

Interactive Sustainable Berry Budgets

User Guide



Interactive Sustainable Raspberry Budget: User Guide

Version 3.0

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INTERACTIVE SUSTAINABLE RASPBERRY BUDGET: USER GUIDE

VERSION 3.0

VERSION: 3.0

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INTRODUCTION

The *Interactive Sustainable Raspberry Budget* is a Microsoft Excel spreadsheet template that calculates costs and expected net returns for field or high tunnel production systems. The economic models provide a framework for current or potential producers to build a base scenario and then analyze that scenario with respect to different market prices or changes to production and management systems for seven years. The tool can be used to perform breakeven, sensitivity and risk analyses. Expected profitability can be calculated using the producer's own production system and expected selling prices.

It should be noted that the budget presented here is intended for use as a guide only, as individual on-farm production systems may have higher or lower production costs and returns than those listed. Production costs and yields on each operation differ due to soil type, climatic conditions and agronomic practices, among other reasons. The prices producers receive are determined by the marketing strategies chosen by the producer, the quality of the product, the supply of fruit in the area and other unique characteristics specific to each production situation. Therefore, producers are encouraged to enter their own values to develop their own costs and returns specific to their raspberry operation.

SOFTWARE REQUIREMENTS

- Windows operating system
- Microsoft Excel version 2007 or higher

QUICK START GUIDE

1. Save the *Interactive Sustainable Raspberry Budget* and *User Guide* to your computer.
2. Enable macros in Excel.
3. Click **Start** to access the *Main Menu* screen of the budget.
4. From the *Main Menu*, click the green **User Input** button.
5. Select a production system (**Field** or **High Tunnel**).
6. Complete the *User Input* form. Press **Demo** for default values or click in the gray boxes to enter your own input information.
7. Click **Run**.
8. View/edit your estimated budget results by choosing options from the *Results Menu*.
9. Select **Estimated Budget** to see a complete seven year summary.
10. Click any production year icon to customize the budget by entering new values in the gray boxes.
11. Select **Economic Analyses** to perform breakeven, sensitivity and risk analyses.
12. When finished, click **Exit Program**.

*If an error occurs please contact cars@uark.edu for technical assistance.

1. GETTING STARTED

This user guide covers everything you need to know to start using the *Interactive Sustainable Raspberry Budget*. This budgeting tool is designed to be both easy to use and easy to customize. Please begin by opening the tool and following the instructions included in this manual.

1.1. Saving the Budget

The program will work best if it is saved on your computer. Do this before making any changes to the budget as it will help ensure that your changes are not lost and allow you to save different versions for comparison. The *Save As* box can be accessed in any Microsoft program by pressing the **F12** key on your keyboard.

1.2. Enabling Macros

Upon opening the budget, a security warning may appear on the left side of the screen alerting you that macros have been disabled. **Macros must be enabled for the budget to work.** To enable macros, press the button found to the right of the security warning (Figure 1).

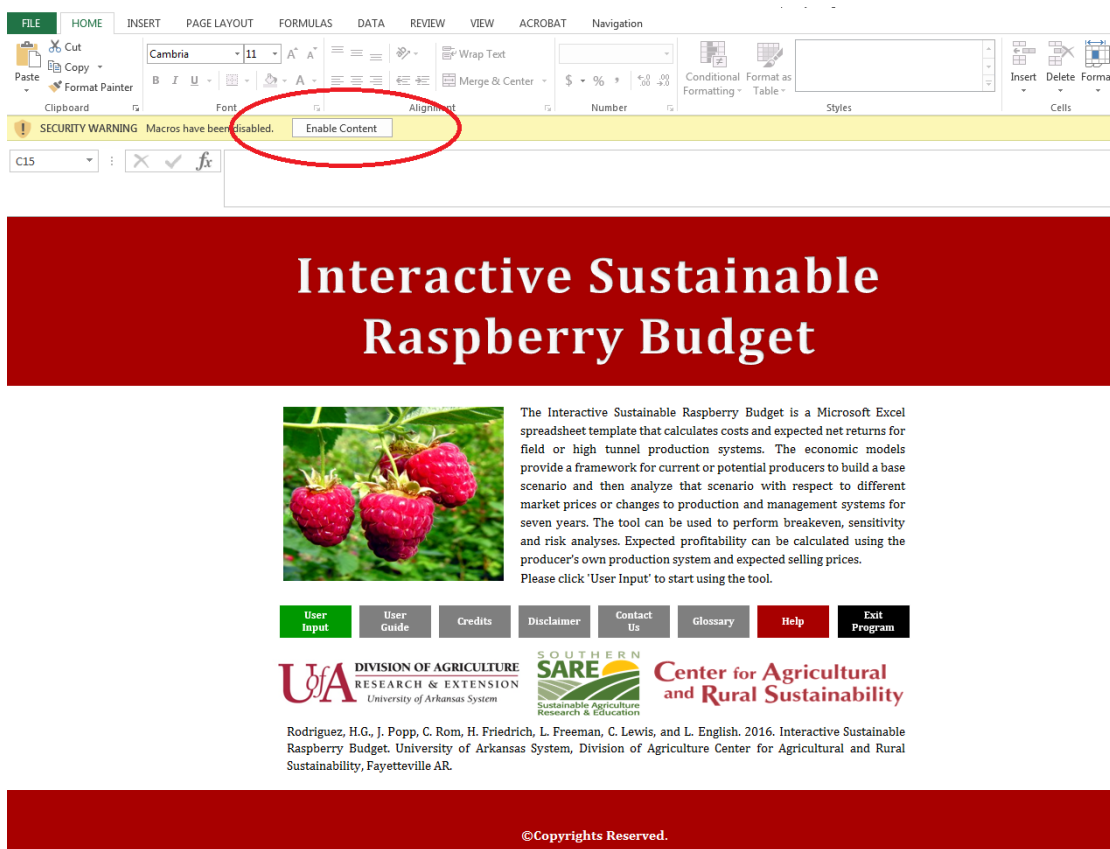


Figure 1: Enabling Macros in Excel

With some older versions of Excel, you may be asked to perform additional steps in order to enable the macros. An example of this is shown in Figure 2.

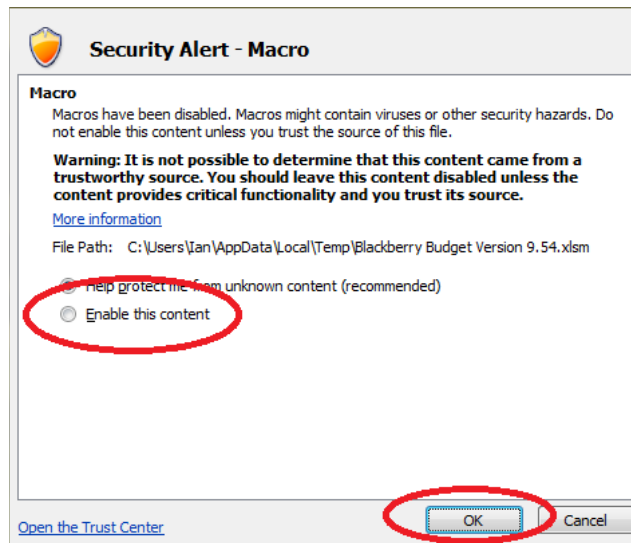


Figure 2: Additional Steps for Enabling Macros

Once the macros are enabled, the “About this Tool” box will appear (Figure 3). Click **Start** to continue on to the *Main Menu* screen.

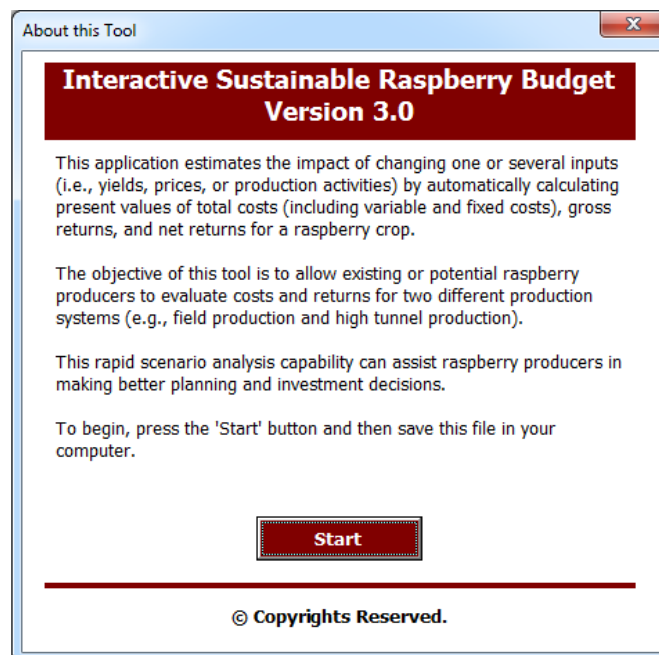


Figure 3: About this Tool Pop-up

1.3. Using the Tool

To begin using the tool, click the green **User Input** icon, shown circled below in Figure 4

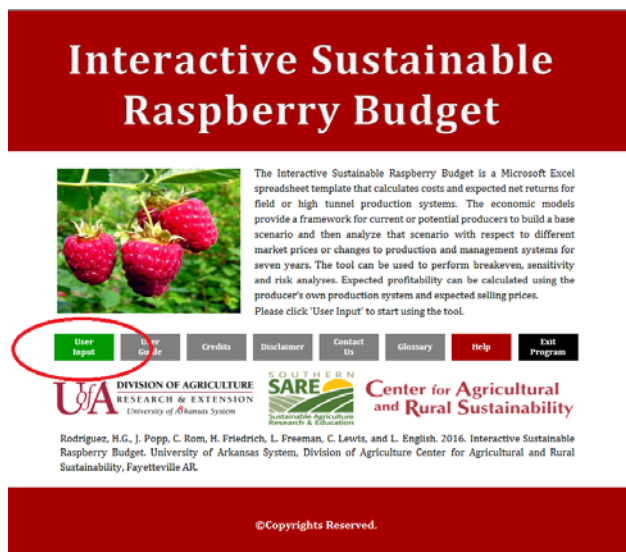


Figure 4: Main Menu Screen

2. INITIAL INPUT

To begin using the tool, you must first enter some information about your operation. This information will be used to calculate an estimated budget covering seven years of production.

2.1. Choosing a Production System

Click **Field** or **High Tunnel** to choose a production system (Figure 5).

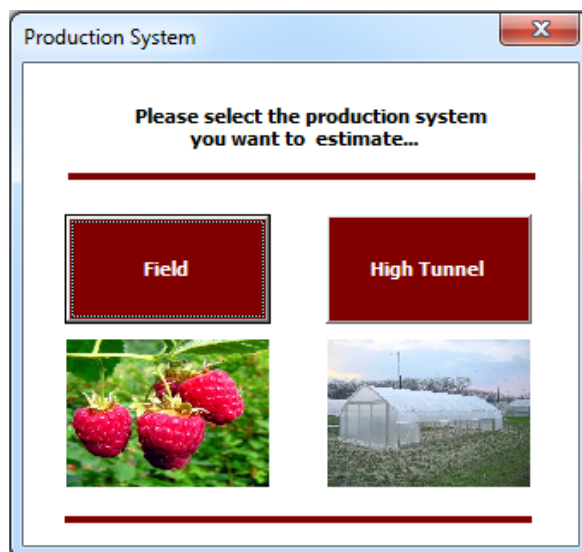
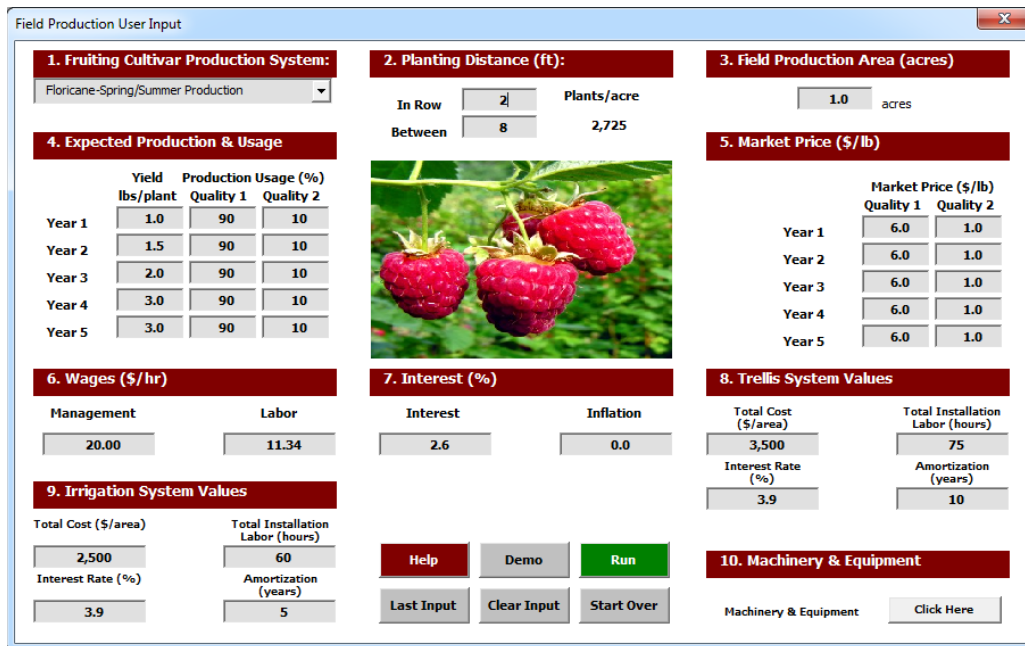


Figure 5: Choosing a Production System

If *Field* is chosen, the user input form shown in Figure 6 will appear:



The 'Field Production User Input' form is divided into ten sections. Section 1, 'Fruiting Cultivar Production System', has a dropdown menu set to 'Florican-Spring/Summer Production'. Section 2, 'Planting Distance (ft):', shows 'In Row' as 2 and 'Between' as 8, resulting in 'Plants/acre' of 2,725. Section 3, 'Field Production Area (acres)', has a value of 1.0. Section 4, 'Expected Production & Usage', is a table with 5 years of data for yield, quality 1, and quality 2. Section 5, 'Market Price (\$/lb)', is a table with 5 years of data for quality 1 and quality 2. Section 6, 'Wages (\$/hr)', shows management at 20.00 and labor at 11.34. Section 7, 'Interest (%)', shows interest at 2.6 and inflation at 0.0. Section 8, 'Trellis System Values', shows total cost at 3,500, interest rate at 3.9, total installation labor at 75, and amortization at 10. Section 9, 'Irrigation System Values', shows total cost at 2,500, interest rate at 3.9, total installation labor at 60, and amortization at 5. Section 10, 'Machinery & Equipment', has a 'Click Here' button. A central image of raspberries is also present.

Year	Yield lbs/plant	Quality 1 (%)	Quality 2 (%)
Year 1	1.0	90	10
Year 2	1.5	90	10
Year 3	2.0	90	10
Year 4	3.0	90	10
Year 5	3.0	90	10

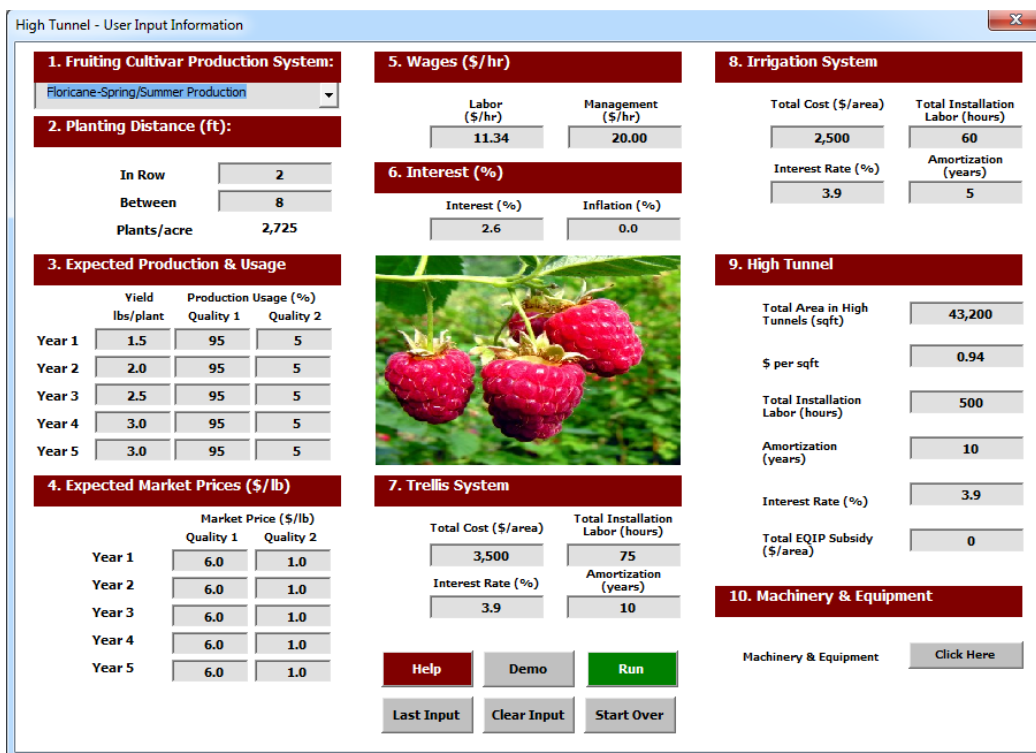
Year	Quality 1 (\$/lb)	Quality 2 (\$/lb)
Year 1	6.0	1.0
Year 2	6.0	1.0
Year 3	6.0	1.0
Year 4	6.0	1.0
Year 5	6.0	1.0

Category	Value
Management (\$/hr)	20.00
Labor (\$/hr)	11.34
Interest (%)	2.6
Inflation (%)	0.0
Total Cost (\$/area)	3,500
Interest Rate (%)	3.9
Total Installation Labor (hours)	75
Amortization (years)	10

Category	Value
Total Cost (\$/area)	2,500
Interest Rate (%)	3.9
Total Installation Labor (hours)	60
Amortization (years)	5

Figure 6: Field Production User Input Form

If *High Tunnel* is chosen, the user input form shown in Figure 7 will appear:



The 'High Tunnel - User Input Information' form is divided into ten sections. Section 1, 'Fruiting Cultivar Production System', has a dropdown menu set to 'Florican-Spring/Summer Production'. Section 2, 'Planting Distance (ft):', shows 'In Row' as 2 and 'Between' as 8, resulting in 'Plants/acre' of 2,725. Section 3, 'Expected Production & Usage', is a table with 5 years of data for yield, quality 1, and quality 2. Section 4, 'Expected Market Prices (\$/lb)', is a table with 5 years of data for quality 1 and quality 2. Section 5, 'Wages (\$/hr)', shows labor at 11.34 and management at 20.00. Section 6, 'Interest (%)', shows interest at 2.6 and inflation at 0.0. Section 7, 'Trellis System', shows total cost at 3,500, interest rate at 3.9, total installation labor at 75, and amortization at 10. Section 8, 'Irrigation System', shows total cost at 2,500, interest rate at 3.9, total installation labor at 60, and amortization at 5. Section 9, 'High Tunnel', shows total area at 43,200 sqft, \$ per sqft at 0.94, total installation labor at 500, amortization at 10, interest rate at 3.9, and total EQIP subsidy at 0. Section 10, 'Machinery & Equipment', has a 'Click Here' button. A central image of raspberries is also present.

Year	Yield lbs/plant	Quality 1 (%)	Quality 2 (%)
Year 1	1.5	95	5
Year 2	2.0	95	5
Year 3	2.5	95	5
Year 4	3.0	95	5
Year 5	3.0	95	5

Year	Quality 1 (\$/lb)	Quality 2 (\$/lb)
Year 1	6.0	1.0
Year 2	6.0	1.0
Year 3	6.0	1.0
Year 4	6.0	1.0
Year 5	6.0	1.0

Category	Value
Labor (\$/hr)	11.34
Management (\$/hr)	20.00
Interest (%)	2.6
Inflation (%)	0.0
Total Cost (\$/area)	3,500
Interest Rate (%)	3.9
Total Installation Labor (hours)	75
Amortization (years)	10

Category	Value
Total Cost (\$/area)	2,500
Interest Rate (%)	3.9
Total Installation Labor (hours)	60
Amortization (years)	5

Category	Value
Total Area in High Tunnels (sqft)	43,200
\$ per sqft	0.94
Total Installation Labor (hours)	500
Amortization (years)	10
Interest Rate (%)	3.9
Total EQIP Subsidy (\$/area)	0

Figure 7: High Tunnel Production User Input Form

2.2. Entering Initial Input

2.2.1. Main User Input Form:

Upon opening, the *User Input* form will appear with boxes containing default values for categories 1 thru 9. You can overwrite these values with your own information at any time. To change these values, click inside the gray boxes (Figure 6 & Figure 7). *Each category must be complete in order to calculate the budget (See [Section 2.3](#)).

2.2.2. Machinery and Equipment Form:

To enter values for purchased (not rented) machinery and equipment, press the **Click Here** button found under category 10. This will bring up the blank *Machinery and Equipment Input* form shown in Figure 8. To fill the form with default values press the **Demo** button, otherwise enter your own values then press **Continue**.

Machinery and Equipment	Purchase Cost	Ownership Life (years)	Salvage Value	Ownership Tax Cost	Ownership Shelter Cost	Ownership Insurance Cost

Please enter your own complete information for each machinery or equipment. Incomplete information would not be used in the calculations. You can also click the 'Demo' button to use default values. Please click 'Continue' when done.

Help Demo Clear Continue

Figure 8: Machinery and Equipment Input Form

The next form will ask you to enter annual use hours for each piece of machinery or equipment. Once you are finished press **Continue** to return to the main *User Input* form. Information must be complete in order to calculate the budget (see [Section 2.3](#)).

2.2.3. Additional Options:

- **Demo** – clicking this button will reset any edited boxes within the *User Input* form back to their default values. This action also fills the *Machinery and Equipment* form with default values.
- **Last Input** – clicking this button will fill the *User Input* form with values from your most recently calculated budget.

- **Clear Input** – clicking this button will clear all values from the *User Input* form, this includes values entered in the *Machinery and Equipment* form.
- **Start Over** – clicking this button will clear all edited values and return you to the *Main Menu* screen.

For more detailed information about the categories found in the *User Input* forms, see [Appendix A](#).

2.3. Calculating Your Budget

Once all the required information is entered in the User Input form, press the **Run** button. Upon clicking **Run**, the tool will check for incorrect or missing information. If the initial input was not entered or entered incorrectly, error messages will appear asking you to correct the data (Figure 9). Boxes requiring corrections will be marked with a “?”. If there is no missing information, the tool will estimate your budget and the *Results Menu* screen will appear. To learn more about your results, see Results ([Section 3](#)).

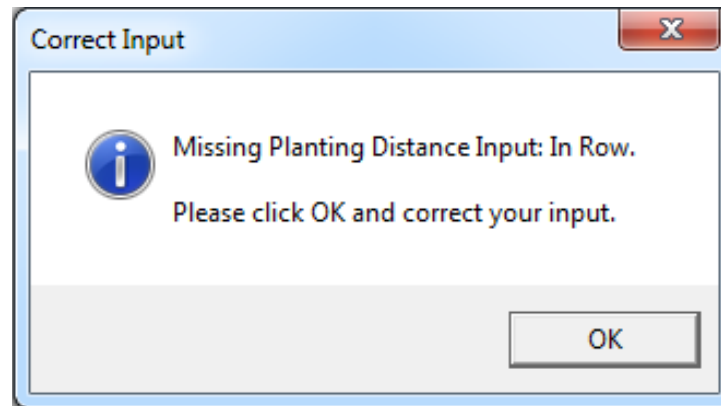


Figure 9: Example of Error Message

Note: There are warning messages in most of the input pages. They will only appear if invalid input is entered or there is missing input. You need to correct or enter input to be able to continue.

3. RESULTS

This tool automatically calculates an estimated enterprise budget derived from values entered in the *User Input* form and default values derived from research conducted at the University of Arkansas, Division of Agriculture's Arkansas Agricultural Research and Extension Center in Fayetteville, AR. The *Results Menu* screen offers several options for viewing your results (Figure 10).

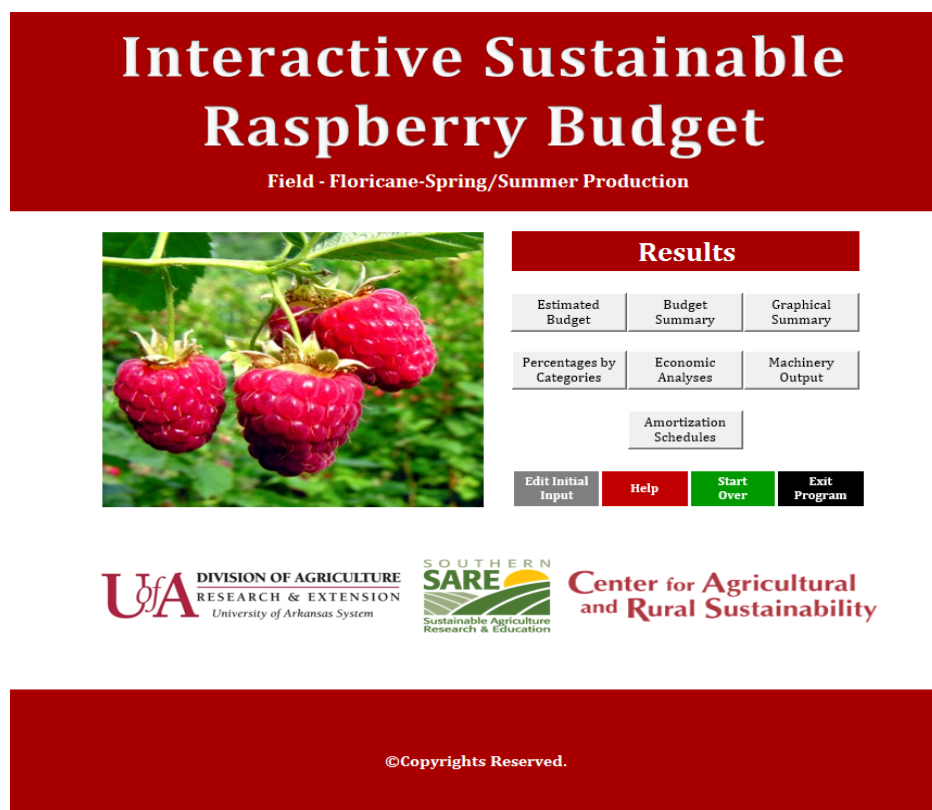





Figure 10: Results Menu Screen

From this screen you may choose to view one of the types of model output or return to edit your input. Results options are explained below.

3.1. Estimated Budget – this option offers a breakdown of the expected total costs and returns for the raspberry enterprise over a seven year period (Figure 11). From this screen you may navigate between years by pressing the gray buttons above each column. The “Totals” column shows the net present value for each cost and return category totaled across the seven year period. See the [Glossary](#) or [Appendix B](#) for more information about net present values.

<div>  <div> Interactive Sustainable Raspberry Budget Field - Floricane-Spring/Summer Production Present Values (\$/area) </div>  </div>									
 <div> DIVISION OF AGRICULTURE RESEARCH & EXTENSION University of Arkansas System </div>		Results Menu	Edit Initial Input	Help	Start Over	Center for Agricultural and Rural Sustainability			
	Soil Preparation	Establishment	Production Year 1	Production Year 2	Production Year 3	Production Year 4	Production Year 5	Totals ¹	
GROSS RETURNS (\$/area)	\$ -	\$ -	\$ 14,237.52	\$ 20,815.09	\$ 27,050.15	\$ 39,547.01	\$ 38,544.84	\$ 140,194.63	
Quality 1 - Fresh Market Fruit	\$ -	\$ -	\$ 13,978.66	\$ 20,436.64	\$ 26,558.33	\$ 38,827.97	\$ 37,844.03	\$ 137,645.63	
Quality 2 - Processed Market Fruit	\$ -	\$ -	\$ 258.86	\$ 378.46	\$ 491.82	\$ 719.04	\$ 700.82	\$ 2,548.99	
VARIABLE COSTS (\$/area)	\$ 1,430.94	\$ 10,403.82	\$ 9,465.18	\$ 11,626.10	\$ 13,348.58	\$ 16,936.24	\$ 16,552.31	\$ 79,763.17	
Fertilizers	\$ 100.00	\$ 56.53	\$ 264.09	\$ 175.35	\$ 170.91	\$ 166.58	\$ 238.32	\$ 1,171.78	
Ground Cover	\$ -	\$ 1,045.69	\$ 509.60	\$ 248.34	\$ 242.05	\$ 235.91	\$ 229.94	\$ 2,511.53	
Harvest	\$ -	\$ -	\$ 3,106.37	\$ 4,541.48	\$ 5,901.85	\$ 8,628.44	\$ 8,409.78	\$ 30,587.92	
Interest on Operating Capital	\$ 34.68	\$ 263.64	\$ 97.63	\$ 103.55	\$ 100.93	\$ 92.23	\$ 96.87	\$ 789.54	
Labor	\$ 287.24	\$ 1,879.99	\$ 1,432.75	\$ 2,026.41	\$ 1,975.06	\$ 1,925.01	\$ 1,876.23	\$ 11,402.70	
Marketing Costs	\$ -	\$ -	\$ 2,503.85	\$ 2,996.22	\$ 3,461.93	\$ 4,430.12	\$ 4,317.86	\$ 17,709.98	
Other Expenses	\$ 946.72	\$ 1,604.38	\$ 969.79	\$ 968.36	\$ 943.82	\$ 919.90	\$ 858.91	\$ 7,211.88	
Nutrient/Foliar Analysis	\$ -	\$ -	\$ 23.75	\$ 23.15	\$ 22.56	\$ 21.99	\$ 21.43	\$ 112.88	
Pest Management	\$ 62.30	\$ -	\$ 557.36	\$ 543.24	\$ 529.47	\$ 516.05	\$ 502.98	\$ 2,711.39	
Planting	\$ -	\$ 5,553.58	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,553.58	
Rental Machinery & Equipment	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
FIXED COSTS (\$/area)	\$ 486.83	\$ 1,438.79	\$ 1,402.33	\$ 1,366.79	\$ 1,332.16	\$ 1,298.40	\$ 1,265.49	\$ 8,590.79	
High Tunnel System	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Irrigation System	\$ -	\$ 418.49	\$ 407.89	\$ 397.55	\$ 387.48	\$ 377.66	\$ 368.09	\$ 2,357.15	
Machinery System	\$ 466.83	\$ 455.00	\$ 443.47	\$ 432.23	\$ 421.28	\$ 410.61	\$ 400.20	\$ 3,029.63	
Management	\$ 20.00	\$ 19.49	\$ 19.00	\$ 18.52	\$ 18.05	\$ 17.59	\$ 17.15	\$ 129.80	
Real Estate	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Trellis System	\$ -	\$ 545.80	\$ 531.97	\$ 518.49	\$ 505.35	\$ 492.54	\$ 480.06	\$ 3,074.21	
TOTAL COSTS (\$/area)	\$ 1,917.78	\$ 11,842.60	\$ 10,867.51	\$ 12,992.89	\$ 14,680.73	\$ 18,234.64	\$ 17,817.80	\$ 88,353.96	
NET RETURNS (\$/area)	\$ (1,917.78)	\$ (11,842.60)	\$ 3,370.01	\$ 7,822.20	\$ 12,369.42	\$ 21,312.37	\$ 20,727.04	\$ 51,840.66	
Information									

¹ Net Present Value

Figure 11: Estimated Budget Results Screen

3.2. Budget Summary – this option offers a brief breakdown of the total annual yield as well as estimated annual total costs and returns. Cumulative net returns are presented in terms of net present values (Figure 12).

Production, Costs, Returns and Net Returns							
Production System:	Field - Floricane-Spring/Summer Production						
Production Year	Total Yield Production (lb/area)			Costs/Returns (\$/area)			
	Fresh Fruit	Processed Fruit	Total Yield	Gross Returns*	Total Costs*	Net Returns*	Cumulative Net Returns*
Soil Preparation	0	0	0	0	1,918	-1,918	-1,918
Establishment	0	0	0	0	11,843	-11,843	-13,760
Production Year 1	2,453	273	2,725	14,238	10,868	3,370	-10,390
Production Year 2	3,679	409	4,088	20,815	12,993	7,822	-2,568
Production Year 3	4,905	545	5,450	27,050	14,681	12,369	9,801
Production Year 4	7,358	818	8,175	39,547	18,235	21,312	31,114
Production Year 5	7,358	818	8,175	38,545	17,818	20,727	51,841
Totals **	25,751	2,861	28,613	140,195	88,354	51,841	

* Present Values
** Net Present Values

Figure 12: Budget Summary Results Screen

3.3. Graphical Summary – this option offers a graphical representation of various costs, gross returns, and net returns broken down by production year (Figure 13).

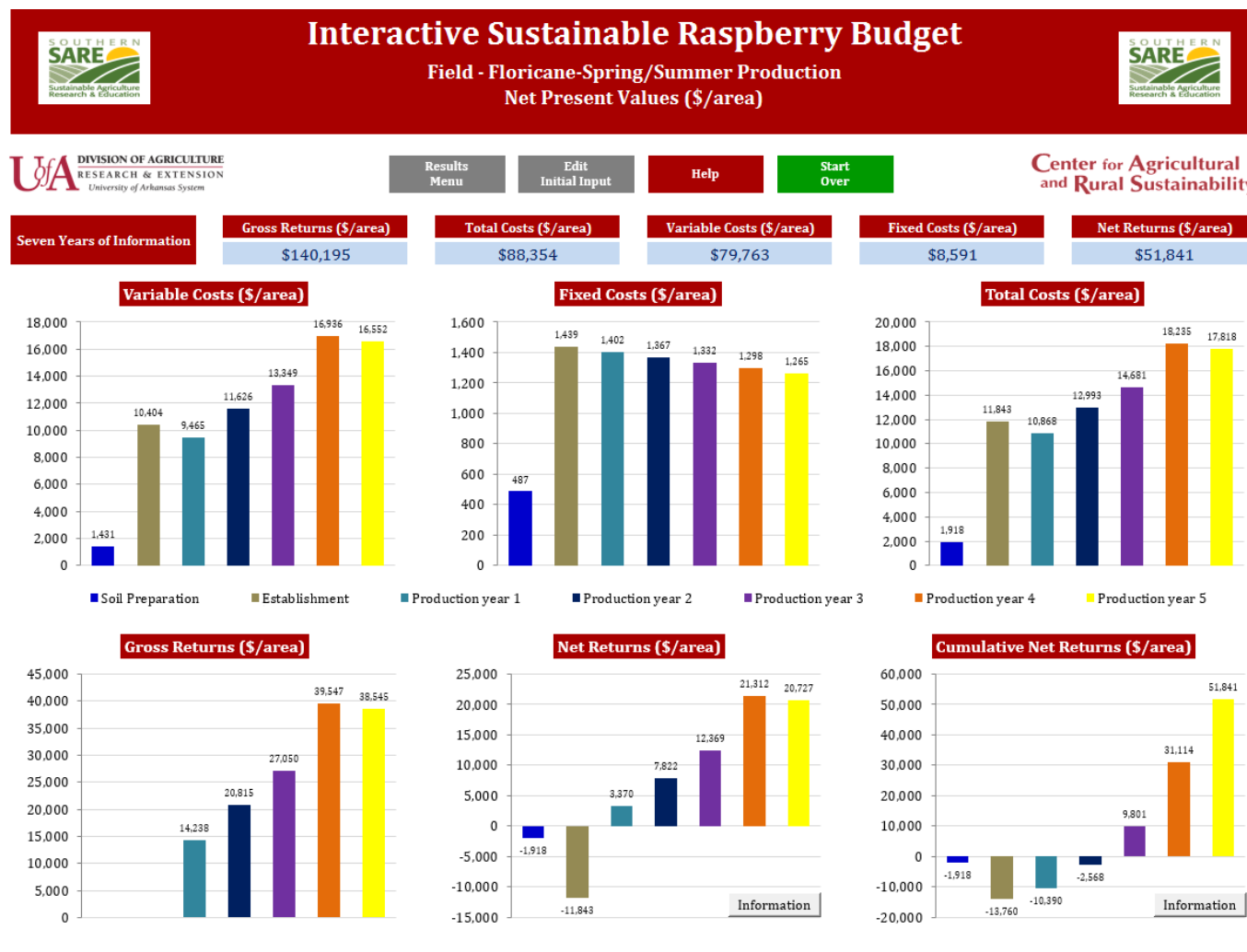


Figure 13: Graphical Summary Results Screen

3.4. Percentages by Categories – this option offers a graphical breakdown of the fixed costs, variable costs and gross returns estimated for the entire production period (Figure 14).

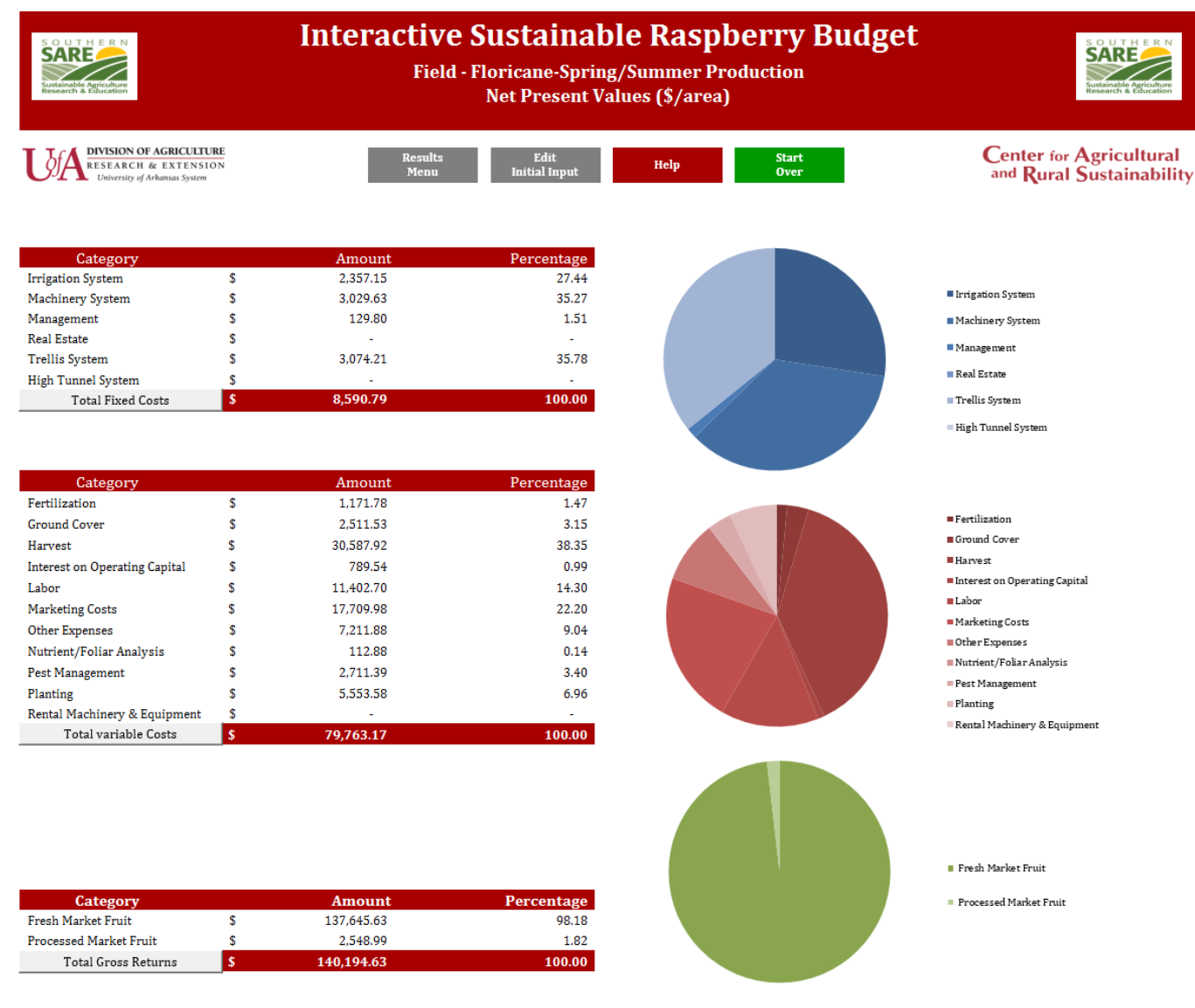


Figure 14: Percentages by Category Results Screen

Additionally variable, fixed and total costs, as well as gross returns, can be viewed individually in table form by clicking on the appropriate button on the *Percentages Summary* pop up box (Figure 15 & Figure 16).

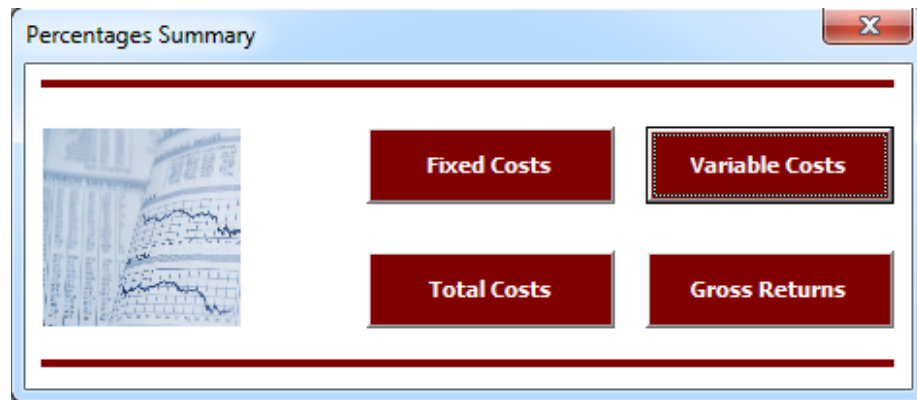


Figure 15: Percentages Summary Choice Box

Variable Costs (\$/area)			
	(\$/area)*	Percentage from Variable Costs (%)	Percentage from Total Costs (%)
Fertilization	1,171.78	1.47	1.33
Ground cover	2,511.53	3.15	2.84
Harvest	30,587.92	38.35	34.62
Interest on Operating Capital	789.54	0.99	0.89
Labor	11,402.70	14.30	12.91
Marketing Costs	17,709.98	22.20	20.04
Other Expenses	7,211.88	9.04	8.16
Nutrient/Foliar Analysis	112.88	0.14	0.13
Pest Management	2,711.39	3.40	3.07
Planting	5,553.58	6.96	6.29
Rental Machinery & Equipment	-	-	-
Total Variable Costs	79,763.17	100.00	90.28

* Net present values over seven years of production

Figure 16: Summary Table for Variable Cost Percentages

3.5. Economic Analyses – this option allows performing three different types of economic analyses for your raspberry enterprise situation (Figure 17). For more information about these analyses see the section titled Performing Economic Analyses (Section 5).

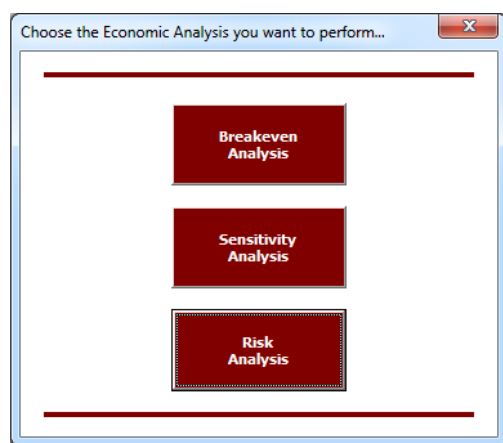


Figure 17: Economic Analyses Results Pop-up

3.6. Machinery Output – this option allows you to see what values were entered for purchased machinery and equipment (Figure 18). Values for machinery and equipment that were rented can be viewed on the individual years of the *Estimated Budget*.

Machinery and Equipment Output						
Machinery and Equipment	Purchase Cost	Salvage Value	Ownership Life (years)	Annual Hour Use	Owenship Cost/Year	Owenship Cost/Hour
30 HP Tractor	20,600	5,592	15	6.41	268.13	41.85
Mower	1,600	454	15	1.50	20.72	13.81
Air Blast Sprayer	1,200	335	15	1.31	15.57	11.92
Bed Shaper	465	129	15	0.13	6.04	46.44
Cooling Unit (Used)	15,000	2,976	15	2000.00	201.33	0.10
Disc	825	244	15	0.08	10.63	135.25
Mulcher	4,000	1,136	15	1.14	51.78	45.31
Plow	500	144	15	0.16	6.46	41.12
1/2 Ton Pickup Truck	25,000	4,323	20	707.14	290.97	0.41
Tiller - 5 feet	1,550	450	15	0.16	20.01	122.88
Miscellaneous Tools (i.e., Pneumatic Pruner, Bc	1,815	515	15	26.10	23.50	0.90

Figure 18: Machinery and Equipment Results Form

3.7. Amortization Schedules – this option allows you to view the amortization schedules of various systems ([Figure 19](#)). For more information about these schedules, you may click on the **Amortization Information** icon or see [Section 4.5](#).

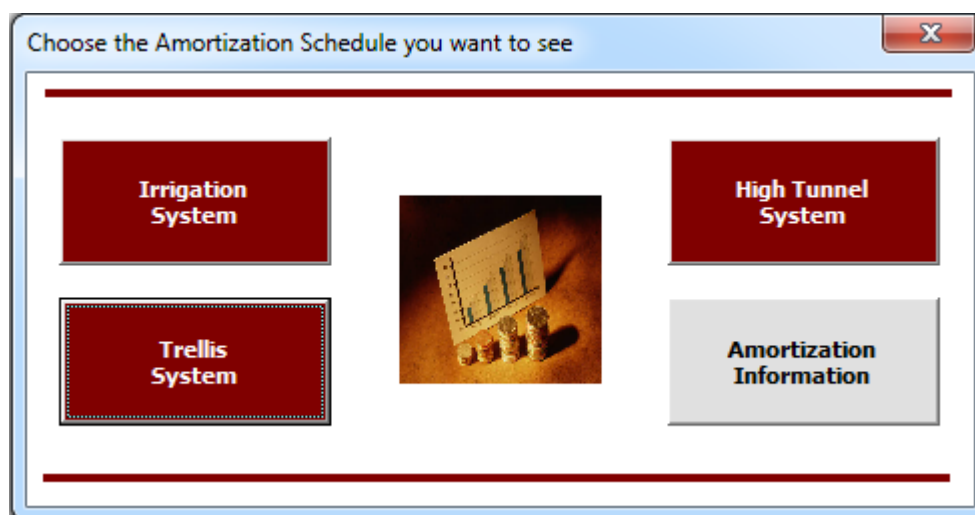


Figure 19: Amortization Schedule Results Pop-up

4. CUSTOMIZING YOUR BUDGET

The budget is estimated using information entered in the *User Input* form and default values derived from research conducted at the University of Arkansas Division of Agriculture's Arkansas Agricultural Research and Extension Center. You may edit the budget by changing your initial input values or editing individual budget categories with values specific to your operation.

4.1. Editing Initial Input

If you would like to go back to the *User Input* form to edit your initial input, you may do this at any time by pressing the **Edit Initial Input** button. This button can be found on the *Results Menu* screen (Figure 20) and is also included as an option on many of the other results screens (Figure 21).

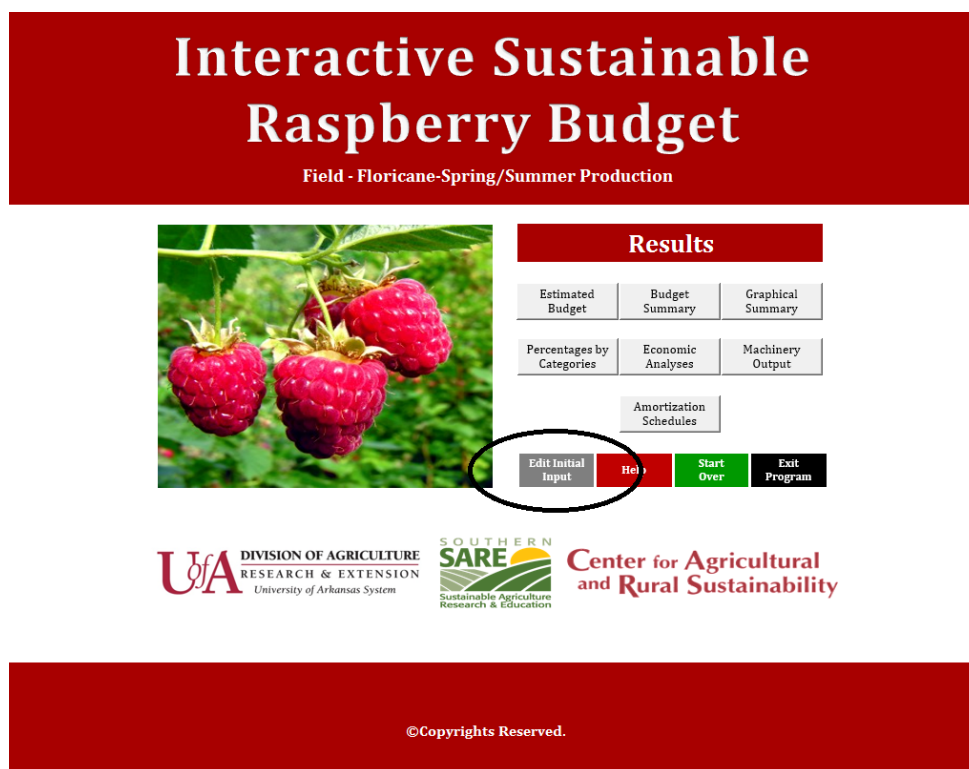


Figure 20: Edit Initial Input from Results Menu Screen

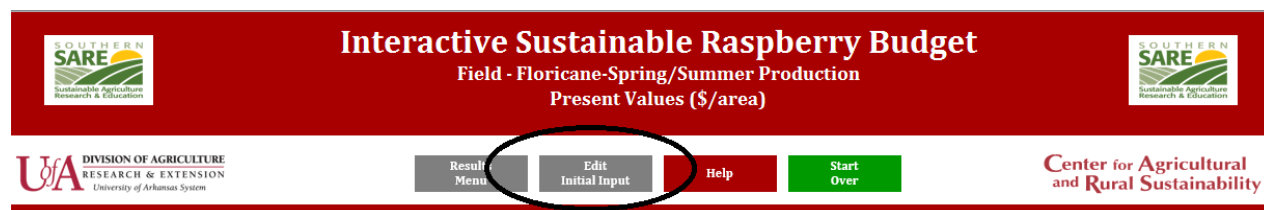


Figure 21: Edit Initial Input from Other Results Screens

The **Edit Initial Input** button will return you to the *User Input* form to make edits to your initial input values (Figure 22). Once your edits are complete, press the **Run** button and the program will update your changes and return you to the *Results Menu* screen. From there, you may return to the *Estimated Budget* page to view the revised budget and edit values for individual production years.

Field Production User Input

1. Fruiting Cultivar Production System:
 Floricane-Spring/Summer Production

2. Planting Distance (ft):
 In Row: 2 Plants/acre
 Between: 8 2,725

3. Field Production Area (acres)
 1.0 acres

4. Expected Production & Usage

	Yield lbs/plant	Production Usage (%)	
		Quality 1	Quality 2
Year 1	1.0	90	10
Year 2	1.5	90	10
Year 3	2.0	90	10
Year 4	3.0	90	10
Year 5	3.0	90	10

5. Market Price (\$/lb)

	Market Price (\$/lb)	
	Quality 1	Quality 2
Year 1	6.0	1.0
Year 2	6.0	1.0
Year 3	6.0	1.0
Year 4	6.0	1.0
Year 5	6.0	1.0

6. Wages (\$/hr)

Management	Labor
20.00	11.34

7. Interest (%)

Interest	Inflation
2.6	0.0

8. Trellis System Values

Total Cost (\$/area)	Total Installation Labor (hours)
3,500	75
Interest Rate (%)	Amortization (years)
3.9	10

9. Irrigation System Values

Total Cost (\$/area)	Total Installation Labor (hours)
2,500	60
Interest Rate (%)	Amortization (years)
3.9	5

10. Machinery & Equipment

Machinery & Equipment [Click Here](#)

Buttons: Help, Demo, **Run**, Last Input, Clear Input, Start Over

Figure 22: Editing Initial Input

4.2. Viewing and Editing Annual Production Values

Individual budget years may be viewed and/or edited by first clicking on the **Estimated Budget** button found on the *Results Menu* screen. From there press the gray button above the column of the production year you would like to view/edit (Figure 23).

Interactive Sustainable Raspberry Budget
 Field - Floricane-Spring/Summer Production
 Present Values (\$/area)

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Buttons: Results Menu, Edit Initial Input, Help, Start Over

Buttons: Soil Preparation, Establishment, Production Year 1, Production Year 2, Production Year 3, Production Year 4, Production Year 5, Totals ¹

Figure 23: Selecting a Production Year for Viewing/Editing

Once a production year has been selected, you may change the quantity or price of items by entering your own values in the “Your Quantity” or “Your Price” columns (Figure 24). You can also add new items by listing them under the “Production Activities” column and entering your own unit, quantity, and price.

Note: If you entered information in the “Your Quantity” or in the “Your Price” columns that information will always be used instead of the default values.

Interactive Sustainable Raspberry Budget
Field - Floricane-Spring/Summer Production
Present Values (\$/area)

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Estimated Budget Results Menu Edit Initial Input Clear All New Input Disregard This Year Help Start Over

Center for Agricultural and Rural Sustainability

Soil Preparation Establishment Production Year 1 Production Year 2 Production Year 3 Production Year 4 Production Year 5

Production Activities	Unit	Quantity	Your Quantity	Unit Price (\$/unit)	Your Price (\$/unit)	Total (\$/area)
VARIABLE COSTS (\$/area)						\$ 2,274.32
Fertilizers						\$ 922.00
Lime	ton	2.00	5.00	21.00	18.00	90.00
Organic Fertilizer (i.e., Poultry Litter)	ton	2.00		29.00		58.00
Fish Meal	lb		450.00		1.72	774.00
						-
						-
						-
						-

Figure 24: Editing Annual Production Items

You may navigate between production years by pressing the green tabs found at the top of the budget sheet. The program will automatically update your budget as new values are entered (Figure 25). If you would like to remove a production year from your budget (e.g., you may want to ignore the soil preparation year and begin with the Establishment phase) you may do this by pressing the **Disregard This Year** button at the top of the page (Figure 25). This action will fill the “Your Quantity” and “Your Price” columns with zeros. To undo this action, press the **Clear All New Input** button.

Interactive Sustainable Raspberry Budget
Field - Floricane-Spring/Summer Production
Present Values (\$/area)

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Estimated Budget Results Menu Edit Initial Input Clear All New Input Disregard This Year Help Start Over

Center for Agricultural and Rural Sustainability

Soil Preparation Establishment Production Year 1 Production Year 2 Production Year 3 Production Year 4 Production Year 5

Figure 25: Navigation and Removing Production Years

4.3. Pest Management

From the *Results Menu*, select **Estimated Budget**. Choose a production year by clicking on the gray box labeling your desired year's column. Each production year contains a section designated for pest management costs. You may change the quantities or prices included in the budget by entering your own information in the "Your Quantity" and "Your Price" columns (Figure 26)

Production Activities	Unit	Quantity	Your Quantity	Unit Price (\$/unit)	Your Price (\$/unit)	Total (\$/acre)	Net Present Value (\$/acre)
Pest Management						\$ 841.08	\$ 801.19
Azadirachtin (e.g., Aza-Direct)	gal	-		\$ 176.89		\$ -	\$ -
Lime Sulphur (Bactericide/Fungicide)	gal	12.0		\$ 8.30	\$ 10.00	\$ 120.00	\$ 114.00
Paraffinic Oil (e.g., JMS Stylet-Oil)	gal	-		\$ 24.00		\$ -	\$ -
Pyrethrin (e.g., PyGanic EC 1.4)	pint	6.0	-	\$ 35.00	\$ -	\$ -	\$ -
Spinosad (e.g., Entrust SC - 6 Appl per year)	oz	12.0	6.0	\$ 12.80		\$ 76.80	\$ 72.96
Trece Spotted Wing Drosophila (SWD) Traps	unit	4.0	15.0	\$ 8.25		\$ 123.75	\$ 117.56
Trece SWD Lures	unit	4.0		\$ 4.50		\$ 18.00	\$ 17.10
Scentry Multilure Trap	unit	4.0		\$ 10.95		\$ 43.80	\$ 41.61
Scentry Lure Pouch	unit	4.0		\$ 6.60		\$ 26.40	\$ 25.08
Yellow Sticky Strips 3" x 5"	unit	4.0		\$ 0.33		\$ 1.32	\$ 1.25
Trap Wires	unit	4.0		\$ 0.25		\$ 1.00	\$ 0.95
Click Here for Additional Products						\$ 432.33	\$ 410.69
						\$ -	\$ -
						\$ -	\$ -

Figure 26: Editing Pest Management Values

For production years 1 through 5, you can access more products by clicking on the **Click Here for Additional Products** button. This will bring up a new page containing a longer list of insecticides, fungicides, and herbicides as well as organic insecticides and fungicides products. If you would like to include any of those products in your budget, enter an "X" in the column labeled "Used." You can modify the quantities and prices by entering your own information in the "Your Quantity" and "Your Price" columns. When finished, press the **Go to Production Year** button found at the top of the screen. The cost of the additional products will appear in the budget and be included in the total costs (Figure 27).

Interactive Sustainable Raspberry Budget

Field - Floricane-Spring/Summer Production
(\$/area)

Go to
Production Year 1

Clear All
New Input

Help

Start
Over

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	Production Activities	Unit	Quantit	Your Quantity	Unit Price (\$/unit)	Your Price (\$/unit)	Total (\$/acre)	Net Present Value (\$/acre)
<input checked="" type="checkbox"/>	Insecticides						\$ 73.33	\$ 69.66
<input checked="" type="checkbox"/>	Acetamiprid (e.g., Assail 30 SG)	oz.	4.50		\$ 5.50		\$ 24.75	\$ 23.51
<input checked="" type="checkbox"/>	Azadirachtin (e.g., Aza-Direct)	fl.oz.	16.00	15.00	\$ 1.64	2.00	\$ 30.00	\$ 28.50
	Azadirachtin (e.g., Neemix)	fl.oz.	64.00		\$ 6.22			
<input checked="" type="checkbox"/>	Bacillus Thuringiensis (e.g., Dipel DF)	oz.	8.00	6.00	\$ 1.44	1.50	\$ 9.00	\$ 8.55
	Bifenazate (e.g., Acramite 50 WS)	oz.	12.00		\$ 4.00			
<input checked="" type="checkbox"/>	Bifenthrin (e.g., Brigade WP)	oz.	6.40		\$ 1.50		\$ 9.58	\$ 9.10
	Carbaryl (e.g., Sevin XLR Plus)	fl.oz.	16.00		\$ 0.44			
	Esfenvalerate (e.g., Asana XL)	fl.oz.	4.80		\$ 0.64			
	Etoxazole (e.g., Zeal Miticide)	fl.oz.	2.00		\$ 100.00			

Figure 27: Adding Additional Pest Management Products

4.4. Machinery and Equipment

In the *User Input* form, you had the option of entering any machinery and equipment to be purchased for your operation. You can review these values by pressing the **Machinery Output** button on the *Results Menu* or by scrolling down to the “Machinery System” category of your individual production year budgets (Figure 28). To edit your purchased machinery and equipment information, press the “Edit Initial Input” button to return to the User Input form.

Machinery and Equipment Output						
Machinery and Equipment	Purchase Cost	Salvage Value	Ownership Life (years)	Annual Hour Use	Ownership Cost/Year	Ownership Cost/Hour
30 HP Tractor	20,600	5,592	15	6.41	268.13	41.85
Mower	1,600	454	15	1.50	20.72	13.81
Air Blast Sprayer	1,200	335	15	1.31	15.57	11.92
Bed Shaper	465	129	15	0.13	6.04	46.44
Cooling Unit (Used)	15,000	2,976	15	2000.00	201.33	0.10
Disc	825	244	15	0.08	10.63	135.25
Mulcher	4,000	1,136	15	1.14	51.78	45.31
Plow	500	144	15	0.16	6.46	41.12
1/2 Ton Pickup Truck	25,000	4,323	20	707.14	290.97	0.41
Tiller - 5 feet	1,550	450	15	0.16	20.01	122.88
Miscellaneous Tools (i.e., Pneumatic Pruner, Bc	1,815	515	15	26.10	23.50	0.90

Figure 28: Machinery System Output

To add any rented machinery or equipment select **Estimated Budget** from the results menu then select the production year you would like to edit by pressing the gray button above the desired column. Scroll down to the section titled “Rental Machinery and Equipment” to add your rented equipment and costs (**Figure 29**).

Interactive Sustainable Raspberry Budget
Field - Floricane-Spring/Summer Production
Present Value (\$/area)

Estimated Budget Results Menu Edit Initial Input Clear All New Input Disregard This Year Help Start Over

Soil Preparation Establishment Production Year 1 Production Year 2 Production Year 3 Production Year 4 Production Year 5

Production Activities	Unit	Quantity	Your Quantity	Unit Price (\$/unit)	Your Price (\$/unit)	Total (\$/acre)	Net Present Value (\$/acre)
Rental Machinery & Equipment						\$ -	\$ -
Tractor	hr		5.0		\$ 20.00	\$ 100.00	\$ 95.00
Tiller	hr		10.0		\$ 15.00	\$ 150.00	\$ 142.49
						\$ -	\$ -

Figure 29: Entering Rental Machinery and Equipment

4.5. Editing Loan Information: Irrigation, Trellis, & High Tunnel Systems

Loan information is presented using an amortization schedule. Every payment made on a loan is split between principal and interest. An amortization schedule is a table with the details of the amount of each loan payment allocated to principal and interest and provides the exact amount remaining on a loan after each payment is made.

This budget offers amortization schedules for irrigation, trellis and high tunnel systems. To view these schedules go to the Results Menu and press **Amortization Schedules**. To edit these schedules, go to the *Results Menu* then press the **Estimated Budget** button. Next, select the production year titled “Establishment” and scroll down to the Irrigation System, Trellis System and High Tunnel categories. Click the green **Edit** button to view/edit the amortization schedule given for each category (**Figure 30**).

Interactive Sustainable Raspberry Budget
Field - Floricane-Spring/Summer Production
Present Values (\$/area)

Estimated Budget Results Menu Edit Initial Input Clear All New Input Disregard This Year Help Start Over

Soil Preparation Establishment Production Year 1 Production Year 2 Production Year 3 Production Year 4 Production Year 5

Production Activities	Unit	Quantity	Your Quantity	Unit Price (\$/unit)	Your Price (\$/unit)	Total (\$/acre)	Net Present Value (\$/acre)
FIXED COSTS (\$/area)						\$ 1,476.20	\$ 1,438.79
Machinery System (Annual Payment)	Output					\$ 466.83	\$ 455.00
Irrigation System (Annual Payment)	Edit					\$ 429.37	\$ 418.49
Total Costs Irrigation System	Unit	1.00		3,500.00		3,500.00	3,411.31
Trellis System (Annual Payment)	Edit					\$ 559.99	\$ 545.80
Total Costs Trellis System	Unit	1.00		2,500.00		2,500.00	2,436.65
High Tunnel (Annual Payment)	Edit					\$ -	\$ -
No High Tunnels used						-	-

Figure 30: Finding Amortization Schedules

From the *Loan Amortization Schedule* page you can modify the start date of the loan and include any extra payments that will be made on the loan (Figure 31). The scheduled payment is the annual cost value used in the budget for each production year.

Irrigation System Loan Amortization Schedule

Enter values	
Loan amount	\$ 3,500.00
Annual interest rate	3.90 %
Loan period in years	10
Number of payments per year	1
Start date of loan	1/1/2016
Optional extra payments	\$ -

Establishment Year

Results Menu

Edit Initial Input

Loan summary	
Scheduled payment	\$ 429.37
Scheduled number of payments	10
Actual number of payments	10
Total early payments	\$ -
Total interest	\$ 793.73

Pmt. No.	Payment Date	Beginning Balance	Scheduled Payment	Extra Payment	Total Payment	Principal	Interest	Ending Balance	Cumulative Interest
1	1/1/2017	\$ 3,500.00	\$ 429.37	\$ -	\$ 429.37	\$ 292.87	\$ 136.50	\$ 3,207.13	\$ 136.50
2	1/1/2018	\$ 3,207.13	\$ 429.37	\$ -	\$ 429.37	\$ 304.29	\$ 125.08	\$ 2,902.83	\$ 261.58
3	1/1/2019	\$ 2,902.83	\$ 429.37	\$ -	\$ 429.37	\$ 316.16	\$ 113.21	\$ 2,586.67	\$ 374.79
4	1/1/2020	\$ 2,586.67	\$ 429.37	\$ -	\$ 429.37	\$ 328.49	\$ 100.88	\$ 2,258.18	\$ 475.67
5	1/1/2021	\$ 2,258.18	\$ 429.37	\$ -	\$ 429.37	\$ 341.30	\$ 88.07	\$ 1,916.87	\$ 563.74
6	1/1/2022	\$ 1,916.87	\$ 429.37	\$ -	\$ 429.37	\$ 354.61	\$ 74.76	\$ 1,562.26	\$ 638.50
7	1/1/2023	\$ 1,562.26	\$ 429.37	\$ -	\$ 429.37	\$ 368.44	\$ 60.93	\$ 1,193.81	\$ 699.42
8	1/1/2024	\$ 1,193.81	\$ 429.37	\$ -	\$ 429.37	\$ 382.81	\$ 46.56	\$ 811.00	\$ 745.98
9	1/1/2025	\$ 811.00	\$ 429.37	\$ -	\$ 429.37	\$ 397.74	\$ 31.63	\$ 413.26	\$ 777.61
10	1/1/2026	\$ 413.26	\$ 429.37	\$ -	\$ 413.26	\$ 397.14	\$ 16.12	\$ -	\$ 793.73

Figure 31: Editing Amortization Schedules

The scheduled payment value is calculated using values for Total Cost, Interest Rate and Amortization (years) which were previously entered in the *User Input* form. If you would like to go back to the *User Input* form to edit these values, you may do so at any time by pressing the **Edit Initial Input** button. Once your edits are complete, press the **Run** button and the program will bring you back to the *Results Menu* screen. From there, you may return to the *Estimated Budget* page to view the revised budget and/or continue editing individual production years.

Any edits made in the annual production budgets will be immediately reflected throughout the other results pages.

5. PERFORMING ECONOMIC ANALYSES

Three different types of economic analyses can be performed using this tool. The results are presented in terms of net present values. Economic analysis tools can be accessed from the *Results Menu* screen by clicking on the **Economic Analyses** button. This will allow you to choose from Breakeven, Sensitivity and Risk analysis options (Figure 32).

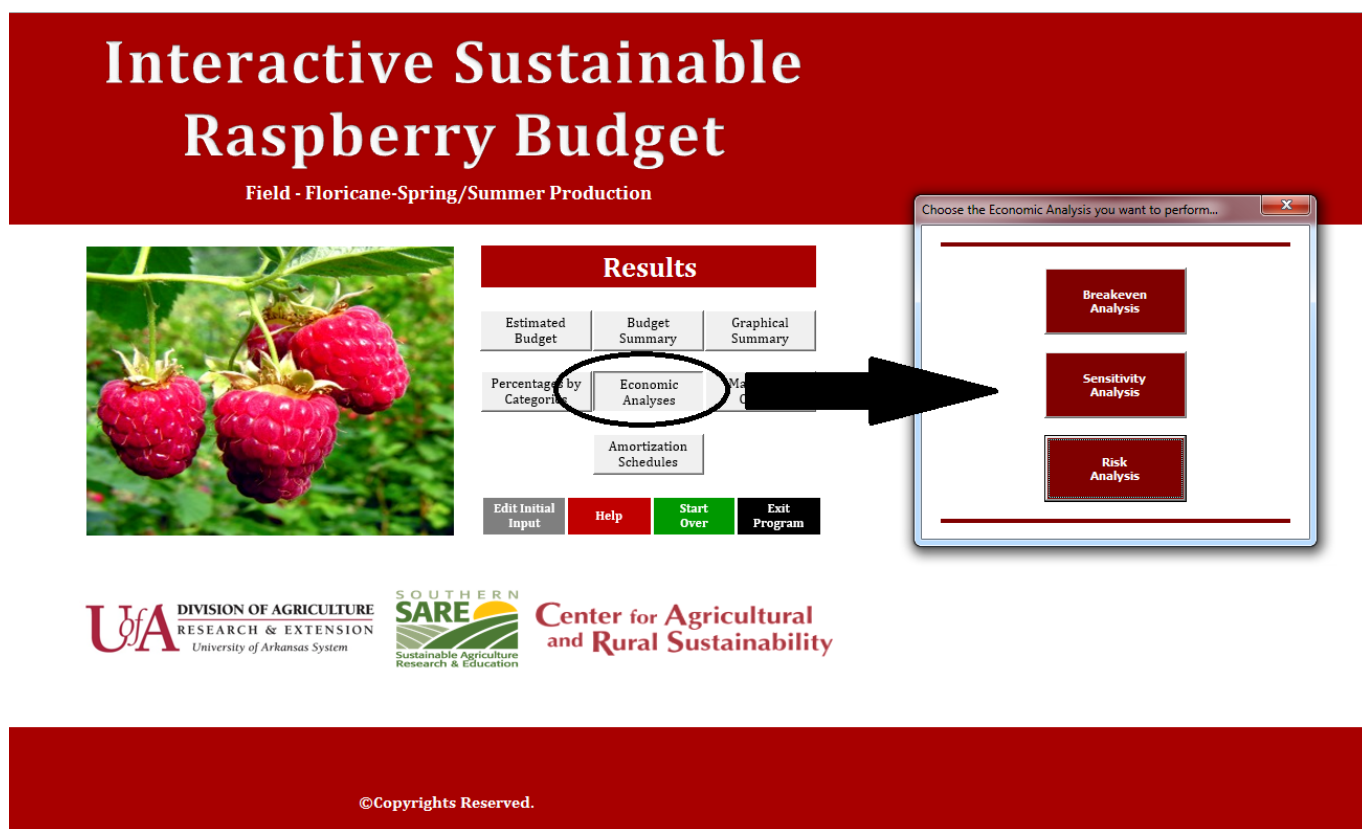


Figure 32: Selecting an Economic Analysis Tool

5.1. Breakeven Analysis

The **Breakeven Analysis** option allows you to determine the selling price and fruit yield that will result in your operation breaking-even at the end of your production period (seven years by default). It also uses price and yield information taken from the *User Input* form to estimate your breakeven year. This is the year you can expect to begin seeing net profits from your operation.

The *Breakeven Analysis* page opens with a graphical representation of your operation totals and breakeven values (Figure 33).

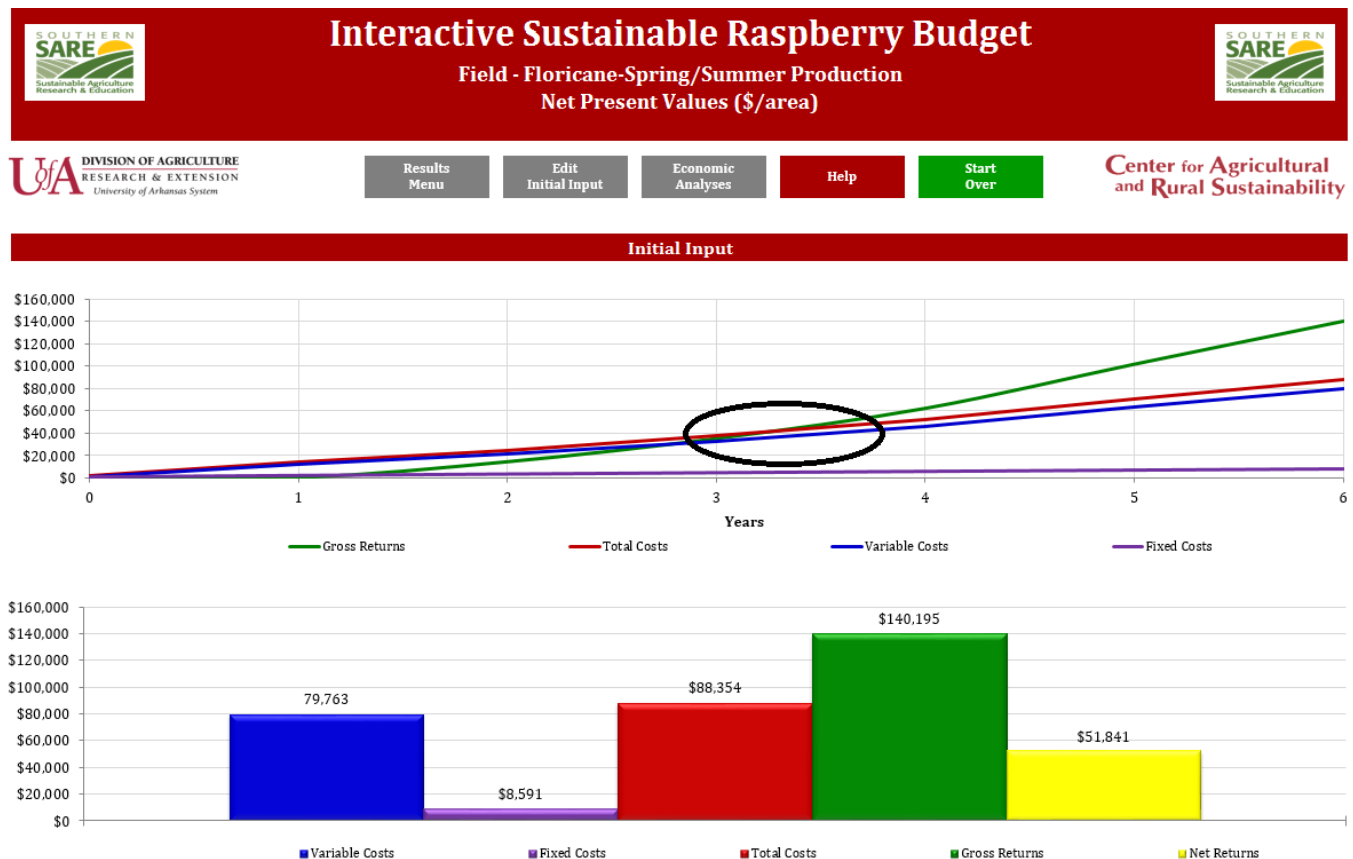


Figure 33: Breakeven Analysis Screen

The top graph shows expected gross returns, total costs, variable costs and fixed costs for the entire production period. Total costs are the sum of variable and fixed costs. The point where your cumulative returns surpass your cumulative total costs is your breakeven point. Figure 33 shows the breakeven results of a berry operation using default values for field production. The breakeven point is circled on the top graph.

$$\text{Total Costs} = \text{Variable Costs} + \text{Fixed Costs}$$

The bottom graph shows expected returns, total costs, variable costs, fixed costs and net returns for the entire production period. Again, total costs are the sum of your variable and fixed costs and net returns should equal your returns minus total costs.

$$\text{Net Returns} = \text{Gross Returns} - \text{Total Costs}$$

To view the breakeven points for your initial farm scenario, press the **Initial Input Breakeven Summary** button found below the graphs (Figure 34).

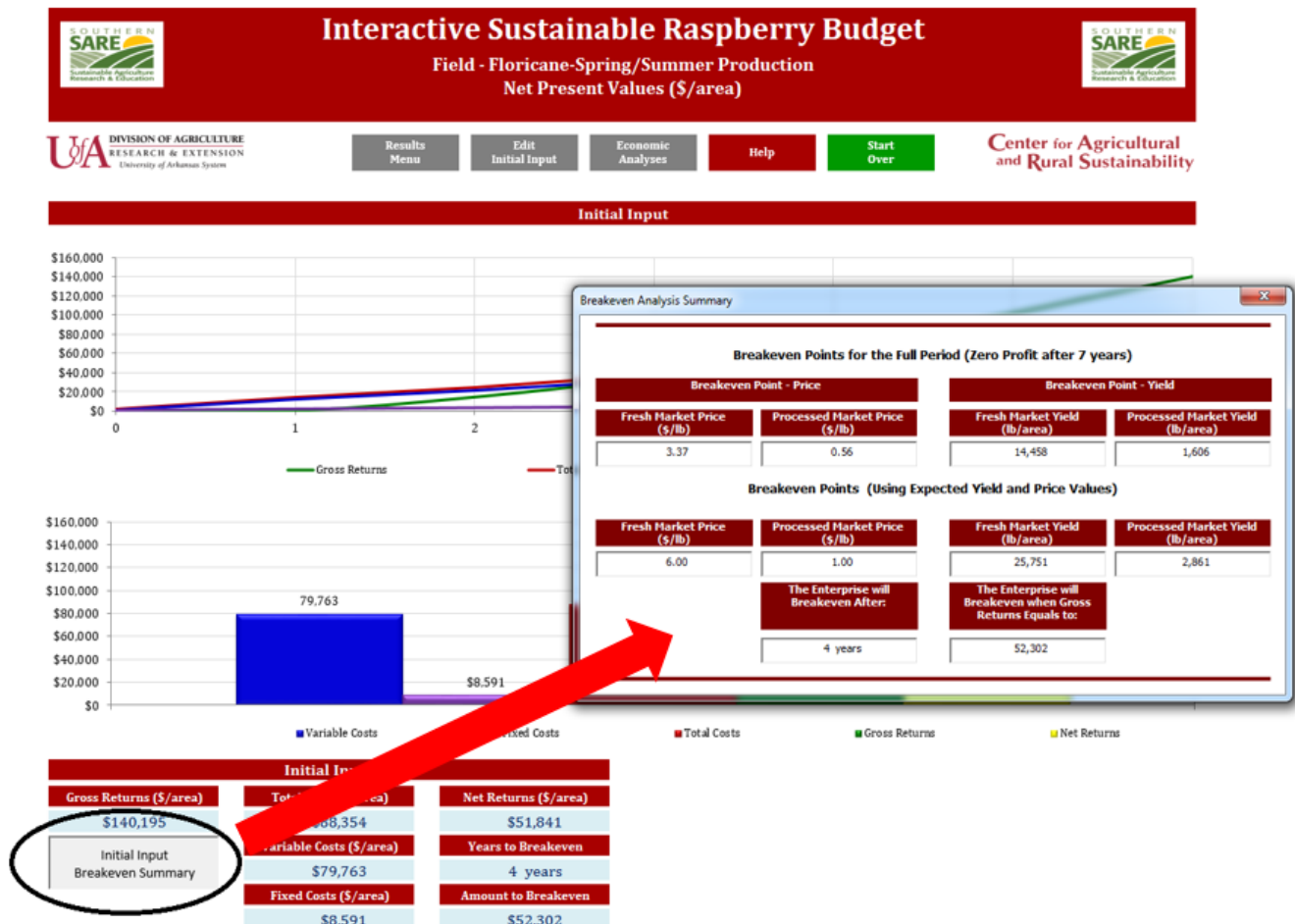


Figure 34: Viewing Your Breakeven Points

As shown in Figure 35, the first section of the *Breakeven Analysis Summary* box lists the prices and yields that each type of fruit (fresh vs. processed) must achieve in order to cover total production costs.

The second section shows the prices and yields estimated from values entered in the *User Input* form. These values can be compared to the breakeven points given in the first section to determine whether or not your operation is likely to breakeven. If so, the breakeven year and breakeven returns can be found at the bottom of the box.

Breakeven Analysis Summary

Breakeven Points for the Full Period (Zero Profit after 7 years)

Breakeven Point - Price		Breakeven Point - Yield	
Fresh Market Price (\$/lb)	Processed Market Price (\$/lb)	Fresh Market Yield (lb/area)	Processed Market Yield (lb/area)
3.37	0.56	14,458	1,606

Breakeven Points (Using Expected Yield and Price Values)

Fresh Market Price (\$/lb)	Processed Market Price (\$/lb)	Fresh Market Yield (lb/area)	Processed Market Yield (lb/area)
6.00	1.00	25,751	2,861
The Enterprise will Breakeven After: <div align="center">4 years</div>		The Enterprise will Breakeven when Gross Returns Equals to: <div align="center">52,302</div>	

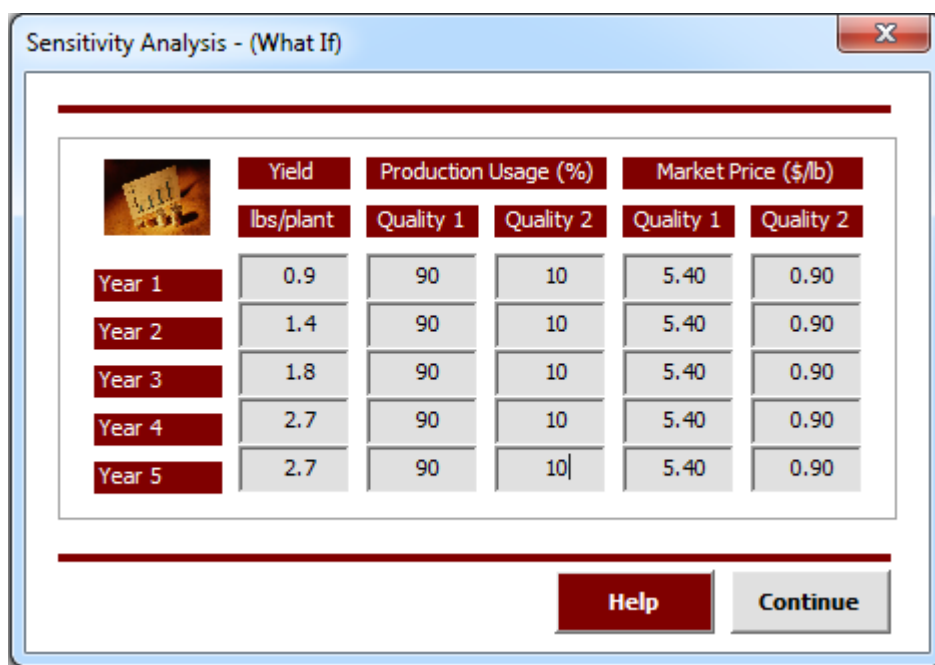
Figure 35: Breakeven Analysis Summary Box

The breakeven analysis option provides a financial snapshot based on your given enterprise information. To see what would happen if these values were to change, see Sensitivity Analysis ([Section 5.2](#))

5.2. Sensitivity Analysis

Sensitivity analysis is a technique used to perform “What If” scenarios. This is helpful to determine how changes in input values such as yield or price could impact your overall return. It is a great tool that allows you to make better decisions by predicting the outcome of different scenarios. You can perform these analyses as many times as you like without having to modify your initial input.

To begin using the sensitivity analysis tool, choose **Economic Analyses** from the *Results Menu*, then press the button for **Sensitivity Analysis**. [Figure 36](#) shows the *Sensitivity Analysis Input Box*. Use this box to enter new values for your yield, production usage and/or market prices, then press **Continue**. The example in [Figure 36](#) uses a 10% decrease in yield and market price.



	Yield	Production Usage (%)		Market Price (\$/lb)	
	lbs/plant	Quality 1	Quality 2	Quality 1	Quality 2
Year 1	0.9	90	10	5.40	0.90
Year 2	1.4	90	10	5.40	0.90
Year 3	1.8	90	10	5.40	0.90
Year 4	2.7	90	10	5.40	0.90
Year 5	2.7	90	10	5.40	0.90

Figure 36: Sensitivity Analysis Input Box

The results of this example show that this 10% decrease in yield and market price would result in the breakeven period increasing from 4 to 5 years. This can be seen by comparing the two sets of graphs shown in [Figure 37](#).

The first set of graphs offers results for your initial input scenario. These are generated using values entered in the *User Input* form. The second set of graphs shows the results for your new scenario. These are generated using values entered in the *Sensitivity Analysis Input Box*.

To view the breakeven points for either scenario, press the **Initial Input Breakeven Summary** or the **New Scenario Breakeven Summary** button found below graphs (Figure 37).

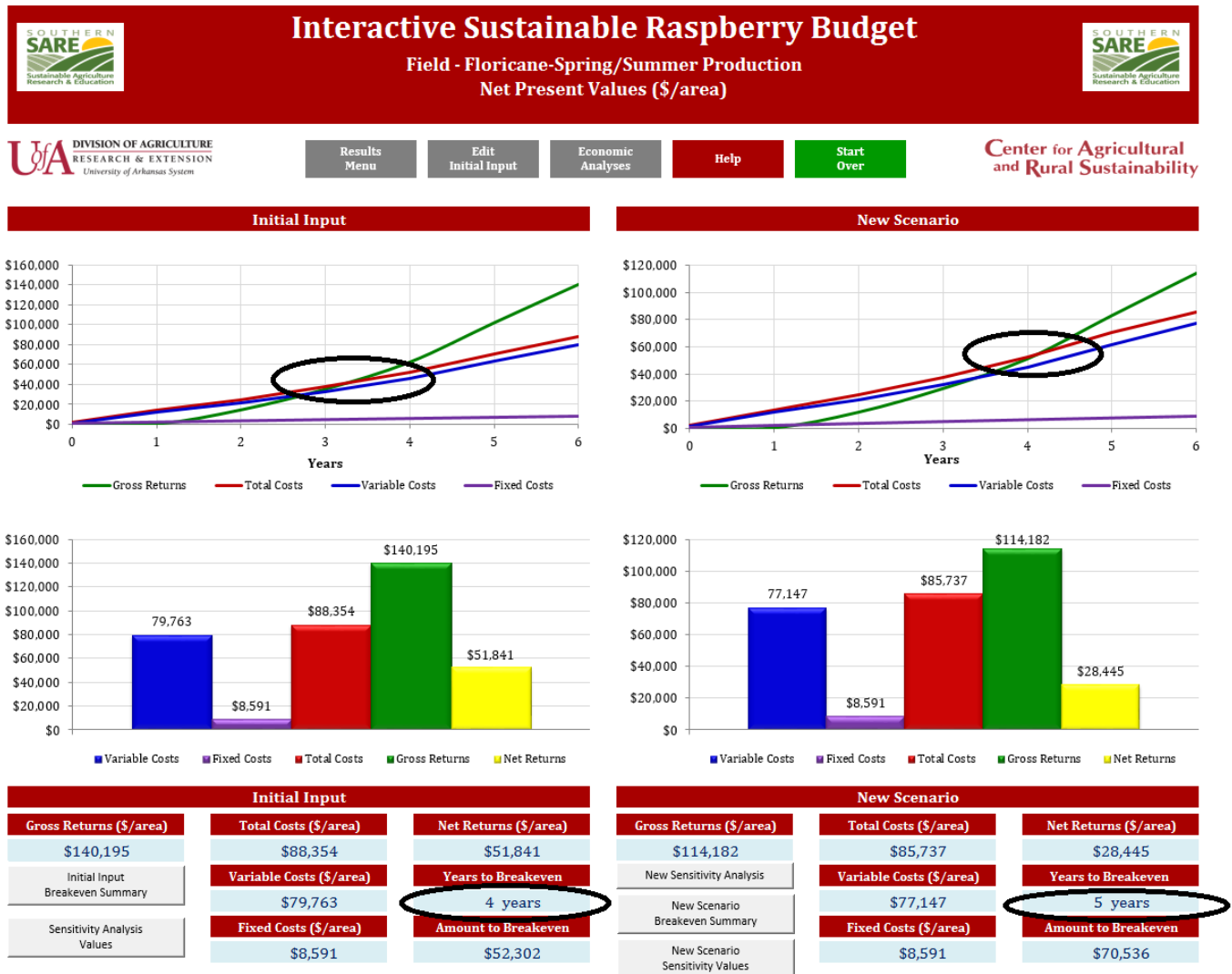


Figure 37: Sensitivity Analysis Results Page

As described in [Section 5.1](#) and shown in [Figure 38](#), the top section of the *Breakeven Analysis Summary Box* lists the prices and yields that each type of fruit (fresh vs. processed) must achieve in order to cover the total production costs.

The “Breakeven Points for the Full Period” can be compared to the “Breakeven Points” calculated from your initial input or “What If” values to determine whether or not your operation will breakeven within the given production period of seven years. If so, the breakeven year and breakeven returns can be found in the bottom two boxes ([Figure 38](#)).

The screenshot shows a window titled "Breakeven Analysis Summary" with a close button (X) in the top right corner. The window contains the following data:

Breakeven Points for the Full Period (Zero Profit after 7 years)			
Breakeven Point - Price		Breakeven Point - Yield	
Fresh Market Price (\$/lb)	Processed Market Price (\$/lb)	Fresh Market Yield (lb/area)	Processed Market Yield (lb/area)
3.61	0.60	15,589	1,730

Breakeven Points (Using Expected Yield and Price Values)			
Fresh Market Price (\$/lb)	Processed Market Price (\$/lb)	Fresh Market Yield (lb/area)	Processed Market Yield (lb/area)
5.40	0.90	23,299	2,589

The Enterprise will Breakeven After:	The Enterprise will Breakeven when Gross Returns Equals to:
5 years	70,536

The bottom two boxes, "The Enterprise will Breakeven After: 5 years" and "The Enterprise will Breakeven when Gross Returns Equals to: 70,536", are circled in the image.

Figure 38: Sensitivity Analysis Summary Box

To perform a new sensitivity analysis, press the **New Sensitivity Analysis** button located below the *New Scenario* graphs. To view a spread of sensitivity values at varying prices and yields, press the **Sensitivity Values** button located below either set of graphs ([Figure 39](#)).

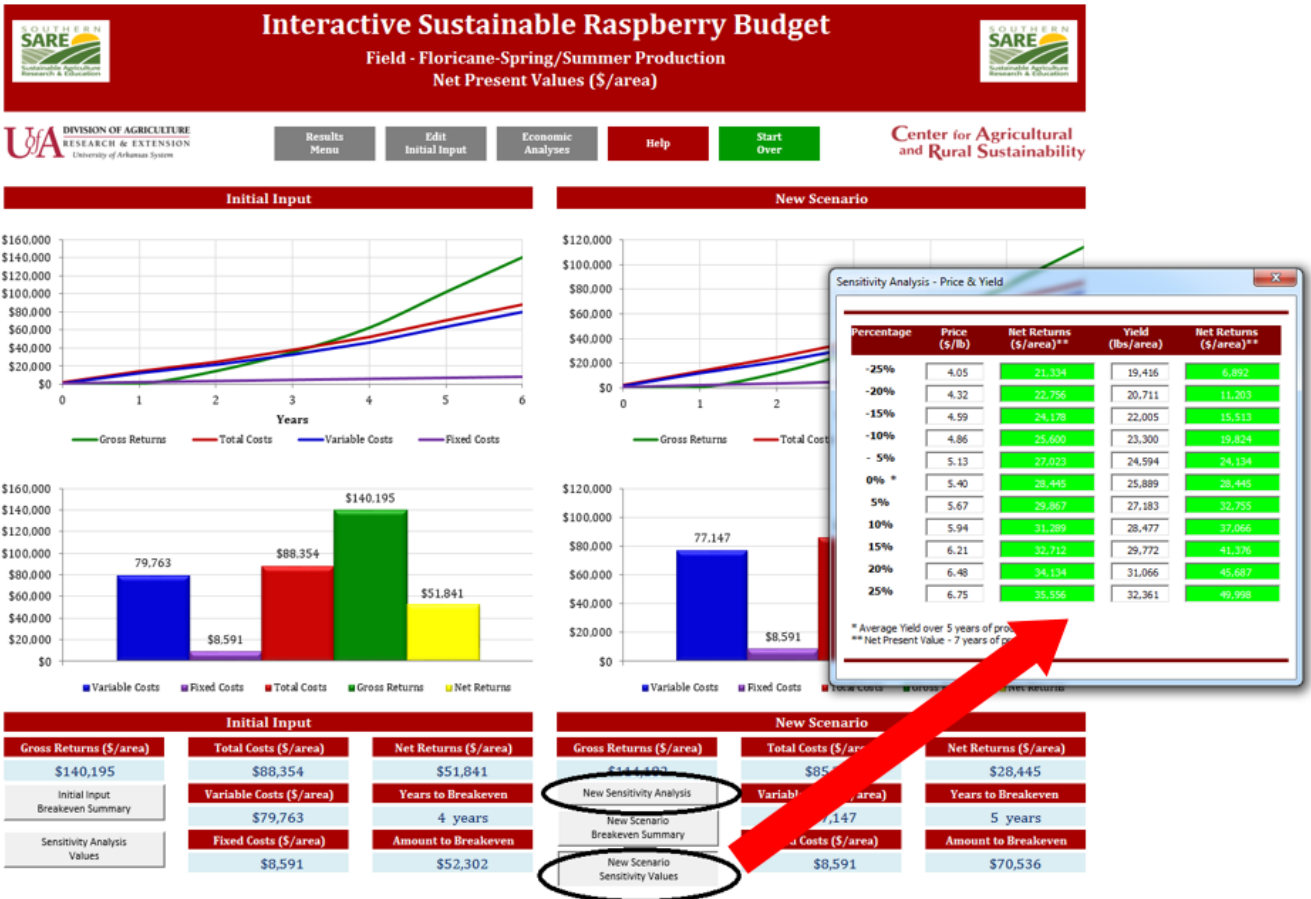


Figure 39: New Sensitivity Analysis and Sensitivity Values Table

5.3. Risk Analysis

Risk analysis is defined as a technique that calculates the probability of obtaining a cumulative net return greater than a specific dollar target (e.g., \$25,000). The model uses a triangular distribution to generate hundreds of different present values of net returns, given some expectations about costs, yields, percentages of yield sold to different markets, as well as prices received from those markets. It also generates the range where the average present value of net return will lie.

To use this risk analysis tool, choose **Economic Analyses** from the *Results Menu*, then press the button for **Risk Analysis**. Figure 40 shows the *Risk Analysis Input Box*. Use this box to enter ranges for your yield, production usage and market price, as well as your cost percentage and five year net return goals. When entering Minimum, Most Likely and Maximum values make sure that the values fall in that order, otherwise an error message will appear. Press **Next** to move through each category then press **Finish** when done. It is important to note that you with this analysis you can observe changes based on changes in one area only (e.g., costs) or how your net returns change when multiple things change (e.g., costs, yields and market prices).

To see an example using default values, simply press **Finish** to move on to the next screen (Figure 40).

Risk Analysis Input - Step 1 of 6

Please indicate your expected minimum, most likely and maximum yield each year...

Yield (lbs/plant)

	Minimum	Most Likely	Maximum
Year 1	0.80	1.00	1.20
Year 2	1.20	1.50	1.80
Year 3	1.60	2.00	2.40
Year 4	2.40	3.00	3.60
Year 5	2.40	3.00	3.60

Help Default << Back Next > Finish

Figure 40: Risk Analysis Input Box

The results of our default scenario for field production are shown in Figure 41. In this baseline scenario, the results indicate that there is a 69.7% probability that our default operation will make at least \$25,000 in profit over the course of seven years. It also indicates that there is a 95% chance that the profit amount generated over seven years will fall between \$27,240 and \$30,293.



Interactive Sustainable Raspberry Budget

Field - Floricane-Spring/Summer Production
Net Present Values (\$/area)



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Results
Menu

Edit
Initial Input

Economic
Analyses

Help

Start
Over

Center for Agricultural
and Rural Sustainability

The probability of obtaining a value equal or greater than **\$ 25,000** during the life of the operation is **100.0** %

There is a 95% chance that the true net present average lies between **\$ 45,803** and **\$ 48,391**

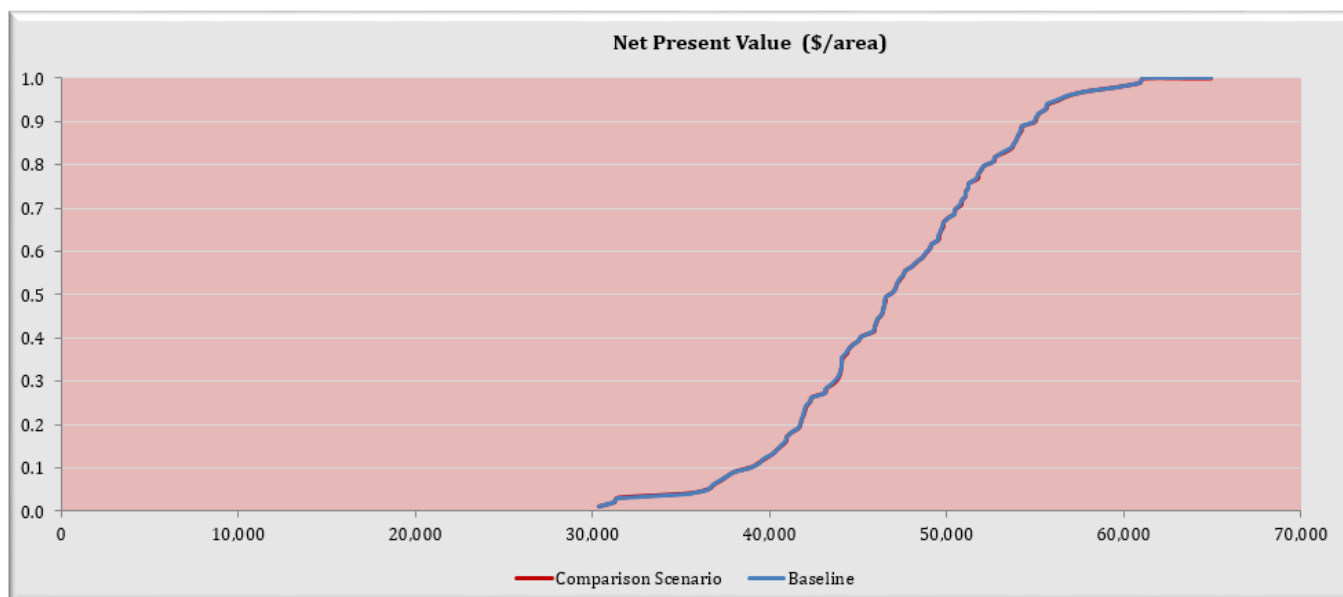


Figure 41: Risk Analysis Results Page

This baseline scenario can be compared to a new scenario by running a second analysis using different values.

In the following example, the default values for yield and fresh market prices (Quality 1) were reduced by 5% (Figure 42).

Risk Analysis Input - Step 1 of 6

Please indicate your expected minimum, most likely and maximum yield each year...

Yield (lbs/plant)

	Minimum	Most Likely	Maximum
Year 1	0.76	0.95	1.14
Year 2	1.14	1.43	1.71
Year 3	1.52	1.90	2.28
Year 4	2.28	2.85	3.42
Year 5	2.28	2.85	3.42

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Finish

Risk Analysis Input - Step 3 of 6

Please indicate your expected direct minimum, most likely, and maximum market prices...

Quality 1 Fruit Market Price (\$/lb)

	Minimum	Most Likely	Maximum
Year 1	4.32	5.40	5.94
Year 2	4.32	5.40	5.94
Year 3	4.32	5.40	5.94
Year 4	4.32	5.40	5.94
Year 5	4.32	5.40	5.94

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Finish

Figure 42: Risk Analysis Example – Editing Default Values

The results of this scenario are shown in Figure 43. These indicate that a constant decrease in yield of 5% and a constant decrease in fresh market price of 10% would result in a 68.7% probability of obtaining at least \$25,000 in profits over the seven year period. This is a 31.3% decrease over the baseline scenario. They also indicate that the actual net profits realized over the seven year period will fall between \$26,613 and \$28,827. In general, the scenario represented with the line furthest to the right is the better scenario for the operation. In this case, the comparison scenario red line is to the left of the baseline scenario, indicating lower potential profit than the baseline scenario.



Interactive Sustainable Raspberry Budget

Field - Floricane-Spring/Summer Production
Net Present Values (\$/area)



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The probability of obtaining a value equal or greater than **\$ 25,000** during the life of the operation is **68.7** %

There is a 95% chance that the true net present average lies between **\$ 26,613** and **\$ 28,827**

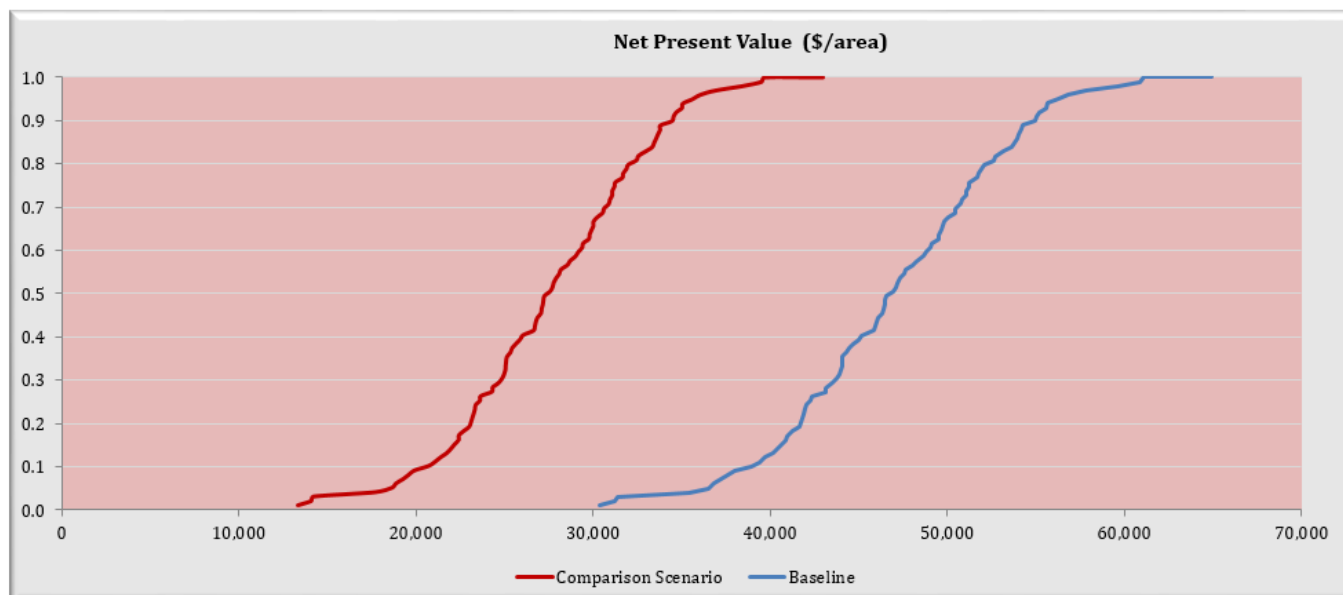


Figure 43: Risk Analysis Example - Comparison Scenario Results

6. EXITING THE BUDGET

The budget may be exited at any time by pressing the “X” located in the top right corner of the screen. If for any reason, this method doesn’t work, you may exit from the *Main Menu* or *Results Menu* screens by pressing the black button labeled **Exit Program**.

Upon exiting, a box should appear asking if you would like to save your changes. In order to keep any edits that were made to the budget, you must save the budget to your computer.

If you should have any issues exiting or saving your budget, contact cars@uark.edu.

GLOSSARY

Breakeven is the point at which *total cost* and *total revenue* (i.e., gross returns) are equal: there is no net loss or gain (i.e., the producer has "broken even").

Breakeven analysis is used to determine when a business will be able to cover all its expenses and begin to make a profit. It is important to identify startup costs, which will help determine the sales revenue needed to pay ongoing business expenses.

Breakeven price is the amount of money for which a product (i.e., raspberry) must be sold to cover the costs of producing it. In this tool, the breakeven price is calculated assuming that the total costs of production must be covered.

Breakeven yield is the yield required to cover the total cost of producing berries. In other words, it is the point at which the money brought in from the sale of berries is equal to the total cost of producing berries.

Cash flow is an amount of money that is either paid out (total cash has decreased; negative) or received (total cash has increased; positive) at the end of a period of time.

Cumulative net returns is the aggregate amount that an investment or production process has gained or lost over a period of time. In this case, it is the addition of all gross returns minus the addition of all total costs during seven years of production.

Depreciation (amortization schedule) is the amount of each payment allocated to principal and interest. Every payment made on a loan is split between principal and *interest*. An amortization schedule provides the exact amount remaining on a loan after each payment is made.

Fixed costs are independent of the quantity of a good produced and include inputs (capital) that cannot be varied in the short term, such as buildings and machinery.

Fresh market fruit is high quality berries ("Quality 1") that are free of injury, decay, calyxes (caps) and sunscald, are fully ripe in color, appear and feel turgid, and are of regular shape. To meet U.S. Grade 1, $\leq 1\%$ of the lot must be free from mold and 5% free of other defects.

Future values the value of an asset or cash at a specified date in the future that is equivalent in value to a specified sum today.

Gross returns the amount of money that the purchasers of a farm's products and/or services actually pay for those items.

Interest is the money paid regularly at a particular rate for the use of money lent, or for delaying the repayment of a debt.

Interest rate is the proportion of a loan that is charged as interest to the borrower, typically expressed as an annual percentage of the loan outstanding.

Net present value (NPV) is the sum of the present values (PVs) of incoming and outgoing cash flows over a period of time. Because of the time value of money, a dollar earned in the future will not be worth as much as one earned today. The discount rate in the NPV formula is a way to account for this (Please see section 3.)

Net return is the money a producer makes after accounting for all+ production expenses. It is calculated as: Gross Returns minus Total Costs.

Present value is the value of an expected income stream determined as of the date of valuation. The present value is always less than or equal to the future value because money has interest-earning potential or “A dollar today is worth more than a dollar tomorrow” (Please see Section 3).

Processed market fruit consists of berries of one variety which fail to meet the requirements of the U.S. No. 1 grade but which do not contain more than 10 percent, by volume, of berries in any lot which are seriously damaged by any cause, including not more than 2 percent for berries which are affected by mold or decay. In this guide, these berries are referred as “Quality 2” fruit.

Revenue (Gross returns) is income that a farm receives from the sale of berries to customers. In other words, it is the total amount of money received by a producer from the sale of any given quantity of berries. It is calculated as: Quantity times Price.

Risk analysis calculates the probability of obtaining the present value of net returns greater than a specific dollar target.

Sensitivity analysis determines how different values of an input will impact the final product or good. It helps to predict the outcome of a decision if a situation turns out to be different from the current situation (same as a “What If” analysis).

Total costs describe the total economic cost of production and is made up of *variable costs* plus *fixed costs*.

Triangular Distribution is defined by three values: the minimum value, the maximum value, and the most-likely value. These three values are used to determine the probability that a random variable (in this case, net present value of net returns) falls in some range above a given value, below a given value, or between a pair of values. This distribution is helpful to determine the probability about what might happen if yields or prices are different than expected.

Variable costs are costs that change in proportion to the good that a farm produces and include inputs such as labor and raw materials. These costs will vary depending on a farm's production volume; they rise as production increases and fall as production decreases.

What If (See *Sensitivity analysis*).

ADDITIONAL RESOURCES

Sources of Cost Information

High Tunnels Prices

- [FarmTek](#)
- [Four Seasons Tools](#)
- [Growers Solutions](#)
- [Haygrove Tunnels](#)
- [Rimol - Greenhouses Systems](#)

Irrigation Price Information

- [DripWorks](#)
- [Mechanical Transporter Company](#)

Machinery Equipment Rates

- [2015 Iowa Farm Custom Rates](#)
- [2014 Machinery Custom Rates](#)
- [Farm Machinery Costs](#)

Pest Management Guides

- [Southeast Regional Caneberries Integrated Management Guide](#)

Production Guides

- [Growing Blackberries in North Carolina](#)
- [Sustainable Blackberries & Raspberries: A Self-Assessment Workbook for Growers](#)
- [Commercial Bramble Culture](#)
- [Organic Blackberries and Raspberries](#)

Spotted Wing Drosophila Management Guides

[Biology, Identification and Management of Spotted Wing Drosophila](#)
[Fruit/Nut Pest Management](#)

CONTACT US

For more information or technical issues about this tool contact:

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DISCLAIMER

Activities and prices were based on research conducted at the Arkansas Agricultural Research and Extension Center (AAREC), Fayetteville, AR. The practices described are based on production procedures considered typical for this crop in Northwest Arkansas, and may not apply to every raspberry crop. The costs, practices, and materials will not be applicable to all situations or every production year. Users are encouraged to replace default information with that specific to their operations.

This material is provided as an educational tool and is not a substitute for individualized technical advice. This budget should be used as a guide only. Please direct all production questions to your university Horticulture Department or your local Cooperative Extension Service office.

APPENDIX

Appendix A: User Input Field Descriptions

Fruiting Cultivar Production System – Choose between Floricane-Spring/Summer production and Primocane-Fall production.

Planting Distance – Enter the planting distance in feet in both “In Row” and “Between Rows” boxes. Once both values have been entered, the tool will automatically calculate the number of plants per acre.

Field Production Area (*only field production) – enter area in acres (e.g., 0.5, 1.0, 2.5, 10, etc.)

Expected Production (Yield – lbs/plant) – in these boxes, you may enter your estimated annual yield in pounds per plant.

Production Usage – for this category you will estimate what percentage of your annual yield will be sold through fresh/direct markets (Quality 1) versus processed markets (Quality 2). These values may or may not add up to 100%, depending on the amount of yield that is estimated to be lost annually, but the total cannot exceed 100%. If the total of both percentages is greater than 100%, a message will appear asking to correct your input. If the total of both percentages is less than 100%, it is assumed that the difference is culled fruit.

Market Price (\$/lb) – Enter the expected prices for “Quality 1” and “Quality 2” fruit for each year.

Wages (\$/hr.) – Enter labor and management wages.

Interest (%) – Enter interest rate and inflation rate. These rates will be used to estimate net present values. See the [Glossary](#) or [Appendix B](#) for more information.

Trellis System – Enter your trellis system information (e.g., total costs, installation labor hours, interest rate and amortization period in years).

Irrigation System – Enter your irrigation system information (e.g., total costs, installation labor hours, interest rate and amortization period in years).

High Tunnel – Enter the size of your high tunnel (sq. ft.), the costs per sq. ft., value of the total Environmental Quality Incentives Program (EQIP) subsidy (if any), the number of labor hours to install the high tunnel, the interest rate (%) for your loan and the number of years to pay the

loan. This information is required if you decided to use a high tunnel in your operation. This information does not apply for field production.

Machinery & Equipment – Press the **Click Here** button to bring up the *Machinery and Equipment* form. Use this form to enter any purchased machinery or equipment for your raspberry operation. DO NOT include any rental equipment.

Click the **Demo** button to use default values. The default values can be modified by overwriting the information in each box. Once the machinery and equipment information is entered click on the **Continue** icon.

Machinery and Equipment	Purchase Cost	Ownership Life (years)	Salvage Value	Ownership Tax Cost	Owership Shelter Cost	Ownership Insurance Cost

Please enter your own complete information for each machinery or equipment. Incomplete information would not be used in the calculations. You can also click the 'Demo' button to use default values. Please click 'Continue' when done.

Help

Demo

Clear

Continue

If there is incomplete information, a message will appear letting you know what information is missing. If a name is not entered in the first column, any information entered in the other columns of that row will not be included in the final calculations.

Once all information is complete, the *Annual Use Hours* screen will be displayed. If **Demo** was previously selected, this screen will contain default values otherwise, the form will be blank. Hour usage information must be entered for at least one of the seven years of production. After clicking **Continue**, it will take from 5 to 30 seconds to process the information and you will be returned to the *User Input* form.

Machinery and Equipment	Hour Annual Use Year 1	Hour Annual Use Year 2	Hour Annual Use Year 3	Hour Annual Use Year 4	Hour Annual Use Year 5	Hour Annual Use Year 6	Hour Annual Use Year 7
30 HP Tractor	3.55	5.95	4.35	7.75	7.75	7.75	7.75
Mower	0.50	1.00	1.00	2.00	2.00	2.00	2.00
Air Blast Sprayer	1.14			2.00	2.00	2.00	2.00
Bed Shaper	0.11	0.80					
Cooling Unit (Used)	0.00	0.00	2800.00	2800.00	2800.00	2800.00	2800.00
Disc	0.55						
Mulcher	1.00	2.00	1.00	1.00	1.00	1.00	1.00
Plow	1.10						
1/2 Ton Pickup Truck	225.00	225.00	900.00	900.00	900.00	900.00	900.00
Tiller - 5 feet	0.14	1.00					
Miscellaneous Tools (i.e., Pneumatic Pruner, Bo	3.40	3.55	20.75	20.75	44.75	44.75	44.75

Please enter your own information if you are not using the default values. You can change the demo annual hour usage but you cannot change the name of your machinery or equipment. If you want to change any machinery or equipment name, close this window and start over. Click 'Continue' when done.

Help	Clear	Continue
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Appendix B: Economic Calculations

The specific economic assumptions included in this user guide may not fit every production situation as production costs and returns are highly variable for any particular raspberry crop. Each producer should tailor his/her budget to reflect their production goals, costs, market prices and marketing goals.

Total Costs (TC)

Total costs describe the total economic costs of producing berries during 7 years. Total costs are the sum of variable costs plus fixed costs (Baumol and Bliss, 2006). Variable costs vary according to the quantity of yield produced and include inputs such as labor, field operations, harvest, and raw materials. Variable costs are divided into 10 categories: fertilizer, ground cover, harvest, interest on operating capital, labor, nutrient analysis tests, other expenses, pest management, planting and rental of machinery and equipment. Harvest variable costs include the cost of labor and custom work directly associated with harvest (e.g., packing, sorting, grading, marketing, etc.). Total variable costs are the cash costs per year required to grow and harvest berries.

Fixed costs are independent of yield and include inputs (capital) that cannot be varied in the short term. Fixed costs include depreciation on capital investments in machinery, irrigation equipment, trellis and high tunnel systems as well as management overhead. These costs do not change as the level of production changes and would be incurred even if berries were not produced. Total costs (\$/area) of production are calculated for each production year. Total costs for each production year are calculated using the following equation:

$$TC_t = \left(TFC_t + \sum_k^n (UVC_{kt} \times Q_{kt}) \right)$$

Where:

- TC_t = total cost per year t
- TFC_t = total fixed cost per year t
- UVC_{kt} = unit variable costs for activity k for n activities per year t
- Q = each activity quantity per year t

The budget used as the core of this interactive economic decision support tool can be modified for the first 7 years (first two establishment years and five production years).

Gross Returns (GR)

Gross returns are estimated by multiplying expected market price (\$/lb.) for each fruit quality (e.g., Quality 1 - fresh market fruit - or Quality 2 - processed fruit) and expected yield (lb./area) for each fruit quality for each year of production. Annual gross returns of production are calculated for each production year t using the following equation:

$$GR_t = ((Y_{EFM_t} \times P_{EFM_t}) + (Y_{EPM_t} \times P_{EPM_t})).$$

Where:

- GR = expected gross returns per year t
- YEFM = expected fresh market (e.g., Quality 1) yield in year t
- PEFM = expected price to fresh market fruit in year t
- YEPM = expected processing market yield in year t
- PEPM = expected processing fruit (e.g., Quality 2) price in year t

Expected yields for each fruit quality are estimated as follows:

$$Y_{EFM_t} = (TY_t \times EFM_t) \times TA$$

$$Y_{EPM_t} = (TY_t \times EPM_t) \times TA$$

Where:

- TY is the expected total yield per year t
- EFM is the expected percentage of quality 1 produced in year t
- EPM is percentage of processed market fruit produced in year t
- TA is the total number of plants per area.

All these yield values are input that the user needs to enter and can be modified or changed at any time. It is important to point out that there will always be some percentage of culls or drops. The user can enter expected Quality 1 and Quality 2 percentages for each year of production. These two percentages must be equal to 100% or less each year. If the total of both percentages is greater than 100%, a message will appear asking to correct the input. If the total of both percentages is less than 100%, it is assumed that the difference is culled fruit.

Net Returns (NR)

Net returns (\$/area) are estimated each year by subtracting total cost (\$/area) from gross returns (\$/area). Net returns for each production year t (NR $_t$) are calculated using the following equation:

$$NR_t = GR_t - TC_t$$

Future Values (FV)

The budget could be used by a producer to estimate costs and returns across the life of a raspberry crop before determining whether or not to undertake the operation; as a result, all future costs and returns are unknown. One way to estimate the values of costs and returns that occur in the future is to increase current values annually by an expected inflation rate using the following equation:

$$FV_t = PV_t \times (1 + I)$$

Where:

- FV is future cash flows occurring at time t
- PV is the present value (explained below)
- I is the inflation rate in decimal form.

Present Values (PV)

Present value is a future amount of money that has been discounted (using an average discount rate) to reflect its current value, as if it existed today. Present value calculations are used to make comparisons between cash flows and production years, as they do not occur at simultaneous times (Baumol and Bliss, 2006). The soil preparation year is assumed as the starting year ($t=0$). After this year, all the calculations are adjusted by the average discount rate to estimate present values. Present values for variable and fixed costs, gross returns and net returns were estimated using the following equation:

$$PV = \sum_{t=1}^n \left(\frac{FV_t}{(1 + d)^t} \right)$$

Where, PV, is the present value of future cash flows (FV) occurring at time t , that must be discounted over the course of n years using d , the discount rate.

Net present value (NPV) was used to estimate the profitability of a raspberry crop that lasts 7 years (2 years to establish, 5 years in production) as annual net returns (gross revenue – total costs) are discounted to the present. Hence, the PV of future net returns received over the life of the

crop represents the sum total of profitability expressed in today's dollars for making the decision to invest in the crop.

$$NPV = \sum_{t=1}^7 \left(\frac{NR_t}{(1+d)^t} \right)$$

Where:

- NPV is the net present value
- NR is the net returns,
- t is time period
- d is the discount rate for one compounding period (in this case, annually).

The inflation rate (i) is used to adjust the value of future cash flows. Then the discount rate (d) is used to determine the PV of future cash flows. Both of these rates are entered by the user and can be updated at any time. Note that year 0 is included to represent cash flows occurred in the soil preparation year that need not be discounted. The PV of net returns or NPV is used in the risk assessment component of these budgets. The larger the NPV, the better is the investment (Baumol and Bliss, 2006). Given our assumptions, a negative NPV implies that total costs cannot be covered using revenue streams generated by the crop.

Breakeven Calculations

The breakeven point is defined in this application as the point at which total costs and total returns are equal. There is no net loss or gain (i.e., the producer has "broken even"). Expected market production (EMP_i) is equal to market yield (EMY_i) per plant times the number of plants (NP) per area times expected market price ($EMPr_i$), t is time in years, and i is "Quality 1" or "Quality 2" (See market production equation). Total returns are the sum of expected "Quality 1" or "Quality 2" market production during the life of the crop.

$$Market\ Production\ (EMP)_i = \sum (EMY_i * NP * EMPr_i)$$

So, the breakeven yield (See breakeven yield equation) is calculated by dividing the cumulative total costs of operating the crop (CTC) by the expected average market price (EMP_i) times the ratio between expected market production (EMP_i) and total returns (TR).

$$Breakeven\ Yield_i = \frac{CTC}{EMP_i} * \left(\frac{EMP_i}{TR} \right)$$

Likewise, the breakeven price (See breakeven price equation) is calculated by dividing the cumulative total costs of operating the crop (CTC) by the expected average market yield (EMY_i) times the ratio between expected market production (EMP_i) and total cumulative returns (TR). The resulting numbers will be the average annual price per pound (for each quality) that must be attained for berries sold for exactly zero profit to be obtained at the end of the year.

$$Breakeven Price_i = \frac{CTC}{EMY_i} * \left(\frac{EMP_i}{TR} \right)$$

REFERENCES: Appendix B

- Baumol, W.J. and C.I. Blinder. Economics Principles and Policy. 10th ed. Kendallville, IN: Thomson South-Western Corporation, 2006.



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