Bulletin No. 331 - Cost and Efficiency of Canning Pea Production in Cache and Box Elder Counties, Utah

Earnest M. Morrison

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IN CACHE AND BOX ELDER COUNTIES, UTAH

1946-1947

by

EARNEST M. MORRISON

Bulletin 331

AGRICULTURAL EXPERIMENT STATION
UTAH STATE AGRICULTURAL COLLEGE
Logan Utah
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June 1948
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COST AND EFFICIENCY OF CANNING-PEA PRODUCTION IN CACHE AND BOX ELDER COUNTIES, UTAH, 1946-1947

By

EARNEST M. MORRISON

INTRODUCTION

THE PRODUCTION of field peas for canning purposes has played an important part in Utah’s agriculture, furnishing some of the intensity needed on her small farms. Peas are a crop that can be handled largely with the labor of the operator and his family and has not required any specialized machinery for their production. They are a suitable alfalfa nurse crop and in most areas do not compete greatly with other crops grown for the farmer’s time.

Canning-pea production in Utah is centered primarily in Box Elder, Cache, Weber, Davis, and Utah Counties, where approximately 75 percent of the crop is produced. Smaller acreages are grown in Juab, Morgan, Salt Lake, Sanpete, Sevier, and Wasatch Counties. In general, the total acreage in the state over the last 30 years, for which statistics are available, has shown an upward trend. Starting with 1920 when about 6,000 acres were reported, the acreage has fluctuated between 6,000 and 16,200 acres (fig. 1). One of the primary factors influencing the acreages planted has been the contract price and terms offered by the canners. The greatest acreage of canning peas reported was reached in 1944 when 16,200 acres were planted. The average season price of $78.60 per ton accompanied the large acreage of 1944, which was the highest on record to that date.

Yield per acre of shelled peas has been relatively constant in Utah over a period of years. A range in yield from .9 tons to 2.1 has been reported; the 28 year-average, from 1920 to 1947, however, is 1.3 tons per acre. A range of 0.2 tons on each side of the 28-year average includes 19 of the 28 years (table I Appendix). Over this period weather conditions during the late spring probably had as much influence on yields as any one factor.

The total value of the canning pea crop in Utah has shown more fluctuation than either acreage or yield, as would be expected since it is affected by both acreage and yield as well as by the general price level. Total value has fluctuated from $329,000 in 1932 to $1,910,000 in 1944. About 1.3 percent of the total farm income of the state comes from canning peas.

1 Contribution of the Department of Agricultural economics, Report on project 149-11, Purnell.
2 Research assistant professor.
Fig. 1. The acreage of canning peas in Utah has shown an upward trend over the past 28 years. With canning peas as with many contract crops, the price offered by the processor has an influence on the acreage planted.

PURPOSE OF STUDY

Since the production of canning peas in Utah has not to date required any specialized machinery for handling the crop on the farm, there is great freedom of choice on the part of the farm operator as to whether or not he produces canning peas from one year to the next. He also has a great amount of freedom in deciding on the number of acres to plant. He should take into consideration, however, the labor requirements of this and other crops and balance them against the available labor that can reasonably be counted upon for the farming operation. He should also consider the costs and relative profitableness of the various alternative crops that can be grown. Out of this consideration a basis will be developed for organizing and operating the plan of farming that will be followed each year.

As an aid in determining more definitely the production requirements of the canning pea enterprise, a study was conducted of the enterprise during the summer of 1946. The results of this study will supplement other known information about pea production. The primary purpose of the study was to ascertain the total labor requirements,
the total costs, and the factors associated with successful canning-pea production.

METHOD OF PROCEDURE

The information on which the study is based was obtained by the survey method from farmers by trained enumerators. Contacts were made within a few days after the crop was harvested and the weights and grades of the peas delivered were known. Data were obtained from the grower for the various operations of preparing the land, planting, growing and harvesting the crop, the value and amount of time spent, and the value of the land. From farm records and other sources the cash expense for seed, fertilizer, water, taxes, hired labor, and the amounts and grades of peas delivered were obtained. This information was summarized and tabulated and constitutes the statistical basis of this report.

Contacts with farmers were confined to the pea-producing areas of Box Elder and Cache Counties. A total of 100 records was obtained and summarized with fifty records from each county, covering the production of 567 acres of peas. The average acreage of peas per farm was 5.7 acres with a yield per acre of 1.68 tons of shelled peas. Schedules were taken from growers as they were located and as they had the time for an interview and were willing to talk over their experience with the 1946 pea crop.

The report of the study thus conducted will be presented in the following order: (1) total labor requirements, (2) cost of production in 1946, (3) receipts, (4) net returns, (5) cost and returns of pea production in 1947, (6) factors associated with success, and (7) summary.

RESULTS OF STUDY

LABOR REQUIREMENTS

The usual operations performed to produce and deliver a crop of peas in 1946 include the following: The land is plowed either in the fall or spring and "worked down" in the spring with a harrow and leveler as the need happens to be. The seed is planted with an ordinary grain drill at the rate of 4 to 6 bushels per acre. The crop is generally flood irrigated once or twice as the peas mature. If insect injury threatens the crop, it is usually necessary to dust or spray. The harvesting operations consist of cutting the peas with a hay mower generally equipped with curlers which leave the mowed vines in a windrow. Where curlers are not used, some type of piling or wind-

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3 This average is based on the harvested acres and is somewhat greater than the average reported in the state in 1946.
rowing is done by hand labor with the use of pitchforks. The vines are loaded on hay wagons either with hand labor or with mechanical hay loaders. The latter were used rather generally in 1946 and greatly reduced the total labor required. The peas are hauled to a viner station, where the growers are required to unload them into a viner chute.

In terms of hours per acre the average man-labor requirement was approximately 26 hours. Of this approximately one-half was spent in harvesting and the other half in preparing the ground, planting, and growing the crop (table 1). Labor requirements per operator in the

| Table 1. Total hours of man labor required to produce an acre of peas, 1946 |
|----------------------------------|------------------|------------------|------------------|
| Operation                        | Cache County     | Box Elder County | Total            |
|                                  | hours | percent | hours | percent | hours | percent |
| Preparation                      |       |         |       |         |       |         |
| Manuring                         | 3.9   | 30      | 2.0   | 32      | 2.8   | 31      |
| Plowing                          | 2.0   | 2.3     | 1.3   | 1.3     | 2.2   |         |
| Harrowing                        | 1.5   | 1.3     | .8    | .8      | 1.3   |         |
| Leveling                         | .7    | .8      | .9    | 1.0     | .8    |         |
| Ditching                         | 1.1   | .9      | 1.0   |         | 1.0   |         |
| Subtotal                         | 9.2   | 30      | 7.3   | 32      | 8.1   | 31      |
| Planting and growing             |       |         |       |         |       |         |
| Drilling                         | 1.0   |         | .9    |         | .9    |         |
| Irrigating                       | 6.0   | 3.2     | 1.3   |         | 4.4   |         |
| Dusting                          | .2    | .1      | .2    |         | .2    |         |
| Subtotal                         | 7.2   | 24      | 4.2   | 19      | 5.5   | 21      |
| Harvesting                       |       |         |       |         |       |         |
| Cutting                          | 1.8   | 1.9     | 1.9   |         | 1.8   |         |
| Loading                          | 5.7   | 3.7     | 1.3   |         | 4.6   |         |
| Hauling                          | 2.1   | 1.2     | 1.2   |         | 1.6   |         |
| Unloading                        | 4.5   | 4.1     | 4.1   |         | 4.3   |         |
| Subtotal                         | 14.1  | 46      | 10.9  | 49      | 12.3  | 48      |
| Grand total labor                | 30.5  | 100     | 22.4  | 100     | 25.9  | 100     |
| Average acres per farm           | 4.8   |         | 6.5   |         | 5.7   |         |
| Tons of peas per acre            | 1.74  | 1.63    | 1.68  |         | 1.68  |         |

two counties surveyed showed about the same relationships to total man-
labor used. Total man-hours of labor in Box Elder County averaged 22.4 per acre compared to 30.5 in Cache. Differences occurred in the time spent applying manure to the land, the time spent irrigating, and in time spent loading and hauling the peas. In Cache County where the village type of settlement is more common, there was a larger number of plots of land at greater distances from the farmyards, which required more time to haul and apply a load of manure to the land and to deliver the peas to viner sheds. In Box Elder County the farm home and buildings are usually on the farm land, and the distance traveled in hauling manure to the land was less, resulting in less time spent in this
operation. Peas in Cache County in 1946 were planted about two weeks later than in Box Elder County, and most of them were irrigated directly after planting. Although this was an unusual situation the growers in Cache County averaged one more irrigation per farm than the Box Elder County farmers in 1946. Ordinarily, however, this difference would not occur.

It is noteworthy that the amount of man-labor required to produce an acre of canning peas has been cut to about half that of 15 years ago. The major saving in labor has resulted from the increased use of power equipment in preparing the land and in harvesting the peas. The location of viner sheds in the producing areas and improved scheduling of deliveries have also been responsible for a considerable amount of saving in man-labor.

Table 2. Cost of producing canning peas, Utah, 1946

<table>
<thead>
<tr>
<th>Item</th>
<th>Cache County</th>
<th>Box Elder County</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Per farm</td>
<td>Per acre</td>
<td>Per farm</td>
</tr>
<tr>
<td>Material costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manure</td>
<td>22</td>
<td>4.37</td>
<td>23</td>
</tr>
<tr>
<td>Commercial fertilizer</td>
<td>4</td>
<td>.80</td>
<td>5</td>
</tr>
<tr>
<td>Seed</td>
<td>110</td>
<td>22.68</td>
<td>152</td>
</tr>
<tr>
<td>Fees</td>
<td>5</td>
<td>1.13</td>
<td>6</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
<td>1.79</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>149</td>
<td>30.77</td>
<td>194</td>
</tr>
<tr>
<td>Overhead costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Int. on money in crop</td>
<td>4</td>
<td>.71</td>
<td>4</td>
</tr>
<tr>
<td>Int. on investment</td>
<td>60</td>
<td>12.48</td>
<td>91</td>
</tr>
<tr>
<td>Bldg. upkeep and depreciation</td>
<td>1</td>
<td>.18</td>
<td>1</td>
</tr>
<tr>
<td>Equip. repair and depreciation</td>
<td>6</td>
<td>1.29</td>
<td>10</td>
</tr>
<tr>
<td>Land taxes</td>
<td>16</td>
<td>3.37</td>
<td>16</td>
</tr>
<tr>
<td>Water and drainage tax</td>
<td>10</td>
<td>2.14</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>97</td>
<td>20.17</td>
<td>130</td>
</tr>
<tr>
<td>Labor costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operator and family</td>
<td>98</td>
<td>20.15</td>
<td>102</td>
</tr>
<tr>
<td>Hired</td>
<td>17</td>
<td>3.62</td>
<td>19</td>
</tr>
<tr>
<td>Total</td>
<td>115</td>
<td>23.77</td>
<td>121</td>
</tr>
<tr>
<td>Power costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horses</td>
<td>16</td>
<td>3.17</td>
<td>17</td>
</tr>
<tr>
<td>Tractor</td>
<td>50</td>
<td>10.49</td>
<td>59</td>
</tr>
<tr>
<td>Truck</td>
<td>14</td>
<td>2.98</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>80</td>
<td>16.64</td>
<td>92</td>
</tr>
<tr>
<td>Grand total costs</td>
<td>441</td>
<td>91.35</td>
<td>537</td>
</tr>
</tbody>
</table>
Costs of Production in 1946

Cost items were grouped together under four major heads (table 2). The material costs include fertilizers, seed, fees, and other miscellaneous material. These costs varied but little between Cache and Box Elder County averages and in the total constitute about 30 percent of the production costs. The second grouping is overhead costs, including interest on the money invested in the crop, interest on money invested in the capital connected with the pea enterprise, building and equipment maintenance costs, and land, water, and drainage taxes. This group constitutes about 20 percent of the total cost of production. The third group of cost items is labor costs and includes the value of the time spent by the operator and his family and all hired labor connected with the enterprise. They constitute about 20 percent of the total costs. The last group consists of horse, tractor, and truck-power costs and constitutes about 15 percent of the total costs.

Labor and power costs in Cache County were somewhat greater than in Box Elder, which is probably accounted for in the extra time spent in irrigation, as mentioned previously, and the greater distances traveled to and from the fields.

Considering the various items of cost separately, seed was the most important single item, accounting for about 27 percent of the total costs. The operator and family labor costs were second in importance as a single item, with interest on capital investment, and tractor-power costs following in that order. The four items constituted about 64 percent of the production cost.

Costs per acre averaged $86.31, or $51.00 per ton (table 2). A detailed statement of what is included in each cost item can be found in the appendix of this report.

Receipts

The total receipts from the pea enterprise were calculated by determining the price paid on a grade basis for shelled peas and multiplying this figure times the pounds of each grade of peas delivered to the buyer. To the price paid for peas, as calculated above, was added $10 per acre as an estimated value of the vines for feeding purposes. During the harvesting season the Pea Growers Association assumes the responsibility for stacking the vines and then allocating them to the growers on the basis of shelled peas delivered. It charges the growers a fee on a per ton basis sufficient to cover the costs of stacking. This fee has been subtracted from the total value of the vines as pea silage in arriving at the figure of $10 per acre for value of vines.
Total receipts per enterprise averaged $773, of which $716 is the purchase price of the shelled peas, and the difference of $57 is the estimated value of the vines.

All peas in Utah were purchased on the basis of a tenderometer grade in 1946. The contract prices ranged from $115 to $50 per ton for grades 1 to 12. The average receipts per ton for shelled peas were $75.50, ranging from $51 to $109 per ton. On a grade basis the average grade was 8.5, or a tenderometer reading of about 108 lbs.4

**Net Returns**

Net returns were calculated as the difference between total receipts and total costs. On an enterprise basis net returns averaged $284 for an enterprise of 5.7 acres producing 1.68 tons per acre. On an acre basis net returns averaged $50, with total costs at $86 and total receipts at $136 (table 3).

<table>
<thead>
<tr>
<th>Item</th>
<th>Cache County</th>
<th>Box Elder County</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Per enterprise</td>
<td>Per acre</td>
<td>Per enterprise</td>
</tr>
<tr>
<td>Receipts from peas</td>
<td>.663</td>
<td>138</td>
<td>770</td>
</tr>
<tr>
<td>Value of vines</td>
<td>48</td>
<td>10</td>
<td>65</td>
</tr>
<tr>
<td>Total receipts</td>
<td>711</td>
<td>148</td>
<td>835</td>
</tr>
<tr>
<td>Total costs</td>
<td>441</td>
<td>92</td>
<td>537</td>
</tr>
<tr>
<td>Net returns</td>
<td>270</td>
<td>56</td>
<td>298</td>
</tr>
</tbody>
</table>

Of the 100 records tabulated, 14 showed a minus net return. The range for the study was from a minus $222 to $2001 per enterprise. When reduced to an acreage basis, the range in net returns was from a minus $63 to $144 per acre. Net returns were greater in Cache than in Box Elder County. The contract price was the same for both counties but Cache County farmers produced .11 tons of peas per acre more than Box Elder County farmers and their peas were graded higher.

**Costs and Returns of Pea Production in 1947**

Costs during 1947 were higher for most items than in 1946. Using the same relationship of one physical factor to another as existed in 1946 the 1947 cost of producing canning peas has been computed by

4 Grade No. 1 are peas with a tenderometer reading of 88 lbs. or less priced at $115 per ton; No. 2, 89 to 91 lbs. at $105; No. 3, 92 to 94 lbs. at $100; No. 4, 95 to 97 lbs. at $96; No. 5, 98 to 100 lbs. at $92; No. 6, 101 to 103 lbs. at $87; No. 7, 104 to 106 lbs. at $82; No. 8, 107 to 109 lbs. at $77; No. 9, 110 to 115 lbs. at $72; No. 10, 116 to 112 lbs. at $65; No. 11, 121 to 135 lbs. at $55; and No. 12, 136 lbs. and over at $50.
applying changes in price, and changes in the various unit costs of labor, power, water, and taxes. The amount of seed and other items were obtained by interview with farmers in the same area in which the 1946 survey was made and the reported change was checked against the index of costs where they exist.

The total costs increased approximately 5.5 percent for 1947 over 1946. On an acreage basis the 1947 cost of production amounted to $91.35, as compared with $86.61 for the year preceding (table 4). The largest increase came in taxes, where an average of 29 percent oc-

Table 4. *Cost of producing canning peas, Utah, 1947*

<table>
<thead>
<tr>
<th>Item</th>
<th>Per acre</th>
<th>Per ton*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Material costs:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fertilizers</td>
<td>4.77</td>
<td>2.84</td>
</tr>
<tr>
<td>Seed</td>
<td>23.09</td>
<td>13.74</td>
</tr>
<tr>
<td>Other, incl. fees</td>
<td>2.48</td>
<td>1.48</td>
</tr>
<tr>
<td>Subtotal</td>
<td>30.34</td>
<td>18.06</td>
</tr>
<tr>
<td><strong>Overhead costs:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Int. on money in crop</td>
<td>.70</td>
<td>.41</td>
</tr>
<tr>
<td>Int. on capital invest.</td>
<td>13.40</td>
<td>7.98</td>
</tr>
<tr>
<td>Bldg. &amp; equip. upkeep &amp; depr.</td>
<td>1.76</td>
<td>1.05</td>
</tr>
<tr>
<td>Land taxes</td>
<td>4.02</td>
<td>2.39</td>
</tr>
<tr>
<td>Water &amp; drainage</td>
<td>1.63</td>
<td>.97</td>
</tr>
<tr>
<td>Subtotal</td>
<td>21.51</td>
<td>12.80</td>
</tr>
</tbody>
</table>

| **Labor costs:**                 |          |          |
| Operator & family               | 19.36    | 11.53    |
| Hired labor                     | 3.50     | 2.08     |

| **Power costs:**                |          |          |
| Horse                            | 3.00     | 1.78     |
| Tractor                          | 10.64    | 6.33     |
| Truck                            | 3.00     | 1.79     |
| Subtotal                         | 16.64    | 9.90     |

Cost per ton is based on the assumption of an average of 1.68 tons per acre or the same yield in 1947 as obtained in 1946.

**FACTORS ASSOCIATED WITH SUCCESS**

By making sorts of the records into different classes on the basis of some particular factor, it is possible to determine whether or not there was any association between that factor and items of cost, methods
of production, or total profitableness of the crop. Several sorts have been made and four that seemed to show some significant relation have been included.

RELATION OF QUALITY OF PEAS TO SUCCESS

Using the average receipts per ton from shelled peas as an indication of the quality of peas delivered, an attempt has been made to ascertain any association between the quality of the crop and the success of the enterprise. Using net returns per ton and net returns per acre as indications of success there would seem to be some association between quality and success (table 5). As the average receipts from peas increased, net returns per ton increased. On a per acre basis, net returns increased consistently for the first three intervals as the grade improved, but declined with the fourth interval. This suggests that it was the best practice to cut the peas early enough for them to grade approximately an average of 7, although greater yield might be obtained at about average of 9 or 11.6 it was most economical to cut the peas prior to grade 7 than to pass beyond that grade. This would suggest also that the producer would gain by planning to harvest a little early rather than to delay his harvesting operations in an attempt to obtain greater yields.

<table>
<thead>
<tr>
<th>Range in receipts per ton</th>
<th>Records average grade</th>
<th>Average receipts per ton</th>
<th>Yield peas per acre</th>
<th>Cost per ton</th>
<th>Net returns per ton</th>
</tr>
</thead>
<tbody>
<tr>
<td>dollars</td>
<td>number</td>
<td>dollars</td>
<td>tons</td>
<td>dollars</td>
<td>dollars</td>
</tr>
<tr>
<td>50.00 to 65.99</td>
<td>22</td>
<td>11.6</td>
<td>61.29</td>
<td>1.72</td>
<td>49.98</td>
</tr>
<tr>
<td>66.00 to 77.99</td>
<td>34</td>
<td>9.0</td>
<td>71.93</td>
<td>1.66</td>
<td>49.92</td>
</tr>
<tr>
<td>78.00 to 87.99</td>
<td>30</td>
<td>7.1</td>
<td>83.26</td>
<td>1.73</td>
<td>50.88</td>
</tr>
<tr>
<td>88.00 to 115.00</td>
<td>14</td>
<td>4.0</td>
<td>96.55</td>
<td>1.47</td>
<td>65.14</td>
</tr>
<tr>
<td>All farms</td>
<td>100</td>
<td>8.5</td>
<td>75.50</td>
<td>1.68</td>
<td>51.59</td>
</tr>
</tbody>
</table>

As the average receipts from peas increased from $61.29 to $83.26, or as the grade improved from an average of 11.6 to 7.1 the yield in tons per acre remained relatively constant, but as the receipts increased to $96.55, a decrease in yields per acre was manifest. This may also be interpreted to indicate that while it was economical to delay harvesting until about an average of grade 7 was obtained, it was distinctly a disadvantage to hold them past an average of grade 7.

It is of interest also to note that costs remain relatively constant throughout, indicating little variation among the factors associated with cost of production as the grade varied.
RELATION OF SIZE OF ENTERPRISE TO SUCCESS

As the size of enterprise as measured by the number of acres of peas increased from 2.0 to 10.8 acres, the costs per ton decreased from about $61 to $47. With this same increase in size, net returns per ton increased from about $21 to $33. As size increased there was some tendency for yields to increase but only slightly. The quality of the crop as measured in receipts per ton was not associated with the size of the enterprise as there was no significant change in receipts per ton as the acreage varied. Man-hours per acre decreased from 34.5 to 23.1. Perhaps the more efficient use of labor is the most influential factor so far as size and success are concerned (table 6).

Table 6. Relation of number of acres of canning peas to various other factors, Utah, 1946

<table>
<thead>
<tr>
<th>Range in acres</th>
<th>Average acres</th>
<th>Number of records</th>
<th>Average yield</th>
<th>Man-hours per acre</th>
<th>Cost per ton</th>
<th>Net returns per ton</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 to 2.9</td>
<td>2.0</td>
<td>23</td>
<td>1.57</td>
<td>34.5</td>
<td>61.37</td>
<td>20.78</td>
</tr>
<tr>
<td>3.0 to 4.9</td>
<td>3.5</td>
<td>25</td>
<td>1.64</td>
<td>28.2</td>
<td>54.03</td>
<td>26.91</td>
</tr>
<tr>
<td>5.0 to 7.9</td>
<td>6.1</td>
<td>27</td>
<td>1.62</td>
<td>26.8</td>
<td>54.87</td>
<td>28.48</td>
</tr>
<tr>
<td>8.0 and over</td>
<td>10.8</td>
<td>25</td>
<td>1.73</td>
<td>23.1</td>
<td>47.33</td>
<td>33.02</td>
</tr>
<tr>
<td>Avg. all farms</td>
<td>5.7</td>
<td>100</td>
<td>1.68</td>
<td>25.8</td>
<td>51.59</td>
<td>29.90</td>
</tr>
</tbody>
</table>

RELATION OF HOURS OF MAN LABOR TO SUCCESS

To discover the relation of number of hours of man labor to success, the records were sorted into four groups of approximately the same size. As the average man hours per acre increased from 15 for the lowest one-fourth to 41 for the highest one-fourth, the cost per acre increased from $76 to $101. Net returns increased rather markedly from $46.20 per acre for the lowest one-fourth to $56.78 for the third group and then decreased to $40.36 for the highest one-fourth (table 7). This suggests that expenditures of labor beyond 31 hours per acre

Table 7. Relation of man hours per acre in production of canning peas to various other factors, Utah, 1946

<table>
<thead>
<tr>
<th>Range in man hours per acre</th>
<th>Average man hrs. per acre</th>
<th>Records</th>
<th>Average acres</th>
<th>Average yield</th>
<th>Cost per acre</th>
<th>Net returns per acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>hours</td>
<td>hours</td>
<td>number</td>
<td>acres</td>
<td>tons</td>
<td>dollars</td>
<td>dollars</td>
</tr>
<tr>
<td>0.0 to 19.9</td>
<td>15</td>
<td>24</td>
<td>7.0</td>
<td>1.54</td>
<td>75.71</td>
<td>46.20</td>
</tr>
<tr>
<td>20.0 to 26.9</td>
<td>23</td>
<td>26</td>
<td>6.0</td>
<td>1.70</td>
<td>83.69</td>
<td>55.08</td>
</tr>
<tr>
<td>27.0 to 35.9</td>
<td>31</td>
<td>26</td>
<td>5.0</td>
<td>1.78</td>
<td>91.01</td>
<td>56.78</td>
</tr>
<tr>
<td>36 and over</td>
<td>41</td>
<td>24</td>
<td>4.5</td>
<td>1.71</td>
<td>101.48</td>
<td>40.36</td>
</tr>
<tr>
<td>Average of all farms 25.8</td>
<td>100</td>
<td>5.7</td>
<td>1.68</td>
<td>86.32</td>
<td>50.23</td>
<td></td>
</tr>
</tbody>
</table>
were not economical when labor and price relations exist as they did during the 1946 crop year.

**Relation of Yield to Success**

The average yield of peas in this study was 1.68 tons per acre. An attempt was made to measure the effect of yield on the success of the enterprise by sorting the records into four groups on the basis of yields per acre and noting the variation in certain other factors (table 8). As the yield increased from 1.0 ton per acre to 2.4 tons, the cost per ton decreased greatly from $83 to $36. While there was some variation in cost per acre as the yield changed, this was not consistent. The required hours of man-labor showed no significant change. Low yields required almost the same amount of man labor as higher yields. Net returns per ton and per acre increased as the yield increased. When the yield was increased 1.4 times, the net returns per ton increased nearly eight times and net returns per acre increased more than 19 times. With any crop with a high value per ton, one of the greatest factors having a bearing on success is yield per acre.

<table>
<thead>
<tr>
<th>Range in yield per acre</th>
<th>Average yield</th>
<th>Records</th>
<th>Man-hrs. per acre</th>
<th>Cost per ton</th>
<th>Cost per acre</th>
<th>Net returns per ton</th>
<th>Net returns per acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>.5 to 1.29 tons</td>
<td>1.0</td>
<td>29</td>
<td>23.7</td>
<td>82.63</td>
<td>81.91</td>
<td>5.05</td>
<td>5.05</td>
</tr>
<tr>
<td>1.30 to 1.69 tons</td>
<td>1.5</td>
<td>24</td>
<td>25.7</td>
<td>56.69</td>
<td>85.01</td>
<td>27.08</td>
<td>40.26</td>
</tr>
<tr>
<td>1.70 to 2.09 tons</td>
<td>1.9</td>
<td>23</td>
<td>28.2</td>
<td>49.76</td>
<td>92.73</td>
<td>31.54</td>
<td>59.93</td>
</tr>
<tr>
<td>2.10 and over 2.4 tons</td>
<td>2.4</td>
<td>24</td>
<td>26.2</td>
<td>36.30</td>
<td>86.14</td>
<td>41.20</td>
<td>98.88</td>
</tr>
<tr>
<td>All farms 1.68</td>
<td>100</td>
<td>25.8</td>
<td>51.59</td>
<td>86.32</td>
<td>29.90</td>
<td>50.23</td>
<td></td>
</tr>
</tbody>
</table>

**Summary**

1. Canning pea production in Utah has trended upward for the past 30 years, reaching a high point of 16,200 acres, valued at $1,910,000 in 1944.

2. The 100 farms surveyed in this study produced 567 acres of peas, or about 4 percent of the peas in the state in 1946. The average size of the pea enterprise was 5.7 acres.

3. The man labor required to produce an acre of peas and deliver the crop to the viner shed was 25.9 hours. Of this, 48 percent was in harvesting the crop.
4. Cost per acre averaged $86.31. On a per ton basis, costs averaged $51. Of the total cost, seed amounted to 27 percent and labor 24 percent. About 85 percent of the labor was contributed by the operator and his family.

5. Receipts were comprised of payment for the shelled peas by the factory and payment for vines by the Pea Growers' Association. Receipts averaged $136 per acre.

6. Quality of peas delivered exerted an important influence on the success of the enterprise. Peas of an average grade of 7 to 8 yielded the greatest returns on an acre basis.

7. Net returns per acre increased significantly as the size of the pea enterprise increased from 2.0 to 10.8 acres. Increased yields combined with decreased labor requirements per acre account for this relationship.

8. Expenditure of labor beyond 31 hours per acre was not economical with the price relationships of 1946.

9. The yield per acre has an important effect on success in canning pea production. As yields increased from an average of one ton per acre to 2.40 tons, net returns per acre increased from $5.05 to $98.88.
## Acreage, Production, and Value of Canning Peas in Utah

Table I. *Acreage, production, and value of canning peas in Utah, 1920-1947*

<table>
<thead>
<tr>
<th>Year</th>
<th>Acres</th>
<th>Tons shelled peas</th>
<th>Price per ton</th>
<th>Total value (000)</th>
<th>Index 1935-39=100</th>
<th>Acres harvested</th>
<th>Total value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>Per acre</td>
<td>dollars</td>
<td>dollars</td>
<td>percent</td>
<td>percent</td>
</tr>
<tr>
<td>1920</td>
<td>6,000</td>
<td>12,600</td>
<td>2.1</td>
<td>65.68</td>
<td>828</td>
<td>48</td>
<td>96</td>
</tr>
<tr>
<td>1921</td>
<td>6,000</td>
<td>9,000</td>
<td>1.5</td>
<td>54.12</td>
<td>487</td>
<td>48</td>
<td>57</td>
</tr>
<tr>
<td>1922</td>
<td>6,660</td>
<td>9,300</td>
<td>1.4</td>
<td>57.68</td>
<td>536</td>
<td>53</td>
<td>62</td>
</tr>
<tr>
<td>1923</td>
<td>7,260</td>
<td>10,900</td>
<td>1.5</td>
<td>58.60</td>
<td>639</td>
<td>58</td>
<td>74</td>
</tr>
<tr>
<td>1924</td>
<td>10,360</td>
<td>12,400</td>
<td>1.2</td>
<td>57.75</td>
<td>716</td>
<td>82</td>
<td>83</td>
</tr>
<tr>
<td>1925</td>
<td>10,750</td>
<td>17,200</td>
<td>1.6</td>
<td>56.05</td>
<td>964</td>
<td>85</td>
<td>112</td>
</tr>
<tr>
<td>1926</td>
<td>9,510</td>
<td>12,400</td>
<td>1.3</td>
<td>58.27</td>
<td>723</td>
<td>75</td>
<td>84</td>
</tr>
<tr>
<td>1927</td>
<td>8,460</td>
<td>10,200</td>
<td>1.2</td>
<td>53.84</td>
<td>549</td>
<td>67</td>
<td>64</td>
</tr>
<tr>
<td>1928</td>
<td>10,150</td>
<td>13,017</td>
<td>1.3</td>
<td>60.00</td>
<td>781</td>
<td>80</td>
<td>91</td>
</tr>
<tr>
<td>1929</td>
<td>11,670</td>
<td>13,158</td>
<td>1.1</td>
<td>56.00</td>
<td>737</td>
<td>92</td>
<td>86</td>
</tr>
<tr>
<td>1930</td>
<td>13,070</td>
<td>17,971</td>
<td>1.4</td>
<td>56.00</td>
<td>1,006</td>
<td>104</td>
<td>117</td>
</tr>
<tr>
<td>1931</td>
<td>7,200</td>
<td>7,344</td>
<td>1.0</td>
<td>50.00</td>
<td>382</td>
<td>57</td>
<td>44</td>
</tr>
<tr>
<td>1932</td>
<td>6,500</td>
<td>7,080</td>
<td>1.1</td>
<td>46.40</td>
<td>329</td>
<td>51</td>
<td>38</td>
</tr>
<tr>
<td>1933</td>
<td>9,300</td>
<td>9,070</td>
<td>1.0</td>
<td>41.50</td>
<td>376</td>
<td>74</td>
<td>44</td>
</tr>
<tr>
<td>1934</td>
<td>10,500</td>
<td>11,020</td>
<td>1.0</td>
<td>53.00</td>
<td>584</td>
<td>83</td>
<td>70</td>
</tr>
<tr>
<td>1935</td>
<td>13,100</td>
<td>21,810</td>
<td>1.7</td>
<td>49.40</td>
<td>1,077</td>
<td>104</td>
<td>125</td>
</tr>
<tr>
<td>1936</td>
<td>12,700</td>
<td>12,060</td>
<td>1.2</td>
<td>47.60</td>
<td>574</td>
<td>101</td>
<td>67</td>
</tr>
<tr>
<td>1937</td>
<td>13,960</td>
<td>18,500</td>
<td>1.3</td>
<td>52.50</td>
<td>971</td>
<td>111</td>
<td>113</td>
</tr>
<tr>
<td>1938</td>
<td>14,250</td>
<td>20,660</td>
<td>1.4</td>
<td>54.50</td>
<td>1,126</td>
<td>113</td>
<td>131</td>
</tr>
<tr>
<td>1939</td>
<td>9,100</td>
<td>11,380</td>
<td>1.3</td>
<td>46.10</td>
<td>548</td>
<td>72</td>
<td>64</td>
</tr>
<tr>
<td>1940</td>
<td>12,400</td>
<td>13,760</td>
<td>1.1</td>
<td>48.20</td>
<td>663</td>
<td>98</td>
<td>77</td>
</tr>
<tr>
<td>1941</td>
<td>13,500</td>
<td>19,170</td>
<td>1.4</td>
<td>46.90</td>
<td>899</td>
<td>107</td>
<td>105</td>
</tr>
<tr>
<td>1942</td>
<td>15,200</td>
<td>21,200</td>
<td>1.4</td>
<td>58.00</td>
<td>1,230</td>
<td>120</td>
<td>143</td>
</tr>
<tr>
<td>1943</td>
<td>16,200</td>
<td>25,350</td>
<td>1.6</td>
<td>74.60</td>
<td>1,891</td>
<td>128</td>
<td>220</td>
</tr>
<tr>
<td>1944</td>
<td>16,200</td>
<td>24,300</td>
<td>1.5</td>
<td>78.60</td>
<td>1,910</td>
<td>128</td>
<td>222</td>
</tr>
<tr>
<td>1945</td>
<td>15,300</td>
<td>24,020</td>
<td>1.6</td>
<td>76.70</td>
<td>1,842</td>
<td>121</td>
<td>214</td>
</tr>
<tr>
<td>1946</td>
<td>13,700</td>
<td>17,190</td>
<td>1.3</td>
<td>78.70</td>
<td>1,353</td>
<td>109</td>
<td>157</td>
</tr>
<tr>
<td>1947†</td>
<td>10,500</td>
<td>14,180</td>
<td>1.4</td>
<td>78.70</td>
<td>1,116</td>
<td>83</td>
<td>130</td>
</tr>
</tbody>
</table>

* Source: U. S. Bureau of Agricultural Economics
† Preliminary figures
DESCRIPTION OF FARMS SURVEYED

The farms on which peas were produced in Box Elder and Cache Counties could be generally described as general livestock and crop farms. Few cases existed where peas were grown on farms particularly specialized in any crop or type of livestock. Table II shows the average acreage of crops on the farms included in the survey. Approximately 32 percent of the 73.8 acres was devoted to forage crop production. Cache County farms averaged about 36 percent of the farm land in forage crops, compared to 27 percent in Box Elder. Approximately 36 percent of the farm land was used in production of grain crops, with slightly larger portions on the Cache County farms and smaller portions of Box Elder County farms planted to grain crops. About 13 percent of the farms was producing row crops of one kind or another, with somewhat greater emphasis here in Box Elder County than in Cache. The canning pea enterprise occupied about 8 percent of the total cultivated acres, with an average of 5.7 acres. Box Elder pea enterprises averaged 6.5 acres, compared to 4.8 acres for Cache.

Table II. Average acreage of principal crops on farms producing canning peas, 1946

<table>
<thead>
<tr>
<th>Crop</th>
<th>Cache County</th>
<th>Box Elder County</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Farms</td>
<td>Average</td>
<td>Farms</td>
</tr>
<tr>
<td></td>
<td>reporting</td>
<td>acreage</td>
<td>reporting</td>
</tr>
<tr>
<td>number</td>
<td></td>
<td>number</td>
<td></td>
</tr>
<tr>
<td>Alfalfa hay</td>
<td>47</td>
<td>29.4</td>
<td>46</td>
</tr>
<tr>
<td>Other hay</td>
<td>—</td>
<td>—</td>
<td>4</td>
</tr>
<tr>
<td>Wheat—irrigated</td>
<td>13</td>
<td>2.7</td>
<td>25</td>
</tr>
<tr>
<td>dry</td>
<td>14</td>
<td>19.8</td>
<td>5</td>
</tr>
<tr>
<td>Barley</td>
<td>34</td>
<td>10.1</td>
<td>28</td>
</tr>
<tr>
<td>Oats</td>
<td>6</td>
<td>0.6</td>
<td>6</td>
</tr>
<tr>
<td>Canning peas</td>
<td>50</td>
<td>4.8</td>
<td>50</td>
</tr>
<tr>
<td>Beets</td>
<td>27</td>
<td>4.0</td>
<td>40</td>
</tr>
<tr>
<td>Potatoes</td>
<td>12</td>
<td>0.7</td>
<td>17</td>
</tr>
<tr>
<td>Sweet corn</td>
<td>15</td>
<td>1.7</td>
<td>16</td>
</tr>
<tr>
<td>Tomatoes (all)</td>
<td>2</td>
<td>0.1</td>
<td>6</td>
</tr>
<tr>
<td>Misc. field crops</td>
<td>5</td>
<td>0.8</td>
<td>7</td>
</tr>
<tr>
<td>Fruit &amp; garden</td>
<td>12</td>
<td>1.2</td>
<td>8</td>
</tr>
<tr>
<td>Fallow</td>
<td>2</td>
<td>1.0</td>
<td>8</td>
</tr>
<tr>
<td>Cultivated pasture</td>
<td>13</td>
<td>5.5</td>
<td>6</td>
</tr>
<tr>
<td>Total cultivated</td>
<td>50</td>
<td>82.4</td>
<td>50</td>
</tr>
</tbody>
</table>

Table III presents the average number of livestock on farms included in the survey of the pea enterprise. Nearly all farmers kept dairy cows, about half had chickens, and about half raised some hogs.
The canning pea enterprise is one of small capital investment. Of the total investment only 5.8 percent was in the pea enterprise, of which about 94 percent was land, 5 percent equipment, and 1 percent was building investment. In only one area was any type of specialized pea equipment encountered, and that was a combination harvester that cut and loaded the peas in one operation. This machine was owned by a canning company. The land devoted to canning pea production in 1946 was valued at $252 per acre, as compared to a value of $196 per acre for all cultivated land and $153 per acre for all land included in the farm. It was estimated by the farmer that about 53 percent of the total acreage of cultivated land was capable of producing canning peas.

Table IV. Capital investment per farm where canning peas were grown, Utah, 1946

<table>
<thead>
<tr>
<th>Value item</th>
<th>Cache County</th>
<th>Box Elder County</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>All land</td>
<td>16,014</td>
<td>15,687</td>
<td>15,850</td>
</tr>
<tr>
<td>Farm building</td>
<td>5,663</td>
<td>5,380</td>
<td>5,522</td>
</tr>
<tr>
<td>Farm equipment</td>
<td>1,606</td>
<td>2,225</td>
<td>1,916</td>
</tr>
<tr>
<td>Livestock</td>
<td>3,139</td>
<td>2,897</td>
<td>3,018</td>
</tr>
<tr>
<td>Total value</td>
<td>26,422</td>
<td>26,189</td>
<td>26,306</td>
</tr>
<tr>
<td>Charged to pea land</td>
<td>1,131</td>
<td>1,722</td>
<td>1,427</td>
</tr>
<tr>
<td>Buildings</td>
<td>9</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Equipment</td>
<td>65</td>
<td>93</td>
<td>79</td>
</tr>
<tr>
<td>Total</td>
<td>1,205</td>
<td>1,823</td>
<td>1,514</td>
</tr>
<tr>
<td>Percent of capital charged</td>
<td>4.5</td>
<td>7.0</td>
<td>5.8</td>
</tr>
</tbody>
</table>
EXPLANATION OF COST ITEMS

Barnyard manure. Of the amount of manure applied to the land in preparation for the 1946 pea crop, only 50 percent of the value was charged to the 1946 pea crop, on the assumption that there would be a residual fertilizing value remaining in the soil from the current application after the 1946 crop was harvested. On the same basis 30 percent of the previous year’s application of manure is charged to the 1946 crop and 20 percent of the second previous year’s application. All manure was valued at $1 per ton in the corral. The man-labor and power cost of applying the manure were charged against the pea crop and are in labor and power costs. Applications of manure cost $.96 per ton for labor and power.

Commercial fertilizers. The pea crop was charged with all the 1945 applications of commercial fertilizers at the actual cost to the farmer. The man-labor and power cost of applying the fertilizers to the land are included under those captions. When the commercial fertilizer was applied merely by throwing it on the load of manure, no charge for application was made for the commercial fertilizer.

Seed. The cost of the seed is the actual amount paid by the farmer for the seed planted. Most of the seed was distributed by the contracting canners, but some was purchased from other sources.

Fees constitute the charges for membership in the growers collective bargaining association. In general these amount to 1 percent of the gross receipts for peas after the cost of seed has been taken out.

Dusting. In all cases where dusting was reported, the work was done by men employed by the canning company with company equipment. The grower was charged a flat rate per acre, but in this connection the man labor involved appears under labor charges, and the balance appears under dusting.

Interest on money in crop. Interest was charged at 5 percent for all cost items as the expenses were actually incurred and continued until the returns from the sale of peas were received. The investment in labor and power was grouped into three periods on the basis of the major operations. Labor and power costs involved in preparing the land earned interest for seven months. Labor and power costs for planting and growing operations earned interest for five months, and such costs connected with harvesting earned interest for two months.

Interest on capital investment. Interest on the investment in land, building, and machinery charged to peas was charged at five percent. Total capital charged to the enterprise was calculated by adding to the value of the land in peas, the value of any specialized pea equipment, a prorated share based on the farmer’s estimate of the value of the farm machinery used on the pea enterprise—except the tractor and truck and their attachments—and a prorated share of the value of the machine shed housing equipment used on the pea enterprise. The value of pea land is the farmer’s estimate of the market value of such land.

Building upkeep and depreciation. Charges for building upkeep and depreciation were calculated by assigning a prorated share of the cost of repairs and normal depreciation of buildings housing machinery used on the pea crop to the pea enterprise.

Land taxes. Land taxes were calculated on the basis of a ratio of valuation of pea land, building, and equipment prorated to the pea enterprise to the total tax valuation.
Drainage and water taxes. These charges were assessed on the basis of the estimated proportion of the total water delivered to the farm that was applied to the pea crop.

Operator and family labor costs. The amount of time spent by the operator and his family was reported by the operator on the basis of the various operations. The value of time thus spent was estimated by the operator on the basis of the customary community wage rate, which averaged $0.78 per hour in Cache County and $0.83 in Box Elder County. The operator's time as a laborer only enters in this item. Wages for any managerial effort are not herein included.

Hired labor costs. Hired labor costs include the actual payment to manual labor, whether working by hand or with some type of machinery or power equipment. In cases where a man and equipment or power units were hired, the operator was paid the customary wage for his time spent and the balance attributed to the equipment and/or power unit.

Horse power costs. The customary rates in the various communities for hired horses were used as a basis for determining the charges assessable against the pea enterprise. The average rate was 14 cents per horse hour. The number of horse hours was reported by the farmer on a job basis.

Tractor power costs. The customary rates for tractor work on a piece basis were used to determine the tractor power costs. The operator was allowed customary wages for the time spent, which amount appears under operator and family labor costs or hired labor, and the balance is attributed to the power unit and included under this item. Tractors hired and those owned and used by the operator on his pea enterprise were handled in the same manner.

Truck power costs. Truck power costs were handled in the same manner as the tractor power costs described above. All attachments to the tractor or truck are charged for in connection with the power unit propelling them.

Risk, general farm overhead. There has been no allowance made as a cost item to include general over-all risk, the canning pea enterprise's share of the general farm overhead expense, or any change in the status of the farm in general, or the land in particular, as a result of having produced a crop of canning peas. It should be further noted in this connection that wages charged against the canning pea crop for the time spent by the operator are wages for common farm labor and do not include a wage for management.