



## Estimating Your Cost of Potato Production

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To help Wisconsin potato farmers to estimate their production costs, we have developed a spreadsheet. This document explains how to use the spreadsheet. The spreadsheet is available at <http://www.aae.wisc.edu/mitchell/PotatoProductionCostEstimator.xls>, or contact Mitchell directly using the above information.

Our method relies primarily on the farm expense data reported on the Schedule F federal tax form over the previous three years. The Schedule F average is then used as a guideline for projecting costs for the next year. If future costs are expected to differ from historical costs, projected costs can be used in replace of the Schedule F estimates. If a potato grower does not file a Schedule F, we assume that he still accounts for all production costs in essentially the same categories as required for the Schedule F.

Each crop on a farm can be treated as a separate enterprise. However, all crops share certain expenses such as labor and machinery. The allocation of these expenses across all enterprises can be difficult. However, an accurate allocation of shared expenses is crucial for an accurate enterprise budget. The allocation method used in this budget estimator is to divide each expenditure into an estimated percentage used for each enterprise/crop. All enterprises (crops) need to be accounted for so that the sum of all percentages is 100%. As a result, the accuracy of the budget estimator is limited to the accuracy of the farmer's allocation of shared costs.

The cost of production estimator is a spreadsheet consisting of seven separate sheets. For convenience all cells where data should be entered have been shaded yellow. In some cases the yellow shaded cells do not need to be filled in, as is explained below. What follows are direction for filing in each sheet. The sheets should probably be filled out in this order.

### **Step 1: Schedule F Sheet**

Total Farm expenses can be taken directly from the Schedule F tax forms for each year. In columns C, D and F, enter the data from the Schedule F for the respective year. In row 4 enter into the yellow shaded cells the names of the other crops produced in addition to potatoes. If fewer than five non-potato crops are produced than leave the unused cells blank. If livestock is raised on the farm it may be treated as its own crop/enterprise. Note that potato storage is treated as a separate crop/enterprise.

For each expense row enter the best estimate for the percentage of the total expense used on each crop. For example, on the first expense line Car & Truck, enter the percentage of the farm vehicle costs due to use for potato production, potato storage, crop 1, crop 2, ... etc. If a crop

does not use a certain input you can just leave it blank. For each expense line, “Percentages Total” column (the sum of all percentages) must equal 100%; otherwise not all of the cost is allocated to an enterprise. If the sum does not equal 100%, then the respective line in the last column (“Error Check”) will read “ERROR.” All costs will not have the same allocation percentages. Also, some expenses will be easier to allocate than others. Use farm records when available and when they are not available, use your best estimate. In the last row (row 31), there are cells to enter the number of acres of potatoes planted each year. These acreages are used to calculate the “3-Year Average Per Acre Cost” (Column I). Finally, two of the expense lines, Depreciation and Interest, are grayed out. This is because the Schedule F value of these expenses is for tax purposes, which differ from economic depreciation and economic interest. These costs will be accounted for on the Capital sheet.

### **Step 2: Overhead Costs Sheet**

For this cost estimate, we consider the overhead costs listed in this sheet as fixed at the time of budgeting, which helps simplify the budgeting process. First, enter the “Total Acres of Potatoes Planted” near the top of Column B. Next, Columns C through F show the average of each cost as reported in the Schedule F Sheet. If you project a certain cost to be different than the Schedule F average, you can enter the new projection cost in the yellow shaded “Alternative Projection” (Column H). Note that this alternative projection is a total farm cost for this particular expense, so you will also need to enter the percentage used on potato production in the preceding yellow column. Depending on why your projected cost has changed from the Schedule F average, this percentage may or may not be the same value estimated in column D. If you do not expect a change from the Schedule F estimate for a particular cost, you can leave the yellow shaded columns for that particular expense line blank and the Schedule F estimate will be used. For instance, if you estimate that office expenses will be similar to the average of your costs from the past three years, then you can leave those yellow shaded cells on that row blank and the Schedule F estimate will be used. Overhead costs for machinery, buildings, and irrigation will be computed in the Capital Sheet.

For the opportunity cost of land, enter the per-acre one-year cash rent value of your farmland (not including an irrigation system). If you lease the land, this is the cost for using the land. If you own the land, this is the opportunity cost of the forgone income that you could earn by renting the land to somebody else to farm. Note that the cost of the irrigation system must be removed from the land opportunity cost (rent) because the annual overhead (depreciation) and opportunity costs for irrigation equipment are estimated on the capital page.

### **Step 3: Variable Inputs Sheet**

On the Variable Input Sheet, you have the option for each variable input category of entering the costs as either “itemized” or in “aggregate” (i.e., individually or all together). For each input category click on the green shaded cell in Column A and use the pull-down menu to choose whether you will enter the costs as itemized or aggregate. If you choose aggregate, you can then enter the total (aggregate) cost for that input category in the yellow shaded cell in column G for that particular input category, leaving the other yellow shaded cells for that input category blank. If you choose to itemize the costs, then enter the name of each input in column C, and then the

corresponding quantity, unit, and price information in the cells to the right. For example, if you know the total cost for all seed potatoes you will use this year, then you can choose the aggregate method. But if you have not computed the total yet, then you can use the itemized method to report these costs. Be sure not to double count any inputs by listing them in the custom hire category and in some other input category as well. For example, if you custom hire a fertilizer application, be sure to only report the fertilizer material costs in the fertilizer and lime category and the cost of the custom application in the custom hire category. Fuel costs are for potato production only. If you do not know the quantity of fuel required for potato production, you can estimate it by multiplying the expected total quantity of fuel by the percentage of fuel used on potato production, which you estimated on the Schedule F Sheet.

If you need more rows to enter more inputs than are provided, do the following. First, click on a row number so that the entire row is selected across the whole sheet. Then right click the mouse and choose “Insert.” You can also choose “Insert” on the main menu at the top of the worksheet, then “Rows” to do the same. These steps will insert an empty row below the highlighted row. You can highlight/choose more than one row to insert more than one row at a time. The inserted cells in the “Total Cost” and “Per Acre Cost” (Columns G and H) will be blank. You will need to paste formulas into these cells that are the same as those cells in other rows in the same input category. If you have difficulty doing this, please contact the authors.

#### **Step 4: Capital Sheet**

The Capital Sheet includes yearly depreciation and economic interest for all capital used in potato production. Yearly depreciation and economic interest is the yearly cost of owning capital. Yearly depreciation is computed using a straight-line depreciation method derived by dividing the difference between the purchase price and salvage value by the lifetime years of use. Economic interest (opportunity cost) is the cash interest paid on borrowed funds to purchase the capital equipment or the forgone interest on the value of the capital. For simplicity we will assume both interest rates are equal. The current long term interest rate should be entered in the red cell at the top of Column E. This is the appropriate rate to use, even if you are paying a different rate for a loan you may have used to purchase the equipment. Other costs of capital such as insurance and repairs and maintenance are already accounted for in the Overhead Sheet.

You will need to know (or estimate) the percentage used on potatoes, purchase price, lifetime years of use, current age and salvage value for all machinery, buildings and irrigation equipment used in potato production. The salvage value is the value of a particular piece of capital that it can be sold for after the lifetime years of use you report. Unless excellent records are kept, many of the estimated values are going to be subjective, specifically lifetime years of use and salvage value. Another difficult part of the Capital Sheet will be making sure that all capital used in potato production is listed. This may take some time but is important to the accuracy of the budget estimator.

#### **Step 5: Storage Sheet**

The Storage Sheet estimates the cost of potato storage. Capital costs for potato storage capital are computed in the same manner as on the Capital Sheet. Note that all capital equipment inside

the storage buildings, such as humidifiers, should be included in the value of the respective building. For all other costs, either Schedule F estimates or new projected estimates can be used. If you wish to use the Schedule F estimate then just leave the yellow shaded cells blank.

### **Cost Summary Sheet**

You do not need to enter anything into the Cost Summary Sheet. The Cost Summary Sheet is, as named, a summary of the costs for potato production. The orange shaded cells indicate the number of errors on the Schedule F Sheet. If this number is not zero, then for at least one cost category on the Schedule F sheet, the percentages of this cost allocated to each crop/enterprise do not sum to 100%. Go back and check the final two columns in the Schedule F sheet. If the “Percentage Totals” for a row is not 100%, then the “Error Check” will read “ERROR,” implying that the sum of the “Percentage Use” you entered for each crop enterprise in that row do not add up to 100%. Change these for that row until all “Percentage Totals” are 100%.

### **Step 6: Net Returns Sheet**

The Net Returns Sheet provides estimated net return for various combinations of potato yield and price. Net returns are the difference between gross revenue (price x yield) and total cost as calculated using your entered data. In the yellow shaded cells enter your expected potato price and yield for both stored and non-stored potatoes and acreage for each. If the acres you enter for non-stored and stored do not add up to the amount listed on the top of the Overhead Sheet, an “Acre Error Check” in the orange cells will read “ERROR;” otherwise it will read “OK.” If it is not “OK,” then change the numbers you reenter in the yellow cells on this sheet, or go back and change the acres you enter on the top of the Overhead Sheet. Similarly, the other orange cells indicate if there are any errors in the percentage use values entered on the Schedule F sheet or the reported acreage. If the number of errors is not zero, then correct these errors as described in the Cost Summary Sheet, then read the results on the Net Returns Sheet.

The rows below the yellow cells then report both per acre and gross revenue, then use the cost estimate to calculate the net returns for these values. Below these, the sheet contains two tables, one for non-stored potatoes and one for stored potatoes. These tables use your cost estimates to compute net returns for different price and yield combinations. These tables should allow identification of the break-even price based on your cost estimates.

### **Conclusion**

This spreadsheet based potato cost estimator is still being perfected. If you find errors or problems, or have suggestions to improve the spreadsheet, please contact the authors. Our goal is to develop a system for Wisconsin potato growers to estimate their production costs in a consistent manner and so allow cross-farmer comparisons. Eventually we want to estimate “typical” costs of production as benchmarks for farmers. We need growers to use the system and give honest and useful feedback on how to make the system better and more useful.