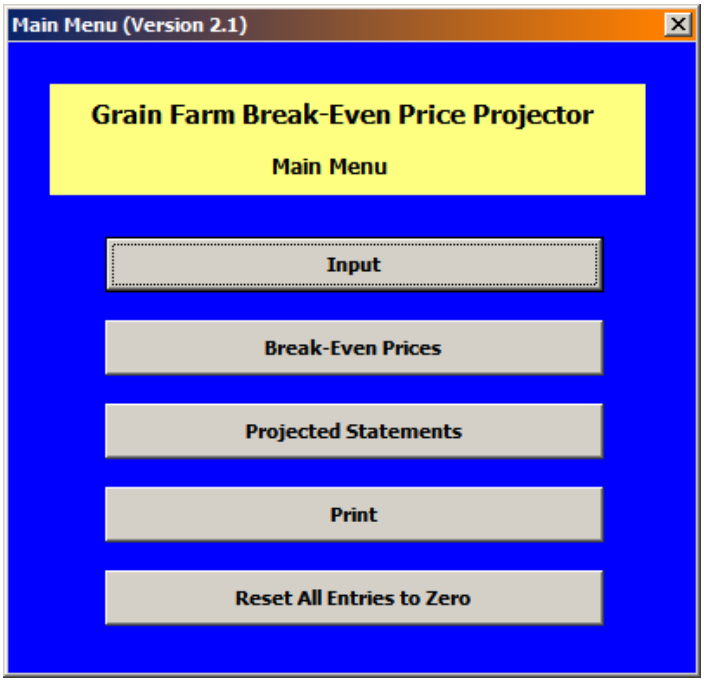
Breakeven Analysis

This program allows the user to calculate breakeven price and yield levels and prepare projected net farm income and cash flow statements.

The Breakeven Analysis program assists farm operators in computing breakeven grain prices and yields for the upcoming production year. In addition, the tool prepares projected net farm income and cash flow statements, and estimates debt repayment ability.

Program Navigation

The Main Menu, shown below, of the program navigates the user through the different input and result pages of the tool.



Input Takes the user to the data input worksheet of the tool.

Break-Even Prices Takes the user to the page that calculates and analyzes breakeven prices and yields.

Projected Statements Takes the user to the page displaying projected income and cash flows statements.

Print Prints the result worksheets of the tool.

Reset All Entries to Zero Clears all entries in the input page.

In addition, tabs at the bottom of the Excel spreadsheet screen help navigate the user among the Input, Breakeven Prices, and Projected Statements worksheets. The Reconcile tab connects to the Reconcile worksheet, explained further in this document.

Input Worksheet

When inserting information into the Input worksheet, enter only where text or numbers are blue. The numbers in black are calculations using the inputted data.

Each input section has “Help” and “Menu” buttons. Clicking the “Help” button displays a description of that specific input section. Clicking the “Menu” button displays the Main Menu.

Farm Information and Acres

Farm information and acreage are entered in the below screen shots. Enter the date the analysis is conducted and the production year being evaluated.

FARM INFORMATION

Name: John and Sally Smith
I.D.:
Year: 2006
Date: December 5, 2005

ACRES

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Menu

	Corn	Soybeans	Wheat	Other	Total
owned	145	117	0	0	262
share rent--split 1	252	204	0	0	456
share rent--split 2	0	0	0	0	0
cash rent	233	188	0	0	422
Total	631	509	0	0	1,140

Enter the acreage per crop according to the ownership/arrangement. The program allows share-rented acres to be entered as “Split 1” or “Split 2.” These split categories allow for the entry of different share-rent arrangements, such as 50-50 and 1/3 - 2/3 share rents. Allocations of revenue and costs between the

farmer and landlord(s) are entered in the Revenue and Cost Splits on Share-Rent Acres section of the Input worksheet.

In the example shown on the previous page, John and Sally Smith own 262 acres (145 corn acres and 117 soybean acres), share rent 456 acres (252 corn acres and 204 soybean acres), and cash rent 422 acres (233 corn acres and 188 soybean acres).

Per-Acre Budgets

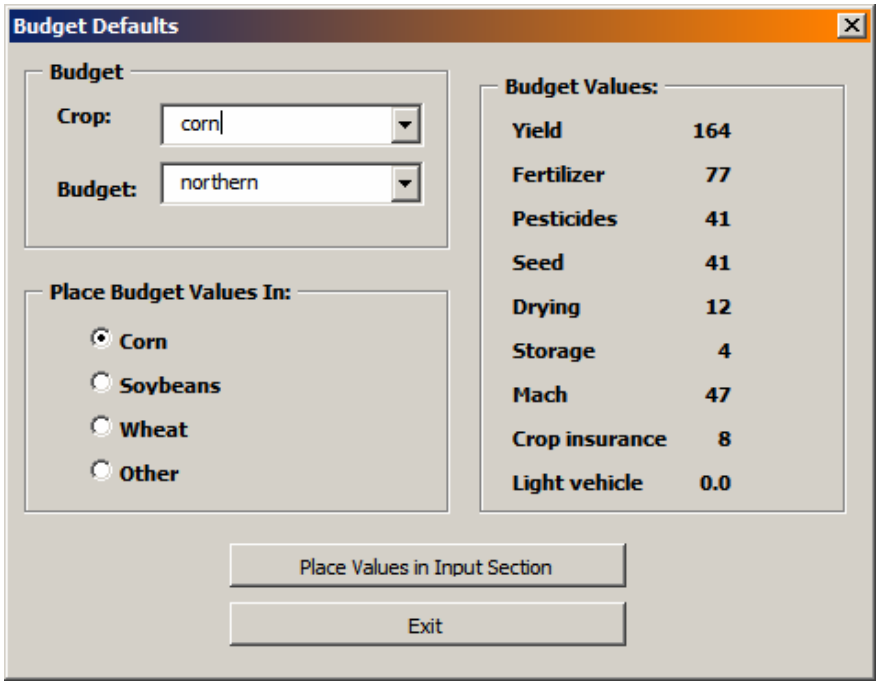
This input section represents a per-acre budget for each crop grown. The top portion of the screen shown below asks for revenue assumptions, including crop yields, sales prices, and government payments. The user can use the previous year's records for these inputs or project the upcoming year's yields, prices, and government payments. The bottom portion requests per-acre production costs. Enter total per-acre amounts whether the farmer or the share-rent landlord is responsible for the costs. Adjustments for share-rent acres are made in the next section.

PER ACRE BUDGETS

Help | Defaults | Reconcile | Menu

	------- per acre owned and cash rented ----------				
	Corn	Soybeans	Wheat	Other	Average
Revenue per acre					
Yield (bu. per acre)	175	51	0	0	
Price per bushel	$2.25	$5.80	$0.00	$0.00	
Crop revenue	$394	$296	$0	$0	$350
Government payments	$27	$27	$0	$0	$27
Total revenue	$421	$323	$0	$0	$377
Variable costs per acre					
Fertilizer	$83	$26	$0	$0	$58
Pesticides	$41	$30	$0	$0	$36
Seed	$44	$31	$0	$0	$38
Drying	$9	$2	$0	$0	$6
Storage	$7	$3	$0	$0	$5
Mach repairs, fuel, hire	$37	$32	$0	$0	$35
Crop insurance	$8	$6	$0	$0	$7
Light vehicle	$2	$2	$0	$0	$2
Other	$0	$0	$0	$0	$0
Other	$0	$0	$0	$0	$0
Variable costs per acre	$231	$132	$0	$0	$187
Revenue less variable costs	$190	$191	$0	$0	$190
Variable costs per bu.	$1.32	$2.59	$0.00	$0.00	

Clicking [Defaults] displays the Budget Defaults screen shown below. The Breakeven Analysis program contains budget data for corn and soybeans for Northern, Central (high quality land), Central (low quality land), and Southern Illinois. Default yields and production costs come from the Illinois Farm Business Farm Management (FBFM) Association. The user can use his/her farm's information, the default budget, or a combination of the two to calculate breakeven points. To use the program's budget values, select the crop and budget region, then specify which budget to insert the data: corn, soybeans, wheat, or other.



Clicking [Reconcile] displays the Reconciliation worksheet (shown on the following page), which is a second method for entering variable production costs into the Per-Acre Budgets input section. The user can enter whole farm crop costs in the Reconcile Values column where blue text appears. The tool allocates these cost amounts between corn and soybeans on a per-acre basis.

Click [Use Reconcile] to use the whole farm production costs in the breakeven analysis.

RECONCILIATION WORKSHEET

Enter amounts that you wish variable costs to equal in the "reconcile values" column. The "Per Acre Values that Give Reconcile Values" columns give the per acre values causing reconciliation. Click on "Use Reconcile" button to use these values. Click "Return" to return to spreadsheet.

Use Reconcile | Return

	----- Total Farm ------					
	From Model	Reconcile Values	Per Acre Values That Give Reconcile Values			
			Corn	Soybeans	Wheat	Other
Fertilizer	$52,486	$0	$0	$0	$0	$0
Pesticides	32,913	0	$0	$0	$0	$0
Seed	34,834	0	$0	$0	$0	$0
Drying	5,358	0	$0	$0	$0	$0
Storage	4,755	0	$0	$0	$0	$0
Mach repairs, fuel, hire	39,635	0	$0	$0	$0	$0
Crop insurance	6,482	0	$0	$0	$0	$0
Light vehicle	2,280	0	$0	$0	$0	$0
Other	0	0	$0	$0	$0	$0
Other	0	0	$0	$0	$0	$0
Variable costs	$178,742	$0				

<u>Revenue and Cost Splits on Share-Rent Acres</u>

This worksheet, shown on the following page, represents a per-acre budget for each crop grown on share-rent acres. This input section allows the user to allocate revenue earnings and cost responsibilities between the farm operator and landlord(s).

This input screen contains two sections: Split 1 and Split 2. The two splits correspond to the “Share Rent - Split 1” and “Share Rent - Split 2” inputs in the Farm Information and Acres section. The user specifies the details of the share-rent agreement:

Percent: The farmer’s percentage of revenue and costs under the share-lease arrangement. For example, an entry of 66% for crop revenue means that the farmer receives 66% of crop receipts, while the landowner receives the balance.

Value Per Acre: The farmer’s total per-acre revenue and costs for the respective share-rent agreement. Values in these columns represent a weighted average of all crops grown under that arrangement.

Total Farm: This column shows the total revenue and expense values for the entire farm operation, which exclude the landlord’s revenue earnings and cost obligations. Values include returns and costs for all farmland control categories: owned, share-rent, and cash-rent farm ground. Comparing these projections to previous actual values allows validation of the inputs in this spreadsheet.

REVENUE AND COST SPLITS ON SHARE RENT ACRES

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Reconcile
Menu

	------- Split 1 ---------		------- Split 2 ----------		
	Percent	Value per acre	Percent	Value per acre	Total Farm
Revenue					
Crop revenue	50%	$175	66%	$0	$319,215
Government payments	50%	$14	66%	$0	$24,624
Total revenue		$189		$0	$343,839
Variable costs					
Fertilizer	50%	$29	66%	$0	$52,486
Pesticides	50%	$18	66%	$0	$32,913
Seed	50%	$19	100%	$0	$34,834
Drying	50%	$3	66%	$0	$5,358
Storage	50%	$3	66%	$0	$4,755
Mach repairs, fuel, hire	100%	$35	100%	$0	$39,635
Crop insurance	50%	$4	66%	$0	$6,482
Light vehicle	100%	$2	100%	$0	$2,280
Other	50%	$0	66%	$0	$0
Other	50%	$0	66%	$0	$0
Variable costs		$112		$0	$178,742
Revenue less variable costs		$77		$0	$165,097
Operator acres	912				

Other Costs and Revenue

This input section, seen on the following page, collects revenue and expense information not gathered in the previous sections. Entries are on a whole-farm basis, except for per-acre property tax and cash rent values. The “Other Costs” portion consists of overhead items that are not easily allocated on a per-acre basis.

The user can include crop insurance payments, custom work, and other farm income sources in the “Other farm revenue” input. If capital purchases are to be made in the upcoming year, the user enters the down payment for these purchases in the “Capital expenditures” input. If money is borrowed for the purchases, enter the interest and principal owed in the year of the purchases in the Loan Information input section. The user can include these obligations in the “Direct entry of principal and interest payment” input.

The user can enter federal income and Social Security taxes directly or the program can estimate these obligations. To have the tool calculate, click Estimate Tax. The program assumes that the user is married and is filing jointly.

OTHER COSTS AND REVENUE

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Other costs			
Utilities	$4,560		
Building repair and rent	$3,420		
Hired labor	$9,120		
Insurance	$6,840		
Miscellaneous	$6,840		
Real estate taxes	$6,817	$26	per acre on 262.2 owned acres
Cash rent	$56,099	$133	per acre on 421.8 cash rent acres
Settlements	$0		
Other	$0		
Other	$0		
Total other costs	$93,697		
Other farm revenue	$0		
Non-farm income	$30,000		
Family living expenditures	$58,285		
Capital expenditures	$0		
Depreciation	$22,922		
Income and SS tax	$18,822		

Estimate Tax

Loan Information

This input section, shown below, asks for information for all outstanding loans and estimates the interest and principal payments due during the next year.

LOAN INFORMATION

Help

Menu

	Years	Interest Rate	Loan Balance	Total Payment	Interest	Principal
Direct entry of principal and interest payment					$13,000	$25,734
Loan 1	0.00	0.00%	$0	$0	$0	$0
Loan 2	0.00	0.00%	$0	$0	$0	$0
Loan 3	0.00	0.00%	$0	$0	$0	$0
Loan 4	0.00	0.00%	$0	$0	$0	$0
Operating	xxxxx	0.00%	$0		$0	
			$0	$0	$13,000	$25,734

Loan information can be entered in three parts:

Direct Entry of Principal and Interest Payments: Enter the total interest and principal due on all loans for the upcoming year. If these totals are unknown, refer to the “Individual Loans” part explained next.

Individual Loans (Loan 1, Loan 2, etc.): Enter the inputs for each individual loan: number of years remaining on the note, interest rate, and present outstanding

principal balance. The interest and principal payments for the next year are calculated.

Operating Loan: Enter the interest rate and the estimated operating loan balance for the upcoming year. The interest balance is calculated.

Breakeven Prices

After entering the required farm information, the user can analyze revenue and expenses on a per-bushel basis. The tool computes four levels of per-bushel breakeven costs, as shown below. The "Yield per acre" output is pulled directly from the projected yields entered in the Per-Acre Budgets input section.

PER BUSHEL BREAK-EVEN PRICES
John and Sally Smith
ID:
For Calender Year 2006
Prepared on December 05, 2005

	Corn	Soybeans	Wheat	Other
Yield per acre	175	51	0	0
Variable costs	$1.38	$2.75	$0.00	$0.00
Other costs	0.59	2.01	0.00	0.00
Interest costs	0.08	0.28	0.00	0.00
Depreciation	0.14	0.49	0.00	0.00
Total costs	$2.19	$5.53	$0.00	$0.00
less other farm revenue	0.15	0.53	0.00	0.00
Break-even to have positive net farm income	$2.04	$5.00	$0.00	$0.00
plus family living and tax	$0.48	$1.66	$0.00	$0.00
less non-farm income	$0.19	$0.64	$0.00	$0.00
Break-even after family living	$2.33	$6.02	$0.00	$0.00
less depreciation	$0.14	$0.49	$0.00	$0.00
plus term-debt principal	$0.16	$0.55	$0.00	$0.00
Break-even for capital replacement & term debt repayment margin	$2.35	$6.08	$0.00	$0.00

This program description will now explain the four levels of breakeven analysis.

1. Breakeven Costs

   Costs are calculated based on the costs entered in the Input worksheet, the farmer's share of expenses, and the number of acres farmed per crop.

Variable Costs: Crop production costs from the Per-Acre Budget section.

Other Costs: Costs taken from the Other Costs and Revenue section.

Interest Costs and Depreciation: Pulled directly from the Input worksheet.

Total Costs: Sum of all farm expenses plus depreciation. This value represents the total per-bushel cost for each crop.

2. Positive Net Farm Income Breakeven

   Less Other Farm Revenue: This figure represents additional farm revenue earned, such as government program payments, crop insurance payments, custom work, etc. These other sources of farm revenue offset expenses. Thus, they are subtracted from total costs.

   Breakeven to Have Positive Net Farm Income: The per-bushel prices needed for a zero or positive net farm income. For example, the worksheet on the previous page indicates that sales prices of $2.04 and $5.00 for corn and soybeans, respectively, are needed to break even (cover all farms costs excluding debt payments).

3. Breakeven After Family Living Expenses

   Plus Family Living and Tax: These are expenses incurred, on a per-bushel basis, to support family living and pay government taxes. This calculation consists of entries for family living expenditures, federal income tax, and Social Security tax divided by each crop's projected yield. These expenses are added to the breakeven price levels.

   Less Non-Farm Income: Off-farm income offsets expenses. Thus, it is subtracted from breakeven prices.

   Breakeven After Family Living: The per-bushel prices needed for a zero or positive net farm income after accounting for family living expenses, taxes, and off-farm income.

4. Breakeven for Capital Replacement and Term Debt Repayment

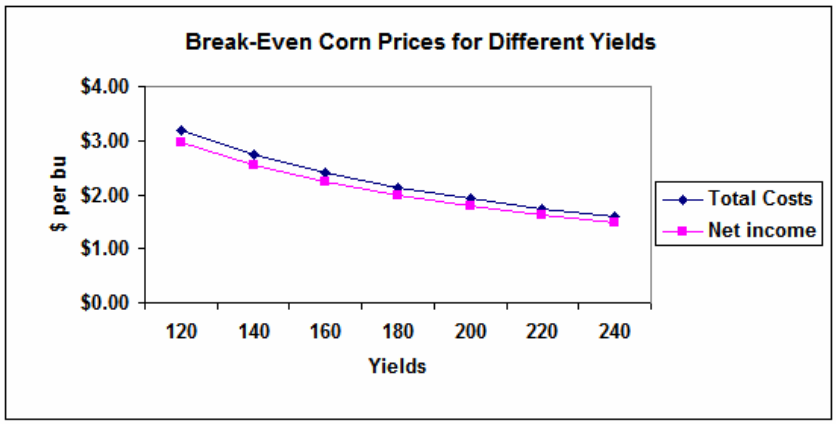
   Less Depreciation: Net farm income from the income statement excludes depreciation. Since depreciation is added to the breakeven cost calculations explained on the previous page, the analysis at this stage subtracts depreciation.

Plus Term Debt Principal: The total principal expense due on outstanding loans in the upcoming year is added to the breakeven costs.

Breakeven for Capital Replacement and Term Debt Repayment Margin: The per-bushel price needed to have a zero or positive net farm income after accounting for family living expenses, taxes, off-farm income, depreciation, and principal on term debt. The breakeven prices for this example are $2.35 and $6.08 for corn and soybeans, respectively. To make a profit and pay next year's principal on all loans, the crop must be sold for more than $2.35 per bushel for corn and $6.08 per bushel for soybeans.

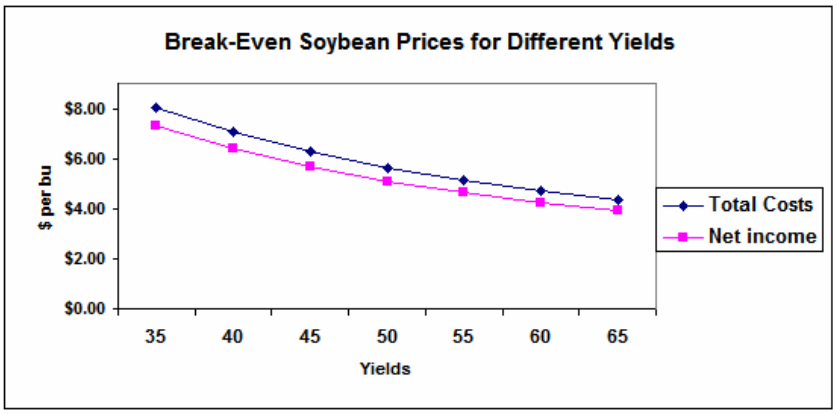
Breakeven Prices for Different Yields

This section of the Breakeven Prices worksheet, shown below, provides numerical and graphical reports of breakeven prices for different corn and soybean yields.



Break-Even Corn Prices for Different Yields

Bu. per Acre	Total Costs	Positive Income
120	$3.19	$2.98
140	$2.74	$2.55
160	$2.40	$2.23
180	$2.13	$1.98
200	$1.92	$1.79
220	$1.74	$1.62
240	$1.60	$1.49



Break-Even Soybean Prices for Different Yields

Bu. per Acre	Total Costs	Positive Income
35	$8.06	$7.29
40	$7.05	$6.38
45	$6.27	$5.67
50	$5.64	$5.10
55	$5.13	$4.64
60	$4.70	$4.25
65	$4.34	$3.92

Each graph plots two lines: "Total Costs" and "Net Income." The "Total Costs" line plots the per-bushel total costs for each yield level. The "Net Income" line depicts the per-bushel price needed to have a positive net farm income for

different crop yields. Notice that in the above example the “Net Income” line appears below the “Total Costs” line. This means that additional farm revenue, such as government payments, custom work, crop insurance payments, etc., is helping to offset costs.

The tables to the right of the figures list the per-bushel total costs and positive net income prices shown in the graphs. For example, a corn price of $2.40 per bushel is needed to cover total costs at a corn yield of 160 bushels. However, only $2.23 per bushel is needed to provide a positive net farm income because other farm revenue helps to absorb costs.

Projected Net Farm Income

This report, displayed below, projects the revenue and expenses used when figuring net farm income for the upcoming year. Net farm income represents the farmer’s annual salary.

PROJECTED NET FARM INCOME Menu

	Total Farm	Operator Acre	Tillable Acre
Crop revenue	$319,215	$350	$280
Other farm revenue	24,624	$27	$22
Total revenue	$343,839	$377	$302
Variable costs	$178,742	$196	$157
Other costs	93,697	$103	$82
Total operating costs	$272,439	$299	$239
Income before interest expense	$71,400	$78	$63
Interest costs	$13,000	$14	$11
Income before depreciation	$58,400	$64	$51
Depreciation	$22,922	$25	$20
Net farm income	**$35,478**	**$39**	**$31**

The user can evaluate income projections on a whole-farm, per-operator-acre, and per-tillable-acre basis. Operator acres are acres the farmer generates revenue from. All owned and cash-rent farm ground is counted as the operator’s acres, along with the operator’s portion of share-rent acres. Tillable acres include all acres farmed by the producer.

The tool calculates total farm business revenue and subtracts total operating costs, interest costs, and depreciation to estimate net farm income. The above example shows a projected net farm income of $35,478 for the upcoming year. This value translates into a return of $39 per operator acre or $31 per tillable

acre. Note that net farm income does not include non-farm income and family living expenses. Thus, this number is comparable to the farmer's annual salary from the farm operation.

Projected Statement of Cash Flows

This report, below screen shot, projects the cash flows of the farm operation by profiling the increases and decreases in the money supply. Non-farm income brings money into the operation and helps offset expenses. Family living, income and Social Security taxes, and capital purchases are expenses that decrease the money supply.

PROJECTED STATEMENT OF CASH FLOW
(before financing activities)

Menu

	Total Farm	Operator Acre	Tillable Acre
Net cash income from farming	$58,400	$64	$51
plus: non-farm income	$30,000	$33	$26
less: family living	$58,285	$64	$51
income and ss tax	18,822	$21	$17
capital purchases	0	$0	$0
Net change in cash	**$11,293**	**$12**	**$10**

The "Net cash income from farming" figure in the above screen is labeled "Income before depreciation" in the Projected Net Farm Income report and represents the net cash income generated by the farm business. Non-farm income is added and family living expenses, income and Social Security taxes, and capital purchases are subtracted to determine the cash in hand before making principal payments on loans.

In the above example, the household earns $58,400 in net farm income before depreciation and $30,000 in non-farm income. Total household income is reduced by $58,285 in family living expenses and $18,822 in taxes. The remaining $11,293 equals a return of $10 per acre for the entire farm operation or $12 per acre for owned acres, cash-rent acres, and the operator's share of crop-share acres. This farm operation is expected to increase its cash balance by $11,293 for the upcoming production year. Recall that this change in cash is calculated without accounting for principal payments on loans. This analysis is conducted in the next section.

Projected Capital Repayment Capacity

The below report projects the farm's ability to pay loan principals after accounting for farm and everyday living expenses. The "Capital replacement and term debt repayment capacity" figure, $11,293 in the below example, is the "Net change in cash" value reported in the Projected Statement of Cash Flows section discussed on the previous page.

PROJECTED CAPITAL REPAYMENT CAPACITY

Menu

	Total Farm	Operator Acre	Tillable Acre
Farm operating income	$35,478	$39	$31
plus: net non-farm income	30,000	$33	$26
plus: depreciation	22,922	$25	$20
less: income and ss tax	18,822	$21	$17
less: family living	58,285	$64	$51
Capital replacement and term debt repayment capacity	$11,293	$12	$10
less: principal payments	$25,734	$28	$23
Capital replacement and term debt repayment margin	**-$14,441**	**-$16**	**-$13**

The total principal due on all loans for the upcoming year, "less: principal payments" line, is subtracted from the cash on hand to determine the capital replacement and term debt repayment margin.

The capital replacement and term debt repayment margin is the difference between the amount of cash on hand and the amount owed next year in principal for capital loans. A *negative* number represents the *inability* to pay the entire principal of the loans. A *positive* number represents the *ability* to pay the total principal for the forthcoming year. The above example farm has a net farm income of $35,478. After accounting for non-farm income, depreciation, taxes, and family living expenses, $11,293 remains. The farm owes $25,734 in principal on loans. This report estimates that the farm business will be $14,441 short of paying the total principal due on loans next year.

Summary

The summary provides an overview of the financials projected in the previous three reports. The farm operation has a projected net farm income of $35,478 for the upcoming production year. The net change in cash is estimated to be $11,293, which is $14,441 short of making next year's principal payments on all loans.

SUMMARY

	Total Farm	Operator Acre	Tillable Acre
Net farm income	$35,478	$39	$31
Net change in cash	$11,293	$12	$10
Capital replacement and term debt repayment margin	-$14,441	-$16	-$13