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# Costs and Physical Inputs In Producing Red Tart Cherries

## 58 Western New York Farms, 1961

by

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# INTRODUCTION

## Importance of Red Tart Cherries in the Nation and New York State

Red tart cherries ranked eighth in value of deciduous fruits produced in the United States during the period 1952-1961. In New York State, this fruit ranked third in value of production, behind apples and grapes, during the last ten years.

The major producer of tart cherries is the State of Michigan with about 65 per cent of the United States production. New York is second with about 15 per cent of the total crop.

A trend in production is rather difficult to define due to the wide range of yearly variations. New York State's pattern has been a little more stable than that of the United States. New York State's production during most years is in the 19,000- to 24,000-ton range. Since 1940 every five-year period has shown a rise then a drop in New York's per cent of the total production of either the United States or that of the Great Lakes States. The rise, however, has not been enough to offset the previous decline. The major determining factor is weather which has shown its effect very dramatically in the past few years. In 1959, New York State had 15 per cent of the production in the Great Lakes States. In 1960, it was down to 10 per cent and in 1961, it rose to approximately 20 per cent.

Table 1. RED TART CHERRY PRODUCTION HAVING VALUE IN SELECTED STATES AND UNITED STATES, 1952-1962

| Year | States | | | | | United States total |
|---|---|---|---|---|---|---|
| | New York | Pennsylvania | Michigan | Wisconsin | Ohio | |
| | thousands tons | | | | | |
| 1952 | 19.1 | 9.9 | 59.5 | 11.0 | 2.2 | 109.7 |
| 1953 | 21.6 | 6.2 | 76.0 | 18.5 | 1.2 | 131.5 |
| 1954 | 24.7 | 9.5 | 48.0 | 11.3 | 1.2 | 106.3 |
| 1955 | 31.2 | 13.0 | 71.0 | 21.7 | 1.6 | 149.1 |
| 1956 | 14.4 | 8.4 | 55.0 | 10.3 | 1.6 | 99.0 |
| 1957 | 22.1 | 9.3 | 89.0 | 12.5 | 1.6 | 146.7 |
| 1958 | 22.0 | 11.2 | 49.5 | 8.0 | 1.9 | 103.4 |
| 1959 | 19.5 | 11.5 | 86.0 | 11.7 | 1.1 | 138.0 |
| 1960 | 11.0 | 9.0 | 80.0 | 5.7 | 1.3 | 116.1 |
| 1961 | 31.2 | 10.3 | 89.5 | 20.0 | 2.3 | 165.4 |
| 1962* | 22.0 | 11.0 | 120.0 | 13.5 | 1.7 | 180.8 |

*Preliminary
Source: U.S.D.A. Crop Reporting Board Reports

Average price per ton of tart cherries has fluctuated rather widely over the years, generally reflecting the year's production. During seven of the last ten years the average price received by New York growers has been higher than the United States average.

Table 2. AVERAGE PRICE RECEIVED BY GROWERS OF RED TART CHERRIES IN SELECTED STATES AND IN THE UNITED STATES, 1952-1961

| Year | States | | | | | United States |
|---|---|---|---|---|---|---|
| | New York | Pennsylvania | Michigan | Wisconsin | Ohio | |
| | dollars per ton | | | | | |
| 1952 | 110 | 155 | 119 | 128 | 140 | 123 |
| 1953 | 205 | 187 | 176 | 180 | 219 | 182 |
| 1954 | 213 | 204 | 220 | 184 | 247 | 209 |
| 1955 | 106 | 138 | 121 | 108 | 165 | 118 |
| 1956 | 175 | 160 | 149 | 170 | 185 | 156 |
| 1957 | 155 | 156 | 132 | 120 | 190 | 138 |
| 1958 | 170 | 172 | 163 | 165 | 185 | 166 |
| 1959 | 124 | 131 | 125 | 125 | 168 | 127 |
| 1960 | 175 | 168 | 154 | 170 | 200 | 158 |
| 1961* | 170 | 174 | 166 | 167 | 187 | 167 |

*Preliminary
Source: U.S.D.A. Crop Reporting Board Reports

The farm sales value of tart cherries has shown less variation than either price or production. This is primarily because price fluctuations offset somewhat yield variations. National sales value from 1955 to 1960 were in the range of from 15 to 19 million dollars. New York's range is a little less than the national average. There is no apparent trend in the sales value of cherries in New York State.

## Areas of Production in New York State

Most of the red tart cherries in New York State are produced in a relatively small zone along Lake Ontario. Eighty-eight per cent of the State's commercial production is grown in this area composed of Wayne, Niagara, Orleans and Monroe Counties. The leading County is Wayne, which produces about 53 per cent of the commercial crop followed by Orleans with 14 per cent, Niagara with 11 per cent and Monroe with 10 per cent. Only in Wayne County is the number of bearing red tart cherry trees increasing. Almost all of the sour cherries produced are sold for processing. The number of farms producing tart cherries in the State declined from 4,685 in 1954 to 3,068 in 1959. Wayne County showed the smallest decline with about 20 per cent.

Table 3. FARM SALES VALUE OF RED TART CHERRIES IN SELECTED STATES AND IN THE UNITED STATES, 1952-1961

| Year | States | | | | | United States total |
|---|---|---|---|---|---|---|
| | New York | Pennsylvania | Michigan | Wisconsin | Ohio | |
| | million dollars | | | | | |
| 1952 | 2.1 | 1.4 | 7.1 | 1.4 | .1 | 13.0 |
| 1953 | 4.4 | 1.1 | 13.3 | 3.3 | * | 23.4 |
| 1954 | 5.2 | 1.8 | 10.5 | 2.0 | .2 | 21.7 |
| 1955 | 3.3 | 1.7 | 8.6 | 2.3 | .2 | 17.3 |
| 1956 | 2.5 | 1.3 | 8.2 | 1.7 | .2 | 15.2 |
| 1957 | 3.4 | 1.4 | 11.8 | 1.5 | .2 | 20.0 |
| 1958 | 3.7 | 1.9 | 8.0 | 1.3 | .3 | 16.8 |
| 1959 | 3.4 | 1.5 | 10.7 | 1.4 | .2 | 17.3 |
| 1960 | 1.9 | 1.5 | 12.3 | .9 | .2 | 18.1 |
| 1961** | 5.3 | 1.8 | 14.9 | 3.3 | .4 | 27.4 |

*Less than $50,000.
**Preliminary
Source: U.S.D.A. Crop Reporting Board Reports

Table 4. NUMBER OF FARMS PRODUCING RED TART CHERRIES AND NUMBER OF BEARING RED TART CHERRY TREES IN SELECTED COUNTIES OF NEW YORK STATE, 1954 and 1959

| County | 1954 | | | | 1959 | | | |
|---|---|---|---|---|---|---|---|---|
| | Number of farms | Number of bearing trees | Per cent of total | Rank | Number of farms | Number of bearing trees | Per cent of total | Rank |
| | | thousands | | | | thousands | | |
| Wayne | 960 | 397 | 48 | 1 | 766 | 450 | 55 | 1 |
| Niagara | 785 | 115 | 14 | 2 | 517 | 101 | 12 | 2 |
| Orleans | 358 | 115 | 14 | 3 | 254 | 95 | 11 | 3 |
| Monroe | 330 | 78 | 9 | 4 | 185 | 74 | 9 | 4 |
| Other counties | 2,252 | 120 | 15 | - | 1,346 | 107 | 13 | - |
| State Total | 4,685 | 825 | 100 | - | 3,068 | 827 | 100 | - |

Source: U. S. Census

## Area Under Study

The red tart cherry enterprises under study were located in the four lake counties of Wayne, Monroe, Orleans and Niagara. Over 85 per cent of the tart cherries produced in New York State are grown in these four counties.

## Organization of the Study

The farms in the study were selected by the following process:

(a) a list was obtained giving the acreage of all farms in the four counties that sold red tart cherries in 1957.

(b) a sample of 60 farms was determined to be adequate in coverage and would meet time and financial considerations.

(c) The farms were stratified into the following size groups; two through five acres, six through 20 acres and 21 acres and over. Farms with less than two acres were not included. On the basis of acreage of the group, 13 farms were selected in the small group, 27 in the medium group and 21 farms in the larger group plus a number of additional farms in each category for possible replacements. The sampling rate of 2.3 per cent of the small farms, 7.4 per cent of the medium and 25 per cent of the large enterprises on the basis of acreage was used.

Two visits per farm were made during the summer of 1961 to get data concerning the red tart cherry enterprise. The final sample consisted of 13 small enterprises, 24 medium and 21 large enterprises, all of which were studied and complete records obtained from them. Over one thousand acres of bearing red tart cherries were included in the study. Thirty-eight farms in Wayne County, nine in Orleans, six in Niagara and five in Monroe County were studied (figure 1).

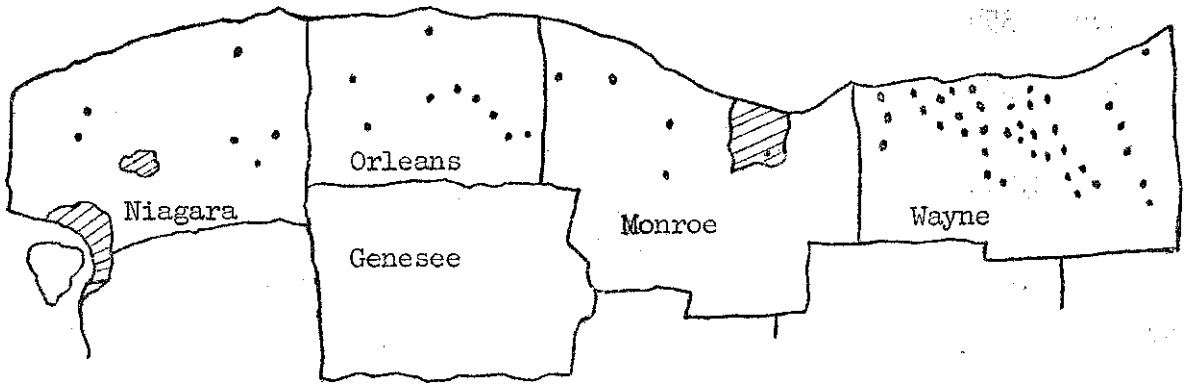


Figure 1. LOCATION OF 58 WESTERN NEW YORK RED TART CHERRY ENTERPRISES STUDIED, 1961

## Description of the Farms Studied

The large enterprises of 21 acres and over of tart cherries, as was expected, were on the larger farms and averaged 140 acres of bearing fruit, 229 total crop land and 298 acres for size of the farms (table 5). These farms were predominantly fruit farms. Only three farms had five per cent or more of the productive man work units from the care of livestock and only three farms had more than ten acres of vegetables.[1/] These were large general fruit and vegetable farms. The production of apples provided the major source of income on the large farms. Only four farms had sour cherry acreages equal to or larger than the acreages of apples. Ten farms had over 100 acres of apples. All 15 Wayne County large farms were apple and cherry operations.

The medium enterprises had six through 20 acres of red tart cherries. These farms were smaller in total size than the large operations, and averaged ten acres of bearing red tart cherry trees out of 61 acres of bearing fruit and 160 acres total crop land. About one-half of these were fruit farms. Twelve were apple-cherry fruit farms while three more farms were fruit plus substantial acreages of vegetables. Eight farms had over 50 acres of apples.

Livestock was much more prevalent among the medium-sized enterprises. Ten farms had over eight per cent of their work units come from livestock consisting mainly of diary cows. Of these, three farms had over one-half of their work units come from cattle.

Small enterprises were defined on those farms with two through five acres of bearing red tart cherries. Their average size of cherry orchard was four acres out of 30 acres of bearing fruit and 91 acres of total crop land. These farms were more variable in operation than medium- or large-sized enterprises. Some farms were part-time operations while others were cattle or vegetable operations. Only six farms had more than 30 acres of bearing apples. Six farms had more than 10 per cent of the productive man work units from cattle. Four farms raised ten or more acres of vegetables.

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1/ A productive man work unit is the average amount of productive work a man can do in a ten-hour day.

Table 5. DESCRIPTION OF THE FARMS INCLUDED IN THE RED TART CHERRY COST OF PRODUCTION AND RETURNS STUDY
58 Western New York Farms, 1961

| Item | Size of enterprise | | |
|---|---|---|---|
| | Small | Medium | Large |
| Number of farms | 13 | 24 | 21 |
| Acres owned | 103 | 168 | 275 |
| Acres rented in | 6 | 28 | 25 |
| Acres rented out | 1 | 1 | 2 |
| Total acres operated | 108 | 195 | 298 |
| Use of crop land (acres)* | | | |
| Red tart cherries, bearing | 4 | 10 | 37 |
| Red tart cherries, non-bearing | 1 | 1 | 4 |
| Apples, bearing | 23 | 43 | 83 |
| Apples, non-bearing | 3 | 7 | 11 |
| Sweet cherries | 1 | 2 | 8 |
| Peaches | 1 | 1 | 2 |
| Pears | - | 3 | 4 |
| Other bearing fruit | 1 | 2 | 4 |
| Other non-bearing fruit | 1 | 2 | 3 |
| Vegetables | 8 | 10 | 14 |
| Grain corn | 3 | 8 | 6 |
| Small grain | 12 | 20 | 9 |
| 1st cut hay and other forage | 20 | 20 | 17 |
| 2nd cut hay and other forage | 12 | 9 | 8 |
| Crop land pasture | 4 | 11 | 10 |
| Idle crop land | 4 | 9 | 9 |
| Soil bank and feed grain bill | 8 | 12 | 6 |
| Total acres of crop land | 91 | 160 | 229 |
| Acres of bearing fruit | 30 | 61 | 140 |

* Includes some double cropped land.

## A DESCRIPTION OF THE PHYSICAL FACTORS

### Farm Labor

The farm labor force is a highly flexible input for growing and harvesting red tart cherries. The pruning practices and available power equipment determine the labor input in any one year. The normal farm labor force average for the 13 small enterprises was 54 man hours per acre (table 6). The medium enterprise average was 37 man hours per acre while the large enterprises had the lowest average of the three groups with 27 man hours per acre. Regular labor was only a small part of the harvest labor force as most of it was hired in the form of migrant picking crews. The normal farm labor force usually worked in sorting and hauling the product to the processor. A total figure for hours per acre of harvest labor was not obtained as crews were paid by the pound or per pail. The cost figure for their labor is given in the harvest costs section.

### Tractor Hours of Use

The pattern of use of tractors was quite similar to the use of labor. Small enterprise operators used their tractors an average of 33 hours per acre which was the highest. The medium enterprise operators used their tractors an average of 20 hours per acre while the large enterprise operators used their tractors about 14 hours per acre. The size of tractor increased from the two-plow rated tractors of the small enterprises to four-plow rated tractors used by the large enterprise operators. The main use of the tractor in harvesting red tart cherries was the hauling of packs of cherries to the trucks and picking up in the orchards. Three small enterprises, six medium and one large enterprise used no tractors at all in picking cherries, relying mainly on trucks for the orchard work. In all three size groups, one or more of the growers used a tractor from five to ten hours per acre.

### Truck Use

The truck mileage charged for growing cherries was, in most cases, very low. In several cases growers used pick-up trucks in place of autos for running errands and other odd jobs. Here the mileage was significantly higher. The main use made of trucks was in the hauling of the product to the processor. A wide range of distances traveled was the rule. Distances traveled varied both between farms and, in some cases, even on a given farm if the crop was sold to several processors. The farms with over 105 miles per acre used pick-up trucks in place of an auto. Small growers used their trucks an average of 192 miles per acre for both growing and harvesting.[1] Medium enterprises used their trucks the equivalent of 59 miles per acre and the large enterprises averaged 49 truck miles per acre.

1/ One farm had unusually high truck mileage figures. If this farm was omitted from the tabulation, the small growers' truck miles per acre would drop to 94 miles.

Table 6. SUMMARY OF PHYSICAL FACTORS FOR GROWING AND HARVESTING ONE ACRE OF RED TART CHERRIES
58 Western New York Farms, 1961

| Item | Size of enterprise | | |
|---|---|---|---|
| | Small | Medium | Large |
| Number of farms | 13 | 24 | 21 |
| Average yield, tons sold per acre | 3.6 | 3.4 | 3.3 |
| Average number of acres of bearing sour cherries | 4 | 10 | 37 |
| Average number of bearing trees per farm | 295 | 840 | 3,080 |
| Number of hours of man labor per acre: | | | |
| Growing | 27 | 21 | 14 |
| Harvesting (other than hired picking) | 27[f] | 16 | 13 |
| Total | 54 | 37 | 27 |
| Number of tractor hours per acre: | | | |
| Growing | 19 | 12 | 8 |
| Harvesting | 14 | 8 | 5 |
| Total | 33 | 20 | 14 |
| Number of truck miles per acre[g] | 192 | 59 | 49 |
| Number of auto miles per acre[h] | 61 | 30 | 54 |
| Fertilizer - (pounds of actual nutrients per acre for all farms): | | | |
| Nitrogen ($N_2$) | 45[a] | 61[b] | 90 |
| Phosphorous ($P_2O_5$) | 11 | 13 | 17 |
| Potassium ($K_2O$) | 21 | 40 | 41 |
| Tons of manure - per acre (for those who used it) | 8[c] | 7[d] | 4[e] |
| Average number of times sprayed in 1961 | 6 | 6 | 6 |
| Number of farms spraying after harvest in 1960 | 4 | 6 | 2 |

[a] No fertilizer used on farms.
[b] No fertilizer used on seven farms.
[c] Only manure used on two farms; manure and fertilizer used on one farm.
[d] Only manure used on one farm; manure and fertilizer used on one farm.
[e] Manure and fertilizer used on two farms.
[f] Cherries picked without any crew on two farms.
[g] Mostly for hauling to processor.
[h] A computed figure, used 8 cents per mile if only a dollar figure was given.

## Auto Use

Many of the growers gave a dollar figure as the portion of the auto use to be charged against the sour cherry enterprise. For the purpose of this study the figure given (miles or dollars) was divided evenly between growing and harvesting. A flat rate of eight cents per mile was used in computing the cost of the auto. The small operations averaged 61 miles of auto use per acre for both growing and harvesting. However, several farms reported no use of auto. The large operations were the next greatest users of autos with 54 miles per acre growing and harvesting. The medium operations had an average of 30 miles per acre.

## Use of Fertilizer Materials

The cultural practices of using fertilizer materials was common on most cherry enterprises studied. The actual composition of materials used varied widely. The most commonly used material was ammonium nitrate. The application of nitrogen was the heaviest of all the nutrients applied. For those farms where fertilizer was used, the small enterprises used an average of 69 pounds of actual nitrogen per acre. The medium enterprises used an average of 80 pounds of actual nitrogen per acre while the large enterprises put on an average of 90 pounds of actual nitrogen per acre.

The rate of application of actual phosphorous was the lightest of the three nutrients used. Only a few farmers in each category used this nutrient. All phosphorous was applied as a part of a complete fertilizer mix. The average amount of actual phosphorous applied per acre by those who used a fertilizer was 16 pounds per acre for the small enterprises. The medium and large enterprises averaged 17 pounds per acre for those using this nutrient.

The rate of application of actual potash per acre was about midway between nitrogen and phosphorous. A few farms applied potash separately but most applied it as a part of a complete fertilizer mix or in a 1-0-1 ratio. Rates of application were higher on the small and medium enterprises than on the large ones for those farmers who used potash. About one-half the growers in the sample used potash, the greatest users being the large enterprises with 11 of the 21 farms.

Manure was used by some growers in each size class. Just three growers used manure as the only plant nutrient and four farmers used a combination of manure and commercial fertilizer. The manure in all cases was from cattle, either beef or dairy. Cover crops were used only on two large enterprises and only a portion of the acreage of cherries was covered on each farm. Lime, a soil amendment, was not used by any growers on red tart cherries in 1960 or 1961. This is not an item of consideration for some of the farms in the region due to their natural lime in the substratum. However, some soil types are acid and lime is needed for higher production rates.

## Spray Materials

The spray schedules of the farms in the sample was a highly variable input in regards to materials used. About 25 different chemical compounds were used, almost every type of material that is available. All groups averaged six sprays per season. Only a few farmers used less than four or more than eight sprays. The practice of post-harvest spraying was not used to any extent by growers in the sample. Only twelve growers used a post-harvest spray in 1960. Of these, four had small enterprises, six had medium and two had large enterprises.

## Weed Control

The farmers used cultivation as a primary method of keeping the weeds under control. Twenty-nine growers harrowed all of their cherry acreage, 20 harrowed and mowed their blocks of cherries and nine mowed only. All those who mowed only were small and medium sized enterprises. Two farms tried weed sprays in 1961, with some success, on part or parts of their non-bearing orchards.

## Special Equipment

In keeping with the general trend, the larger operators tended to have the newer types and more efficient pieces of equipment. Also the equipment on the larger farms was of a larger capacity. However, in many cases on the smaller cherry operations, the machinery was up-to-date because of the large acreage of apples as cherries were only a minor crop in the farmer's total operation.

Table 7. TYPES OF SPECIAL EQUIPMENT USED IN GROWING RED TART CHERRIES
58 Western New York Farms, 1961

| Item | Size of enterprise | | |
|---|---|---|---|
| | Small | Medium | Large |
| | number of enterprises | | |
| Speed sprayer | 7 | 19 | 21 |
| Hi pressure rig | 6 | 5 | - |
| Power pruner | - | 7 | 10 |
| Pruning platform | - | 2 | 2 |

The standard tillage and mowing equipment were listed by all growers. Several growersused brush chopping machines to clear prunings but most preferred to haul and burn them. An almost even distribution occurred in the method of spreading fertilizer. The small enterprise operators and

some of the other enterprises spread fertilizer by hand while a number of the medium and large operators used power spreaders. Seven growers used tanks to haul cherries to processors in 1961 and a number of the large operators expressed an interest in converting to tanks. One farmer used a mechanical tree shaker to harvest a part of his cherries, while three other larger growers expressed an interest in mechanical harvesting. One farmer used a duster during the long picking season for brown rot control while still another farmer used airplane dusting for its control. Weed sprayers, tillers and a few other specialty machines were used but not in any significant number.

## Yields

The factor of yields is the key to the success of any practice and to profitability of any enterprise. The 1961 red tart cherry crop was an unusually heavy one. The long, cool, wet growing season and the long harvest season contributed to the high yield. The small enterprises averaged 3.6 tons per acre of saleable cherries with a range of from .9 to 6.9 tons. The medium enterprises averaged 3.4 tons per acre of saleable cherries with a range of from 1.5 to 6.6 tons. The large enterprises averaged 3.3 tons per acre with a range of from .8 to 6.4 tons per acre.

Table 8. A FREQUENCY DISTRIBUTION OF YIELDS OF SALEABLE RED TART CHERRIES
58 Western New York Farms, 1961

| Yield of cherries per acre | Size of enterprise | | |
|---|---|---|---|
| | Small | Medium | Large |
| tons | Number of enterprises | | |
| Under 2.0 | 2 | 3 | 5 |
| 2.1 - 3.0 | 3 | 10 | 5 |
| 3.1 - 4.0 | 3 | 3 | 5 |
| 4.1 - 5.0 | 2 | 4 | 3 |
| Over 5.1 | 3 | 4 | 3 |
| Total | 13 | 24 | 21 |

The small enterprises were almost evenly distributed over the range. There is no one figure at which there was a definite grouping. Ten of the medium enterprises came in the 2.1 to 3.0 ton range. A further breakdown of this group showed nine farms producing between 2.6 and 3.0 tons per acre. The large enterprise units likewise showed no tendency to group around any one particular figure or range. In the study as a whole, six farms had an average yield of over six tons per acre on a total of 63 acres.

## A DESCRIPTION OF THE FINANCIAL FACTORS

### Costs of Growing

The average cost of growing an acre of red tart cherries up to harvest showed a steady decline as the size of enterprise increased. The small enterprises had the highest cost with an average of $156 per acre. Medium sized enterprises had a cost of $145 per acre to grow while the large enterprises were lowest with an average of $136 per acre to grow an acre of cherries (table 9).

Considering the various charges for growing one acre of red tart cherries, the land charge was one-quarter to one-third the total cost (table 10). Farm labor was another important item of the growing cost, accounting for about one-fifth of the total. It was not as important in the large enterprises as charges for sprays and dusts. Charge for power declined from 14 to seven per cent of the total cost of growing. This was in part due to the more efficient use of larger tractors. Sprays and dusts comprised a little less than one-fifth of the total growing costs and ranged from 14 per cent of the budget in small enterprises to 20 per cent for medium enterprises. The larger growers used the more recent chemicals which cost less per acre in some cases. Commercial fertilizer use constantly rose as size of enterprise increased reaching eventually 12 per cent of the budget in large enterprises.

Table 9. A DESCRIPTION OF THE COSTS TO GROW ONE ACRE OF RED TART CHERRIES
58 Western New York Farms, 1961

| Item | Size of enterprise | | |
|---|---|---|---|
| | Small | Medium | Large |
| Number of farms | 12 | 24 | 21 |
| Yield - tons of saleable cherries per acre | 3.6 | 3.4 | 3.3 |
| Growing costs per acre: | | dollars | |
| Labor | 34 | 31 | 21 |
| Land | 40 | 35 | 42 |
| Power | 22 | 13 | 10 |
| Truck and auto | 7 | 2 | 3 |
| Special equipment | 12 | 15 | 10 |
| All sprays and dust | 22 | 28 | 24 |
| Fertilizer and manure | 12 | 13 | 18 |
| Other | 4 | 4 | 5 |
| General overhead | 2 | 2 | 2 |
| Interest | 1 | 2 | 1 |
| Total | 156 | 145 | 136 |
| Growing cost per pound of saleable cherries | .0220 | .0219 | .0220 |

Table 10. A BREAKDOWN IN PER CENT OF THE COMPONENTS OF GROWING COSTS*.
58 Western New York Farms, 1961

| Item | Size of enterprise | | |
|---|---|---|---|
| | Small | Medium | Large |
| | per cent of total | | |
| Labor | 22 | 21 | 15 |
| Power | 14 | 9 | 7 |
| Sprays and dusts | 14 | 20 | 18 |
| Commercial fertilizer | 6 | 8 | 12 |
| Special equipment and gasoline | 8 | 10 | 7 |
| Land | 26 | 24 | 31 |
| Other | 10 | 8 | 10 |
| Total | 100 | 100 | 100 |

* Costs of various inputs were determined thusly; labor - farmer's estimation of cost to replace his labor per hour; tractor and truck, manure and overhead - Cornell Cost Account figures. Land - 10 per cent of farmer's estimation of value of land per acre. A maximum value of $750 per acre of bearing orchard was established for purposes of the study.

A wide range in costs was evident in all three size groups. Seven of the 13 small enterprises had costs in the $151 to $200 range while 11 of the 21 large enterprises and nine of the medium enterprises had costs in the $101 to $150 range (table 11).

Table 11. A FREQUENCY DISTRIBUTION OF GROWING COSTS PER ACRE
58 Western New York Farms, 1961

| Cost per acre | Size of enterprise | | |
|---|---|---|---|
| | Small | Medium | Large |
| dollars | number of enterprises | | |
| Under 101 | 1 | 6 | 1 |
| 101 - 150 | 2 | 9 | 11 |
| 151 - 200 | 7 | 4 | 8 |
| 201 and over | 3 | 5 | 1 |
| Total | 13 | 24 | 21 |

## Costs of Harvesting

The average harvesting cost per acre showed similar declines per acre as size of enterprise increased. The small enterprises averaged the highest harvest cost per acre with $279. The medium enterprises had the lowest, about $30 less per acre or $249 while the large enterprises averaged $253. This was caused mainly by changes in yield.

Table 12. A DESCRIPTION OF THE COSTS TO HARVEST ONE ACRE OF RED TART CHERRIES
58 Western New York Farms, 1961

| Item | Size of enterprise | | |
|---|---|---|---|
| | Small | Medium | Large |
| | dollars | | |
| Farm labor | 35 | 25 | 20 |
| Special picking labor | 192 | 183 | 196 |
| Total labor | 226 | 208 | 216 |
| Power | 16 | 9 | 6 |
| Truck and auto | 15 | 8 | 7 |
| Harvest equipment | 3 | 3 | 5 |
| Selling expenses | 13 | 15 | 13 |
| Overhead | 2 | 2 | 2 |
| Other | 4 | 4 | 4 |
| Total | 279 | 249 | 253 |
| Harvesting cost per pound of saleable cherries | .0393 | .0376 | .0389 |

The major part of the harvesting cost which made up 81 to 85 per cent of the total was labor. The majority of this labor was hired special picking crews. Harvest costs made up 64 to 65 per cent of the total cost of producing sour cherries.

There was a wide range in harvesting costs per acre (table 13). This is not too surprising since tart cherries are picked and paid for by the pound. The labor cost is a direct function of the yield. In most cases those with the greater costs obtained the higher yields and profits per acre. However, extremely high or extremely low costs were not conducive to making profits in most cases.

Table 13. A FREQUENCY DISTRIBUTION OF THE COST TO HARVEST ONE ACRE OF RED TART CHERRIES
58 Western New York Farms, 1961

| Cost per acre | Size of enterprise | | |
|---|---|---|---|
| | Small | Medium | Large |
| dollars | number of enterprises | | |
| Under 151 | 3 | 2 | 4 |
| 151 - 200 | 1 | 6 | 4 |
| 201 - 250 | 4 | 8 | 2 |
| 251 - 300 | 1 | 2 | 5 |
| 301 - 350 | 1 | 2 | 1 |
| 351 and over | 3 | 4 | 5 |
| Total | 13 | 24 | 21 |

Variation in harvesting costs per pound by size of enterprise is shown in table 14. Nine medium and seven large-size growers experienced costs between 3.5 and 4 cents per pound. There was no such grouping among small growers. Five of them harvested their crop for less than 3.25 cents while four had costs of 4.5 cents or more per pound.

Table 14. DISTRIBUTION OF HARVESTING COSTS PER POUND
58 Western New York Farms, 1961

| Harvesting cost per pound | Size of enterprise | | |
|---|---|---|---|
| | Small | Medium | Large |
| cents | number of enterprises | | |
| Less than 3.25 | 5 | 5 | 2 |
| 3.25 - 3.49 | 1 | 3 | 3 |
| 3.50 - 3.99 | 1 | 9 | 7 |
| 4.00 - 4.49 | 2 | 4 | 6 |
| 4.50 and over | 4 | 3 | 3 |
| Total number | 13 | 24 | 21 |

## Total Production Costs

The total average costs of growing and harvesting an acre of red tart cherries varied from $389 on the large enterprises to $435 on the small enterprises (table 15). When placed on a per-pound basis, average production costs were very similar in 1961 for each size group.

Table 15. TOTAL COSTS OF PRODUCING RED TART CHERRIES
58 Western New York Farms, 1961

| Description | Size of enterprise | | |
|---|---|---|---|
| | Small | Medium | Large |
| Yield per acre (tons) | 3.6 | 3.4 | 3.3 |
| | dollars per acre | | |
| Growing costs | 156 | 145 | 136 |
| Harvesting costs | 279 | 249 | 253 |
| Total production costs | 435 | 394 | 389 |
| | (cents per pound) | | |
| Growing costs | 2.20 | 2.19 | 2.20 |
| Harvesting costs | 3.93 | 3.76 | 3.89 |
| Total production cost | 6.13 | 5.95 | 6.09 |

## BREAK EVEN ANALYSIS

Any precise discussion of returns to management in the production of red tart cherries requires records for a minimum of several years on costs of production and yields. This is necessary because of annual fluctuation in yields. An attempt was made in the study to get previous year's production. However, increasing size of enterprises, removal of old orchards and other factors reduced the number of farms which had the same acreage of cherries over a period of years. Several farms purchased producing orchards in addition to their own plantings. In most cases it would have been impossible to determine costs of production and returns in previous years because of addition of new machinery and changes in production practices.

Table 16 presents an indication of the variation in yield of a selected sample of enterprises. These 32 growers reported no changes in acreage or blocks of cherries for four years. The average production per acre of these 32 enterprises in 1961 was 3.9 tons per acre while the average for the survey sample of 58 farms in 1961 was 3.3 tons. This increase reflects the fact that the trees were older in the 32 farm sample. It is difficult to explain the variations between size of enterprise and yield per acre which is the reverse of the survey sample. The small enterprises had the lowest yield per acre while the study as a whole showed the small enterprises as having the highest yield per acre. The reverse was true for the large enterprises. The average production per acre for the years 1958 to 1961 for the 32 farm sample was 2.4 tons per acre which is close to the 1958 figure.

Table 16. A COMPARISON OF PRODUCTION PER ACRE OF RED TART CHERRIES FOR 1958 TO 1961 ON SELECTED FARMS
32 Western New York Farms

| Size of enterprise | Number of farms | Average yield per acre | | | |
|---|---|---|---|---|---|
| | | 1961 | 1960 | 1959 | 1958 |
| | | tons | | | |
| Small | 8 | 3.0 | .9 | 1.6 | 1.7 |
| Medium | 16 | 3.8 | 1.3 | 2.1 | 2.0 |
| Large | 8 | 4.1 | 1.3 | 2.1 | 2.5 |
| Total or average | 32 | 3.9 | 1.3 | 2.1 | 2.3 |

It was decided in view of the lack of data for a series of years than an analysis of break even yields would be more relevant. This type of information indicates to the grower what size yield per acre would be needed to cover all costs of production and harvest (including a charge for his labor) and any excess would be returns to management, after subtracting harvesting costs on the additional yield.

A series of three tables were derived which varied the the harvest cost per pound but held price per pound and growing costs per acre constant. The three ranges of growing costs per acre and harvest cost per pound were based on the results of this study and generally reflect low, average and high cost situations.

The formula used to estimate the break even yield is:

Price per pound - harvest and selling cost per pound = difference per pound to be applied towards growing costs

$$\frac{\text{Growing cost per acre}}{\text{Difference per pound to be applied towards growing costs}} = \text{break even yield in pounds}$$

The tables prepared enable one to quickly determine the necessary yield to break even under varying prices received per pound, harvest cost per pound and growing cost per acre:

Example: A grower anticipates a price per pound of red tart cherries of 7.5 cents. His harvest cost per pound is 3.5 cents and his growing cost per acre is $150. Using the formula above:

$.075 - .035 = .04$

$\frac{150}{.04} =$ 3,750 pounds or 1.9 tons of cherries necessary to break even.

Tables 17 to 19 have been prepared for the rapid computation of break even yields. To determine the answer in the example above, select the proper harvest cost table (table 18) of .035 cents per pound, locate price per pound in cents (7.5) and read the yield 1.9 tons per acre which is in the $150 growing costs per acre column (all figures are rounded to the nearest tenth). If the price per pound and harvest cost per pound in the above example remained the same but the growing costs decreased to $110 per acre, then the yield necessary to break even decreases to 1.4 tons per acre. Conversely, if growing costs increase to $190 per acre, then the break even yield increases to 2.4 tons per acre. Interpolation can be used if costs are between the stated figures.

If the average price per pound of red tart cherries in New York State is taken as 8.25 cents in 1958, 6.0 cents in 1959, 8.5 cents in 1960 and 8.5 cents in 1961, then the break even points can be calculated for this group of 32 selected farms, using 1961 average growing and harvest cost data. Using an average of 3.5 cents per pound harvest cost and $150 per acre growing cost then in 1958, a 1.6 ton per acre average yield was necessary to break even. The actual average production was 2.3 tons per acre. All three enterprise sizes could have made a profit. In 1959 with a lower price per pound, a 3.0 ton average yield per acre was necessary to break even. The average production of the selected sample was 2.1 tons per acre, or below the break even point. The price of 8.5 cents per pound in 1960 indicates that a yield of 1.5 tons was necessary to break even. However, no enterprise group was able to approach this because of adverse weather. The average yield was 1.3 tons. The same break even yield is true for 1961 and with favorable weather, all three sizes of enterprises were able to produce above the break even yield. The average production for the sample was 3.9 tons per acre.

Table 17. YIELDS OF RED TART CHERRIES NECESSARY TO BREAK EVEN WITH HARVEST COSTS OF 3.0 CENTS PER POUND AND VARIOUS LEVELS OF PRICES AND GROWING COSTS

| Price per pound of saleable cherries | Harvesting and selling cost per pound | Difference to apply towards growing costs | Yield necessary to break even with growing costs per acre of: | | |
|---|---|---|---|---|---|
| | | | $110 | $150 | $190 |
| cents | cents | cents | | tons | |
| 5 | 3 | 2 | 2.8 | 3.8 | 4.8 |
| 6 | 3 | 3 | 1.8 | 2.5 | 3.2 |
| 7 | 3 | 4 | 1.4 | 1.9 | 2.4 |
| 7.5 | 3 | 4.5 | 1.2 | 1.7 | 2.1 |
| 8 | 3 | 5 | 1.1 | 1.5 | 1.9 |
| 8.5 | 3 | 5.5 | 1.0 | 1.4 | 1.7 |
| 9 | 3 | 6 | .9 | 1.3 | 1.6 |

Table 18. YIELDS OF RED TART CHERRIES NECESSARY TO BREAK EVEN WITH HARVEST COSTS OF 3.5 CENTS PER POUND AND VARIOUS LEVELS OF PRICES AND GROWING COSTS

| Price per pound of saleable cherries | Harvesting and selling cost per pound | Difference to apply towards growing costs | Yield necessary to break even with growing costs per acre of: | | |
|---|---|---|---|---|---|
| | | | $110 | $150 | $190 |
| cents | cents | cents | | tons | |
| 5 | 3.5 | 1.5 | 3.7 | 5.0 | 6.3 |
| 6 | 3.5 | 2.5 | 2.2 | 3.0 | 3.8 |
| 7 | 3.5 | 3.5 | 1.6 | 2.1 | 2.7 |
| 7.5 | 3.5 | 4.0 | 1.4 | 1.9 | 2.4 |
| 8 | 3.5 | 4.5 | 1.2 | 1.7 | 2.1 |
| 8.5 | 3.5 | 5.0 | 1.1 | 1.5 | 1.9 |
| 9 | 3.5 | 5.5 | 1.0 | 1.4 | 1.8 |

Table 19. YIELDS OF RED TART CHERRIES NECESSARY TO BREAK EVEN WITH HARVEST COSTS OF 4.0 CENTS PER POUND AND VARIOUS LEVELS OF PRICES AND GROWING COSTS

| Price per pound of saleable cherries | Harvesting and selling cost per pound | Difference to apply towards growing costs | Yield necessary to break even with growing costs per acre of: | | |
|---|---|---|---|---|---|
| | | | $110 | $150 | $190 |
| cents | cents | cents | | | |
| 5 | 4 | 1.0 | 5.5 | 7.5 | 9.5 |
| 6 | 4 | 2.0 | 2.8 | 3.8 | 4.8 |
| 7 | 4 | 3.0 | 1.8 | 2.5 | 3.2 |
| 7.5 | 4 | 3.5 | 1.6 | 2.1 | 2.7 |
| 8 | 4 | 4.0 | 1.4 | 1.9 | 2.4 |
| 8.5 | 4 | 4.5 | 1.2 | 1.7 | 2.1 |
| 9 | 4 | 5.0 | 1.1 | 1.5 | 1.9 |

## SUMMARY AND CONCLUSIONS

Red tart cherry production, as with all fruit crops, is highly specialized, requires large investments and involves financial risks. One dominant factor the farmer has no control over is weather. The farmer has some control over such factors as disease and less control over price. Most other factors of production are under the direct control of the farmer.

The industry of New York State has been the most stable in terms of tree numbers. Bearing tree numbers declined four per cent from 1949 to 1959. In Michigan, where 65 per cent of the commercial crop is produced, bearing tree numbers increased 54 per cent during this same period. New York's red tart cherry production is generally 19,000 to 24,000 tons with the price averaging five to ten dollars above the national average. Size of the cherry orchard has been increasing as the number of commercial producers decline in New York State.

The study on physical inputs and costs was conducted on a survey basis. A stratified random sample of 60 farms was drawn from the farms producing this crop in the four major producing counties along Lake Ontario. Each farm was visited twice during the summer and fall of 1961 to get data on input costs and outputs. Records were completed on 58 farms. Most farms studied were fruit farms with the major crop being apples. Livestock, vegetable and cash crop production were not important sources of farm income.

Physical inputs varied widely between farms. Labor was a big factor in the cost of growing, however, this factor depended largely upon pruning practices of individual farmers. Small enterprises used more labor and tractor hours per acre but less commercial fertilizer while the large enterprises used less labor and tractor hours and more fertilizer to grow one acre of

cherries. The large operations used larger tractors and were generally mechanized with equipment of recent make. Speed sprayers were used on most of the medium and large enterprises and one-half of the small enterprises. The important factor here was the overall size of the fruit operation. Interest was expressed in tank hauling of sour cherries and mechanized harvesting.

Small enterprises had the highest cost per acre for growing red tart cherries with $156 while the large enterprises had the lowest cost per acre at $136. All three sizes of enterprises had the same cost of 2.2 cents for growing one pound of sour cherries. Harvest cost per pound of cherries was a little more variable but not significantly so. Medium enterprises had the lowest cost per pound, 3.8 cents, while the small enterprises had the highest, 3.9 cents. The average break even yield in 1961 was about two tons per acre. Forty-four farms having an average yield higher than this made a profit while seven growers lost money. With a yield below two tons, only two growers showed a profit while five lost money.

New York State most likely will remain in second place in total red tart cherry tonnage produced. The outlook for individual growers is favorable if they are able to produce average or better yields efficiently and economically. A major problem to be conquered in the future is the virus yellows disease. If this disease can be checked so that higher yields are possible, then the red tart cherry industry stands a better chance of being a profitable one in New York State.