



Final Report

Maine Potato Industry Cost of Production Study

**For: Maine Potato Board
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This report supersedes earlier drafts presented to the Directors of the Maine Potato Board on October 22, 2008 and to a group of growers and lenders on November 19, 2008. It incorporates comments and suggestions voiced at those meetings, but is, by no means, "the last word" on cost of production analysis. It is, rather, a first step in what will be an ongoing effort on the part of the Maine Potato Board, Maine's potato growers and their suppliers to deepen their knowledge regarding all the factors affecting the cost of growing potatoes in Maine.

This report is accompanied by a Cost of Production Worksheet that incorporates the information compiled in this report and makes it available to growers who wish to compare their own costs to industry and peer averages and to use past costs per acre as a guide for estimating future cost budgets. Copies of this worksheet may be obtained from the Maine Potato Board.

Planning Decisions, Inc. gratefully acknowledges the assistance provided by Tim Shaw of STS & Associates, Pete Hallowell of Farm Credit of Maine, Mike Mathers of the Farm Service Agency of Maine, Brian Flewelling of Key Bank and Jeff Pangburn of Katahdin Trust Company. They contributed invaluable to the preparation and completion of this report, but responsibility for its content rests solely with Planning Decisions, Inc.

1. Background & Purposes

The goals of a cost of production study are two fold: first, to *provide a context* for the individual operator within which to evaluate his own costs; and second, to provide a *decision-making tool* with which an individual operator can evaluate operational and investment alternatives.

Operating a potato farm is an enormously complicated enterprise involving agricultural, business, mechanical, accounting, marketing and organizational skills. By assembling income and expense data from a wide range of growers, a cost of production study allows individual growers to see how they compare to industry-wide averages both for overall results and for individual cost items. To the extent that a common template exists for compiling, organizing and analyzing the enormous volume of data involved in the operation, it helps simplify life for the grower and makes it easier to present a picture of the enterprise both for himself and for his banker. These comparisons enable a grower to see where he is doing well and where he may need improvement. It also enables the industry as a whole to see how costs vary with factors such as farm size, value of sales, type of product, region and financial structure.

At the same time, the data derived from such a study enable individual growers to explore a variety of “What if...?” scenarios for their own operations. What if I achieved a yield 5% greater than the industry average? What if I increased my acreage planted by 20%? What if I reduced my fuel expenses by 10%? What if I lease or buy more land? Or a new storage shed? Or install an irrigation system? By looking at the costs of an operation similar to what he plans and comparing that to his own past returns, a grower can estimate the returns he might reasonably expect for a variety of different investments. And, by estimating these returns for a range of possible potato prices and factor costs, he can assess the risk of those investments. In addition, the study would allow the industry as a whole to explore the idea of a “best practices” model. It could be used as a guide for both industry education and training efforts and further research.

The purpose of this report is to construct such a study for Maine’s potato growers by assembling and analyzing production and financial data gathered by potato financing agencies. The Maine Potato Board approached four entities that provide financing for many of Maine’s potato growers – Farm Credit Services of Maine (FCS), The Farm Service Agency (FSA), Key Bank of Maine and Katahdin Trust Company. All agreed to provide – in a completely anonymous fashion – data collected from their clients. Planning Decisions, Inc., the consulting company that prepared the 2003 Economic Impact Report on Maine’s potato industry, compiled the data into a common form and prepared the report.

2. Description of the Data

Table 1 below summarizes the data collected for this report.

Table 1: Acreage and Yield Data by Source

Data Source	Avg. Acres	Cwt./Acre	Years
Farm Credit Services (FCS)	299	323	2006-07
Farm Service Agency (FSA)	160	276	2005-08
Key Bank	573	303	2007-08
Katahdin Trust	449	296	2008
Total	274	308	n.a.

Income and expense data on individual farms¹ were provided by Farm Credit Services (FCS), the Farm Service Agency (FSA) of the U.S. Department of Agriculture, by Key Bank and by Katahdin Trust. The 101 records used accounted for nearly 28,000 acres of potato planting that yielded over 8.5 million CWT. of production.

FCS data contained income statement and balance sheet data for 2006 and 2007 (although not all farms were represented in both years). FSA data contained income statement and some limited balance sheet data for the years 2003 through projections for 2008, though not all records included data for all years. The data provided by the banks included some income statement and limited balance sheet data for 2007 and budgeted projections for 2008.

In order to make the most complete analysis of production cost data, Planning Decisions first combined the 2006 and 2007 records from FCS and FSA into single databases for 2006 and 2007. We then reviewed each record carefully to remove any we (or officials from FCS or FSA) considered seriously incomplete or misleading. We dropped records for which no expenses were reported and several that reported unrealistically high levels of income per CWT. For the final analysis, we included 79 records in the 2006 database and 74 records in the 2007 database².

¹ All forms were provided anonymously. No identifying characteristics of individual farms were released. Forms contained only income, expense and, in some cases, a limited amount of balance sheet data. Planning Decisions, Inc. coded them by order received and entered each into a common data base to facilitate analysis.

² 15 records had data only for 2006, 13 records had data only for 2007 and 64 records had data for both 2006 and 2007; another 9 records had only 2008 budget data prepared in the Spring of 2008.

For the purposes of cost analysis, we used the structure provided by Farm Credit Services. Table 2 lists that format.

Table 2: Expense Categories

Expense Category	Explanations
Operating Expenses	Not all farms reported costs in all categories.
Chemicals	
Depreciation	Sometimes estimated using three year average when no cost listed
Fertilizer	
Gas/Fuel	Combined freight & trucking and fuel costs and some reported as "car & truck"
Insurance	
Interest	Term and credit line payments
Labor	Hired labor
Rent/Lease	Land & equipment
Repairs	
Seed	
Supplies	
Taxes	Property taxes
Utilities	
Miscellaneous	Includes contracted services
Ownership Expense	
Living Expense	Represents owner labor & management
Capital Expense	Represents overhead, cost of putting capital into this business; see explanation in text below.
Total Expense	

1. labor expense

Most expense sheets listed a category for "hired labor" under operating expenses; several had a category for "custom hire" expenses. This generally represented costs for hiring labor and machinery for planting, cultivation or harvesting. FCS included this cost in the "miscellaneous" category, so we followed that convention.

2. living expense

Most records listed an item for "owner draw" or "living expenses" in the balance sheet or cash flow section of the report. While this is not an "official" expense for tax calculation purposes, it does represent the owner's cost of operating the enterprise. We therefore include it as an "ownership" cost rather than include it in labor under operating costs. Where no cost was recorded, we inserted a value

of \$30,000 to \$40,000 whichever was closer to the values recorded for similar sized farms. For four records, we left the value at zero on the assumption that these were small operations for which the owners took no “living” expenses. This could be, for instance, farms where operators worked other jobs for living expenses and operated the farm as a side business. We decided that in these instances, attributing a “living” expense to the farm would unrealistically inflate the cost of operation.

3. depreciation expense

Nine records listed no depreciation expense for 2006 or 2007. Five of these did list an average depreciation expense for the three-year period from 2005 to 2007. For these, we listed the average expense for 2006 or 2007 and adjusted the total expense figure accordingly. For records that had a machinery value listed but no depreciation expense, we applied the average depreciation to machinery ratio obtained from all the records that contained those figures (14%), to their reported machinery value.

4. capital expense

In addition to the expenses associated with operating a potato farm and the owner’s expense of managing the operation, there is a capital cost of allocating one’s assets to farming. If one chose not to farm, he/she could sell land, buildings, equipment and inventory and invest the proceeds in some other way—the safest being U.S. Government Securities. The earnings that could be obtained on this alternate investment represents the “opportunity cost” of the capital tied up in the farming operation and is a second category of ownership cost that must be accounted for to estimate the total cost of this business.

For purposes of this report, we follow the methodology used by FCS. It assumes selling machinery and buying a “risk-less” investment. Based on earning 5% interest, this cost is calculated at 5% of the reported value of machinery. It also assumes renting land and buildings. Based on an assumed land and building asset blend of 65%-35% and assumed rental rates, this cost is calculated as 7.96% of the reported value of farmland and buildings.³

For those records that reported no machinery or farm real estate values, we estimated values by applying the machinery and farm real estate values per acre found on comparably sized farms to the acreages of the non-reporting farms.⁴

³ These calculations were contained in a spreadsheet containing the data provided by FCS.

⁴ The spreadsheets containing the data used in this analysis, including the derivation of estimated values was provided to the Maine Potato Board separately from this report.

3. Analysis of the Data

Cost of Production

The first question to answer in analyzing the data collected is, “What does it cost to produce potatoes in Maine?” Table 3 provides an initial answer for the industry as a whole for the years 2006 and 2007 and, based on projections of increases in the costs of the various elements of production, an estimate for 2008.

Table 3: Industry-Wide per-Acre Costs of Production, Maine, 2006-2008

Revenue/Expense	2006 (79 records)	2007 (77 records)	2006-07 (92 records)	2007-08% increases	2008 estimate (101 records)
Operating Expenses	\$2,024	\$1,964	\$2,145	N.A.	\$2,665
Chemicals	\$240	\$228	\$263	60%	\$429
Depreciation	\$178	\$205	\$168	5%	\$179
Fertilizer	\$243	\$239	\$268	60%	\$418
Gas/Fuel	\$125	\$135	\$146	60%	\$247
Insurance	\$79	\$69	\$76	10%	\$82
Interest	\$111	\$128	\$128	10%	\$127
Labor	\$240	\$236	\$223	5%	\$249
Rent/Lease	\$121	\$118	\$161	5%	\$169
Repairs	\$167	\$148	\$180	10%	\$197
Seed	\$172	\$178	\$197	0%	\$189
Supplies	\$58	\$50	\$52	10%	\$64
Taxes	\$69	\$66	\$65	5%	\$68
Utilities	\$59	\$55	\$59	30%	\$76
Miscellaneous	\$162	\$109	\$159	5%	\$172
Ownership Expense	\$340	\$358	\$362	N.A.	\$362
Living Expense	\$170	\$186	\$193	5%	\$193
Capital Expense	\$170	\$172	\$169	0%	\$169
Total Expense	\$2,364	\$2,322	\$2,507	N.A.	\$3,027

Source: To create the common database, we averaged the records with two years of data and added the others. For 2008, we added 9 records that had only 2008 budget figures. We then increased per acre costs by the amounts noted in column 5 based on cost data obtained from the Bureau of Labor Statistics and local suppliers.

The most striking fact evident in the table is the similarity of costs in 2006 and 2007. While some records included in 2006 were absent in 2007, and for others, the reverse was true, the vast majority of records were included in both years.

The consolidated 2006-07 data shows somewhat higher costs because of the inclusion of more records.

It is important to note here that 2007 and 2008 present stark contrasts in underlying conditions. In 2007, weather was relatively good, enabling growers to keep input costs, primarily chemical applications, to a minimum. In 2008, in contrast, the weather and threat of blight required larger and more frequent applications. Thus growers faced a double whammy on costs – higher prices for chemicals and the need to apply higher volumes to keep blight at bay. This speaks to the need for developing longer-term cost of production histories in order to smooth out annual variations and better estimate future costs.

The second most striking fact evident in the table is the drastic increase likely for 2008. Certainly, the spike in commodity prices over the past year has been well documented. Table 4 lists the price indices for a series of commodities relevant to the potato industry for the past three years.

Table 4: Selected Producer Price Indices, 2006-2008

Item	Sep-06	Sep-07	Sep-08	% increase 07-08
Gasoline	185.7	225.6	314.8	40%
No. 2 diesel fuel	201.3	246.2	342.2	39%
Industrial chemicals	216.4	227.5	314.6	38%
Machinery and equipment	127.4	127.1	131	3%
Motor vehicle parts	117.4	118.3	121	2%
Lumber	182.2	174.2	166.9	-4%
Iron and steel	195.3	199.8	273.3	37%

Source: Bureau of Labor Statistics, <http://data.bls.gov/PDQ/servlet/SurveyOutputServlet>.

Only lumber declined over the past year, and oils, chemicals and metal products showed enormous increases.

A third fact not evident in the industry-wide average but obvious upon an examination of the distribution of individual records around the average is that costs vary greatly from farm to farm. Table 5 presents a picture of this distribution.

Table 5: Variation of Costs Around Industry Average, 2008

Expense Category	Per Acre	low	high	std. dev.	% of avg.
Operating Expenses	\$2,665	\$1,325	\$6,562	\$781	29%
Chemicals	\$429	\$64	\$1,038	\$200	47%
Depreciation	\$179	\$8	\$973	\$147	81%
Fertilizer	\$418	\$77	\$1,310	\$171	41%
Gas/Fuel	\$247	\$0	\$860	\$123	50%
Insurance	\$82	\$18	\$288	\$44	53%
Interest	\$127	\$0	\$415	\$86	68%
Labor	\$249	\$0	\$583	\$138	56%
Rent/Lease	\$169	\$2	\$862	\$132	78%
Repairs	\$197	\$0	\$1,647	\$113	57%
Seed	\$189	\$0	\$1,092	\$148	78%
Supplies	\$64	\$0	\$258	\$67	106%
Taxes	\$68	\$0	\$188	\$42	61%
Utilities	\$76	\$0	\$226	\$40	53%
Miscellaneous	\$172	\$7	\$735	\$136	79%
Ownership Expense	\$362	\$94	\$2,534	\$328	91%
Living Expense	\$193	\$0	\$2,116	\$289	150%
Capital Expense	\$169	\$23	\$536	\$100	59%
Total Expense	\$3,026	\$1,775	\$6,878	\$865	29%

For virtually every cost item, there is a wide variation from the lowest reported expense to the highest. This undoubtedly reflects both a wide variation in farming practices and a number of instances of individual growers paying for two year's worth of expenses in a particular category in one year and then reporting zero expense in the next. In some cases, such as fertilizer, the standard deviation around the average is far less than the average indicating a fairly tight cluster of most growers around the average. In other cases, such as living expenses and supplies, the deviation is much larger relative to the average, indicating a wide scatter of reported totals above and below the average.

These facts point to the value of using many records and, where possible, averaging individual totals for several years to get a more accurate picture of more common or typical industry practices. If these records are collected in future years, more useful analysis will undoubtedly be available.

For the purposes of further analysis in this report, we will use the estimated 2008 cost figures. We will examine the patterns of cost with respect to type of product sold (processed, general, seed, unclassified), size of farm (acreage) and yield (CWT produced per acre).

The general question motivating this analysis was, "Are there any significant differences in the structure of costs based on:

- ✓ the type of product grown (or market shipped to)? or
- ✓ the size of farm in acreage planted? or
- ✓ the yield obtained in terms of CWT per acre harvested?

The tables below treat each question in turn.

Cost & Type of Product

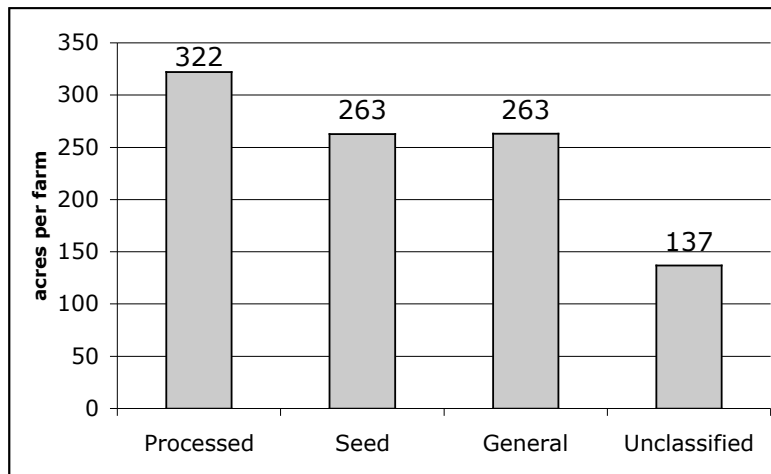
Table 6 presents the data displaying average costs by product produced.

Table 6: Production Costs per Acre by Major Product, 2008, estimated

2008 Estimated Data	All Records	Processed	Seed	General	Unclassified
Number of Records	101	54	13	13	21
Total Acreage	27,114	17,398	3,418	3,420	2,878
Total CWT	8,309,446	5,460,638	989,720	1,078,855	810,233
Average Acres/Farm	268	322	263	263	137
Average CWT/Acre	306	314	290	315	282
Expense Category	Per Acre	Per Acre	Per Acre	Per Acre	Per Acre
Operating Expenses	\$2,669	\$2,682	\$2,677	\$2,682	\$2,531
Chemicals	\$429	\$441	\$396	\$348	\$488
Depreciation	\$182	\$186	\$172	\$190	\$126
Fertilizer	\$418	\$433	\$353	\$433	\$386
Gas/Fuel	\$247	\$246	\$218	\$287	\$235
Insurance	\$82	\$86	\$66	\$89	\$72
Interest	\$127	\$125	\$174	\$67	\$158
Labor	\$249	\$216	\$335	\$359	\$211
Rent/Lease	\$169	\$193	\$101	\$127	\$158
Repairs	\$197	\$211	\$173	\$189	\$146
Seed	\$189	\$182	\$269	\$128	\$205
Supplies	\$64	\$52	\$87	\$115	\$46
Taxes	\$68	\$65	\$103	\$66	\$49
Utilities	\$76	\$79	\$77	\$72	\$56
Miscellaneous	\$173	\$167	\$153	\$212	\$195
Ownership Expense	\$362	\$353	\$358	\$369	\$394
Living Expense	\$193	\$184	\$183	\$229	\$213
Capital Expense	\$169	\$169	\$175	\$140	\$181
Total Expense	\$3,031	\$3,035	\$3,035	\$3,051	\$2,925
Expense per CWT.	\$9.89	\$9.67	\$10.48	\$9.67	\$10.39

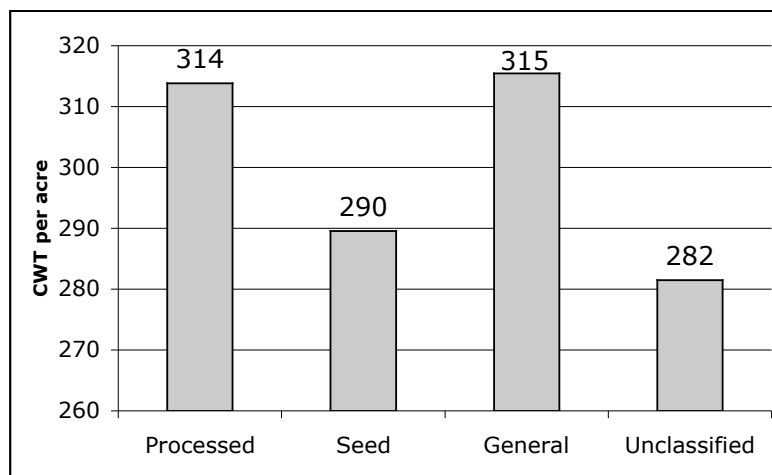
On a per acre basis, there are no major differences in overall production costs by type of product. All categories have operating costs of between \$2,600 and \$2,700 and total costs of about \$3,000 per acre. It is interesting to note, however, that growers for processing tend to have above average sized farms while those growers that were not classified by any particular product had substantially below average sized farms. Figure 1 illustrates these differences.

Figure 1: Average Farm Size by Type of Product, 2007



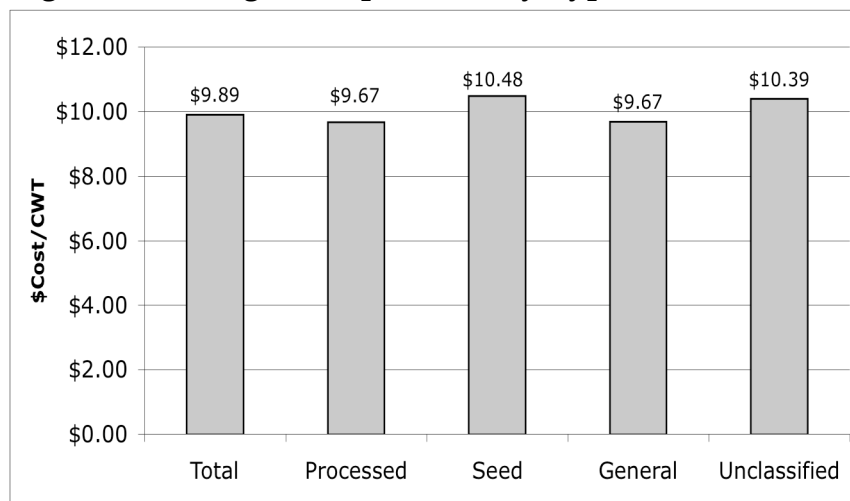
It is also interesting to note that both seed and unclassified growers tend to have below average yields per acre. Figure 2 illustrates these data.

Figure 2: Average Yield by Type of Product, 2007



This differential yield magnifies the cost differences when costs are considered on a per CWT basis. Figure 3 illustrates this relatively greater cost differential.

Figure 3: Average Cost per CWT by Type of Product, 2008



Because of their relatively lower per acre yields, average costs for seed growers rise to 6% above average on a per CWT basis, and farms in the unclassified category rise from below average to 5% above average. Conversely, the slightly above average yield attained by growers in the general category serves to reduce their costs from 1% above average on a per acre basis to 2% below average on a per CWT basis.

Cost & Size of Farm

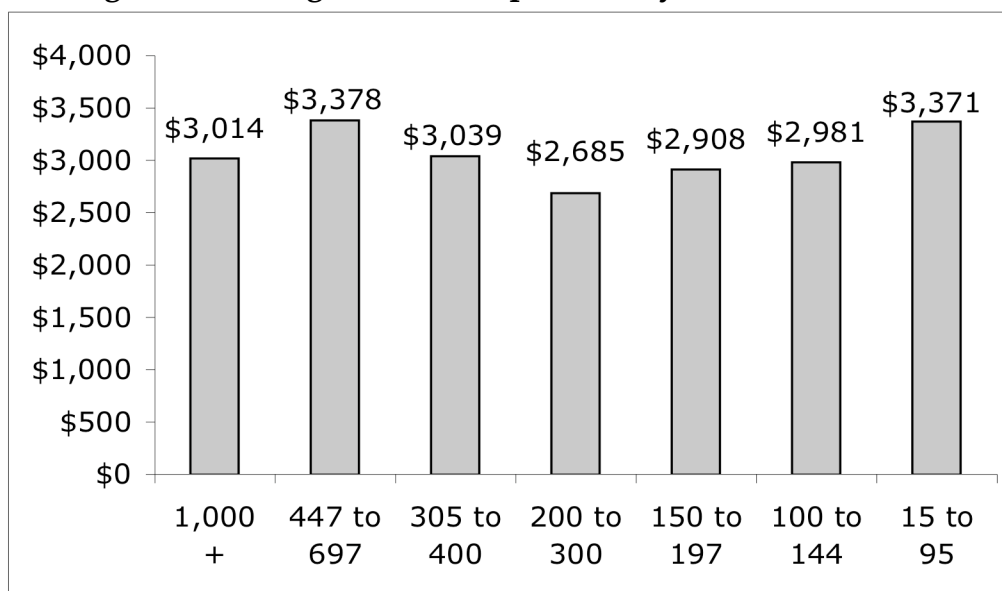
A second question to consider is, “Is there a relationship between farm size measured in acreage and either yield or operational expenses?” Table 7 presents the data.

Table 7: Production Costs per Acre by Farm Size, 2008, estimated

2008 Estimated Data	All Records	1,000 +	447 to 697	305 to 400	200 to 300	150 to 197	100 to 144	15 to 95
Total Acreage	27,114	4,881	5,177	4,933	5,958	3,123	2,432	610
Total CWT	8,309,446	1,461,340	1,661,297	1,585,527	1,758,448	940,011	735,159	167,664
Average Acres/Farm	268	1,220	518	352	248	174	122	55
Average CWT/Acre	306	299	321	321	295	301	302	275
Expense Category (per acre)								
Operating Expenses	\$2,669	\$2,732	\$3,055	\$2,692	\$2,324	\$2,523	\$2,491	\$2,518
Chemicals	\$429	\$463	\$515	\$427	\$368	\$446	\$330	\$327
Depreciation	\$182	\$181	\$180	\$165	\$155	\$222	\$190	\$203
Fertilizer	\$418	\$381	\$571	\$397	\$362	\$416	\$351	\$401
Gas/Fuel	\$247	\$244	\$239	\$274	\$233	\$218	\$254	\$368
Insurance	\$82	\$63	\$95	\$104	\$71	\$71	\$95	\$75
Interest	\$127	\$82	\$159	\$134	\$127	\$141	\$125	\$111
Labor	\$249	\$199	\$246	\$294	\$286	\$217	\$228	\$181
Rent/Lease	\$169	\$271	\$233	\$131	\$105	\$119	\$129	\$176
Repairs	\$197	\$244	\$265	\$174	\$166	\$128	\$175	\$153
Seed	\$189	\$178	\$148	\$173	\$137	\$214	\$203	\$230
Supplies	\$64	\$54	\$47	\$118	\$39	\$65	\$68	\$54
Taxes	\$68	\$70	\$85	\$77	\$52	\$60	\$67	\$42
Utilities	\$76	\$86	\$100	\$77	\$56	\$70	\$64	\$47
Miscellaneous	\$173	\$216	\$172	\$147	\$167	\$136	\$212	\$150
Ownership Expense	\$362	\$282	\$323	\$347	\$361	\$385	\$490	\$853
Living Expense	\$193	\$117	\$154	\$199	\$205	\$182	\$287	\$641
Capital Expense	\$169	\$165	\$169	\$148	\$156	\$203	\$203	\$212
Total Expense	\$3,031	\$3,014	\$3,378	\$3,039	\$2,685	\$2,908	\$2,981	\$3,371
Expense per CWT.	\$9.89	\$10.08	\$10.52	\$9.47	\$9.10	\$9.66	\$9.87	\$12.26

The most interesting fact evident in Table 7 is the way in which average total costs fall, rise and then fall again with farm size. Figure 4 isolates this factor.

Figure 4: Average Total Cost per Acre by Farm Size, 2008



The average cost of production for the smallest farm size category is 11% above the all-industry average of \$3,031. Average total cost per acre declines for each farm size category to the 200 to 300 acre category where it reaches a low of \$2,685, 11% below the all-industry average. Average total costs rise again in the next two largest categories to a peak of nearly \$3,400 per acre for farms in the 450 to 700 acre category before falling again in the 1,000+ acre size category. This suggests certain efficiencies of production that are achieved at two separate size levels. Examining Table 7 carefully shows that chemical, fertilizer, rent/lease and repair costs per acre all increase substantially for farms in the second and third largest size categories. Careful scrutiny of these figures may reveal other reasons for this apparent relationship between farm size and total cost per acre.

When varying yields are added to the analysis to obtain figures for cost per CWT., a similar but slightly different pattern emerges. Figure 5 illustrates this pattern.

Figure 5: Indices of Cost per Acre and per CWT. by Farm Size, 2008

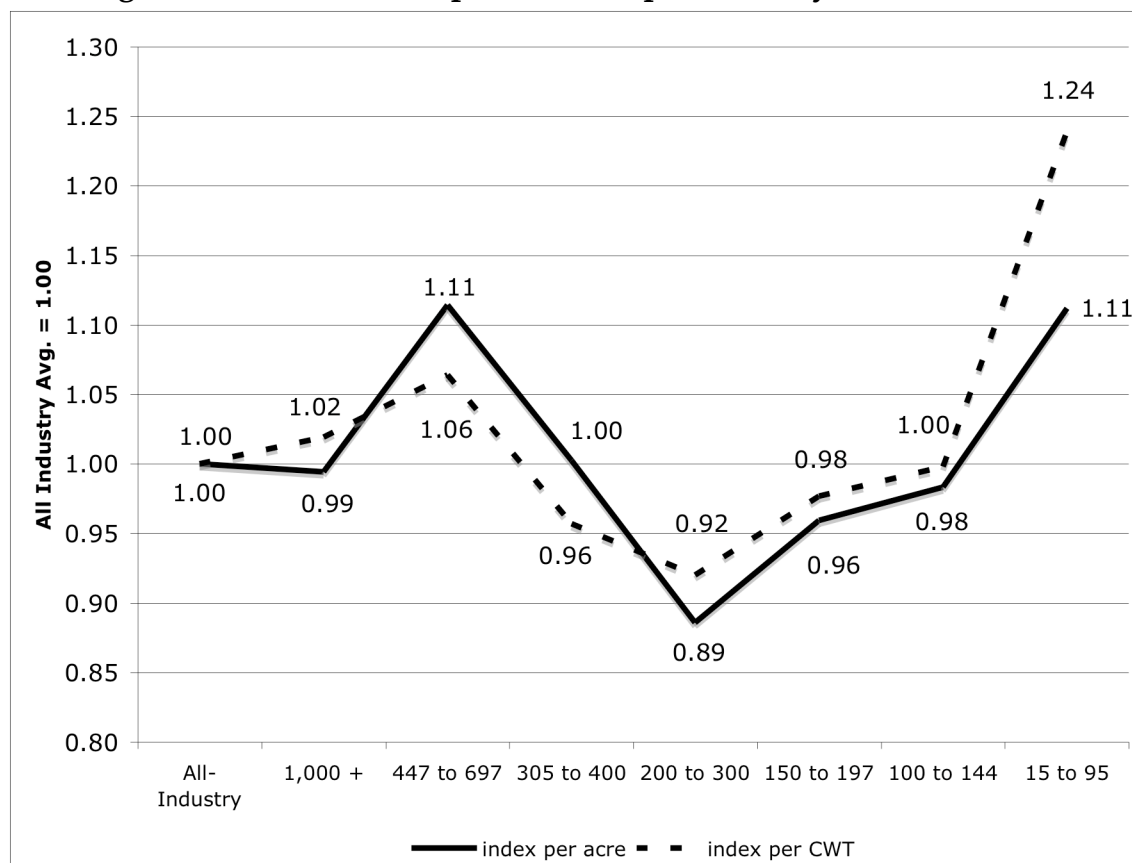


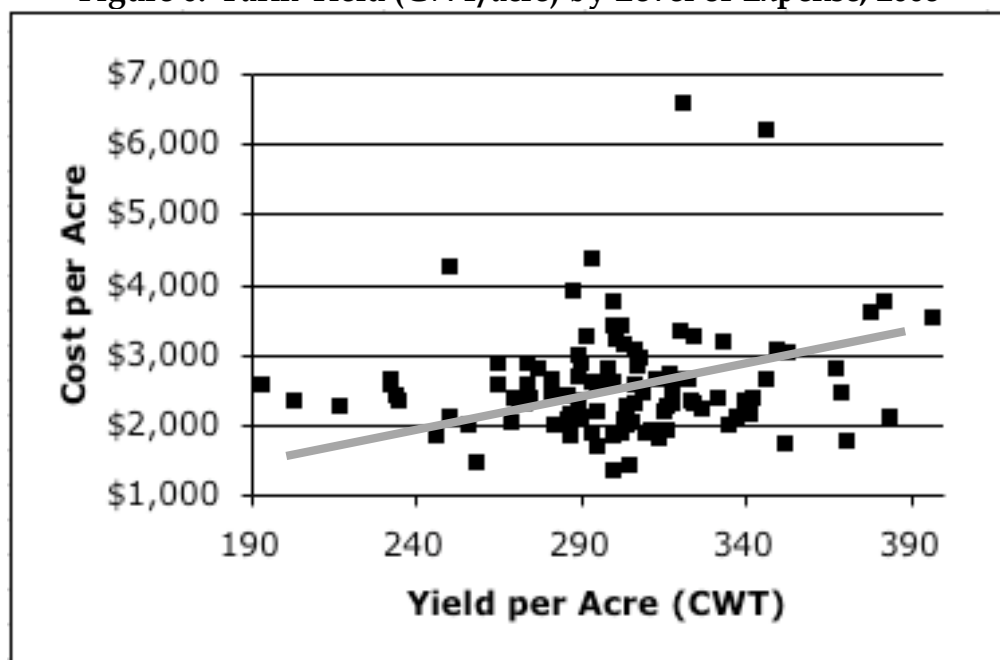
Figure 5 compares cost per acre and per CWT. to the all-industry average for each farm size category. Farms in the 1,000 acre+ category, for instance have an average cost per acre that is 1% below the all-industry average. However, because these farms – at least in this year from these records – obtained an average yield per acre that was slightly below the all-industry average (299 CWT. per acre vs. 306), their average cost on a per CWT. basis was 2% above the all-industry average. Conversely, above average yields in the 447 to 697 and in the 305 to 400 acre categories lowered their relative costs on a per CWT. basis. For the four smallest size categories, their lower average yields raised their relative average costs on a per CWT. basis. This trend is particularly strong for the smallest size category where total costs are 11% above average on a per acre basis and 24% above average on a per CWT. basis.

The relationship between farm size and relative yield and relative cost is clearly a phenomenon that deserves further tracking and analysis.

Cost & Yield

A third and closely related question for this analysis is, “Is there a relationship between farm productivity measured in CWT. per acre and operational expenses?” In theory, one might expect that as more operational expenses were applied to a given acre, the productivity of that acre in terms of pounds of potatoes produced would increase. In actual fact, however, that relationship is, at best, very weak. Figure 6 shows the general relationship.

Figure 6: Farm Yield (CWT/acre) by Level of Expense, 2008



The gray line illustrates the generally positive relationship. Some farms do achieve higher yields with higher levels of expense, but there is clearly no systematic, industry-wide pattern. Individual variations from the line are huge. The correlation coefficient between expense per acre and yield per acre is only 0.19 on the scale of 1.00 equals perfect correlation and 0.00 equals no relationship. Clearly understanding the reasons behind varying yields per acre requires more investigation.

To start that analysis, we examined the relationship between yield and labor cost per acre, machine cost per acre, repair cost per acre, machinery and repair cost per acre, chemicals and fertilizer cost per acre, value of machinery per acre and value of farm real estate per acre. Table 8 presents the results.

Table 8: Relationship Between Yield and Various Elements of Cost, 2008

Cost per Acre for:	Coefficient of Correlation
Total Operating Expense	0.19
Labor	0.07
Machinery	0.16
Repair	0.22
Machinery & Repair	0.26
Chemicals & Fertilizer	-0.23
Value of Machinery	0.16
Value of Farm Real Estate	-0.09

Several points can be made from this analysis:

1. no relationship is very strong; wide variations around the average mean that there is no clear systematic relationship between these input costs and the output of CWT. produced;
2. the highest positive correlation (0.26) is between the combination of machinery and repair costs taken together and related to CWT per acre;
3. the combination of chemical plus fertilizer cost per acre actually has a negative relationship (-0.23), indicating that some of the highest chemical and fertilizer costs per acre are found on farms with lower output yields;
4. labor costs have a very weak correlation indicating that higher labor costs per acre apparently do not have a very close relationship to output achieved.

The most important point to be taken from these data, however, is that no clear conclusions should be drawn before more detailed examination is conducted. The most useful conclusion seems to be that growers need to continue to analyze their cost of production data to better understand the relationship between inputs and outputs in the business of growing potatoes.

4. Ways to Use the Data

As noted on page 1 above, one of the purposes of a cost of production study is to provide growers with a decision making tool, a financial map as it were to allow them both to situate themselves in their environment and to set a direction. Planning Decisions, Inc. provided a first version of such a tool as part of this report. It consists of an Excel spreadsheet that contains the industry average costs noted in the report and a place for individual growers to insert their own cost data. Based on what the grower enters, the spreadsheet displays the average comparable values for the grower's size category. In this way, the grower is able automatically to see how his/her figures compare to those of his/her peers in the same size category.

The spreadsheet also contains a second tab presenting the grower's 2008 actual reported production and expense figures in a format suitable for estimating 2009 production and expenses from known or estimated changes in the costs and degrees of use of required inputs. Combining these production and expense estimates with various estimates of yield and price, the grower can assess the probable return for various changes in input elements he/she may choose to consider.

Figure 8 below presents a picture of Tab 1 of this worksheet along with explanatory notes imposed over the format. Figure 9 on the following page presents a similar description of Tab 2, the budgeting worksheet. The original of this worksheet was delivered to the Maine Potato Board as part of this report. It is clearly intended as a first step toward helping growers and their financial partners better understand, analyze and budget for their production and cost information. Further refinements will undoubtedly become obvious as the model is put to practical use.

Figure 8: Cost of Production Worksheet
2008 Cost of Production Analysis

Please enter actual values for your most recent production year in the "Farm Actual" column below. The program will calculate your average values per acre and compare them to the comparable averages for the farms in your size category.

Capital (\$)		Farm Actual		
current value of machinery & equipment		\$150,000		
current value of farm real estate		\$700,000		

Production (CWT)		Farm Actual	Peer Average	% Variation from Peer Average
acres planted		350	352	-0.6%
CWT harvested		110,000	112,992	-2.6%
Yield (CWT/Acre)		314	321	-2.1%

	Farm Actual Total	Farm Actual Per Acre	Peer Average per Acre	% Variation from Peer Average
Operating Expenses (\$)	\$917,000	\$2,620	\$2,692	-2.7%
Chemicals	\$155,000	\$443	\$427	3.7%
Depreciation	\$60,000	\$171	\$165	3.9%
Fertilizer	\$140,000	\$400	\$397	0.8%
Gas/Fuel	\$90,000	\$257	\$274	-6.2%
Insurance	\$35,000	\$100	\$104	-3.8%
Interest	\$40,000	\$114	\$134	-14.7%
Labor	\$85,000	\$243	\$294	-17.4%
Rent/Lease	\$55,000	\$157	\$131	20.0%
Repairs	\$60,000	\$171	\$174	-1.5%
Seed	\$65,000	\$186	\$173	7.3%
Supplies	\$20,000	\$57	\$118	-51.6%
Taxes	\$25,000	\$71	\$77	-7.2%
Utilities	\$22,000	\$63	\$77	-18.4%
Miscellaneous	\$65,000	\$186	\$147	26.3%
Ownership Expense	\$108,220	\$309	\$347	-10.9%
Living Expense	\$45,000	\$129	\$199	-35.4%
Capital Expense	\$63,220	\$181	\$148	22.0%
Total Expense	\$1,025,220	\$2,929	\$3,039	-3.6%

Enter actual data here.

Program calculates peer averages per acre.

Program calculates farm averages per acre.

and variations between farm and per averages.

Figure 9: Budgeting Worksheet

2009 Cost of Production Projection			
Please enter estimated values for your next production year in the "2009 Budget" column below, including an estimated sales price per CWT. to be produced. The program will calculate your estimated total income and expenses.			
Capital (\$)			
	2008 Actual	2009 Budget	
value of machinery & equipment	\$150,000	\$175,000	
value of farm real estate	\$700,000	\$700,000	
Production (CWT)			
	2008 Farm Actual	2008 Peer Average	2009 Farm Budget
acres planted	350	352	375
CWT harvested	110,000	112,992	120,375
Yield (CWT/Acre)	314	321	321
	2008 Actual Per Acre	2009 Estimate Per Acre	2009 Estimate Total Expense
Operating Expenses (\$)	\$2,620	\$2,789	\$1,045,875
Chemicals	\$443	\$460	\$172,500
Depreciation	\$171	\$175	\$65,625
Fertilizer	\$400	\$500	\$187,500
Gas/Fuel	\$257	\$260	\$97,500
Insurance	\$100	\$100	\$37,500
Interest	\$114	\$114	\$42,750
Labor	\$243	\$250	\$93,750
Rent/Lease	\$157	\$160	\$60,000
Repairs	\$171	\$175	\$65,625
Seed	\$186	\$190	\$71,250
Supplies	\$57	\$60	\$22,500
Taxes	\$71	\$75	\$28,125
Utilities	\$63	\$70	\$26,250
Miscellaneous	\$186	\$200	\$75,000
Ownership Expense	\$309	\$352	\$131,970
Living Expense	\$129	\$133	\$50,000
Capital Expense	\$181	\$219	\$81,970
Total Expense	\$2,929	\$3,141	\$1,177,845
Total Revenue	\$2,514	\$2,889	\$1,083,375
price per CWT.	\$8.00	\$9.00	\$9.00
Net Income	-\$415	-\$252	\$97,500

Values carried over from prior Tab.

Grower enters 2009 estimates here.

Program calculates 2009 budget here.