The Potato Industry of the State of Maine

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THE POTATO INDUSTRY

Of the

STATE OF MAINE.

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By

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The potato (Solanum Tuberosum) is one of the six tuber bearing plants out of a family of 1600 species. The tomato, tobacco, egg-plant and belladonna are also included in this family. It is more generally known by the name of "Irish potato", "White potato", and sometimes as "English potato." It is a native of America, coming originally from the plateaus of Chilli, Peru, and Mexico. One species of it being found as far north as South Colorado.

The potato was introduced into Virginia and North Carolina during the last half of the sixteenth century. It is claimed that colonists returning to England took the potato with them in 1586. It had already been carried to Europe by the Spanish, and is described in Gerard's Herbal, which was published in 1597, and the edition published in 1636 contains a wooden cut representing the potato as it appeared at this time, being a small gnarly enlargement of the underground stem. The potato did not make as rapid progress in England as it did in America. The only country where it was grown to any extent was Ireland, hence the name follows. In America it was extensively used by both White
people and Indians before 1722.

Since this date its growth in this country has been very rapid and its use has become more and more general until at the present day it constitutes one of the leading crops of the country.

At first its growth was more general and wide-spread throughout the southern and central states. Michigan being the leading state at this time. For the last few years the crop has gradually worked north until at the present time Maine has the lead for the largest production per acre of any state in the Union, and this industry alone brings into the state over eleven million dollars, when we reckon the crop at sixty-one cents per bushel, which is a fair average.
The following tabulation shows in a comparative way the production in bushels of potatoes in the different countries for the years 1900, 1901, 1903, and 1904, as shown by the year book for 1905:

<table>
<thead>
<tr>
<th>Country</th>
<th>1900</th>
<th>1901</th>
<th>1903</th>
<th>1904</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>210,927,000</td>
<td>187,595,000</td>
<td>247,128,000</td>
<td>332,836,000</td>
</tr>
<tr>
<td>Canada</td>
<td>57,108,000</td>
<td>57,843,000</td>
<td>56,944,000</td>
<td>55,436,000</td>
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<tr>
<td>Austria Hungary</td>
<td>611,005,000</td>
<td>616,009,000</td>
<td>544,167,000</td>
<td>520,460,000</td>
</tr>
<tr>
<td>Belgium</td>
<td>87,913,000</td>
<td>101,082,000</td>
<td>86,580,000</td>
<td>91,632,000</td>
</tr>
<tr>
<td>Denmark</td>
<td>23,332,000</td>
<td>22,002,000</td>
<td>25,256,000</td>
<td>24,214,000</td>
</tr>
<tr>
<td>Finland</td>
<td>15,367,000</td>
<td>16,325,000</td>
<td>19,212,000</td>
<td>16,500,000</td>
</tr>
<tr>
<td>France</td>
<td>426,422,000</td>
<td>411,055,000</td>
<td>450,244,000</td>
<td>451,039,000</td>
</tr>
<tr>
<td>Germany</td>
<td>1,491,255,000</td>
<td>1,788,950,000</td>
<td>1,576,361,000</td>
<td>1,333,326,000</td>
</tr>
<tr>
<td>Italy</td>
<td>29,395,000</td>
<td>29,395,000</td>
<td>29,395,000</td>
<td>29,395,000</td>
</tr>
<tr>
<td>Norway</td>
<td>22,924,000</td>
<td>24,320,000</td>
<td>22,851,000</td>
<td>17,253,000</td>
</tr>
<tr>
<td>Ireland</td>
<td>68,762,000</td>
<td>125,896,000</td>
<td>88,227,000</td>
<td>98,635,000</td>
</tr>
<tr>
<td>Japan</td>
<td>9,890,000</td>
<td>10,153,000</td>
<td>9,824,000</td>
<td>11,274,000</td>
</tr>
<tr>
<td>Total (Commonwealth)</td>
<td>15,202,000</td>
<td>11,934,000</td>
<td>14,973,000</td>
<td>16,777,000</td>
</tr>
<tr>
<td>Total Africa</td>
<td>2,678,000</td>
<td>3,589,000</td>
<td>3,541,000</td>
<td>4,048,000</td>
</tr>
</tbody>
</table>
In the following tabulation the acreage, production, and value of the potatoes in the United States in 1905 is shown, for all states producing over 100 bushels per acre. The states are arranged in the order of their production per acre.

<table>
<thead>
<tr>
<th>States in order of their production per acre</th>
<th>Acreage</th>
<th>Average yield per acre</th>
<th>Production</th>
<th>Average price Dec. 1</th>
<th>Farm value Dec. 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maine</td>
<td>103,317</td>
<td>175</td>
<td>18,080,475</td>
<td>$.61</td>
<td>$11,029,090</td>
</tr>
<tr>
<td>Wyoming</td>
<td>4,002</td>
<td>170</td>
<td>680,340</td>
<td>$.56</td>
<td>380,990</td>
</tr>
<tr>
<td>California</td>
<td>50,291</td>
<td>165</td>
<td>8,298,015</td>
<td>$.67</td>
<td>5,559,670</td>
</tr>
<tr>
<td>Colorado</td>
<td>51,052</td>
<td>160</td>
<td>8,168,320</td>
<td>$.57</td>
<td>4,655,942</td>
</tr>
<tr>
<td>Washington</td>
<td>34,199</td>
<td>142</td>
<td>4,856,258</td>
<td>$.46</td>
<td>2,233,879</td>
</tr>
<tr>
<td>Idaho</td>
<td>11,782</td>
<td>140</td>
<td>1,649,480</td>
<td>$.48</td>
<td>791,750</td>
</tr>
<tr>
<td>Utah</td>
<td>12,356</td>
<td>132</td>
<td>1,631,256</td>
<td>$.43</td>
<td>701,440</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>6,490</td>
<td>125</td>
<td>811,250</td>
<td>$.89</td>
<td>722,012</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>19,723</td>
<td>120</td>
<td>2,366,760</td>
<td>$.72</td>
<td>1,704,067</td>
</tr>
<tr>
<td>Montana</td>
<td>13,688</td>
<td>120</td>
<td>1,642,560</td>
<td>$.59</td>
<td>969,110</td>
</tr>
<tr>
<td>Nevada</td>
<td>2,808</td>
<td>120</td>
<td>335,720</td>
<td>$.82</td>
<td>276,110</td>
</tr>
<tr>
<td>Mississippi</td>
<td>5,863</td>
<td>110</td>
<td>644,930</td>
<td>$.85</td>
<td>548,190</td>
</tr>
<tr>
<td>Oregon</td>
<td>40,488</td>
<td>110</td>
<td>4,453,680</td>
<td>$.60</td>
<td>2,672,208</td>
</tr>
</tbody>
</table>
It has been my purpose and aim in taking this subject for a thesis to make a study of the methods employed in growing and handling this crop here in the state and to compose them with those employed in some of the other large potato producing states, such as Michigan, New York, Colorado, Vermont, Wyoming and others.

To do this a set of fifty papers which contained some fifty questions, made up so as to cover the industry in full were sent out over the state. They went into every county, but the most were sent into those counties where the greatest amount of potatoes have been grown in past years. Fifty per cent of these were answered promptly, and a great deal of valuable data gathered. It was impracticable to send these papers out into other states, so for the purpose of comparison bulletins and books were resorted to and these, with what aid could be given by some of the leading men in the Experiment Stations in the several states, have proven of great value.

The information obtained is classified under the headings as the questions were asked.

How many acres in your farm? Of the replies obtained three reported having farms of between 75 and 100
acres; six between 100 and 200; three between 200 and 300; one reported a farm of 320; and one 480. The rest failed to report on this subject.

**How do you divide it as regards crops?** In all replies the farms were similarly divided but the amount allotted to each part varied greatly. For potatoes the acreage ranged from 8 to 50; grain 15 to 50; grass 40 to 160; pasture 15 to 40; and woodland 20 to 80. One man reported a farm of 100 acres all of which was under cultivation, and was divided as follows: 30 acres to potatoes; 30 to grain; and 40 in grass. The farm of 480 acres had only 125 acres of cleared land. Of this 30 acres was planted to potatoes; 30 to grain, and the rest was grass land.

**Do you practice rotation?** If so name. Without an exception every man answered yes to this question. Some did not state what the rotation was. Right reported a potato, grain, clover rotation; two used potato, corn, and grass; and one made this into a six year rotation, allotting two years to each crop; one reported as using a four year rotation of potatoes, corn, oats and peas, followed by grass.

**How many men do you employ? Wages?** The work here in the state seems to be mostly done by the farmer himself. The number of men hired varied from one to four and their wages
ranged from $20. to $50. per month. Three report as hiring men when they need them and pay them $1.50 per day.

Do you give them other things, such as, house, heat, light, milk, etc.? Without exception all that the men got outside of their wages was their board.

How many animals have you on your farm? It was interesting to note the variation of the answers in regard to this question and the next. There were only four that reported their stock as under 25; there were three more than 25 and less than 50; four between 50 and 100; one reporting 130; and one 125. The rest kept stock but did not give the number of head.

Kind and number of each?

Cattle. This includes cows, young stock, bulls, and oxen. Ten reported less than 20; all the rest had less than 50.

Horses. Eleven kept 5 or less; two had 10; and one reported having 8.

Hogs. A very few men had 10 or over, but the general average was 2.

Sheep. It is surprising that in this state where the facilities are so great, that so few sheep should be raised.
Of all the papers sent out only six reported keeping any sheep. Three had 14, 16 and 17 respectively; one had 50; one 60; and one kept 100.

Hens. Without doubt there is not a farmer in this state that does not have at least a few hens, yet only three classed them among the animals kept on the farm. One of these had 24; one kept from 100 to 150; and the other had 25. For some reason this little animal has been much neglected. She is put in out-of-the-way places and for the most part has to shift for herself, or else is turned over to the housewife, and no credit is ever given her for the eggs she supplies or for the extra money she brings into the household every once in a while. One man kept three geese besides his hens.

Have you a telephone? Of all the replies received only two answered this question in the negative.

Do you live on a Trolley line or a Railroad? There were only two who lived on a trolley line, and the same for the railroad.

If not, the distance to the nearest point of transportation? The distance ranged from one mile to five. Seven reported living within 2 1/2 miles of the station, the rest
range between 2 1/2 and 5 miles.

Do you raise your own horses? I was quite surprised at the number of men who answered this in the affirmative, and especially was this true throughout Aroostook County. In referring to the papers I find that 44 percent of the answers are yes.

Do you keep accounts? Two answered no, some kept them in a crude way, others in a general way, but the majority said yes. Yet even these, when it came to some simple questions later in the papers, about the cost of various things, could not answer. It seems to me that this is the keynote to success as a farmer, to know just what every thing costs, and to know just where every cent goes. "Take care of the pennies and the dollars will take care of themselves" is a maxim the farmer can practice much to his advantage.

Rate of taxes? 18 to 25 mills.

Insurance? Four report as only insured in the Grange. The rest give their rate as ranging between 1/2 and 2/3 of one percent.

What do you value your farm at? As expected, there was a wide variation as regards value. The farms in the western part of the state running at a much lower figure than those of the northern part. In Aroostook the values as placed ran from $2000. to $40,000., while the highest estimated farm in any other part of the state was $12,000. To enumerate, there were two farms
valued at $2,000; one at $4,000; two at $5,000; two at $10,000; two at $12,000; one at $20,000; and one at $40,000. Doubtless the tendency to leave out the answer to this question and a few following ones was due to the tendency of American people and especially those of New England to shun all investigations which have the least indication of pertaining to personal affairs.

What is the value of your buildings? Machinery?
The range in the valuation of buildings was very great, beginning at $800. and extending as high as $10,000. The greater part set the value between $2,000 and $5,000. Only three placed a value above $5,000; and one valued his buildings as low as $800.

The value of the machinery ranged between $400. and $2000. There were only two who valued their machinery at the maximum; two at $1000; the rest placed the value between $400 and $800.

When do you plough your potato land - fall or spring?
The tendency here in the state seems to be to do the ploughing in the fall. There were only four who ploughed at all in the spring, and one of these only ploughed his old ground then, doing the breaking up in the fall; and one did his work at either time. To me it seems to be the better method to plough in the
fall. There are many reasons for this; fall ploughing will kill out much of the witch grass, if there is any in the land. It allows earlier working of the land in the spring, the effect of freezing and weathering does much to break down the soil formation, it exposes the weed seeds, worms, and beetles to the cold and does much to eradicate them. Of course there are some things in favor of spring ploughing but to my mind they are not nearly as important as those in favor of the fall work. Then too, in this state, the springs are so late that if the work is not done in the fall it is nearly impossible to get the crop in on time. Again, during the fall the teams are not nearly as busy as at the other times of the year, and so work can be done then at a greater advantage to the farmer.

**Cost of ploughing per acre?** As would be expected in this question there was a wide range in the answers, due to the difference of soil in the various localities. The cost ran from $1.50 to as high as $3.30 with the majority around $1.75; $2.00, and $2.50. Again there would be a difference as to old or new ground, one man reported on this, setting the cost of breaking new ground to be $3.30 against $2.00 for old ground.

**How many times do you harrow?** Here again the condition
of the land would come in and many farmers speak of this and report that they handle the land until they have a fine seed bed, one in which the moisture can work up by capillarity and on which they can work their machinery to advantage, and keep the weeds down with the least amount of work. The general tendency seems to be to handle the land more times than for any other general crop unless it was corn. The number of times to handle the land ran from two to ten times, with the average at about three or four.

What harrows do you use and in what order? The greater part of the replies stated that they used the disk, spring tooth, and smoothing harrow, in the order named, going over the land from once to three times with each one. This practice would place the land in the best of condition to receive the seed. There were three who left out the disk, using only the last two. This might be done on old land, but on new potato land, the advantage of the other practice can easily be seen. In the latter case the sods are simply torn to pieces while in the first method they are chopped up. By the use of the spring tooth the land is worked over, stirred, and smoothed to such an extent that when the smoothing harrow is run over, the field is left in ideal condition for planting
either by hand or with the planters, and the after work will be found remarkably easier.

_How much does it cost you to harrow per acre?_ Here again the soil would have much to do with the cost, still the figures given ran much closer than was expected, four reported $1.00; four between $1.20 and $2.00; one at $3.00; and one at $3.50. These figures represent the cost of the total cultivation per acre. The general average for one cultivation was found by estimating the cost of each cultivation as given, and then finding the average of these. In this way the average cost of one cultivation was estimated to be 55 cents per acre, the minimum cost was 33 1/2 cents and the maximum was 75 cents.

_How many acres do you plan to plant?_ The acreage ranged from a few acres in the western part of the state to as high as forty acres in Aroostook, and one man reports planting eighty. In actual numbers there were seven who planted ten or less acres; three who planted from ten to twenty acres; two between twenty and thirty; and two who planted forty or more acres to this crop.

_What place in the rotation do you place the potato?_ With one exception the potato held first place in the rotation,
all placing it after sod. What seems to be the general practice among the farmers here, is also the practice elsewhere and especially does the crop seem to do its best when it follows a rich clover sod. This sod not only furnishes an abundance of the plant food of which the potato is in need, but it also furnishes it at the cheapest possible price. The one exception mentioned was that of a man who placed corn first and followed it with the potato.

What is the nature of the soil on your farm? Five reported a clay loam; four a gravel loam; three a light loam; one sandy loam, and a brown loam. There were a number of remarks as to the soils containing more or less limestone and in one case mention was made of the soil being a gravelly loam overlying a limestone bed. These soils which are of this formation, and especially those within which the limestone is present seem to be the best land for the production of good potato crops.

Where do you get your seed? Cost per bushel?
Without exception the men who answered raised their own seed. One man from the southern part of the state renewed his seed once in four years from Aroostook, another farmer, exchanged with a near-by farmer whose soil was different. Those who raised their seed valued it at fifty cents, while those who
bought from the Aroostook set the cost of seed at $1.00.

How many bushels of seed do you allot per acre?
The rate of seeding ranged from 7 to 15 bushels. Four using 10; four planted 11; four 12; one 13; and one 15. The greater per cent planted 10 to 12 bushels according to the size of the seed.

What varieties do you plant? It had long been my opinion that the Green Mountain was the leading potato in this state and the papers confirmed this opinion, for every farmer named that potato for the main late crop; the Irish Cobbler was the early potato; others mentioned were the White Mountain, Prolific, Early Rose, Early Fortune, Northern Red, and Charles Pride.

Do you prefer small, medium, or large seed? The medium seed has the preference by nearly every farmer; one planted either medium or small; one large; and one man saved the best kills at digging. This is a very commendable plan although it requires a deal of care and personal attention.

Do you treat seed for potato scab? Cost of treatment? What do you use? Only two persons reported yes on this question, both of them used the formolin, the cost of
which was very small, 2½ per bushel. It is interesting to note the causes of this parasitic fungus as it is given by the farmer in general. Some place the cause as being due to the "worms throwing up the dirt in bunches and molds." Others claim that chip dirt, ashes, and stable manure are the causes.

Dr. Roland Thaxter of Harvard University (Farmers Bul. 91) made a study of this disease and he was the first to pronounce it as being a fungus disease, and he designated it as Oospora scabies. At present his theory is generally accepted by American pathologists. There is not another potato disease that is so widespread as this one and there is hardly a station in the country that has not done more or less work on this common enemy.

It has been determined that wood ashes, stable manure, air-slacked lime, caustic lime, and carbonate of soda, potash, lime and magnesia, or chip dirt do not cause the disease, but they furnish a media in which the disease, if present, in the soil, thrives best. If the disease is in the soil there are some things that may be done which tend to eradicate it. By applying commercial fertilizers, seaweed, potash salts, land plaster, common salt and ammonia, sulphate, and also by frequent application of green manure the disease can gradually be worked out of the land. If the soil is badly infested it is best to grow
such crops as grain, clovers and grasses for as long a period as possible, leaving out such crops as beets, mangles, turnips and rutabagers, which are quite as sensitive to the disease as the potato.

From investigation made at Vermont (Bul. 28) it is indicated that scaly seed tubers can and will, under ordinary circumstances, produce a scabby crop upon any kind of soil.

Seed potatoes free of disease, in any soil produce an undiseased crop, provided that the disease is not in the soil. Smooth seed does not indicate, necessarily, a seed free from disease. If the seed has been sorted from a scabby lot it will probably have the disease. Disease germs can and do remain from year to year in the ground.

When scabby potatoes are fed animals, the disease can pass through and flourish in the manure. (Cooking will remedy this). Potato scab grows and produces similar scab on beet roots. Soaking seed in weak solution for formolin (corrosive sublimate) disinfects them so that they can produce a sound crop if they are planted on a field free from scab.
In cultivating, implements should be well cleaned, or disinfected in passing from land suspected of having scab, to that which is free from it. This is essential since this is one of the easiest ways for the disease to be carried from field to field.

The treatment to be used on seed is very simple and easily applied. Bulletin 141 of the Maine Station gives two very satisfactory methods for treating seed:

(1) Small amounts of seed are best disinfected by soaking: (a) two hours in solution of one half pint formalin to fifteen gallons of water, or (b) one and one half hours in two ounces of corrosive sublimate dissolved in fifteen gallons of water.

(2) For large quantities of seed, formaldehyde gas, generated by the use of potassium permanganate is the most practical disinfecting agent. Place seed tubers in bushel crates or shallow slat-work bins in a light room. For each 1000 cubic feet of space spread 23 ounces of potassium permanganate evenly over the bottom of a large pan or pail in center of room. Pour over this 3 pints of formalin, leave room at once and allow it to remain tightly closed for 24 to 48 hours.
Do you cut your seed by hand? If not, name machine used.

Only one reported as using a machine to cut his seed. This seems to be the general practice throughout the country though there are a number of machines manufactured for this purpose. The one exception mentioned, was a farmer who used a machine which is made by Darwin Eddy, of Woodland, Maine.

Do you plant by hand? If not name machine used?

Only one planted his seed by hand. Among the rest the use of the various makes of planters was about evenly divided with the Robbins and Aspinwall in the lead with five users each; followed by the Evans and Eureka with two users.

Fertilizers, home mixed or prepared? Cost? Where obtained? Fourteen report using a prepared fertilizer against one who used the home mixed. Three of the fourteen used both kinds. For the most part they bought of the local agents. The man who used the chemicals bought of the Swift Fertilizer Company. The prices ranged from $35. to $40. with the prepared, while with the home mixed they ranged from $25. to $34. per ton.

It seems to me that this is one of the secrets of success in potato growing especially in the southern states.
There is a great saving at the start and a dollar saved at this time is as good as two bushels of potatoes in the fall. This can be shown by figures better than by writing. Take for example the fertilizer which is so generally used in Aroostook. This fertilizer calls for 3 per cent nitrogen, 6 per cent available phosphoric acid, and 10 per cent potash, and is valued at $37.50.

To compute a homemade fertilizer equivalent to this in the amount of available plant food, it would be necessary to use nitrate of soda which contains 15% available plant food and valued at $56; tankage which contains 5 1/2% phosphoric acid valued at $26; acid rock which contains 15% phosphoric acid available valued at $15; and sulphate of potash which contains 50% available potash valued at $48.

The formula given calls for:

- 3 percent nitrogen, or 60 pounds;
- 6 percent phosphoric acid, or 120 pounds;
- 10 percent potash, or 200 pounds.

Take one per cent of a ton of nitrogen from nitrate of soda:
20# Nitrogen from 133# Nitrate of Soda a .028 per lb $3.72
40# " ) = 727# Tankage .013 " " 9.45
109# Phosphoric acid)
11# " = 74# Acid Rock .0075 " " .56
200# Potash " 400# Sulphate Potash .024 " " 9.60
Total .1334# $ 23.33
Mixing 1.00
Making total cost of the home mixed fertiliser $ 24.33

These two fertilisers have the same commercial value. The lightness of the home mixture is made up with a filler, if desired (road dust or sifted coal ashes). This is sometimes desirable to reduce the strength of the fertilizer and to allow evener distribution.

Amount used per acre? The average amount per acre here in the state as obtained from replies was 1850 pounds. One reported using as low as 600 pounds; two used 1000 pounds; one used from 500 to 1000 pounds; four used from 1000 to 1500 pounds; two used 1500 pounds; one 1800; and one reports using from 1000 to 2000 pounds. The average as obtained by the papers is rather large. The best results have been obtained here at the station with about 1500 pounds.
The Geneva Station, from a number of experiments tried at the station and on Long Island, determined that the best amount to use in that state was 1000 to 1500 pounds, above this the extra production of tubers would not pay for the extra amount of fertilizer used.

How early do you plan to plant? Most of the farmers planted as soon as the ground would work in the spring, provided there is no danger of injury from frost. The dates as given range from May 1 to June 1 with the greatest percent at the middle of May.

Do you do any cultivating before plants come up? All but one went over the land from one to four times before the plants came up. One ran the spading harrow down four inches and then brushed the land, this being done soon after the crop was planted.

The practice of cultivating the land at this time is a good one for it kills the weeds that have started and also preserves a great deal of moisture.

After plants appear how often do you cultivate? And for how long? For the most part the crop was cultivated every week as long as a team could go through the field without injury to the tops. Three went through the field
four times only, while one cultivated eight to ten times.

Cost of cultivation per acre? From 76 cents to $3.00 with an average of $2.79. These figures represent the total cost of cultivation per acre. The average cost for one cultivation being 46 cents, and the average number of times an acre was cultivated was six, this shows a pretty thorough cultivation.

Do you practice level culture or not? It can be said that proper cultivation has as much to do toward the production of a good crop as does the application of fertilizer. The latter may be in the soil in an abundance but if the soil is not in a condition to promote plant growth then the fertilizer will do no good. The potato is a plant which requires an abundance of water as well as plant food to enable it to produce good tubers, and for this reason it would be well to govern the style of cultivation by the weather conditions. It is a well established fact now that moisture is preserved to the best advantage when the soil is kept level and with just the first few inches stirred so as to form a dirt mulch.

Then too the more ridges there are in the field the greater is the surface exposed and the greater the amount of moisture evaporated. It is easy to see the advantage derived by preserving this moisture, which, during a dry season is as valuable as fertilizer. The surface of an acre of land in level culture
exposed to the sun is 43,560 square feet. With rows three feet apart and moderately ridged the same acre of land would present a surface of 48,400 square feet or 4840 square feet more of surface exposed to the sun's rays and the wind. This shows far better than anything else what the loss to the soil must be, yet not a man reports using the level culture method.

This subject of cultivation is very aptly put in bulletin 196 of Cornell: - "There is no royal road to success with potatoes. Methods of practice which are applicable during one season must be modified to meet the requirements of another season; treatment of one soil might be radically wrong when applied to another soil. Success will only be attained by thorough familiarity with the plant and its habits of growth and then conditions must be made to meet as completely as possible the requirements of the plant."

**Do you spray for blight? Mixture used? Cost per acre?**

Without exception all sprayed for blight and in all cases the mixture used was Bordeaux. In some cases Paris Green was added to kill the Colorado beetle. This was mixed at the rate of 5# copper sulphate, 5# lime to 50 gallons of water, and when Paris Green was added it was mixed at the rate of 1/2 pound to 50 gallons, when the lime is used the amount of Paris Green may
be increased slightly. This has been found effective both for early blight and late blight. It has been generally used all over the country. In New York they found it a protection against the flea beetle, and grass hoppers as well as for the others. At the same time experiments were tried to determine the effect of Bordeaux on the maturity of marketable crop and it was found that the applications had a marked effect on the yield of the field and they estimated that by three applications the crop was increased 62.25 bushels at a cost of $4.98. The cost of spraying per acre in this state ranges from 75 cents to $5.00; two report $1.00; three between $1.50 and $2.50; two above $2.50, and the rest were below $1.00. The average for one spraying is 50 cents.

How often do you spray? I find that the farmers are rather inclined to spray more here in this state than anywhere else in the country. The number of times varied from three to ten with eight spraying every ten days and three every seven days.

Have you found spraying to be profitable and effective? All considered spraying a very effective remedy for the blight and are equally emphatic in claiming it as being profitable to use.
Do you use a digger to harvest? If so, kind? Cost of digging per acre? All but one used a digger to harvest his crop. The great number of them used the Hoover; three used the Reuther, and one the Hallock. Cost ranged from $6 to $15; six were between $6 and $10; the rest were between $12 and $15.

Yield per acre? The yield varied from 125 to 500 bushels per acre. There were only three who fell below the 200 bushel mark, all the rest produced between 200 and 500 bushels per acre last year. One man had kept track of his crop for 18 years and had a yearly average of 139 bushels.

Do you store crop or ship direct from field? For the most part there is a tendency to divide the crop, shipping half direct from the field and storing the other half. Three shipped the entire crop, and two depended on the market conditions.

What do you consider a good price for potatoes in field? 35 to 50 cents is considered a good price per bushel in the field. Seven set the price at 34 cents; five at 40 cents, and three at 50 cents.
Cost per bushel for getting crop in house or cellar?
This cost is so small that few people reckoned it at all, those that did give this cost set it between two and eighteen cents per bushel; two placed it at four and one at five cents, and one at six, ten, and eighteen cents respectively.

How much do potatoes shrink in storage? The crop shrinks between 5 and 15 per cent as given by the reports. Two reporting 5 percent; four reporting a shrinkage of 10 percent; and two a shrinkage of 15 percent. These figures compare very favorably with those obtained by experiments at Michigan and other stations.

What kind of a house do you use in storing crop?
For the most part the house or barn cellar was used as a store house. One man had a wooden potato house, another had built a house in the side of a hill and one man put his crop in cold storage.

Cost per bushel for storing? Here again the cost was so small that few reckoned it, only five reporting at all. Two of them figured on a cost of three cents; one at two cents; one at two 5/10 cents; and one at four.

Average price in winter? The price as estimated for winter ran from 32 to 63 cents per bushel. Three reporting
below 50 cents with the lowest at 32 and the highest price given was 63 cents.

Do you have your own store house? An estimate of the cost of this house? Six reported as having potato cellars. The cost of four of these ranged from $400, to $1800. One of these houses was 30 x 70 and had a capacity of 3000 bushels and cost $1800, while the $1000 house only held 1500 bushels.

Cost per barrel of delivering crop to nearest point of transportation? Cost ran from two to eight cents with an average of five and 5/10 cents.

Cost per bushel of shipping to various markets? Boston, New York, etc? The cost ranged from nine to nineteen cents per barrel. Two giving figures for New York which were fifteen and sixteen cents respectively.

Cost of shipping to foreign markets? Price potatoes bring in these markets? There were no replies as to the cost of shipment and only one man gave prices on these markets, which for this year were $1.60 to $2.00 per barrel.

Cars desired in shipping? Cost of different kinds of cars? One man reported the cost of Eastman heaters at $10 per trip.

Cost of heating cars with stoves? The same man replied that it costs $5 per trip to heat this way.
<table>
<thead>
<tr>
<th>Counties</th>
<th>Cost of Ploughing per acre</th>
<th>Cost of Harrowing per acre</th>
<th>Acreage</th>
<th>Cost of Seed</th>
<th>Rate of Seeding</th>
<th>Cost of Fertilizer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aroostock</td>
<td>$2.50</td>
<td>$2.00</td>
<td>38</td>
<td>$.75</td>
<td>12 bu.</td>
<td>$-</td>
</tr>
<tr>
<td>Somerset</td>
<td>3.00</td>
<td>2.00*</td>
<td>16.5</td>
<td></td>
<td>13.5 &quot;</td>
<td>$29.50</td>
</tr>
<tr>
<td>Penobscot</td>
<td>2.37</td>
<td>2.00</td>
<td>10</td>
<td></td>
<td>12 &quot;</td>
<td>25</td>
</tr>
<tr>
<td>Washington</td>
<td>2.00</td>
<td>30*</td>
<td>.75</td>
<td>13 &quot;</td>
<td>38.</td>
<td></td>
</tr>
<tr>
<td>Sagadahoc</td>
<td>2.50</td>
<td>2.37</td>
<td>8</td>
<td>1.00*</td>
<td>12 &quot;</td>
<td>30.</td>
</tr>
<tr>
<td>Averages</td>
<td>2.476</td>
<td>2.09</td>
<td>20.5</td>
<td>1.16</td>
<td>12.5&quot;</td>
<td>28. - 30.</td>
</tr>
</tbody>
</table>

* Only one reported

1 " " " from that county.
<table>
<thead>
<tr>
<th>Amount used per acre</th>
<th>Cost of Cultivation per acre</th>
<th>Cost of Spraying per acre</th>
<th>Cost of Digging per acre</th>
<th>Yield per Field</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000 - 1500#</td>
<td>$2.50</td>
<td>$1.50</td>
<td>$7.75</td>
<td>309 bu.</td>
<td>$.36</td>
</tr>
<tr>
<td>1000 - 1500#</td>
<td>2.00*</td>
<td>.75*</td>
<td>15.00</td>
<td>225 *</td>
<td>.50</td>
</tr>
<tr>
<td>1000#</td>
<td>2.00</td>
<td>.87</td>
<td>11.50</td>
<td>225 *</td>
<td>.45</td>
</tr>
<tr>
<td>2000#</td>
<td></td>
<td>.75</td>
<td></td>
<td>200 *</td>
<td>.36</td>
</tr>
<tr>
<td>1000 - 1800#</td>
<td>3.00</td>
<td>2.64</td>
<td>13.50</td>
<td>250 *</td>
<td>.50</td>
</tr>
<tr>
<td>1200 - 1560#</td>
<td>2.375</td>
<td>1.282</td>
<td>11.68</td>
<td>221.8*</td>
<td>.43</td>
</tr>
<tr>
<td>Cost of putting crop in cellar per bu.</td>
<td>Shrinkage</td>
<td>Cost per bu. for Storing</td>
<td>Average price in winter.</td>
<td></td>
<td></td>
</tr>
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<td>--------------------------------------</td>
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<td>--------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$.018</td>
<td>10 - 15%</td>
<td>$.018</td>
<td>$.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.02*</td>
<td>10%</td>
<td>.03*</td>
<td>.65*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.01</td>
<td></td>
<td>.03</td>
<td>.70</td>
<td></td>
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</tr>
<tr>
<td>.07</td>
<td>5%</td>
<td>.03*</td>
<td>.61</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.0295</td>
<td>8.75 - 11.25%</td>
<td>.026</td>
<td>.61</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In the following tables the average of two farms in each of the counties of Aroostook, Somerset, Penobscot, Washington, and Sagadahoc was taken and then the average of all five counties was computed. The reason for taking such a small number of farms in each county was on account of the small number of replies from some of the counties.
The total cost of producing a bushel of potatoes when 1500# of fertilizer is used, valued at $36.00, is 28¢ or there is a net gain of 16¢ per bushel in the fall. The cost of a bushel of potatoes in winter is 31¢ or there is a net gain of 30¢ per bushel when the crop is saved till mid winter.

As an outlet for unmarketable potatoes, and also for the surplus in the years of over production, there might be mentioned the starch and alcohol industry, both of which are deserving of no small mention. The starch industry is especially of note since the potato yields the only starch that can be used in the sizing of cloth.

The alcohol industry does not seem to be destined to a very remarkable career, especially in this state, for by the present laws, the manufacturer is subject to arrest the moment he starts his distillery, unless there can be devised some means to denature the product before it comes from the still.
References which were consulted are:-

On Fertilisers

On Spraying

On Cutting and Planting.
Vermont 13; Michigan 93; Kentucky 72; and Cornell 130.

On Treatment for Scab.
Vermont 44, and 28; Michigan 108; Maine 141; Farmers Bulletin 91.

On Storage.

Bulletin 113 from Cornell contains quite an amount of general information.

Fraser's book on "The Potato" was consulted to some extent for general information.