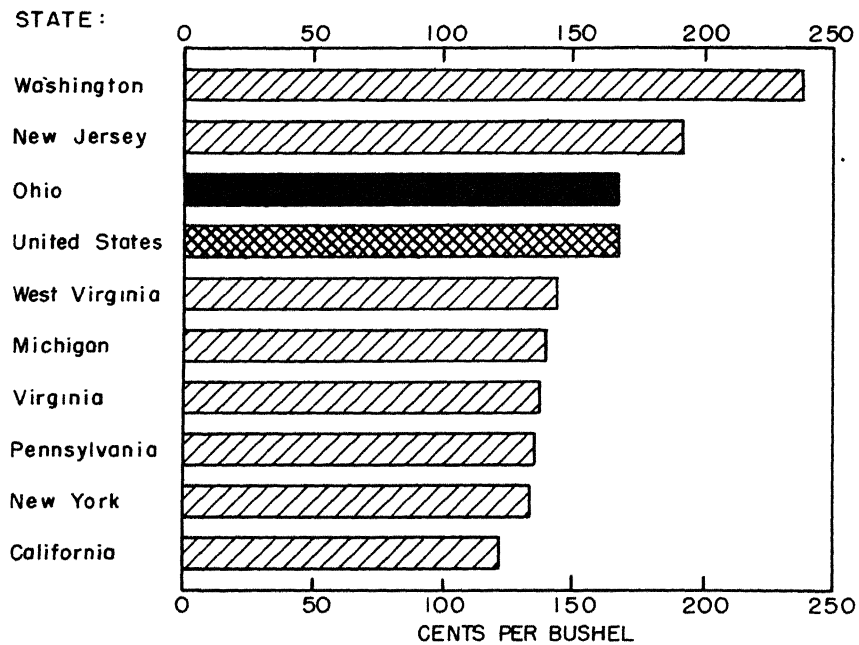
PRICES IN OHIO AND WASHINGTON HAVE BEEN RELATIVELY MORE FAVORABLE IN  
RECENT THAN EARLIER YEARS WHEN COMPARED WITH THOSE IN MICHIGAN AND NEW  
YORK.



SOURCE: REFERENCE 6

FIGURE 5 - FARM PRICE OF PEACHES AS A PERCENT OF U.S. PRICE, SELECTED AREAS, 1910 TO 1953.

THE MAJOR VARIATION IN MOVEMENT AMONG AREAS HAS BEEN ASSOCIATED WITH THE PRICE LEVEL WITH THE CENTRAL AND EASTERN STATES HAVING RELATIVELY FAVORABLE PRICES DURING THE LOW PRICE PERIOD OF THE 1930'S WITH LOW PRICES FOR THE WESTERN STATES. THE REVERSE APPEARS IN THE 1940'S.



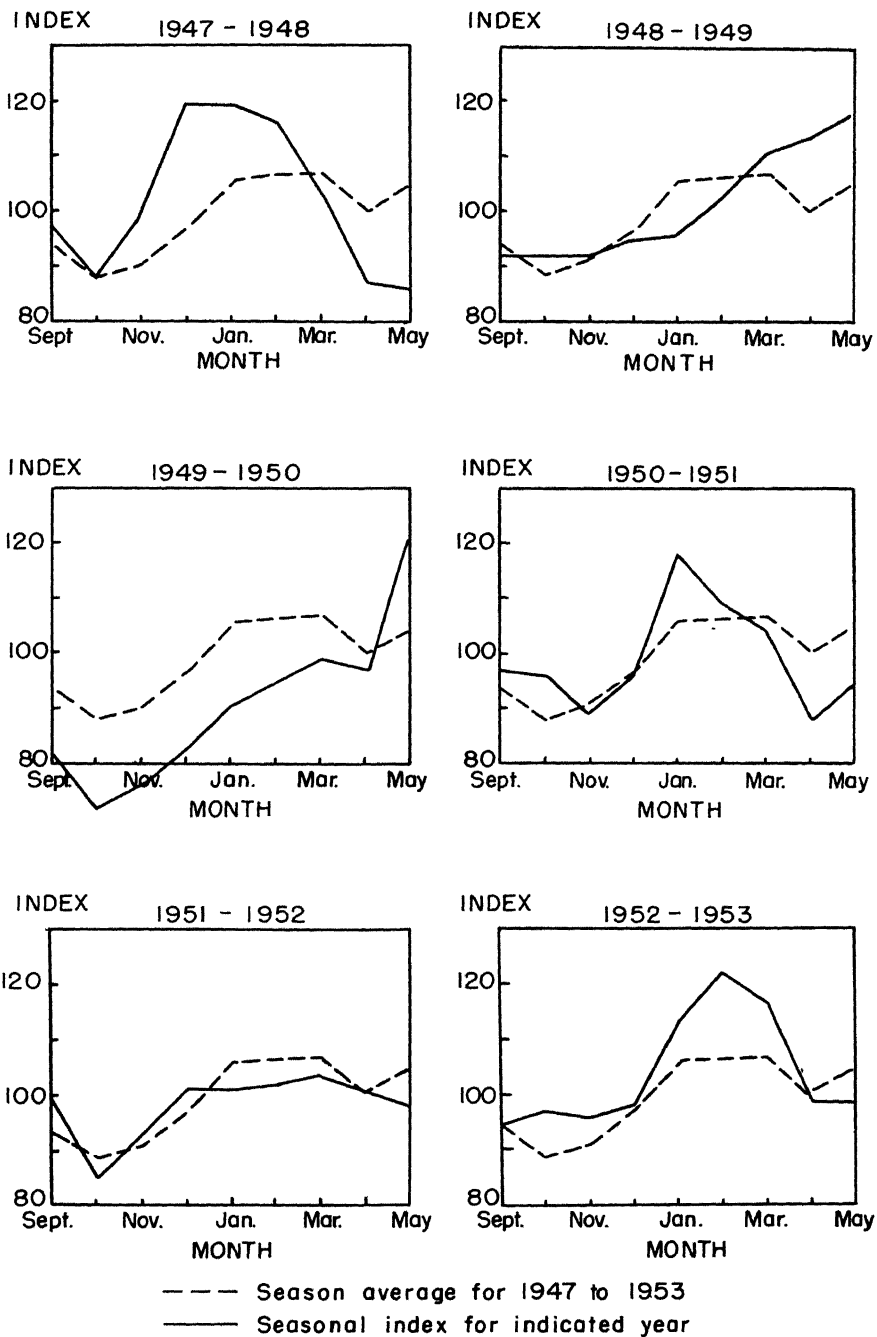
SOURCE: REFERENCE 6

\*

FIGURE T - FARM PRICE OF APPLES IN OHIO AND SELECTED STATES, 1949 - 1952.

\* 4 YEAR AVERAGE WEIGHED BY PRODUCTION.

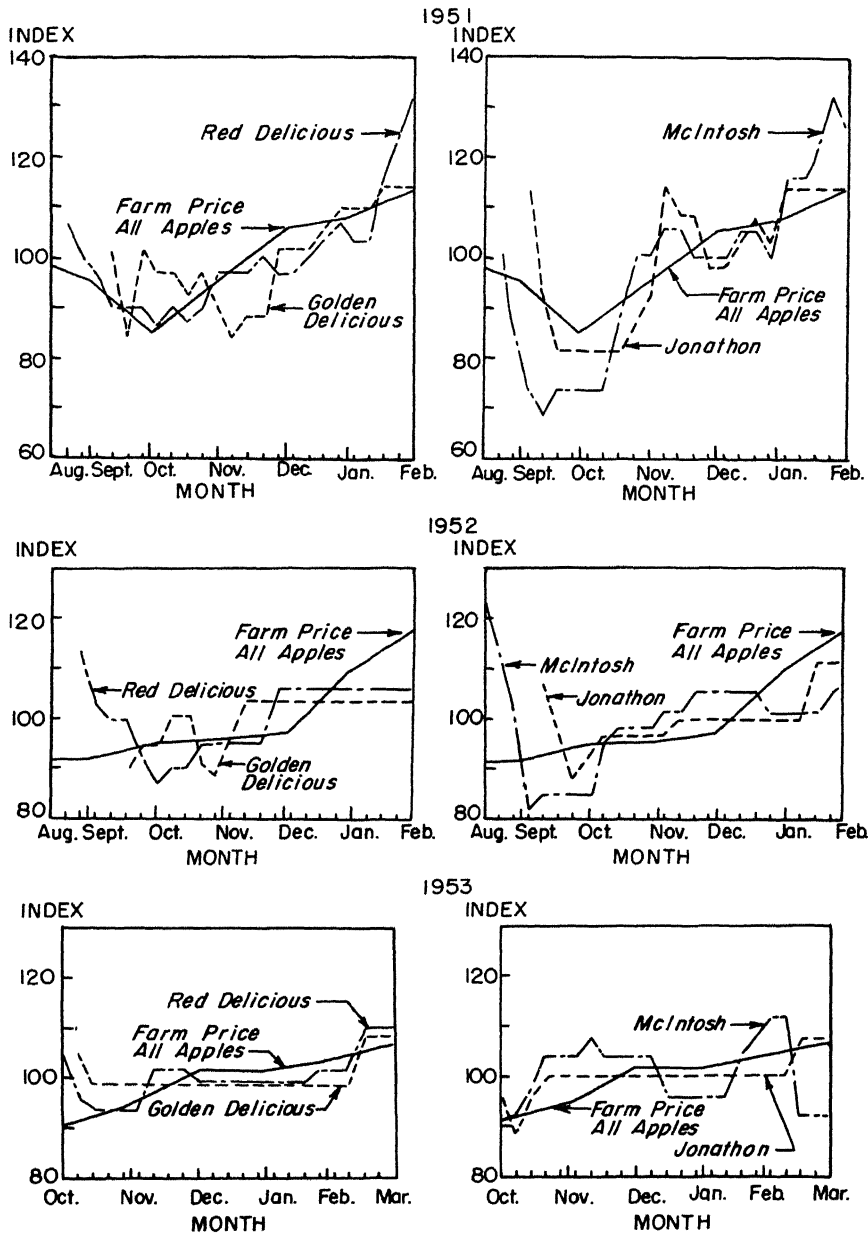
THE AVERAGE OHIO FARM PRICE OF APPLES WAS THE SAME AS THE U.S. AVERAGE AND ABOVE THAT IN MAJOR CENTRAL AND EASTERN STATES FOR THE FOUR YEAR PERIOD 1949-1952.



SOURCE: REFERENCE 12 AND 13

FIGURE U - SEASONAL INDEX OF OHIO APPLE PRICES, SEPTEMBER TO MAY, 1947 TO 1953.

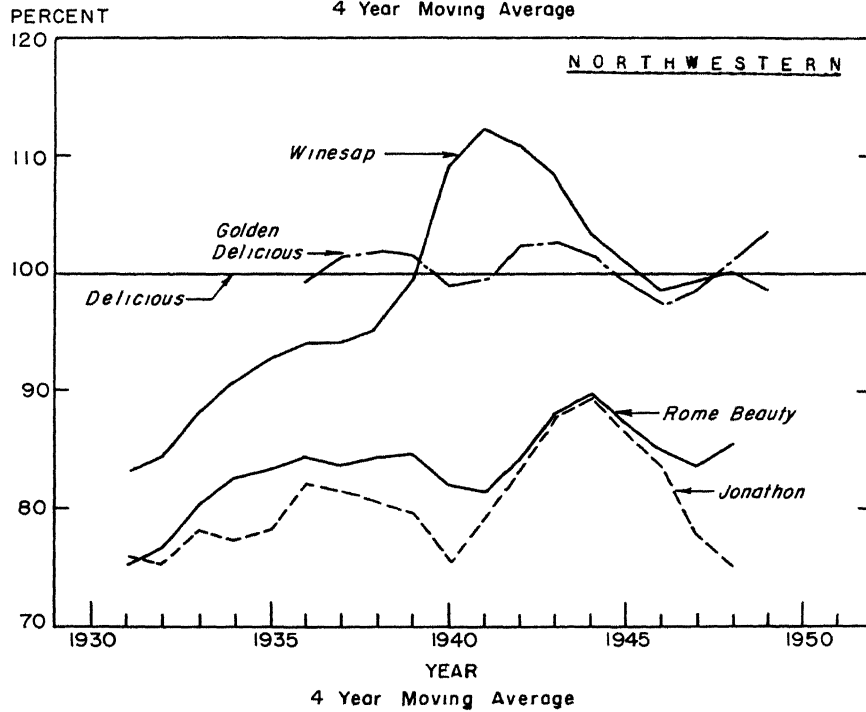
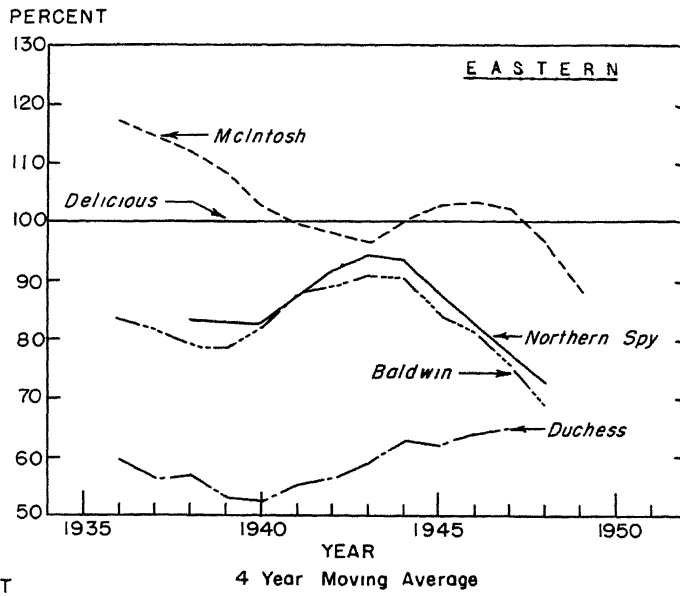
A CONSIDERABLE YEAR TO YEAR VARIATION IN THE SEASONAL PRICE PATTERN HAS OCCURRED DURING THE PAST SIX YEARS.



SOURCES: REFERENCE 11 AND 19

FIGURE V - SEASONAL INDEX OF OHIO FARM APPLE PRICE AS COMPARED TO THE SEASONAL INDEX OF CLEVELAND MARKET PRICE OF SELECTED MIDWESTERN VARIETIES, 1951 TO 1953.

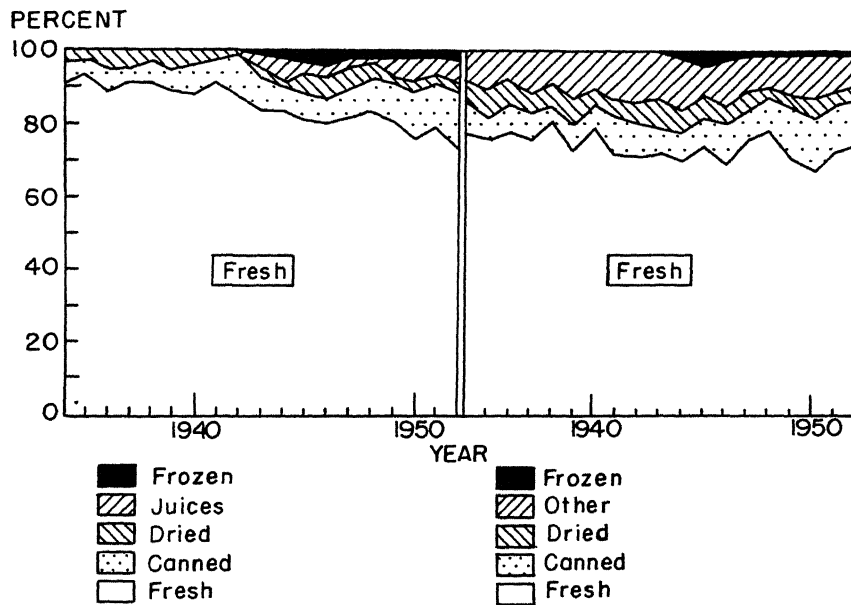
THE SEASONAL PRICE OF MAJOR VARIETIES OF APPLES HAVE TENDED TO FOLLOW THE SEASONAL INDEX OF THE FARM PRICE OF ALL APPLES.



SOURCES: REFERENCE 1

FIGURE W - TRENDS IN PRICES OF EASTERN AND NORTHWESTERN APPLES VARIETIES ON THE NEW YORK CITY MARKETS COMPARED WITH THE DELICIOUS VARIETY, 1929 - 49.

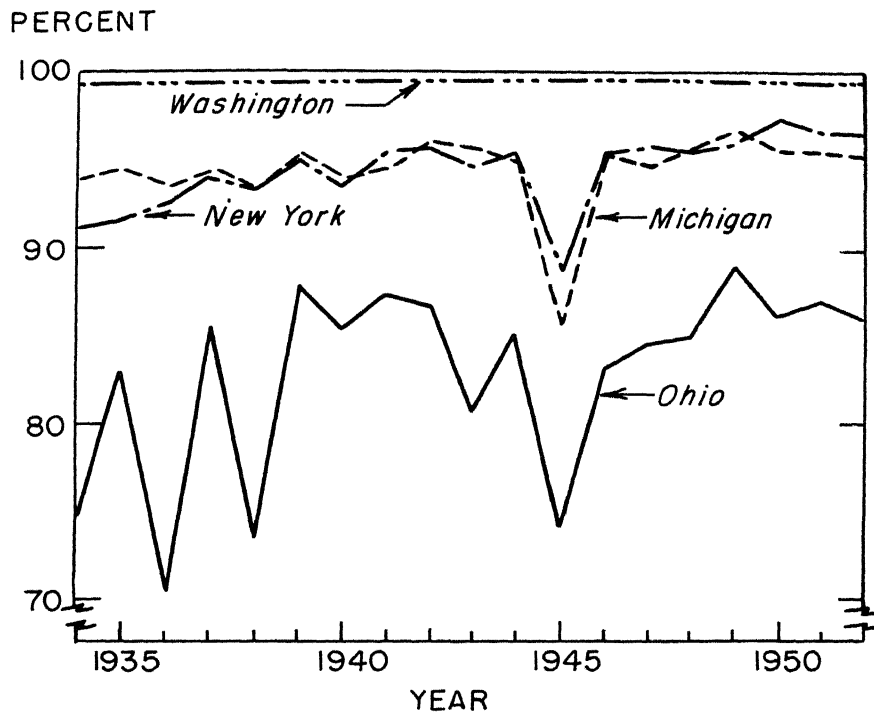
ON THE NEW YORK CITY MARKET THE PREFERENCE FOR EASTERN DELICIOUS APPLES HAS APPARENTLY INCREASED DURING THE PAST 15 YEARS. HOWEVER, WESTERN WINESAP AND ROME BEAUTY APPLES HAVE GAINED IN PRICE RELATIVE TO WESTERN DELICIOUS APPLES.



SOURCE: REFERENCE 4 AND 6

FIGURE X - FORM IN WHICH APPLES CONSUMED AND MANNER OF UTILIZATION OF COMMERCIAL CROP, U.S., 1934-52.

ABOUT 70 PERCENT OF ALL APPLES CONSUMED TODAY ARE PURCHASED AS FRESH APPLES. THIS COMPARED WITH 80 PERCENT IN 1934, AS SHOWN ON THE CHART TO THE LEFT. UTILIZATION OF COMMERCIAL PRODUCTION COINCIDES MORE NEARLY WITH DOMESTIC CONSUMPTION AS EXPORTS DECLINE AS SHOWN ON CHART TO RIGHT.

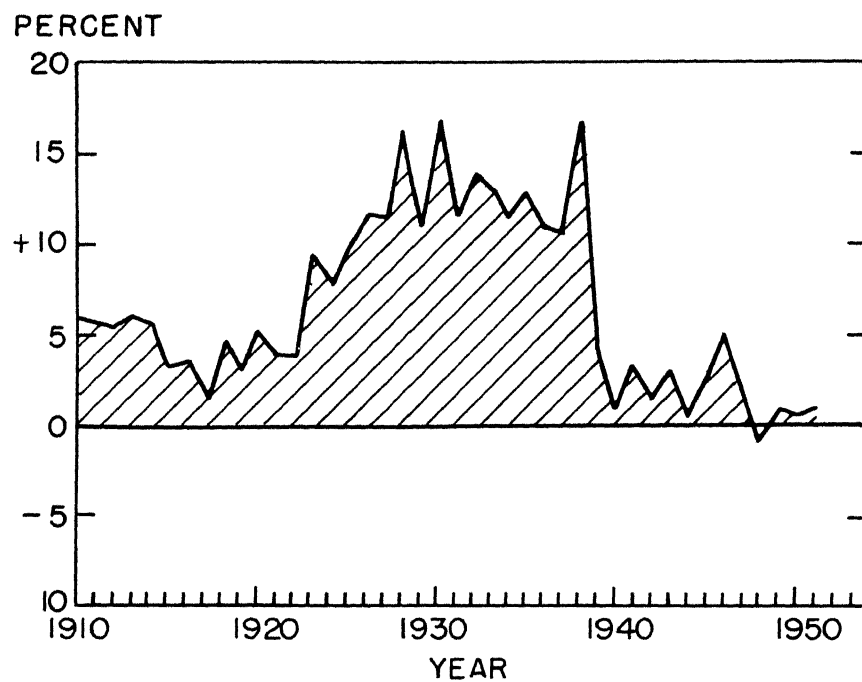


SOURCE: REFERENCE 6

FIGURE Y - PERCENT OF COMMERCIAL PRODUCTION HAVING VALUE SOLD IN OHIO, AND SELECTED OTHER STATES, 1934-1952.

ABOUT 85 PERCENT OF OHIO'S COMMERCIAL PRODUCTION IS SOLD COMPARED WITH MORE THAN 95 PERCENT OF THAT OF MICHIGAN AND NEW YORK AND OVER 99 PERCENT OF THAT OF WASHINGTON.





SOURCE: REFERENCE 8

FIGURE 2 - NET EXPORTS (EXPORTS-IMPORTS OF APPLES) EXPRESSED AS A PERCENT OF TOTAL PRODUCTION, 1910 TO 1951.

NET EXPORTS OF APPLES HAVE BEEN INSIGNIFICANT SINCE 1939. BETWEEN 1925 AND 1939, 10 TO 15 PERCENT TO TOTAL PRODUCTION WAS EXPORTED COMPARED WITH ABOUT 1 PERCENT OF THE CROP AT THE PRESENT TIME.

TABLE A - FARM VALUE OF FRUITS IN OHIO, 1945 AND 1950 CENSUS

|                  | 1944         |                  | 1949         |                  |
|------------------|--------------|------------------|--------------|------------------|
|                  | VALUE        | PERCENT OF TOTAL | VALUE        | PERCENT OF TOTAL |
| Apples           | \$11,790,866 | 61.1             | \$7,685,120  | 61.1             |
| Peaches          | 3,715,043    | 19.4             | 1,812,780    | 14.7             |
| Grapes           | 1,116,011    | 7.5              | 877,051      | 7.0              |
| Pears            | 504,538      | 2.6              | 275,408      | 2.2              |
| SOUR CHERRIES)   |              |                  | 239,988      | 1.9              |
| SWEET CHERRIES)  | 528,809      | 2.7              | 71,753       | .6               |
| Plums and Prunes | 211,048      | 1.1              | 169,567      | 1.3              |
| Strawberries     | 575,094      | 3.0              | 956,733      | 7.6              |
| Raspberries      | 451,762      | 2.3              | 419,860      | 3.3              |
| Other Berries    | 51,905       | .3               | 33,283       | .3               |
| TOTAL            | \$19,305,076 | 100.0            | \$12,569,563 | 100.0            |

SOURCE: U. S. CENSUS OF AGRICULTURE, 1945 AND 1950.

TABLE B - COMPARISONS OF COMMERCIAL AND NON-COMMERCIAL APPLE PRODUCING COUNTIES IN OHIO, CENSUS YEARS 1935 TO 1950

|                                | BEARING TREES | NON-BEARING TREES | PRODUCTION | NON-BEARING TREES TO EACH 100 BEARING TREES |
|--------------------------------|---------------|-------------------|------------|---------------------------------------------|
|                                | Percent       | Percent           | Percent    | Number                                      |
| <u>COMMERCIAL COUNTIES</u>     |               |                   |            |                                             |
| 1935                           | 60.7          | 64.1              | 73.2       | 29                                          |
| 1940                           | 67.7          | 59.8              | 73.8       | 22                                          |
| 1945                           | -             | -                 | 75.4       | -                                           |
| 1950                           | 68.0          | 60.0              | 70.7       | 19                                          |
| <u>NON-COMMERCIAL COUNTIES</u> |               |                   |            |                                             |
| 1935                           | 39.3          | 35.9              | 26.8       | 25                                          |
| 1940                           | 32.3          | 40.2              | 26.2       | 30                                          |
| 1945                           | -             | -                 | 24.6       | -                                           |
| 1950                           | 32.0          | 40.0              | 29.3       | 26                                          |

SOURCE: UNITED STATES CENSUS OF AGRICULTURE, 1935 TO 1950.

TABLE C - RANKING STATES IN APPLE PRODUCTION, SELECTED YEARS, 1889 TO 1952

| Rank | 1889           | 1899          | 1909           | 1919         |
|------|----------------|---------------|----------------|--------------|
| 1    | Ohio           | New York      | New York       | Washington   |
| 2    | Michigan       | Pennsylvania  | Michigan       | New York     |
| 3    | Kentucky       | Ohio          | Pennsylvania   | Virginia     |
| 4    | Illinois       | Virginia      | Missouri       | California   |
| 5    | Indiana        | Illinois      | Kentucky       | Ohio         |
| 6    | Missouri       | Michigan      | Iowa           | Arkansas     |
| 7    | New York       | Indiana       | Virginia       | Oregon       |
| 8    | Virginia       | West Virginia | California     | Michigan     |
| 9    | North Carolina | Missouri      | Ohio           | Pennsylvania |
| 10   | Pennsylvania   | Kentucky      | North Carolina | Missouri     |

| Rank | 1929          | 1939          | 1949          | 1953          |
|------|---------------|---------------|---------------|---------------|
| 1    | Washington    | Washington    | Washington    | Washington    |
| 2    | New York      | New York      | New York      | New York      |
| 3    | Virginia      | Virginia      | Michigan      | Michigan      |
| 4    | California    | Michigan      | California    | California    |
| 5    | Michigan      | Pennsylvania  | Virginia      | Virginia      |
| 6    | Pennsylvania  | California    | Pennsylvania  | Pennsylvania  |
| 7    | West Virginia | Ohio          | Ohio          | Ohio          |
| 8    | Idaho         | West Virginia | Illinois      | West Virginia |
| 9    | Oregon        | Illinois      | West Virginia | Illinois      |
| 10   | Illinois      | New Jersey    | Massachusetts | New Jersey    |

SOURCE: FRUITS (NON-CITRUS) PRODUCTION, FARM DISPOSITION, VALUE AND UTILIZATION OF SALES, 1889-1953

TABLE D - PERCENTAGE DISTRIBUTION OF THE APPLE INDUSTRY AS TO SIZE OF GROWER  
1940 AND 1950 CENSUS

| Trees Of Bearing Age Per Farm | Farms Reporting Apples |         | Trees Not Of Bearing Age |         | Trees Of Bearing Age |         | Production |         | Yield Per Bearing Tree |        | Number of Non-Bearing Trees To Each 100 Bearing Trees |      |
|-------------------------------|------------------------|---------|--------------------------|---------|----------------------|---------|------------|---------|------------------------|--------|-------------------------------------------------------|------|
|                               | Number                 | Percent | Percent                  | Percent | Percent              | Percent | Percent    | Percent | Bushel                 | Bushel | 1940                                                  | 1950 |
|                               | 1940                   | 1950    | 1940                     | 1950    | 1940                 | 1950    | 1940       | 1950    | 1940                   | 1950   | 1940                                                  | 1950 |
| <u>UNITED STATES</u>          |                        |         |                          |         |                      |         |            |         |                        |        |                                                       |      |
| Less Than 100                 | -                      | 96.9    | 64.3                     | 59.5    | 33.4                 | 31.3    | 19.0       | 10.8    | 1.5                    | 1.2    | 43                                                    | 53   |
| 100 To 199                    | -                      | 1.2     | 4.5                      | 3.5     | 7.8                  | 5.8     | 6.0        | 3.8     | 2.0                    | 2.1    | 13                                                    | 17   |
| 200 To 999                    | -                      | 1.5     | 14.7                     | 14.2    | 25.2                 | 24.7    | 30.1       | 30.9    | 3.1                    | 4.2    | 14                                                    | 16   |
| 1,000 And Over                | -                      | .4      | 17.4                     | 22.8    | 33.6                 | 38.6    | 44.9       | 54.5    | 3.4                    | 4.7    | 12                                                    | 16   |
| TOTAL & AVERAGE*              |                        | 100.0   | 100.0                    | 100.0   | 100.0                | 100.0   | 100.0      | 100.0   | 2.6                    | 3.3    | 23                                                    | 28   |
| <u>OHIO</u>                   |                        |         |                          |         |                      |         |            |         |                        |        |                                                       |      |
| Less Than 100                 | -                      | 94.9    | 67.7                     | 60.9    | 33.1                 | 28.8    | 23.9       | 14.5    | 1.9                    | 1.4    | 50                                                    | 45   |
| 100 To 199                    | -                      | 2.0     | 5.4                      | 5.4     | 9.5                  | 7.6     | 8.1        | 5.1     | 2.2                    | 1.9    | 14                                                    | 15   |
| 200 To 999                    | -                      | 2.5     | 14.7                     | 16.4    | 28.2                 | 30.2    | 30.0       | 33.9    | 2.8                    | 3.1    | 13                                                    | 11   |
| 1,000 And Over                | -                      | .6      | 12.2                     | 17.3    | 29.2                 | 33.4    | 38.0       | 46.5    | 3.4                    | 3.9    | 10                                                    | 11   |
| TOTAL & AVERAGE*              | -                      | 100.0   | 100.0                    | 100.0   | 100.0                | 100.0   | 100.0      | 100.0   | 2.6                    | 2.8    | 24                                                    | 21   |
| <u>MICHIGAN</u>               |                        |         |                          |         |                      |         |            |         |                        |        |                                                       |      |
| Less Than 100                 | -                      | 91.7    | 50.8                     | 48.9    | 29.6                 | 21.2    | 14.1       | 8.2     | 1.3                    | 1.2    | 41                                                    | 48   |
| 100 To 199                    | -                      | 2.9     | 9.9                      | 6.6     | 11.8                 | 6.7     | 11.4       | 4.5     | 2.6                    | 2.1    | 20                                                    | 20   |
| 200 To 999                    | -                      | 4.4     | 22.1                     | 23.9    | 30.1                 | 32.7    | 38.2       | 37.0    | 3.4                    | 3.6    | 18                                                    | 15   |
| 1,000 And Over                | -                      | 1.0     | 17.2                     | 20.6    | 28.5                 | 39.4    | 36.3       | 50.3    | 3.5                    | 4.1    | 15                                                    | 11   |
| TOTAL & AVERAGE*              | -                      | 100.0   | 100.0                    | 100.0   | 100.0                | 100.0   | 100.0      | 100.0   | 2.7                    | 3.2    | 24                                                    | 20   |

\* Weighted Average

SOURCE: UNITED STATES CENSUS OF AGRICULTURE, 1940 AND 1950.

TABLE E - NUMBER OF APPLE TREES NOT OF BEARING AGE FOR EACH  
100 BEARING TREES, CENSUS YEARS  
1910 TO 1950

|                | 1910 | 1920 | 1925 | 1930 | 1935 | 1940 | 1950 |
|----------------|------|------|------|------|------|------|------|
| United States  | 43   | 31   | 33   | 28   | 21   | 23   | 28   |
| Western States | 125  | 15   | 15   | 16   | 14   | 10   | 24   |
| Eastern States | 37   | 37   | 30   | 26   | 19   | 21   | 24   |
| Central States | 37   | 33   | 43   | 43   | 26   | 31   | 34   |
| Michigan       | 30   | 37   | 34   | 42   | 27   | 24   | 21   |
| Washington     | 62   | 10   | 15   | 18   | 19   | 8    | 26   |
| New York       | 25   | 30   | 26   | 24   | 19   | 22   | 17   |
| Virginia       | 49   | 39   | 28   | 18   | 14   | 16   | 22   |
| Ohio           | 29   | 34   | 38   | 42   | 27   | 24   | 21   |
| District 1     |      | 20   | 22   | 26   | 22   | 21   | 21   |
| District 2     |      | 36   | 43   | 50   | 30   | 18   | 15   |
| District 3     |      | 43   | 59   | 59   | 33   | 25   | 17   |
| District 4     |      | 12   | 14   | 19   | 26   | 56   | 35   |
| District 5     |      | 30   | 33   | 38   | 28   | 26   | 21   |
| District 6     |      | 26   | 34   | 32   | 26   | 20   | 24   |
| District 7     |      | 28   | 48   | 59   | 37   | 33   | 29   |
| District 8     |      | 59   | 42   | 36   | 16   | 16   | 31   |
| District 9     |      | 27   | 30   | 38   | 23   | 23   | 21   |

SOURCE: UNITED STATES CENSUS, 1910 TO 1950

TABLE F - PREDICTING BEARING TREE NUMBERS

|                      | A<br>1                                                                                                         | B<br>2                                                       | C<br>3                                                          | D<br>4                                                                                        | E<br>5                                                                                     | F<br>6                                                     | G<br>7                                                                                     | H<br>8                                                  | I<br>9                                            | J<br>10                     |
|----------------------|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------------------------------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------|-----------------------------|
|                      | Non-Bearing<br>Trees Reported<br>in Previous<br>Census Which<br>Are Still Non-<br>Bearing In<br>Present Census | Total Non-<br>Bearing Trees<br>Reported In<br>Present Census | Trees Planted<br>Between Previous<br>Census & Present<br>Census | Trees Planted<br>Prior To Pre-<br>vious Census<br>Which Are Bear-<br>ing In Present<br>Census | Trees Not<br>Bearing In<br>Previous<br>Census Which<br>Are Bearing<br>In Present<br>Census | Bearing<br>Trees<br>Reported<br>in Pre-<br>vious<br>Census | Total Bearing<br>Trees<br>Reported<br>In<br>Present<br>Census<br>Before<br>Any<br>Removals | Bearing<br>Trees<br>Reported<br>In<br>Present<br>Census | Re-<br>movals<br>Since<br>Pre-<br>vious<br>Census | Rate<br>Of<br>Re-<br>movals |
| OHIO                 | (000)                                                                                                          | (000)                                                        | (000)                                                           | (000)                                                                                         | (000)                                                                                      | (000)                                                      | (000)                                                                                      | (000)                                                   | (000)                                             | (%)                         |
| 1920                 | 768                                                                                                            | 2,048                                                        | 1,280                                                           | -                                                                                             | -                                                                                          | -                                                          | 5,970                                                                                      | 5,970                                                   | -                                                 | -                           |
| 1925                 | 512                                                                                                            | 2,066                                                        | 1,554                                                           | 768                                                                                           | -                                                                                          | 5,970                                                      | 6,800                                                                                      | 5,754                                                   | 2,152                                             | 36.0                        |
| 1930                 | 622                                                                                                            | 1,932                                                        | 1,217                                                           | 724                                                                                           | 1,536                                                                                      | 5,354                                                      | 6,661                                                                                      | 4,661                                                   | 2,159                                             | 40.0                        |
| 1935                 | 227                                                                                                            | 1,432                                                        | 905                                                             | 790                                                                                           | 1,412                                                                                      | 4,661                                                      | 6,073                                                                                      | 5,263                                                   | 810                                               | 17.4                        |
| 1940                 | 366                                                                                                            | 826                                                          | 424                                                             | 547                                                                                           | 1,070                                                                                      | 5,263                                                      | 6,323                                                                                      | 3,494                                                   | 2,839                                             | 54.0                        |
| 1945                 | 196                                                                                                            | 450                                                          | 252                                                             | 296                                                                                           | 658                                                                                        | 3,494                                                      | 4,153                                                                                      | 3,250                                                   | 903                                               | 25.8                        |
| 1950                 | 101                                                                                                            | 460                                                          | 359                                                             | 151                                                                                           | 349                                                                                        | 3,250                                                      | 3,599                                                                                      | 2,176                                                   | 1,424                                             | 43.8                        |
| 1955                 | 144                                                                                                            | -                                                            | -                                                               | 215                                                                                           | 316                                                                                        | 2,176                                                      | -                                                                                          | 1,600                                                   | 892                                               | 41.0                        |
| <b>UNITED STATES</b> |                                                                                                                |                                                              |                                                                 |                                                                                               |                                                                                            |                                                            |                                                                                            |                                                         |                                                   |                             |
| 1920                 | 13,565                                                                                                         | 36,173                                                       | 22,608                                                          | -                                                                                             | -                                                                                          | -                                                          | 115,281                                                                                    | 115,281                                                 | -                                                 | -                           |
| 1925                 | 9,043                                                                                                          | 34,280                                                       | 25,236                                                          | 13,565                                                                                        | 27,130                                                                                     | 115,281                                                    | 142,411                                                                                    | 103,670                                                 | 38,741                                            | 33.6                        |
| 1930                 | 10,092                                                                                                         | 27,437                                                       | 17,312                                                          | 15,112                                                                                        | 24,185                                                                                     | 103,670                                                    | 127,955                                                                                    | 88,815                                                  | 38,041                                            | 37.7                        |
| 1935                 | 6,937                                                                                                          | 17,510                                                       | 10,573                                                          | 10,405                                                                                        | 20,500                                                                                     | 88,815                                                     | 109,315                                                                                    | 82,509                                                  | 26,806                                            | 30.2                        |
| 1940                 | 4,229                                                                                                          | 15,507                                                       | 8,273                                                           | 6,244                                                                                         | 13,281                                                                                     | 82,509                                                     | 77,789                                                                                     | 59,145                                                  | 37,644                                            | 45.6                        |
| 1945                 | 3,711                                                                                                          | 11,776                                                       | 8,064                                                           | 5,557                                                                                         | 9,796                                                                                      | 59,145                                                     | 67,242                                                                                     | 54,000                                                  | 13,242                                            | 24.0                        |
| 1950                 | 3,225                                                                                                          | 11,069                                                       | 7,863                                                           | 4,839                                                                                         | 8,550                                                                                      | 54,000                                                     | 62,550                                                                                     | 39,498                                                  | 23,052                                            | 44.5                        |
| 1955                 | 3,145                                                                                                          | -                                                            | -                                                               | 4,718                                                                                         | 7,944                                                                                      | 39,498                                                     | 47,441                                                                                     | 32,000                                                  | 15,441                                            | 39.1                        |

- Two-fifths of trees planted (those planted in last 2 years) in the period prior to present census will still be non-bearing at the next census. Calculated by taking 2/5 of Column C except for 1920 census where it was assumed that plantings between 1913-1915 were the same as for the period 1915-1920.
  - Actual reported trees not of bearing age.
  - Column B-A or total non-bearing trees less plantings from previous census that are still under 8 years of age.
  - Three-fifths of the trees planted in five year period between the previous census and one prior to that. These are trees appearing for the first time as bearing trees.
  - Non-bearing trees from previous census that are bearing for first time as bearing trees. The trees in Column D in this census plus those in Column A in the last census appear for the first time as bearing trees.
  - Actual bearing trees reported in previous census.
  - Total bearing trees in present census if there had been no removals between previous census and this census. Column E and F.
  - Actual bearing trees reported in present census.
  - Trees removed since last census. This is found by subtracting Column H from Column G.
  - Column I divided by Column F gives the percent of the bearing trees in previous census removed.
- NOTE: Assumptions 1) Bearing age of 8 years. 2) Equal rates of planting each year from one census to another.

TABLE G - RETAIL PRICE, FARMER'S PRICE AND MARKETING CHARGES OF FRESH APPLES, UNITED STATES, 1937-1941 AND 1949-1953

|              | Price Per Bushel <sup>1/</sup> (Dollars) |           |          | Price Per Pound <sup>1/</sup> (Cents) |           |          |
|--------------|------------------------------------------|-----------|----------|---------------------------------------|-----------|----------|
|              | 1937-1941                                | 1949-1953 | Increase | 1937-1941                             | 1949-1953 | Increase |
| Retail Price | \$1.92                                   | \$2.41    | \$.49    | 3.99¢                                 | 5.03¢     | 1.04¢    |
| Farmer Price | .82                                      | 1.07      | .25      | 1.69                                  | 2.24      | .55      |
| Margin       | 1.10                                     | 1.34      | .24      | 2.30                                  | 2.79      | .49      |

<sup>1/</sup> Adjusted By Index Of Wholesale Prices

SOURCE: "PRICE SPREADS BETWEEN FARMERS AND CONSUMERS FOR FOOD PRODUCTS", 1934-1953

TABLE H - TOTAL APPLE PRODUCTION, SELECTED AREAS AND STATES, 1889 TO 1938  
(100,000 Bushel)

|      | United States | Central States | Western States | Eastern States | Ohio | Michigan | New York | Washington |
|------|---------------|----------------|----------------|----------------|------|----------|----------|------------|
| 1889 | 113.0         | 88.1           | 3.3            | 51.6           | 13.8 | 13.2     | 8.5      | .3         |
| 1890 | 85.2          | 46.8           | 4.0            | 29.4           | 3.9  | 7.9      | 6.1      | .5         |
| 1891 | 198.2         | 90.9           | 5.3            | 102.7          | 15.7 | 8.4      | 29.4     | .7         |
| 1892 | 120.5         | 43.6           | 4.3            | 72.6           | 7.8  | 8.2      | 24.4     | .6         |
| 1893 | 114.8         | 37.8           | 6.0            | 71.0           | 28.9 | 7.2      | 17.1     | .8         |
| 1894 | 134.7         | 60.7           | 6.0            | 68.0           | 10.8 | 13.0     | 24.5     | .8         |
| 1895 | 219.6         | 116.7          | 7.0            | 95.9           | 24.7 | 5.4      | 25.5     | 1.1        |
| 1896 | 232.6         | 102.6          | 4.9            | 125.0          | 19.8 | 23.0     | 54.2     | 1.0        |
| 1897 | 163.7         | 77.9           | 9.5            | 76.3           | 7.7  | 3.8      | 19.7     | 1.7        |
| 1898 | 118.1         | 46.1           | 8.9            | 63.1           | 4.3  | 11.8     | 13.2     | 2.1        |
| 1899 | 175.3         | 78.1           | 6.0            | 91.2           | 20.6 | 8.9      | 24.1     | .7         |
| 1900 | 205.0         | 79.0           | 9.3            | 117.6          | 13.8 | 11.6     | 17.0     | 1.0        |
| 1901 | 135.5         | 72.2           | 9.0            | 54.6           | 10.5 | 5.2      | 11.0     | 1.0        |
| 1902 | 212.3         | 92.7           | 11.3           | 108.3          | 12.7 | 18.0     | 41.0     | 2.3        |
| 1903 | 192.7         | 76.2           | 11.4           | 108.1          | 13.5 | 13.4     | 46.0     | 2.6        |
| 1904 | 233.6         | 91.3           | 13.0           | 129.4          | 14.0 | 16.7     | 55.0     | 2.7        |
| 1905 | 136.2         | 52.0           | 11.2           | 72.8           | 5.8  | 6.3      | 21.0     | 2.5        |
| 1906 | 216.7         | 117.1          | 14.5           | 85.1           | 16.0 | 13.7     | 31.0     | 3.0        |
| 1907 | 119.5         | 35.8           | 11.9           | 71.8           | 4.0  | 9.5      | 28.0     | 3.8        |
| 1908 | 148.9         | 50.4           | 14.2           | 84.3           | 6.0  | 7.0      | 33.0     | 3.2        |
| 1909 | 145.4         | 63.4           | 15.2           | 66.8           | 4.7  | 12.3     | 25.4     | 2.7        |
| 1910 | 139.9         | 46.3           | 18.8           | 74.8           | 5.9  | 4.2      | 17.0     | 5.8        |
| 1911 | 210.4         | 94.2           | 15.8           | 100.4          | 18.7 | 12.1     | 39.0     | 3.5        |
| 1912 | 225.0         | 90.0           | 24.8           | 110.2          | 10.6 | 16.3     | 44.0     | 7.7        |
| 1913 | 135.1         | 63.6           | 20.5           | 51.0           | 4.8  | 8.2      | 19.5     | 6.9        |
| 1914 | 233.3         | 73.9           | 28.1           | 131.3          | 3.3  | 15.4     | 49.6     | 9.8        |
| 1915 | 201.7         | 101.4          | 24.2           | 76.1           | 18.0 | 8.3      | 24.9     | 9.8        |
| 1916 | 181.2         | 54.6           | 30.5           | 96.1           | 8.6  | 10.6     | 35.3     | 18.6       |
| 1917 | 159.4         | 57.9           | 37.2           | 60.3           | 6.2  | 6.7      | 12.7     | 18.4       |
| 1918 | 161.5         | 44.1           | 35.5           | 81.9           | 7.6  | 11.1     | 37.0     | 19.6       |
| 1919 | 140.6         | 39.1           | 50.1           | 51.4           | 3.0  | 5.8      | 14.3     | 25.3       |
| 1920 | 206.7         | 64.4           | 36.4           | 105.9          | 13.2 | 15.1     | 44.6     | 18.3       |
| 1921 | 95.7          | 16.5           | 54.9           | 24.3           | 3.0  | 5.1      | 11.3     | 31.5       |
| 1922 | 189.4         | 62.0           | 52.3           | 75.1           | 6.4  | 10.6     | 30.0     | 27.4       |
| 1923 | 180.9         | 53.3           | 62.0           | 65.6           | 10.0 | 9.9      | 19.8     | 33.0       |
| 1924 | 160.5         | 46.1           | 43.5           | 70.9           | 6.4  | 5.4      | 19.1     | 22.0       |
| 1925 | 152.4         | 41.0           | 51.2           | 60.2           | 6.5  | 8.4      | 22.9     | 28.7       |
| 1926 | 229.7         | 59.7           | 63.1           | 106.9          | 12.8 | 8.7      | 30.6     | 34.4       |
| 1927 | 115.7         | 25.0           | 47.1           | 43.6           | 5.3  | 4.1      | 11.3     | 24.9       |
| 1928 | 177.8         | 39.0           | 68.3           | 70.5           | 6.6  | 3.2      | 18.2     | 37.8       |
| 1929 | 135.1         | 28.1           | 31.8           | 55.2           | 2.6  | 7.2      | 14.0     | 30.0       |
| 1930 | 156.6         | 24.4           | 64.2           | 68.0           | 4.2  | 6.0      | 23.6     | 38.0       |
| 1931 | 205.4         | 64.5           | 33.4           | 87.5           | 15.5 | 11.0     | 18.7     | 31.0       |
| 1932 | 146.8         | 25.8           | 54.8           | 66.2           | 5.5  | 6.5      | 23.5     | 32.0       |
| 1933 | 148.7         | 35.2           | 50.2           | 63.3           | 4.8  | 9.9      | 17.1     | 29.2       |
| 1934 | 128.2         | 26.8           | 51.1           | 50.3           | 4.5  | 7.6      | 13.6     | 33.0       |
| 1935 | 174.4         | 44.2           | 55.3           | 74.9           | 8.8  | 10.5     | 16.4     | 32.2       |
| 1936 | 116.8         | 20.5           | 47.2           | 49.1           | 3.2  | 8.3      | 12.2     | 27.3       |
| 1937 | 201.5         | 56.9           | 52.6           | 92.0           | 10.8 | 13.5     | 21.1     | 30.0       |
| 1938 | 125.4         | 21.7           | 49.2           | 54.5           | 3.2  | 6.9      | 14.8     | 29.4       |

SOURCE: U.S.D.A., B.A.E. FRUITS (NON-CITRUS) PRODUCTION, FARM DISPOSITION, VALUE AND UTILIZATION OF SALES, 1889 TO 1953



TABLE 1 - COMMERCIAL APPLE PRODUCTION, SELECTED AREAS AND STATES, 1934-1953

(100,000 BUSHELS)

|      | United States | Central States | Western States | Eastern States | Ohio | Michigan | New York | Washington |
|------|---------------|----------------|----------------|----------------|------|----------|----------|------------|
| 1934 | 106.0         | 16.7           | 47.4           | 41.9           | 3.3  | 6.0      | 12.8     | 31.8       |
| 1935 | 140.4         | 27.3           | 51.6           | 61.5           | 6.1  | 8.0      | 15.4     | 31.2       |
| 1936 | 98.0          | 13.0           | 43.6           | 41.4           | 2.5  | 6.6      | 11.5     | 26.2       |
| 1937 | 153.2         | 32.4           | 49.2           | 69.6           | 7.9  | 10.3     | 19.4     | 29.2       |
| 1938 | 105.7         | 13.5           | 46.0           | 46.2           | 2.4  | 5.5      | 14.0     | 28.5       |
| 1939 | 139.2         | 31.3           | 41.6           | 66.3           | 7.7  | 11.0     | 24.0     | 24.8       |
| 1940 | 111.4         | 20.3           | 41.2           | 49.9           | 4.3  | 6.3      | 12.9     | 25.6       |
| 1941 | 122.2         | 24.8           | 42.4           | 55.0           | 5.7  | 8.0      | 16.3     | 26.8       |
| 1942 | 126.7         | 23.7           | 40.3           | 62.7           | 5.8  | 9.2      | 18.2     | 27.3       |
| 1943 | 87.3          | 14.9           | 37.5           | 34.9           | 2.1  | 5.9      | 12.7     | 23.0       |
| 1944 | 121.3         | 18.5           | 46.3           | 56.5           | 4.5  | 7.3      | 15.8     | 31.6       |
| 1945 | 66.7          | 7.7            | 44.5           | 14.5           | 4.8  | 1.2      | 2.2      | 21.5       |
| 1946 | 118.9         | 19.1           | 47.0           | 52.8           | 2.3  | 7.6      | 15.1     | 32.7       |
| 1947 | 112.9         | 20.6           | 52.4           | 39.9           | 3.0  | 6.4      | 15.0     | 33.5       |
| 1948 | 89.3          | 14.3           | 38.4           | 36.6           | 1.9  | 4.8      | 11.7     | 29.8       |
| 1949 | 134.0         | 30.1           | 48.8           | 55.1           | 5.4  | 11.7     | 20.1     | 31.3       |
| 1950 | 124.5         | 19.4           | 48.1           | 67.0           | 3.5  | 7.4      | 18.7     | 38.6       |
| 1951 | 110.7         | 24.4           | 33.5           | 62.8           | 4.4  | 9.1      | 17.3     | 19.1       |
| 1952 | 92.5          | 14.9           | 38.8           | 38.8           | 2.5  | 6.5      | 11.4     | 22.7       |
| 1953 | 92.6          | 17.9           | 36.0           | 38.7           | 2.7  | 6.2      | 13.1     | 24.3       |

SOURCE: U.S.D.A., B.A.E. FRUITS (NON-CITRUS) PRODUCTION, FARM DISPOSITION, VALUE AND UTILIZATION OF SALES, 1889 TO 1953

TABLE J - APPLE TREES, SELECTED AREAS AND STATES, CENSUS YEARS, 1890 TO 1950

(1000 TREES)

|                       | United States        |                          |             | Central States       |                          |             |
|-----------------------|----------------------|--------------------------|-------------|----------------------|--------------------------|-------------|
|                       | Trees Of Bearing Age | Trees Of Not Bearing Age | Total Trees | Trees Of Bearing Age | Trees Not Of Bearing Age | Total Trees |
| 1890                  | 120,144              | *                        | *           | 67,912               | *                        | *           |
| 1900                  | 201,106              | *                        | *           | 122,526              | *                        | *           |
| 1910                  | 151,297              | 65,779                   | 217,076     | 89,975               | 32,940                   | 122,915     |
| 1920                  | 115,281              | 76,173                   | 151,454     | 49,177               | 16,504                   | 65,681      |
| 1925                  | 103,670              | 34,280                   | 137,950     | 40,411               | 17,840                   | 58,251      |
| 1930                  | 88,815               | 27,437                   | 116,252     | 34,525               | 14,998                   | 49,523      |
| 1935                  | 82,509               | 17,510                   | 100,018     | 34,128               | 9,010                    | 43,138      |
| 1940                  | 58,145               | 13,508                   | 71,653      | 23,229               | 7,155                    | 30,384      |
| 1945                  | *                    | *                        | 62,776      | *                    | *                        | 29,957      |
| 1950                  | 39,498               | 11,089                   | 50,587      | 15,101               | 5,164                    | 20,265      |
| <u>Eastern States</u> |                      |                          |             |                      |                          |             |
| 1890                  | 49,010               | *                        | *           | 3,222                | *                        | *           |
| 1900                  | 65,284               | *                        | *           | 13,556               | *                        | *           |
| 1910                  | 49,185               | 18,003                   | 67,188      | 12,137               | 14,837                   | 26,973      |
| 1920                  | 44,903               | 16,546                   | 61,447      | 21,203               | 2,124                    | 23,326      |
| 1925                  | 44,837               | 17,166                   | 61,993      | 18,272               | 2,674                    | 20,946      |
| 1930                  | 40,822               | 10,890                   | 51,712      | 17,267               | 2,077                    | 19,344      |
| 1935                  | 36,824               | 6,890                    | 43,714      | 11,756               | 1,610                    | 13,366      |
| 1940                  | 26,753               | 5,825                    | 32,578      | 6,164                | 827                      | 6,991       |
| 1945                  | *                    | *                        | 31,397      | *                    | *                        | 8,431       |
| 1950                  | 17,994               | 4,346                    | 22,340      | 6,404                | 1,578                    | 7,982       |
| <u>Western States</u> |                      |                          |             |                      |                          |             |
| <u>Ohio</u>           |                      |                          |             |                      |                          |             |
| 1890                  | 10,860               | *                        | *           | 14,428               | *                        | *           |
| 1900                  | 12,953               | *                        | *           | 15,055               | *                        | *           |
| 1910                  | 8,505                | 2,438                    | 10,943      | 11,248               | 2,829                    | 14,077      |
| 1920                  | 5,970                | 2,048                    | 8,018       | 9,637                | 2,932                    | 12,569      |
| 1925                  | 5,354                | 2,066                    | 7,420       | 8,469                | 2,422                    | 10,891      |
| 1930                  | 4,661                | 1,939                    | 6,600       | 8,285                | 2,017                    | 10,302      |
| 1935                  | 5,263                | 1,432                    | 6,695       | 7,684                | 1,415                    | 9,099       |
| 1940                  | 3,494                | 856                      | 4,350       | 5,377                | 1,204                    | 6,582       |
| 1945                  | *                    | *                        | 3,700       | *                    | *                        | 6,574       |
| 1950                  | 2,174                | 460                      | 2,634       | 4,257                | 719                      | 4,976       |
| <u>New York</u>       |                      |                          |             |                      |                          |             |
| <u>Michigan</u>       |                      |                          |             |                      |                          |             |
| 1890                  | 8,582                | *                        | *           | 315                  | *                        | *           |
| 1900                  | 10,223               | *                        | *           | 2,736                | *                        | *           |
| 1910                  | 7,354                | 2,253                    | 9,787       | 3,009                | 1,863                    | 4,872       |
| 1920                  | 5,616                | 2,050                    | 7,666       | 7,264                | 726                      | 8,720       |
| 1925                  | 5,244                | 1,871                    | 7,116       | 6,782                | 1,050                    | 7,832       |
| 1930                  | 5,200                | 1,394                    | 6,594       | 5,194                | 948                      | 6,142       |
| 1935                  | 5,713                | 1,028                    | 6,741       | 4,593                | 659                      | 5,252       |
| 1940                  | 4,317                | 1,041                    | 5,357       | 3,404                | 272                      | 3,676       |
| 1945                  | *                    | *                        | 5,209       | *                    | *                        | 3,276       |
| 1950                  | 3,351                | 683                      | 4,034       | 2,692                | 697                      | 3,389       |
| <u>Washington</u>     |                      |                          |             |                      |                          |             |

\* ONLY BEARING TREES WERE REPORTED IN 1890 AND 1900 AND ONLY TOTAL TREES WERE REPORTED IN 1945

SOURCE: U.S. DEPT. OF COMMERCE, CENSUS BUREAU, U.S. CENSUS OF AGRICULTURE, 1890 TO 1950

TABLE K - FARM PRICE OF APPLES, SELECTED AREAS AND STATES, 1909 TO 1953

|      | United States | Central States | Western States | Eastern States | Ohio  | Michigan | New York | Washington | Virginia |
|------|---------------|----------------|----------------|----------------|-------|----------|----------|------------|----------|
| 1909 | \$.78         | \$.71          | \$1.07         | \$.79          | \$.86 | \$.59    | \$.88    | \$1.61     | \$.65    |
| 1910 | .80           | .82            | .95            | .75            | .83   | .88      | .90      | 1.08       | .62      |
| 1911 | .68           | .68            | .95            | .63            | .52   | .57      | .59      | 1.12       | .65      |
| 1912 | .62           | .65            | .66            | .58            | .63   | .49      | .54      | .58        | .51      |
| 1913 | .89           | .80            | 1.09           | .93            | 1.08  | .62      | .94      | 1.27       | .78      |
| 1914 | .57           | .71            | .59            | .49            | .64   | .47      | .46      | .58        | .44      |
| 1915 | .68           | .62            | .80            | .70            | .57   | .63      | .73      | .93        | .58      |
| 1916 | .82           | .94            | .92            | .73            | .94   | .77      | .72      | 1.01       | .65      |
| 1917 | 1.11          | 1.15           | 1.08           | 1.09           | 1.34  | 1.12     | 1.20     | 1.22       | .96      |
| 1918 | 1.28          | 1.40           | 1.46           | 1.12           | 1.52  | .97      | 1.10     | 1.60       | .99      |
| 1919 | 1.78          | 1.85           | 1.72           | 1.75           | 2.42  | 1.59     | 2.02     | 1.95       | 1.47     |
| 1920 | 1.24          | 1.45           | 1.54           | 1.00           | 1.30  | .84      | .81      | .71        | .95      |
| 1921 | 1.64          | 2.00           | 1.40           | 1.90           | 2.19  | 1.64     | 1.98     | 1.47       | 2.06     |
| 1922 | .99           | 1.05           | .90            | .97            | 1.36  | .85      | .85      | 1.05       | .86      |
| 1923 | 1.10          | 1.17           | .94            | 1.19           | 1.13  | 1.00     | 1.22     | 1.04       | 1.02     |
| 1924 | 1.23          | 1.24           | 1.37           | 1.11           | 1.32  | 1.12     | 1.16     | 1.66       | .87      |
| 1925 | 1.26          | 1.29           | 1.26           | 1.24           | 1.43  | .98      | 1.20     | 1.35       | 1.01     |
| 1926 | .88           | .99            | .86            | .78            | .96   | .78      | .78      | 1.01       | .61      |
| 1927 | 1.48          | 1.54           | 1.43           | 1.47           | 1.60  | 1.40     | 1.60     | 1.72       | 1.37     |
| 1928 | 1.09          | 1.21           | .97            | 1.11           | 1.36  | 1.12     | 1.30     | 1.10       | .85      |
| 1929 | 1.39          | 1.48           | 1.31           | 1.34           | 1.85  | 1.34     | 1.51     | 1.40       | 1.15     |
| 1930 | 1.03          | 1.33           | .92            | 1.03           | 1.35  | .99      | .99      | 1.04       | 1.05     |
| 1931 | .64           | .62            | .69            | .64            | .60   | .24      | .60      | .62        | .47      |
| 1932 | .61           | .71            | .24            | .65            | .67   | .85      | .69      | .52        | .63      |
| 1933 | .79           | .82            | .71            | .84            | .95   | .70      | .90      | .83        | .69      |
| 1934 | .88           | .98            | .70            | 1.00           | 1.05  | .84      | 1.10     | .71        | .87      |
| 1935 | .72           | .77            | .60            | .79            | .76   | .64      | .80      | .70        | .68      |
| 1936 | 1.04          | 1.14           | .96            | 1.07           | 1.25  | .99      | 1.21     | 1.09       | 1.00     |
| 1937 | .64           | .72            | .58            | .68            | .62   | .56      | .65      | .72        | .56      |
| 1938 | .82           | .96            | .76            | .85            | 1.03  | .86      | .88      | .84        | .79      |
| 1939 | .64           | .65            | .63            | .64            | .57   | .53      | .59      | .69        | .62      |
| 1940 | .80           | .90            | .72            | .82            | .85   | .87      | .86      | .78        | .73      |
| 1941 | .96           | .86            | 1.01           | .96            | .84   | .83      | 1.00     | 1.14       | .84      |
| 1942 | 1.37          | 1.25           | 1.70           | 1.19           | 1.11  | 1.19     | 1.28     | 1.91       | 1.13     |
| 1943 | 2.39          | 2.46           | 2.36           | 2.39           | 2.65  | 2.33     | 2.43     | 2.56       | 2.55     |
| 1944 | 2.00          | 2.06           | 2.33           | 1.69           | 2.20  | 1.65     | 1.65     | 2.48       | 1.45     |
| 1945 | 2.90          | 2.86           | 2.83           | 3.12           | 3.64  | 2.90     | 3.15     | 3.04       | 2.75     |
| 1946 | 2.50          | 2.10           | 2.60           | 2.08           | 2.80  | 1.65     | 1.70     | 2.80       | 1.96     |
| 1947 | 1.79          | 1.75           | 1.77           | 1.83           | 1.90  | 1.35     | 1.40     | 2.05       | 1.80     |
| 1948 | 2.22          | 2.26           | 2.43           | 1.96           | 2.40  | 2.20     | 2.00     | 2.80       | 1.60     |
| 1949 | 1.38          | 1.27           | 1.51           | 1.32           | 1.25  | 1.05     | 1.15     | 1.73       | 1.18     |
| 1950 | 1.59          | 1.81           | 1.62           | 1.48           | 1.90  | 1.40     | 1.30     | 1.67       | 1.30     |
| 1951 | 1.77          | 1.63           | 2.44           | 1.37           | 1.60  | 1.40     | 1.10     | 3.05       | 1.25     |
| 1952 | 2.55          | 2.36           | 3.03           | 2.11           | 2.45  | 2.15     | 2.05     | 3.86       | 1.80     |
| 1953 | 2.85          | 2.31           | 3.65           | 2.32           | 2.35  | 2.20     | 2.26     | 4.25       | 2.15     |

SOURCE: U.S.D.A., B.A.E. FRUITS (NON-CITRUS) PRODUCTION, FARM DISPOSITION, VALUE AND UTILIZATION OF SALES, 1889 TO 1953

TABLE L - MONTHLY FARM PRICE OF APPLES, OHIO, 1910-1953

|      | Jan.   | Feb.   | March  | April  | May    | June   | July   | Aug.  | Sept. | Oct.  | Nov.  | Dec.  |
|------|--------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|
| 1910 | \$1.06 | \$1.11 | \$1.26 | \$1.11 | \$1.20 | \$1.28 | \$1.01 | \$.76 | \$.80 | \$.75 | \$.90 | \$.95 |
| 1911 | 1.10   | 1.15   | 1.20   | 1.30   | 1.30   | 1.38   | .79    | .51   | .51   | .44   | .50   | .58   |
| 1912 | .70    | .72    | .75    | .80    | .90    | 1.10   | .65    | .65   | .55   | .60   | .63   | .71   |
| 1913 | .75    | .75    | .90    | .90    | .98    | .99    | 1.00   | .98   | .95   | 1.00  | 1.05  | 1.15  |
| 1914 | 1.20   | 1.40   | 1.50   | 1.60   | 1.75   | 1.60   | .99    | .75   | .61   | .60   | .60   | .65   |
| 1915 | .70    | .75    | .73    | .80    | .85    | 1.02   | .96    | .56   | .50   | .52   | .52   | .58   |
| 1916 | .70    | .73    | .73    | .76    | .80    | 1.10   | .90    | .65   | .60   | .68   | .68   | .65   |
| 1917 | 1.10   | 1.25   | 1.40   | 1.45   | 1.50   | 1.70   | 1.60   | 1.30  | 1.25  | 1.25  | 1.35  | 1.50  |
| 1918 | 1.50   | 1.60   | 1.50   | 1.50   | 1.65   | 1.50   | 1.65   | 1.35  | 1.33  | 1.50  | 1.50  | 1.60  |
| 1919 | 1.75   | 1.90   | 2.20   | 2.10   | 2.30   | -      | 2.70   | 2.50  | 2.10  | 2.50  | 2.40  | 2.70  |
| 1920 | 2.70   | 3.00   | 3.10   | 3.40   | 3.50   | 3.60   | 2.70   | 1.40  | 1.20  | 1.20  | 1.23  | 1.30  |
| 1921 | 1.77   | 1.38   | 1.50   | 1.40   | 1.70   | 2.07   | 2.00   | 2.00  | 1.90  | 2.20  | 2.32  | 2.43  |
| 1922 | 2.51   | 2.60   | 2.80   | 2.85   | 2.85   | 2.70   | 1.65   | 1.18  | 1.12  | 1.25  | 1.35  | 1.43  |
| 1923 | 1.55   | 1.67   | 1.88   | 2.10   | 2.00   | 3.00   | 2.26   | 1.30  | 1.01  | 1.07  | 1.08  | 1.11  |
| 1924 | 1.18   | 1.30   | 1.31   | 1.40   | 1.40   | 1.60   | 1.20   | 1.27  | 1.15  | 1.30  | 1.25  | 1.32  |
| 1925 | 1.50   | 1.60   | 1.67   | 1.61   | 1.55   | 2.00   | 1.23   | 1.25  | 1.15  | 1.30  | 1.40  | 1.46  |
| 1926 | 1.65   | 1.60   | 1.72   | 1.60   | 1.85   | 1.65   | 1.70   | 1.95  | 1.55  | 1.90  | 1.90  | 1.96  |
| 1927 | 1.00   | 1.00   | 1.00   | 1.00   | 1.10   | 1.40   | 1.40   | 1.60  | 1.45  | 1.40  | 1.55  | 1.60  |
| 1928 | 1.75   | 1.85   | 2.00   | 2.05   | 2.15   | 2.20   | 1.80   | 1.05  | 1.05  | 1.30  | 1.30  | 1.40  |
| 1929 | 1.50   | 1.55   | 1.60   | 1.65   | 1.85   | 2.05   | 2.05   | 1.90  | 1.80  | 1.85  | 1.80  | 1.85  |
| 1930 | 1.85   | 1.90   | 1.95   | 2.05   | 2.05   | 2.15   | 1.80   | 1.35  | 1.35  | 1.35  | 1.30  | 1.35  |
| 1931 | 1.32   | 1.35   | 1.35   | 1.52   | 1.52   | 1.50   | 1.10   | .60   | .50   | .50   | .45   | .45   |
| 1932 | .45    | .50    | .55    | .65    | .75    | 1.00   | .85    | .55   | .55   | .60   | .65   | .70   |
| 1933 | .75    | .85    | .90    | 1.00   | 1.10   | 1.10   | 1.10   | 1.00  | .95   | .90   | .90   | .95   |
| 1934 | 1.00   | 1.10   | 1.20   | 1.25   | 1.40   | 1.25   | 1.15   | .95   | .95   | 1.00  | 1.05  | 1.10  |
| 1935 | 1.15   | 1.20   | 1.30   | 1.30   | 1.25   | 1.35   | 1.05   | .75   | .75   | .70   | .65   | .75   |
| 1936 | .80    | .90    | .95    | .95    | 1.10   | 1.60   | 1.40   | 1.05  | 1.10  | 1.20  | 1.20  | 1.35  |
| 1937 | 1.35   | 1.50   | 1.55   | 1.60   | 1.80   | 1.55   | 1.20   | .85   | .75   | .60   | .55   | .60   |
| 1938 | .65    | .70    | .65    | .70    | .80    | .90    | 1.00   | .90   | 1.00  | .95   | 1.00  | 1.05  |
| 1939 | 1.20   | 1.15   | 1.20   | 1.20   | 1.30   | 1.20   | .95    | .65   | .65   | .55   | .55   | .55   |
| 1940 | .65    | .70    | .75    | .80    | .85    | .85    | 1.15   | .95   | 1.00  | .85   | .80   | .90   |
| 1941 | .90    | .90    | .90    | .95    | .90    | .85    | .90    | .60   | .75   | .75   | .85   | .95   |
| 1942 | 1.15   | 1.15   | 1.20   | 1.20   | 1.40   | 1.35   | 1.20   | 1.20  | 1.05  | 1.00  | 1.10  | 1.15  |
| 1943 | 1.30   | 1.35   | 1.40   | 1.65   | 1.90   | 2.40   | 2.30   | 2.50  | 2.35  | 2.60  | 2.75  | 2.85  |
| 1944 | 3.00   | 3.05   | 3.05   | 3.05   | 3.05   | 3.05   | 3.50   | 2.10  | 2.15  | 2.10  | 2.10  | 2.20  |
| 1945 | 2.40   | 2.50   | 2.60   | 2.70   | 2.80   | 3.00   | 3.50   | 3.10  | 3.10  | 3.20  | 3.80  | 3.90  |
| 1946 | 4.20   | 4.40   | 4.60   | 4.80   | 4.80   | 4.50   | 3.20   | 3.00  | 2.70  | 2.65  | 2.80  | 2.80  |
| 1947 | 3.00   | 2.85   | 3.10   | 3.20   | 3.10   | 3.10   | 2.60   | 2.60  | 2.50  | 2.20  | 2.35  | 2.75  |
| 1948 | 2.70   | 2.60   | 2.30   | 1.95   | 1.95   | 1.95   | 2.40   | 2.20  | 2.40  | 2.50  | 2.60  | 2.80  |
| 1949 | 2.85   | 3.00   | 3.20   | 3.20   | 3.20   | 3.20   | 2.00   | 1.90  | 1.60  | 1.30  | 1.30  | 1.35  |
| 1950 | 1.45   | 1.55   | 1.65   | 1.65   | 2.15   | 2.15   | 2.50   | 2.35  | 1.90  | 1.90  | 1.75  | 1.85  |
| 1951 | 2.20   | 2.00   | 1.90   | 1.60   | 1.70   | 1.70   | 2.00   | 1.90  | 1.85  | 1.65  | 1.65  | 2.05  |
| 1952 | 2.10   | 2.20   | 2.30   | 2.30   | 2.30   | 2.30   | 3.10   | 2.50  | 2.50  | 2.60  | 2.60  | 2.65  |
| 1953 | 3.00   | 3.20   | 3.05   | 2.60   | 2.60   | 2.00   | 2.40   | 2.45  | 2.45  | 2.55  | 2.65  | 2.85  |

SOURCE: OHIO CROP REPORTING SERVICE, U.S.D.A.

TABLE M - CONSUMPTION OF APPLES, UNITED STATES

| Year | Fresh 1/<br>Lbs. | Canned 2/<br>Lbs. | Juice 3/<br>Lbs. | Dried 4/<br>Lbs. | Frozen 5/<br>Lbs. |
|------|------------------|-------------------|------------------|------------------|-------------------|
| 1909 | 61.3             | .6                |                  | .2               |                   |
| 1910 | 58.6             | .7                |                  | .2               |                   |
| 1911 | 72.5             | .6                |                  | .3               |                   |
| 1912 | 73.5             | .7                |                  | .4               |                   |
| 1913 | 58.4             | .5                |                  | .2               |                   |
| 1914 | 70.8             | .7                |                  | .1               |                   |
| 1915 | 68.0             | .5                |                  | .4               |                   |
| 1916 | 63.0             | 1.1               |                  | .5               |                   |
| 1917 | 55.3             | 1.5               |                  | .4               |                   |
| 1918 | 56.1             | 1.1               |                  | .4               |                   |
| 1919 | 44.6             | 1.1               |                  | .4               |                   |
| 1920 | 62.1             | 1.8               |                  | .2               |                   |
| 1921 | 35.6             | 1.0               |                  | .1               |                   |
| 1922 | 56.7             | 1.8               |                  | .3               |                   |
| 1923 | 54.0             | 1.1               |                  | .1               |                   |
| 1924 | 53.4             | .9                |                  | .2               |                   |
| 1925 | 44.7             | .6                |                  | .1               |                   |
| 1926 | 61.4             | .6                |                  | .1               |                   |
| 1927 | 36.9             | .6                |                  | .1               |                   |
| 1928 | 46.3             | 1.0               |                  | .1               |                   |
| 1929 | 39.2             | 1.1               |                  | .2               |                   |
| 1930 | 47.5             | .7                |                  | .1               |                   |
| 1931 | 50.0             | .7                |                  | .1               |                   |
| 1932 | 38.7             | .6                |                  | .1               |                   |
| 1933 | 39.3             | .9                |                  | .1               |                   |
| 1934 | 34.4             | 1.0               |                  | .1               |                   |
| 1935 | 44.8             | 1.0               |                  | .1               |                   |
| 1936 | 37.7             | 1.2               |                  | .2               |                   |
| 1937 | 42.7             | 1.0               |                  | .2               | .01               |
| 1938 | 36.4             | 1.1               |                  | .1               | .04               |
| 1939 | 41.8             | 1.2               | .05              | .2               | .01               |
| 1940 | 40.4             | 1.4               | .10              | .1               | .01               |
| 1941 | 43.1             | 1.4               | .20              | .1               | .03               |
| 1942 | 38.2             | 1.7               | .36              | .0               | .07               |
| 1943 | 33.9             | 1.4               | .43              | .1               | .11               |
| 1944 | 34.8             | 1.0               | .61              | .1               | .30               |
| 1945 | 31.2             | 1.1               | .26              | .2               | .48               |
| 1946 | 31.2             | 1.3               | .34              | .2               | .59               |
| 1947 | 34.2             | 1.6               | .26              | .2               | .34               |
| 1948 | 35.7             | 1.8               | .25              | .1               | .32               |
| 1949 | 34.1             | 2.0               | .50              | .2               | .28               |
| 1950 | 31.6             | 2.4               | .64              | .1               | .28               |
| 1951 | 35.1             | 2.3               | .61              | .1               | .21               |
| 1952 | 29.1             | 2.7               | .68              | .1               | .27               |

1/ Farm Weight Based on Total Production  
 2/ To Convert to Fresh Weight Equivalent, Multiply By 1.709.  
 3/ " " " " " " " " " " 1.538.  
 4/ " " " " " " " " " " 8.00.  
 5/ " " " " " " " " " " 1.670.

SOURCE: THE FRUIT SITUATION, B.A.E., U.S.D.A., JULY-AUGUST 1953.