



Crop Budget Estimator Tool

This factsheet helps to explain the key concepts and uses of the Crop Budget Estimator Tool.

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Farm managers face many decisions throughout the course of a production year. Each of these decisions impacts the operation's ability to generate profits, cover its financial obligations, and grow the overall value of the farm business. The Crop Budget Estimator is a Microsoft Excel based tool built around key areas that managers need to consider as they plan for and continually evaluate their season.

Using your own farm records, you can build a budget that is used for marketing decisions, comparing chemistry and fertilizer programs recommended by crop nutritionists and advisors, evaluating capital purchases (i.e. a new tractor or combine), and other important management decisions for their farm.

These management decisions are broken into four key areas:

- Net Returns
- Financial Scorecard
- Break-Evens
- Fertility Program

Let's explore each of these areas more closely...

Net Returns

This section focuses on several concepts, including both Accounting and Economic principles of profitability:

- Return Over Variable & Fixed Costs
- Net Farm Income
- Net Cash Flow

Return Over Variable & Fixed Costs

This area concentrates on purchases for the farm that you will commonly see when filing your taxes. Often referred to as "Schedule F" expenses, they include input purchases for Seed, Fertilizer, Chemicals, Land Rent and Farm Insurance.

To input numbers for this section, there are five main tabs of the tool the producer must use. *Variable & Fixed*, *Chemical Plan*, *Nutrient Management*, *Fertilizer Prices*, and *Fertilizer Plan*.

Variable & Fixed

The first thing to remember about the *Variable & Fixed* tab is that it is affected by the numbers of acres entered for corn, soybeans, and wheat. This allows for a more exact expense per acre for items that are not routinely purchased on a "per acre" or "per bag" basis.

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For example, Fuel is purchased for \$1,038.00 and the producer has 100 acres of corn. The producer enters “100” into the acres field for corn on the *Crop Budget (Main)* tab and then \$1,038.00 into the Equipment Fuel line on the *Variable & Fixed* tab. The tool then calculates that the per acre expense is \$10.38 and forwards that value onto the *Crop Budget (Main)* tab automatically.

| Direct & Overhead Expenses | | | | | | | | | | | | |
|----------------------------|----------------------------|---------------|-----------|-------------------------------|---------------|-----------|-----------------------------|---------------|---------------|-----------|--|--|
| Seed Expense | Corn Unit Price (i.e. Bag) | Planting Rate | Cost/Acre | Soybean Unit Price (i.e. Bag) | Planting Rate | Cost/Acre | Wheat Unit Price (i.e. Bag) | Seeds/lb | Planting Rate | Cost/Acre | | |
| | (Enter Below) | (Enter Below) | | (Enter Below) | (Enter Below) | | (Enter Below) | (Enter Below) | (Enter Below) | | | |
| Seed Purchases | \$ 265.00 | 28000 | \$92.75 | \$ 72.00 | 140000 | \$72.00 | \$ 16.00 | 15000 | 1,600,000 | \$34.13 | | |

One key difference on the *Variable & Fixed* tab is with Seed expense. The tool allows a producer to enter the exact price paid per bag of seed and the planting population rate used for that crop. For Wheat acres, the producer can also input the Seeds/lb. for a more accurate per acre expense. This allows for an accurate per acre calculation of their seed expense.

Chemical Plan

The *Chemical Plan* tab allows the producer to determine what the actual expense per acre of their chemical purchases are for each specific crop.

For example, when spraying with Glyphosate it is recommended by the MSU Weed Control Guide to use the adjuvant Ammonium Sulfate. Depending on the type of weed being sprayed, additional adjuvants (i.e. crop oil or methylated seed oil) is recommended to be added for increased efficacy. These are “overlooked” expenses that affect the producers Net Returns on the farm.

Chemicals and adjuvants can be selected by clicking on the “drop down” menu featured in each section of the *Chemical Plan* tab.

| Corn | | | | | | |
|--|----------------|---------------------------------|---------------|------------|----------|----------|
| Pre-plant/Pre-emergence Chemicals | | | | | | |
| Brand | Site of Action | Package Price (Gals, Lbs, etc.) | Rate/Acre | Rate Units | Cost | |
| <i>Herbicides (drop down menu)</i> | | (Enter Below) | (Enter Below) | | | |
| Surestart II/TripleFlex II | 2/4/15 | \$ 66.56 | 1.00 | qt | \$ 16.64 | |
| Atrazine (Liquid) | 5 | \$ 14.64 | 1.00 | qt | \$ 3.66 | |
| Atrazine (Liquid) | 0 | \$ - | 0.00 | 0 | \$ - | |
| Balance Flex | 0 | \$ - | 0.00 | 0 | \$ - | |
| Basis Blend | 0 | \$ - | 0.00 | 0 | \$ - | |
| Bicip II Magnum Lite/Cinch ATZ Lite | 0 | \$ - | 0.00 | 0 | \$ - | |
| Bicip II Magnum/Cinch ATZ/Parallel Plus | | | | | | |
| Breakfree NXT ATZ/Harness XTRA/Key | | | | | | |
| Breakfree NXT Lite/Degree XTRA/Fultra | | | | | | |
| Breakfree NXT/Harness/Supass NXT | | | | | | |
| | | (Enter Below) | (Enter Below) | | | |
| None | | \$ - | 0.00 | 0 | \$ - | |
| None | | \$ - | 0.00 | 0 | \$ - | |
| None | | \$ - | 0.00 | 0 | \$ - | |
| None | | \$ - | 0.00 | 0 | \$ - | |
| None | | \$ - | 0.00 | 0 | \$ - | |
| Pre-Plant/Pre-Emergence Chemical Cost/Acre | | | | | | \$ 20.30 |

There is also an *Adjuvant Help Guide* tab to assist in determining adjuvant rates as the units of measurement on some crop recommendations may be different than those found on product labels.

Nutrient Management

Fertilizer planning involves the use of soil sampling and test results to understand what is already present in a particular field or farm. If this information is available, it can be entered into the *Nutrient Management* tab in the Soil Test Level area. This allows for the tool to be used for either field by field or whole farm decisions, depending on the variability of your fields.

The soil test information and the expected yield entered on the *Crop Budget (Main)* tab are then used in the Tri-State Recommendations area. This second area of the tab uses the Tri-State Fertilizer Recommendations from Michigan State, Ohio State, and Purdue Universities (as updated in 2020) to determine what your farm’s



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fertility needs will be in the budget. You do not need to enter any data in this area, as it will auto-calculate.

The third area of the tab is where the tool calculates the Nutrient Removal needs of each crop. This is based on the yield entered on the *Crop Budget (Main)* tab and [MSU Extension Nutrient Recommendations for Field Crops in Michigan, Extension Bulletin E2904](#). You do not need to enter any data in this area, as it will auto-calculate.

The fourth area of the *Nutrient Management* tab is for entering any Manure Applications made on the farm. Different types of manure offer varying amounts of nutrients when applied. Nutrients provided in any manure applications will lessen the need for commercial fertilizer products. The value or purchase price of manure will also vary based on its nutritional content, so a fertilizer value calculator is provided in this area as well. Using the manure fertilizer value calculator will ensure that the cost of the manure is accounted for on the *Crop Budget (Main)* tab.

The fifth and final area of the tab is where total nutrient needs for the budget are calculated. It reviews the information input or auto calculated in the previous four areas to determine what nutrient amounts will still need to be addressed on the *Fertilizer Plan* tab. If no information is entered into the soil test level area, the values auto default to the nutrient removal needs.

Fertilizer Pricing & Fertilizer Plan

The *Fertilizer Pricing* and *Fertilizer Plan* tabs work together much in the same way that the *Chemical Plan* tab functions. The *Fertilizer Pricing* tab is where the “per unit” prices for commercial fertilizer products is entered.

On the *Fertilizer Plan* tab, the fertilizer products that you will use for each crop can be selected from a “down” menu as show below.

| Nutrient Management | | | | | | | | | |
|--|----|-----|----------|----|-----|-------|----|-----|--|
| Corn | | | Soybeans | | | Wheat | | | |
| Soil Test Level: Input the amount of nutrients currently present in the field (i.e. soil test results) | | | | | | | | | |
| N | P | K | N | P | K | N | P | K | |
| 0 | 70 | 250 | 0 | 50 | 125 | 0 | 70 | 115 | |
| S | Ca | Mag | S | Ca | Mag | S | Ca | Mag | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Z | B | Mn | Z | B | Mn | Z | B | Mn | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| CEC Level: 15 | | | 10 | | | 5 | | | |
| Tri-State Recommendations Based on soil test data, the following are tri-state recommendations for fertilizer needs to meet yield goals. | | | | | | | | | |
| N | P | K | N | P | K | N | P | K | |
| 0 | 70 | 40 | 0 | 40 | 135 | 0 | 45 | 55 | |
| S | Ca | Mag | S | Ca | Mag | S | Ca | Mag | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Z | B | Mn | Z | B | Mn | Z | B | Mn | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Nutrient Removal: The amount of nutrients being removed based on yield goal from the Crop Budget (Main) tab. | | | | | | | | | |
| N | P | K | N | P | K | N | P | K | |
| 142 | 58 | 42 | 163 | 34 | 60 | 83 | 43 | 25 | |
| S | Ca | Mag | S | Ca | Mag | S | Ca | Mag | |
| 13 | 2 | 5 | 8 | 6 | 6 | 7 | 2 | 10 | |
| Z | B | Mn | Z | B | Mn | Z | B | Mn | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

| Corn | | | | | | | | | |
|---------------------------------------|---------------------------------|-----------|-------|----------|------|------|------|--|--|
| Pre-Plant/Broadcast Fertilizer | | | | | | | | | |
| Fertilizer Source | Package Price (Gals, Lbs, etc.) | Rate/Acre | Units | Cost | N | P | K | | |
| Macronutrients (drop down menu) | | | | | 16 | 41 | 50 | | |
| Potash (0-0-62) | \$ 355.00 | 80.00 | lbs | \$ 14.20 | | | | | |
| DAP (18-46-0) | 505.00 | 90.00 | lbs | \$ 22.73 | | | | | |
| Urea (46-0-0) | - | 0.00 | 0 | \$ - | | | | | |
| Potash (0-0-82) | - | 0.00 | 0 | \$ - | | | | | |
| AMS (21-0-0-24S) | - | 0.00 | 0 | \$ - | | | | | |
| K-Mag (0-0-22-11Mg-21S) | - | 0.00 | 0 | \$ - | | | | | |
| MAP (11-52-00) | - | 0.00 | 0 | \$ - | | | | | |
| Gypsum (0-0-0-17S-21Ca) | - | 0.00 | 0 | \$ - | | | | | |
| Anhydrous (32-0-0) | - | 0.00 | 0 | \$ - | 0.00 | 0.00 | 0.00 | | |
| Micronutrients (drop down menu) | | | | | | | | | |
| None | \$ - | 0.00 | 0 | \$ - | | | | | |
| None | \$ - | 0.00 | 0 | \$ - | | | | | |
| None | \$ - | 0.00 | 0 | \$ - | | | | | |
| None | \$ - | 0.00 | 0 | \$ - | | | | | |
| Lime (drop down menu) | | | | | | | | | |
| None | \$ - | 0.00 | 0 | \$ - | | | | | |
| Nitrogen Stabilizers (drop down menu) | | | | | | | | | |
| None | \$ - | 0.00 | 0 | \$ - | | | | | |
| None | \$ - | 0.00 | 0 | \$ - | | | | | |
| Starter Fertilizer Cost/Acre | | | | \$ 36.93 | | | | | |

These product choices can be further broken down between broadcast, starter fertilizer, and post-applied depending on when each fertilizer is used. Each of these areas of the tab include macronutrients, micronutrients, lime, and nitrogen stabilizers, if used. As you select each product and enter the pounds per acre of applied, the tab begins to calculate the cost per acre. It uses the prices entered on the *Fertilizer Pricing* tab as part of the calculation.

At the same time as these values are being entered, a “nutrient analyzer” calculates how many pounds of actual nutrients are being applied to that crop.

At the bottom of the page, not only will you



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see what the total fertilizer expense per acre exists for their crop, but also how many actual nutrients the fertilizer plan is providing. These values are transferred automatically to the *Crop Budget (Main)* tab.

The tab is also designed to be printable, so that you can compare different types of fertilizer plans and their overall cost to your farm’s budget.

Net Farm Income

This is often referred to as “operating profit” as it looks at revenue remains after paying for the expenses needed to operate the farm. It takes the Return Over Variable & Fixed Costs and subtracts the fixed expenses (i.e. Farm Insurance, Land Rent, Real Estate Taxes, etc.) to determine what the farm’s initial profit level is. It also includes the use of Depreciation. This is not the same type of depreciation that you will find on your IRS tax return, but the “economic” form of depreciation.

Economic depreciation focuses on the lost value of assets over time. As machinery and buildings begin to age, their resale value will begin to decline on the open market. In order to maintain the overall value of the farm business (i.e. net worth), enough revenue has to be produced to either purchase additional assets to replace the aging asset or to have available cash on hand to make those purchases at a later date. Depreciation is not an expense that the farm will actually write a check to cover. However, it is included in the calculation of Net Farm Income because of its importance to the longevity of a farm business.

| Depreciation Calculator | | | | | | | | |
|-------------------------|---------------------------|----------------------|------------------|---------------------|--|-------------------|----------------------|--------------------|
| | (Enter Below) | (Enter Below) | (Enter Below) | (Enter Below) | Depreciation Value | | | |
| | Depreciation Rate | Beginning Year Value | Purchases | Sales | (Beginning Year Value + Purchases - Sales) x Depreciation Rate | | | |
| 6 | Machinery and equipment | 7% | \$ 130,733.00 | \$ 35,000.00 | \$ 25,000.00 | \$ | 9,851.31 | |
| 7 | Titled vehicles | 4% | \$ 24,750.00 | \$ - | \$ - | \$ | 990.00 | |
| 8 | Buildings and improvement | 4% | \$ - | \$ - | \$ - | \$ | - | |
| 9 | Total depreciation | | | | | \$ | 10,841.31 | |
| 11 | | (Enter Below) | Corn Cost (acre) | Soybean Cost (acre) | Wheat Cost (acre) | Corn Cost (total) | Soybean Cost (total) | Wheat Cost (total) |
| 12 | Total Depreciation | \$ 10,841.31 | \$ 39.42 | \$ 39.42 | \$ 39.42 | \$ 3,942.29 | \$ 2,956.72 | \$ 3,942.29 |
| 13 | Income Taxes | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| 14 | Owner Withdrawal | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |

To calculate this amount, select the *Capital & Opportunity* tab. Then enter the values of machinery and equipment, titled vehicles, and buildings and improvements into the depreciation calculator. These values can be found easiest on the farm’s most recent balance sheet, typically beginning of the year. Then select what depreciation rate is most appropriate for the assets.

The level of depreciation or decline is somewhat subjective with machinery and equipment falling between 5-10% and 2-5% on buildings. Often a higher rate of depreciation is used on newer assets. Producers should be sure to account for any purchases or sales of assets as they will impact the final depreciation value.

Net Cash Flow

Cash flow focuses on the farm’s ability to repay its debt obligations by making both principal and interest payments as well as other financing related expenses. These are listed on the *Crop Budget (Main)* tab under the “Financing” section.

In order to calculate these values, you will select two different tabs: *Loans & Financing* and *Capital & Opportunity*. To determine the Interest and Principal payments, a producer should select the *Loans & Financing* tab. On this tab, the type of loan debt being accounted for on the farm can be written in under the description column. The loan types

| Loans | | | | | | | | | |
|--------------------------|----------------|--------------------|---------------|----------------|------------------|-----------------------|---------------------|-----------------------|-----|
| | | | | | | | | Acres to Cover Loans: | 275 |
| Operating | | | | | | | | | |
| Description | Purchase Price | Loan Terms (Years) | Interest Rate | Yearly Payment | Interest Payment | Interest Payment/Acre | Yearly Payment/Acre | | |
| Revolving Line-of-Credit | \$ 60,000 | 1 | 6.5% | \$63,900.00 | \$3,900.00 | \$14.18 | \$232.36 | | |
| Seed Financing | \$ 15,000 | 1 | 2.5% | \$15,375.00 | \$375.00 | \$1.36 | \$55.91 | | |
| Chemical Financing | \$ - | 1 | 0.0% | \$0.00 | \$0.00 | \$0.00 | \$0.00 | | |
| | \$ - | 1 | 0.0% | \$0.00 | \$0.00 | \$0.00 | \$0.00 | | |
| | \$ - | 1 | 0.0% | \$0.00 | \$0.00 | \$0.00 | \$0.00 | | |
| | \$ - | 1 | 0.0% | \$0.00 | \$0.00 | \$0.00 | \$0.00 | | |
| Total Cost | | | | \$79,275.00 | \$4,275.00 | \$15.55 | \$288.27 | | |



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include operating, capital purchase (i.e. tractor), or the purchase of land. After filling in the description of the loan, enter the loan amount in the purchase price column. The loan terms column is where the number of years that the loan will be in existence can be entered followed by the interest rate of the loan.

| | | Financing by Crop | | | | | |
|----------------------------|-----------------|-------------------|--------------|-------------|-----------|--------------|------------|
| | | Total | | | Per Acre | | |
| | | Corn Cost | Soybean Cost | Wheat Cost | Corn Cost | Soybean Cost | Wheat Cost |
| Interest | Expenses | | | | | | |
| Operating Interest Exp. | \$4,275.00 | \$ 1,554.55 | \$ 1,165.91 | \$ 1,554.55 | \$ 15.55 | \$ 15.55 | \$ 15.55 |
| Intermediate Interest Exp. | \$975.00 | \$ 354.55 | \$ 265.91 | \$ 354.55 | \$ 3.55 | \$ 3.55 | \$ 3.55 |
| Long-Term Interest Exp. | \$0.00 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| Principal | | | | | | | |
| Intermediate Principal | \$2,634.52 | \$ 958.01 | \$ 718.50 | \$ 958.01 | \$ 9.58 | \$ 9.58 | \$ 9.58 |
| Long-Term Principal | \$0.00 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |

With this information, an annual payment will be calculated for each type of loan the producer enters. The payment is then allocated across Corn, Soybeans, and Wheat using the acres entered on the *Crop Budget (Main)* tab for each crop. A table to the right of these columns illustrates what the allocations look like as a total per crop and then per acre as well.

Income taxes and owner withdrawal can be found in the same area of the *Capital & Opportunity* tab as depreciation. *Note on Depreciation: remember that this is not an expense that the farm writes a check from the farm account to cover. Therefore, when calculating Cash Flow, the tool subtracts this value from the overall expenses prior to determining the Net Cash Flow amount for the farm.*

Economic Profit

Economic profit includes not only operating, but cash flow and net worth activities as well. Most importantly, it includes the consideration of opportunity costs.

Opportunity costs on the farm relate to the income you could be gaining if your resources were put towards another use. These resources include the unpaid hours a farm manager works and the value of capital (i.e. equipment, land, etc.) if it were invested elsewhere. These are important numbers for you to understand, even if the business has a positive net cash flow and creates a positive change in the farm's net worth. This is especially important during tough economic times. Especially when a farm is considering continuing to operate or to sell the business as better opportunities may exist elsewhere.

The opportunity costs included in this tool are found under in the *Capital & Opportunity* tab. Beneath the depreciation calculator are three areas relating to Economic Profit. They include the *Labor & Management* and *Equity Capital*. In the labor & management area, you can calculate the *value of unpaid labor & management* as shown below:

$$\text{Value of Unpaid Labor \& Management} = (\text{Value of Farm Production (VFP)} \times 10\%) + \text{Value of Unpaid Labor Hours}$$

| Labor & Management | | | | | | | |
|---|--------------------------------|------------------|--|-------------------|-------------------|----------------------|---------------------|
| | Corn | Soybeans | Wheat | | | | Total |
| Value of Farm Production (VFP) | \$66,627.27 | \$30,570.45 | \$48,467.27 | (Enter Below) | | (Enter Below) | \$145,665.00 |
| Value of Unpaid Labor & Management | Value of Farm Production | \$139,165.00 | Unpaid Labor | 2000 | Hourly Rate | \$10.00 | \$33,916.50 |
| VFP + (Unpaid Labor Hours X Hourly Rate) | | | | | | | |
| | | Corn Cost (acre) | Soybean Cost (acre) | Wheat Cost (acre) | Corn Cost (total) | Soybean Cost (total) | Wheat Cost (total) |
| Value of Unpaid Labor & Management Per Crop | | \$123.33 | \$123.33 | \$123.33 | \$12,333.27 | \$9,249.95 | \$12,333.27 |
| Equity Capital | | | | | | | |
| | (Enter Below) | | (Enter Below) | | | | |
| Value of Unpaid Equity Capital | Net Worth (From Balance Sheet) | \$50,000 | Opportunity Cost (Percentage Rate of Return) | 6% | | | Total \$3,000.00 |
| | | Corn Cost (acre) | Soybean Cost (acre) | Wheat Cost (acre) | Corn Cost (total) | Soybean Cost (total) | Wheat Cost (total) |
| | | \$10.91 | \$10.91 | \$10.91 | \$1,090.91 | \$818.18 | \$1,090.91 |



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One of the key factors in calculating this value is to identify the *Value of Farm Production*. The tool assists in determining this value by taking the market value of each crop set on the *Crop Budget (Main)* tab and adds them together. You can then enter your unpaid labor hours and the rate/hour that those hours would be worth if you were receiving a wage. The calculated value is then allocated evenly across the acres for corn, soybeans, and wheat.

In the equity capital area, you calculate the *value of equity capital* as shown below:

$$\text{Value of Unpaid Equity Capital} = \text{Net Worth (value of assets)} \times \text{Rate of Return on Assets (desired by the producer)}$$

You'll enter the value of your assets and then the desired rate of return expected for the use of those assets. The value of your assets is typically entered as the Net Worth of the business, because without paying off all debt obligations beforehand, you would not have assets available to invest elsewhere. This value can be found on the most recent balance sheet for the farm business.

Financial Scorecard

| Financial Scorecard | | | | | | | |
|---------------------|--|-----|------------|-----|------------|-----|------------|
| 87 | OPERATING EXPENSE RATIO | 80% | 80 - 100% | 70% | 80 - 100% | 76% | 80 - 100% |
| 89 | How much of every \$1.00 generated goes to operating costs? | | 60 - 80% | | 60 - 80% | | 60 - 80% |
| 90 | | | 0 - 60% | | 0 - 60% | | 0 - 60% |
| 91 | | | | | | | |
| 92 | DEPRECIATION EXPENSE RATIO | 9% | 10% - over | 14% | 10% - over | 16% | 10% - over |
| 93 | How much of every \$1.00 generated goes to depreciation costs? | | 5 - 10% | | 5 - 10% | | 5 - 10% |
| 94 | | | 0 - 5% | | 0 - 5% | | 0 - 5% |
| 95 | | | | | | | |
| 96 | INTEREST EXPENSE RATIO | 5% | 10% - over | 8% | 10% - over | 9% | 10% - over |
| 97 | How much of every \$1.00 generated goes to interest costs? | | 5 - 10% | | 5 - 10% | | 5 - 10% |
| 98 | | | 0 - 5% | | 0 - 5% | | 0 - 5% |
| 99 | | | | | | | |
| 100 | NET FARM INCOME RATIO | 5% | 0 - 10% | 9% | 0 - 10% | -2% | 0 - 10% |
| 101 | How much of every \$1.00 generated is farm income? | | 10 - 20% | | 10 - 20% | | 10 - 20% |
| 102 | | | 20% - over | | 20% - over | | 20% - over |
| 103 | *Note: these four ratios add up to 100% | | | | | | |

The *Farm Financial Scorecard* is a means of monitoring the financial health of the producer's farm. It can be used either at a single point in time or year after year. It focuses on measuring the financial performance of the business using twenty-one key financial ratios. These ratios are outlined in the MSU Extension article series: [Financial Ratios](#).

The ratios listed on the *Crop Budget (Main)* tab include *operating expense*, *depreciation expense*, *interest expense*, and *net farm income*. Measured as percentages, these ratios add up to 100% to illustrate where the revenue generated by the farm ends up. The color codes and value ranges provide a benchmark to compare your budget information against.

For example, if the operating expense ratio is at 90%, then that means for every \$1.00 of revenue generated by the farm, \$0.90 is needed to cover operating expenses. That means that only 10%, or \$0.10 of every \$1.00 of revenue, remains available to pay for interest on term debt and depreciation costs. Understanding how much of the farm's revenue is left over to pay for these important expenses can mean the difference between a profitable farm and one in serious financial trouble.

This is one of several importance financial ratios found on the Farm Financial Scorecard that can help a producer understand the financial health of their operation and where they can focus on improving their business. The [Farm Financial Scorecard](#) can be found via the University of Minnesota's Center for Farm Financial Management website.



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Break-Evens

Every farm wants to be able to market their grain for the best possible price. When prices are low, they'll focus on producing the best yield possible to make a profit. The question then becomes, what price or yield does the farm need to achieve to be profitable? These break-even values are provided on the *Crop Budget (Main)* tab for you to consider when entering your farm's information. In particular, the tool focuses on three break-evens for you to think about when marketing your products.

| Break-Even Calculations | | | | | | | |
|-------------------------|---|--------|---------|---------|---------|--------|---------|
| 104 | | | | | | | |
| 105 | | | | | | | |
| 106 | Net Returns Break-even (Over Variable & Fixed) | | | | | | |
| 107 | Break-even \$\$/Bushel | \$4.30 | /Bushel | \$10.29 | /Bushel | \$6.16 | /Bushel |
| 108 | Break-even Yield/Acre | 172.11 | Bushels | 47.88 | Bushels | 81.43 | Bushels |
| 109 | | | | | | | |
| 110 | Repayment Capacity Break-even (Cash Flow) | | | | | | |
| 111 | Break-even \$\$/Bushel | \$4.49 | /Bushel | \$11.02 | /Bushel | \$6.61 | /Bushel |
| 112 | Break-even Yield/Acre | 180.02 | Bushels | 51.24 | Bushels | 87.40 | Bushels |
| 113 | | | | | | | |
| 114 | Capital Retainment Break-even (Net Worth) | | | | | | |
| 115 | Break-even \$\$/Bushel | \$4.91 | /Bushel | \$12.55 | /Bushel | \$7.57 | /Bushel |
| 116 | Break-even Yield/Acre | 196.83 | Bushels | 58.38 | Bushels | 100.07 | Bushels |
| 121 | | | | | | | |

Net Return (Over Direct & Fixed) Break-Even – Much of a production season is focused on variable and fixed input expenses. That is why this is the most common number that farm managers tend to think about. The program calculates these break-evens by using the following formulas:

$$\text{Break-Even Price (Net Return)} = (\text{Variable Cost} + \text{Fixed Cost}) \div \text{Production Level}$$

$$\text{Break-Even Yield (Net Return)} = (\text{Variable Cost} + \text{Fixed Cost}) \div \text{Price Per Bushel}$$

Repayment Capacity (Cash Flow) Break-Even – These are the numbers that the lender will want a farm business to focus on. Cash flow is where the farm covers not only the variable and fixed expenses, but also the non-operating or financial obligations for the year. This includes any family living expense, real estate taxes, and term debt payments that the business is expected to pay for. The program calculates these break-evens by using the following formulas:

$$\text{Break-Even Price (Cash Flow)} = (\text{Variable Cost} + \text{Fixed Cost} + \text{Financial Obligations}) \div \text{Production Level}$$

$$\text{Break-Even Yield (Cash Flow)} = (\text{Variable Cost} + \text{Fixed Cost} + \text{Financial Obligations}) \div \text{Price Per Bushel}$$

Capital Retainment (Net Worth) Break-Even – The increase of value or net worth is a sign that your farm business is doing well. This is accomplished mainly through the generating of cash or dollars that the farm can use. Often these dollars are re-invested through the purchase of newer equipment, upgrading/adding facilities, or the purchase of land. These additional dollars are also used to cover the depreciation in value of those same investments. To know what break-even the farm needs to achieve to increase the value of the business, the program calculates these break-evens by using the following formulas:

$$\text{Break-Even Price (Net Worth)} = (\text{Variable Cost} + \text{Fixed Cost} + \text{Financial Obligations}) \div \text{Production Level}$$

$$\text{Break-Even Yield (Net Worth)} = (\text{Variable Cost} + \text{Fixed Cost} + \text{Financial Obligations}) \div \text{Price Per Bushel}$$



For additional information, visit www.canr.msu.edu/farm_management/

Fertility Program

The Crop Budget Estimator tool allows you to understand the financial situation of your farm, but also the agronomic impact of your fertility program. Using the information, you provided on the *Nutrient Management* tab, the tool was able to calculate the total nutrient needs for your budget. In the *Fertilizer Plan* tab, you input specific information about what fertilizers will be used and determine how much of various macro- and micro-nutrients will be provided to the crops.

| Fertility Program | | | | | | | | | | | |
|--|--|------|------|--|------|------|------|--|------|------|------|
| | N | P | K | | N | P | K | | N | P | K |
| 124 Total Nutrient Needs | | | | | | | | | | | |
| 125 (Based on Nutrient Management tab) | 142 | 70 | 40 | | 163 | 0 | 85 | | 83 | 45 | 55 |
| | S | Ca | Mag | | S | Ca | Mag | | S | Ca | Mag |
| 127 | 13 | 2 | 5 | | 8 | 6 | 6 | | 7 | 2 | 10 |
| 128 | Z | B | Mn | | Z | B | Mn | | Z | B | Mn |
| 129 | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 |
| 130 | | | | | | | | | | | |
| 131 Nutrients Provided by Fertilizer Plan | | | | | | | | | | | |
| 132 (Pounds of Actual Nutrient Per Acre) | 146 | 58 | 62 | | 0 | 37 | 56 | | 95 | 46 | 31 |
| 133 | S | Ca | Mag | | S | Ca | Mag | | S | Ca | Mag |
| 134 | 21 | 0 | 0 | | 0 | 0 | 0 | | 12 | 0 | 0 |
| 135 | Z | B | Mn | | Z | B | Mn | | Z | B | Mn |
| 136 | 0.00 | 0.00 | 0.00 | | 0.00 | 0.00 | 0.00 | | 0.00 | 0.43 | 0.00 |
| 137 | | | | | | | | | | | |
| 138 | To adjust for Nitrogen Credits, reference: MSU Bulletin E-2904, Nutrient Recommendations for Field Crops in Michigan | | | | | | | | | | |
| 139 | | | | | | | | | | | |

On the *Crop Budget (Main)* tab, you can compare the *nutrients provided by fertilizer plan* to the *total nutrient needs*. This comparison helps you to determine if your plan is providing sufficient nutrients to achieve the farm's yield expectations.

With the addition of the fertility program information, the Crop Budget Estimator tool has the ability to view agronomic and economic impacts in one central place. This can be useful information to ensure that you are meeting your production and financial goals at the same time while planning for the upcoming growing season.

The Crop Budget Estimator Tool can be found on the MSU Extension Farm Management website at:

https://www.canr.msu.edu/farm_management/budgets-cost-of-production