TEN YEARS’ PROFITS FROM AN APPLE ORCHARD.

U. P. HEDRICK.
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TEN YEARS' PROFITS FROM AN APPLE ORCHARD.¹
U. P. HEDRICK

INTRODUCTION.

Most men grow fruit for the money to be made. In common parlance they are practical business men. Yet in this day in which efficiency is the slogan of business, not many fruit-growers have precise knowledge of what their capital and labor are accomplishing. As a class, it is not to be supposed that those who grow fruit are more than others wilfully negligent of money matters, but, lacking data with which to start and method with which to keep track of the outgo and income of their orchards, and because of special difficulties, life spins past with the business affairs of most fruit-growers in a tangled skein which they hardly dare attempt to unravel.

COST OF PRODUCTION DATA NEEDED BY INVESTORS.

Everywhere men from city and town are planting orchards—beginners embarking upon what seems to be a pleasing hobby and yet one capable of giving a living and an income for old age. But if their ventures are founded on the figures seen in print or on the occasional phenomenal crops that nearly every orchard bears, the chances are they will find the times out of joint long before their plantings come into bearing and will take to building aerial castles in some other profession. They will learn through experience dearly paid for that many of the cocksure statements read or heard are “but the stuff dreams are made of.” Thousands of newly fledged fruit-growers who are now drawing checks on the bank of expectancy, will leave money in, rather than take it from, the field of horticulture. They might not have been thus deluded had there been anywhere a substantial body of figures from which could have been obtained a true conception of the financial conditions of fruit-growing.

ORCHARDING A BUSINESS.

We are well justified in saying that with increasing competition, manifold uncertainties in orchard conditions, and unbusinesslike

¹Also presented, in essentials, before Western New York Horticultural Society, Rochester, N. Y., January 28, 1914.
administration, fruit-growing is becoming a more and more risky business. Of this you need to be reminded rather than informed. Experience and the teachings of years have given the old hands in fruit-growing, at least, knowledge of the uncertainties in growing fruit, and now everywhere we are hearing discussions of the business side of the industry. Temporarily the "idea of making two blades of grass grow where one grew before," with which agriculture has been chiefly concerned in the immediate past, is eclipsed by the conception, just beginning to be realized, that agriculture is a rather highly developed enterprise requiring for success careful business management.

ACCURATE DATA DIFFICULT TO SECURE.

This Bulletin is presented with the hope that it may prove a helpful contribution to those who want data on the cost of producing apples and on the yields, selling price, and profits in the culture of this fruit. Neither time nor material, however, suffices for anything like a full consideration of the subject; for keeping accounts in apple-growing is a difficult and complicated piece of business. The yearly inventory and striking of balances which do very well for the grocer and butcher do not begin to tell the whole story in fruit-growing. In growing apples, for instance, it takes several years to bring an orchard into bearing, after which it barely maintains itself for a decade or two; the lean years and fat years are more accentuated than in most other industries; advantages and disadvantages are exceedingly changeable; and the value of the investment is variable.

ORCHARD PRODUCTION MUST BE STUDIED BY PERIODS.

The only possible way to obtain an absolutely accurate reckoning of the profits and losses of an apple orchard is to add up the expenses for the whole life of the trees and subtract from the total income; the remainder, if plus, is the profits; if minus, as often will be the case, the losses. This plan in the short span of human life will not work. Since annual accountings are not fair, and total ones not possible, we must divide the life of the orchard into periods and take data for each division. In New York, where the apple tree lives as long as man, we may make from the life of an orchard
seven periods of a decade each; these ought to make very fair units for the collection of data.

DATA FOR ONE PERIOD MAY BE USEFUL.

Unfortunately we do not have for any one of the seven periods much accurate data either as to the average total cost of production or the cost of any one of the several orchard operations, nor do we know much about the average cost of the materials used in orcharding, or the average selling price of the produce of the orchard. Now the value of such data is obvious to those who are making any attempt to keep track of the finances of their business and the object of the present paper is to put you in possession of figures that, rightly used, ought to be helpful. "Rightly used," because most figures are capable of several interpretations and all are subject to the lapses and mistakes common to erring mortals.

COST OF APPLE PRODUCTION IN AUCHTER ORCHARD

CONDITION OF ORCHARD.

The fruit to be considered is the apple as grown in an orchard situated a few miles west of Rochester, known to many as the Auchter orchard, in which the Geneva Experiment Station has carried on a comparative test of sod mulch and tillage during the past ten years. Added value is given to the figures to be presented by the fact that the orchard was selected for experimental work because it was as typical as could be found in the great apple belt of western New York. The trees are Baldwins, 27 years old at the beginning of the experiment, 37 now. The accounts tell what each of the orchard operations has cost, the number of bushels of fruit produced, and the selling price—something substantial to show what the outgo and the income of a New York apple orchard are, in its fourth decade, the period just preceding prime of life. The data, as far as possible, are given for three units, the barrel of apples, the tree and the acre.

AVERAGE YIELD.

The first information we must have in getting at the problem before us is the number of barrels of apples per acre per year. The exact number for the cultivated plat in this ten-year average is
116.8 barrels. Graded, the acre average for the period is 79.2 of barreled stock, 37.6 barrels of evaporator and cider stock. Reducing these figures to the tree unit we have for barrel stock 2.93, for evaporator stock 1.4; or total per tree, 4.33 barrels. The proportion of evaporator and cider stock is seemingly high — made so by two autumn gales in different seasons which gave many windfalls. Such episodes come in the life of every orchard. Yields per acre will vary greatly with the same variety in different orchards even in the same section but there is little reason to think that the ten-year acre average just given is much above the mark for orchards that are cared for — well tilled, sprayed and pruned plantations. It is of course much greater than the average yield of Baldwins in New York for the reason that many orchards are wholly or partially neglected. The annual yields are shown in Table I.

**Table I.— Annual Yield of Fruit in Auchter Orchard for Ten Years.**

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Per tree</th>
<th></th>
<th>Per acre</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Barreled apples</td>
<td>Culls and drops</td>
<td>Total yield</td>
</tr>
<tr>
<td>1904</td>
<td>2.45</td>
<td>2.13</td>
<td>4.58</td>
</tr>
<tr>
<td>1905</td>
<td>1.42</td>
<td>.74</td>
<td>2.16</td>
</tr>
<tr>
<td>1906</td>
<td>2.67</td>
<td>1.44</td>
<td>4.11</td>
</tr>
<tr>
<td>1907</td>
<td>2.41</td>
<td>.88</td>
<td>3.29</td>
</tr>
<tr>
<td>1908</td>
<td>4.18</td>
<td>1.41</td>
<td>5.59</td>
</tr>
<tr>
<td>1909</td>
<td>2.37</td>
<td>1.64</td>
<td>4.01</td>
</tr>
<tr>
<td>1910</td>
<td>1.92</td>
<td>.69</td>
<td>2.61</td>
</tr>
<tr>
<td>1911</td>
<td>3.41</td>
<td>2.19</td>
<td>5.60</td>
</tr>
<tr>
<td>1912</td>
<td>3.86</td>
<td>1.70</td>
<td>5.56</td>
</tr>
<tr>
<td>1913</td>
<td>4.41</td>
<td>1.02</td>
<td>5.43</td>
</tr>
<tr>
<td>Totals</td>
<td>29.10</td>
<td>13.84</td>
<td>42.94</td>
</tr>
<tr>
<td>10-Year average</td>
<td>2.91</td>
<td>1.38</td>
<td>4.29</td>
</tr>
</tbody>
</table>

**INTEREST ON INVESTMENT.**

The first item in cost of production to be considered is interest on investment — an entry in the account over which there can be much disagreement. Unfortunately we do not know how much money has been spent in bringing this orchard to its present con-
dition and can only assume that the amount invested is approximately what the present valuation is. What is a Baldwin orchard, in full bearing in the prime of life, worth? Sales are too few and most of those that take place are made under conditions too abnormal to make selling price a safe gauge of value. We will suppose the value to be $500.00 per acre and the interest five per cent. This valuation is not high, for it includes not only cost of land, trees and labor, but the deferred dividends of the first twelve or fifteen years. It is sufficient, too, to cover the overhead expense of houses and barns — or at least the share of these changes that would fall to a ten-acre orchard in New York. The first expense item, then, is $25.00 per acre on investment, a sum which, divided by 116.8, the number of barrels per acre, gives a charge per barrel of 21 cents as interest on investment.

TAXES.

Taxes vary greatly in different counties as they do somewhat in different years in the same county. Since this orchard is but a part of a general farm, only an estimate can be made of the cost of taxes. There are few regions or years in New York in which taxes for such an orchard would be over $1.50 an acre, making the tax on each barrel of apples 1.2 cents.

DEPRECIATION OF OUTFIT.

The next account to be charged to cost of production is depre-
ciation in teams and tools and interest on the money invested in them. First-class machinery for running the average orchard will cost in the neighborhood of $1,000, the items being as follows: team $400, spraying outfit $250, harness $50, wagon $75, plow, harrows, ladders, crates, pruning tools, etc., $115. The figures named are below rather than above average prices but there are few instances, indeed, in which the tools and teams named would be used exclusively for a ten-acre orchard. If we set the depreciation and interest on money at 20 per cent. for the above equipment, we must add 17 cents per barrel of apples to the depreciation account. Take notice that in obtaining the cost of production in the Auchter orchard the depreciation account must be thrown out, for the Station hired all work done and the workmen furnished their own teams and tools. This item is put in, then, only as an approximation of what men who are doing their own work must charge for depreciation.
COST OF TILLAGE.

Passing now to orchard operations the annual cost of tillage per acre for the decade was $7.39, making the amount to be charged against each barrel of fruit 6.3 cents. Tillage consisted, in this orchard, of plowing the ground in the spring, after which it was harrowed, rolled and then cultivated by harrowing an average of seven times per season. The price paid for team work at the beginning of the period was $4.00 per day of 10 hours; but the price advanced to $5.00, a fair average being $4.50. Tillage includes the labor of putting in the cover crop but not the cost of the seed. For the cover-crop seed, in this orchard, usually red clover, must be added $2.74 per acre for seed or 2.3 cents per barrel of apples.

COST OF PRUNING.

The expense of pruning per year per acre was $3.56 — since there are 27 trees to the acre in this orchard the cost per tree was 13.1 cents. The cost per barrel of apples was 3 cents. The average price paid for the work was $2.00 per day of 10 hours.

COST OF SPRAYING.

The average cost per acre for spraying was $11.28; per tree 41.8 cents; per barrel of apples 9.6 cents. The spraying was done the first few years with a hand sprayer, then for several years with a Niagara gas sprayer and the last three with a gasoline power outfit having two runs of hose. The first five years bordeaux mixture and arsenite of lime were used; the last five, lime-sulphur and arsenate of lead. The orchard was sprayed three times per season the first five of the ten seasons. The second five years it was sprayed but twice per season, the first application being the dormant spray made just before buds began to swell; the second just as blossoms dropped. This treatment has given an almost perfect crop, wormy and scabby apples being rarities scarcely to be found in the orchard.

EXPENSE OF SUPERINTENDENCE.

The last of the cost of production charges is that of superintending the work. The services of the average fruit-grower are worth more than the $2.00 per day allowed for actual work and this defici-
ency should be made up by a charge for superintending the work. The Station paid for this service $300 per year. This is a fair price since there are few competent orchardists who could not superintend a farm enterprise of several times the magnitude of a ten-acre orchard. The charge to be entered against a barrel of apples then for superintending is 25 cents; against the acre unit, $30; against an apple tree $1.10.

HARVEST EXPENSES.

Picking, packing, sorting and hauling have been done in diverse ways during the ten years and the items cannot be segregated. But the total cost of these operations has been 24.4 cents per barrel. The apples, it should be said, were sorted and packed in the field. The crop was hauled to a station one and a half miles away over a country road not better than the average.

The following is a summary of the cost sheet for a barrel of apples:

<table>
<thead>
<tr>
<th>Expense</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest on investment</td>
<td>$0.21</td>
</tr>
<tr>
<td>Taxes</td>
<td>.012</td>
</tr>
<tr>
<td>Tilling</td>
<td>.063</td>
</tr>
<tr>
<td>Pruning</td>
<td>.03</td>
</tr>
<tr>
<td>Spraying</td>
<td>.096</td>
</tr>
<tr>
<td>Cover crop</td>
<td>.023</td>
</tr>
<tr>
<td>Superintending orchard</td>
<td>.25</td>
</tr>
<tr>
<td>Picking, packing, sorting and hauling</td>
<td>.244</td>
</tr>
</tbody>
</table>

$0.93

COST OF BARRELS.

All of the first and second-grade apples from the Auchter orchard have been packed in barrels. The average price of barrels for ten years has been 36 cents each; the price fluctuated from 30 cents to 40 cents. The culls have been handled in crates and a charge for packages cannot be entered against them. Adding the cost of the barrel to the cost of production we have $1.29 as the total cost of a barrel of apples at the shipping point.
### Table II.—Annual Cost of Tillage, Cover-crop Seed, Pruning, Spraying, Harvesting and Price of Barrels in Auchter Orchard for Ten Years.

<table>
<thead>
<tr>
<th>Year</th>
<th>Tillage</th>
<th>Cover-crop seed</th>
<th>Pruning</th>
<th>Spraying</th>
<th>Harvesting (inc. bbls.)</th>
<th>Price of barrels</th>
</tr>
</thead>
<tbody>
<tr>
<td>1904</td>
<td>$21.25</td>
<td>$12.50</td>
<td>$14.62</td>
<td>$58.22</td>
<td>$210.90</td>
<td>$0.375</td>
</tr>
<tr>
<td>1905</td>
<td>34.11</td>
<td>14.60</td>
<td>13.25</td>
<td>44.27</td>
<td>96.85</td>
<td>.30</td>
</tr>
<tr>
<td>1906</td>
<td>24.00</td>
<td>6.30</td>
<td>15.12</td>
<td>46.51</td>
<td>231.80</td>
<td>.32</td>
</tr>
<tr>
<td>1907</td>
<td>29.13</td>
<td>17.50</td>
<td>18.31</td>
<td>73.84</td>
<td>224.20</td>
<td>.40</td>
</tr>
<tr>
<td>1908</td>
<td>28.87</td>
<td>7.80</td>
<td>22.11</td>
<td>50.45</td>
<td>338.59</td>
<td>.36</td>
</tr>
<tr>
<td>1909</td>
<td>52.91</td>
<td>7.94</td>
<td>16.69</td>
<td>61.75</td>
<td>229.91</td>
<td>.35</td>
</tr>
<tr>
<td>1910</td>
<td>39.70</td>
<td>15.45</td>
<td>13.62</td>
<td>49.70</td>
<td>183.89</td>
<td>.35</td>
</tr>
<tr>
<td>1911</td>
<td>44.00</td>
<td>17.91</td>
<td>14.25</td>
<td>51.97</td>
<td>373.20</td>
<td>.35</td>
</tr>
<tr>
<td>1912</td>
<td>35.00</td>
<td>21.80</td>
<td>19.50</td>
<td>52.84</td>
<td>415.51</td>
<td>.40</td>
</tr>
<tr>
<td>1913</td>
<td>42.25</td>
<td>8.25</td>
<td>21.87</td>
<td>46.35</td>
<td>415.24</td>
<td>.40</td>
</tr>
<tr>
<td>Total</td>
<td>$351.22</td>
<td>$130.14</td>
<td>$169.34</td>
<td>$535.90</td>
<td>$2,720.09</td>
<td>$3.605</td>
</tr>
<tr>
<td>Average per barrel</td>
<td>.063</td>
<td>.023</td>
<td>.03</td>
<td>.006</td>
<td>.604</td>
<td>.36</td>
</tr>
<tr>
<td>Average per tree</td>
<td>.27</td>
<td>10</td>
<td>.131</td>
<td>.41</td>
<td>2.10</td>
<td></td>
</tr>
<tr>
<td>Average per acre</td>
<td>7.39</td>
<td>2.74</td>
<td>3.56</td>
<td>11.28</td>
<td>57.26</td>
<td></td>
</tr>
</tbody>
</table>

### Returns from Auchter Orchard.

**Price of Apples.**

We come now to the average price of apples for the past ten years as grown in the Auchter orchard. We have received an average of $2.60 for all the barreled stock sold, which includes firsts and seconds. For evaporator and cider stock we have received 72 cents per barrel, rather above the average, possibly, because in two seasons gales of wind, as has been said, gave an abnormally large quantity of very good windfalls. The yearly prices received appear in Table III.

### Table III.—Price per Barrel Received for Apples in the Auchter Orchard for Ten Years.

<table>
<thead>
<tr>
<th>Year</th>
<th>Barreled apples</th>
<th>Culls and drops</th>
<th>Year</th>
<th>Barreled apples</th>
<th>Culls and drops</th>
</tr>
</thead>
<tbody>
<tr>
<td>1904</td>
<td>$1 41</td>
<td>$0 26</td>
<td>1909</td>
<td>$3 35</td>
<td>$1 11</td>
</tr>
<tr>
<td>1905</td>
<td>2 50</td>
<td>66</td>
<td>1910</td>
<td>3 35</td>
<td>1 08</td>
</tr>
<tr>
<td>1906</td>
<td>2 00</td>
<td>34</td>
<td>1911</td>
<td>2 50</td>
<td>1 02</td>
</tr>
<tr>
<td>1907</td>
<td>3 50</td>
<td>79</td>
<td>1912</td>
<td>2 00</td>
<td>60</td>
</tr>
<tr>
<td>1908</td>
<td>2 25</td>
<td>37</td>
<td>1913</td>
<td>3 00</td>
<td>97</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
<td></td>
<td>$2 61</td>
<td>$0 72</td>
</tr>
</tbody>
</table>
YIELDS.

As stated on page 84, the average yield of the orchard for the ten years has been 79.2 barrels of barrel stock per acre, and 37.6 barrels of evaporator and cider stock.

BALANCE SHEET.

We are now ready to calculate profits and declare dividends: Subtracting $1.29, the cost of a barrel of apples, from $2.60, the amount received, a net profit of $1.31 per barrel remains for firsts and seconds. Multiplying by 79, the number of barrels per acre, gives $103.49 as the profit per acre for firsts and seconds. Subtracting 72 cents from 93 cents, gives 21 cents as the difference between average cost of production and average selling price of culls. Multiplying 37.6, the number of barrels of culls per acre, by 21, gives a loss of $7.89 per acre on the culls, leaving the average net profit per acre in this orchard for the past ten years $95.60; add to this the $25 interest on the investment and we have $120.60 net, or 24.12 per ct. on $500, as the annual ten-year dividend from this orchard.

GENERAL STATEMENTS.

In closing, several general statements must be made:

The first of these is that the pan has not been skimmed in the Auchter orchard work and the milk that is left is equally as good as that which was taken. This orchard, barring accidents, will do as well, or rather better, during the next twenty years than it has in the past ten.

Secondly, as good or better dividends are coming from many New York apple orchards similarly situated and similarly cared for. The figures given are a fair average for a Baldwin orchard in its fourth decade. The cost of production is, if anything, high, since the State cannot do work as cheaply as an individual. The extra cost, if such there be, has been offset, however, by the skill and efficiency with which Mr. Auchter, in direct charge of the work, has managed every detail.

Third, the profits of this orchard are probably many times as great as those from the average plantation in New York. Indeed,
if the financial history of every apple tree in New York could be written it would be found that the total cost of all quite equals the receipts from all — in other words, many are losing and few are winning. This is the history of financial endeavors in all industries.