

# OSU Horticultural Enterprise Budget Software Advanced User's Guide

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July 2016

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Funding support from The Samuel Roberts Noble Foundation for the original enterprise budget software project was greatly appreciated. Horticulture budgets have been adapted from other commodities with the funding support of USDA – Risk Management Agency.



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# OSU Horticultural Enterprise Budget Advanced User's Guide

## July 2016

### INTRODUCTION

The OSU Enterprise Budget software is designed to facilitate the development of budgets that are appropriate to a geographic region. Users are allowed to override defaults with their own values to totally customize the budget if their experience and farm records indicate different values and production practices. Our intent is to provide software that is flexible and user-friendly, with default values that are reasonable for items that are difficult to calculate, for example, per acre machinery costs for a specific crop. Additionally, the software is to serve as an educational tool and resource. Links to many references are provided, such as OSU fact sheets and current reports, Oklahoma Agricultural Statistics Service data, and, in some cases, expert opinion. Where possible, web-links are built into the spreadsheets to provide users who have Internet access direct links.

The farm size, cropping plan, and machinery inventory are important determinants of crop budget costs. Farm acreage was defined for two different sizes (small and medium) in order to develop budget default values (Figure 1). Cultural practices and tillage operations were developed through several sources, including consultations with state and area Extension specialists, and a machinery survey of producers. MACHSEL (Kletke and Sestak), a machinery selection spreadsheet template, was used to estimate the costs for a particular machinery complement on a given size farm in a region. Machinery cost estimation is based on equations (some in modified form) from the American Society of Agricultural Engineers (ASAE).

In the spreadsheets, numbers can be entered specified with many values to the right of the decimal point (for example, 1/3 could be entered as 33.33333333%). However, some cells are formatted so that zero, one or two values to the right of the decimal place appear in the form (exact values may still be viewed in the cell label at the top of the screen). Calculations in the spreadsheets will be based on the exact value entered whether or not it appears in the form. For the summary page, values are rounded to the nearest two decimal places and/or cents.

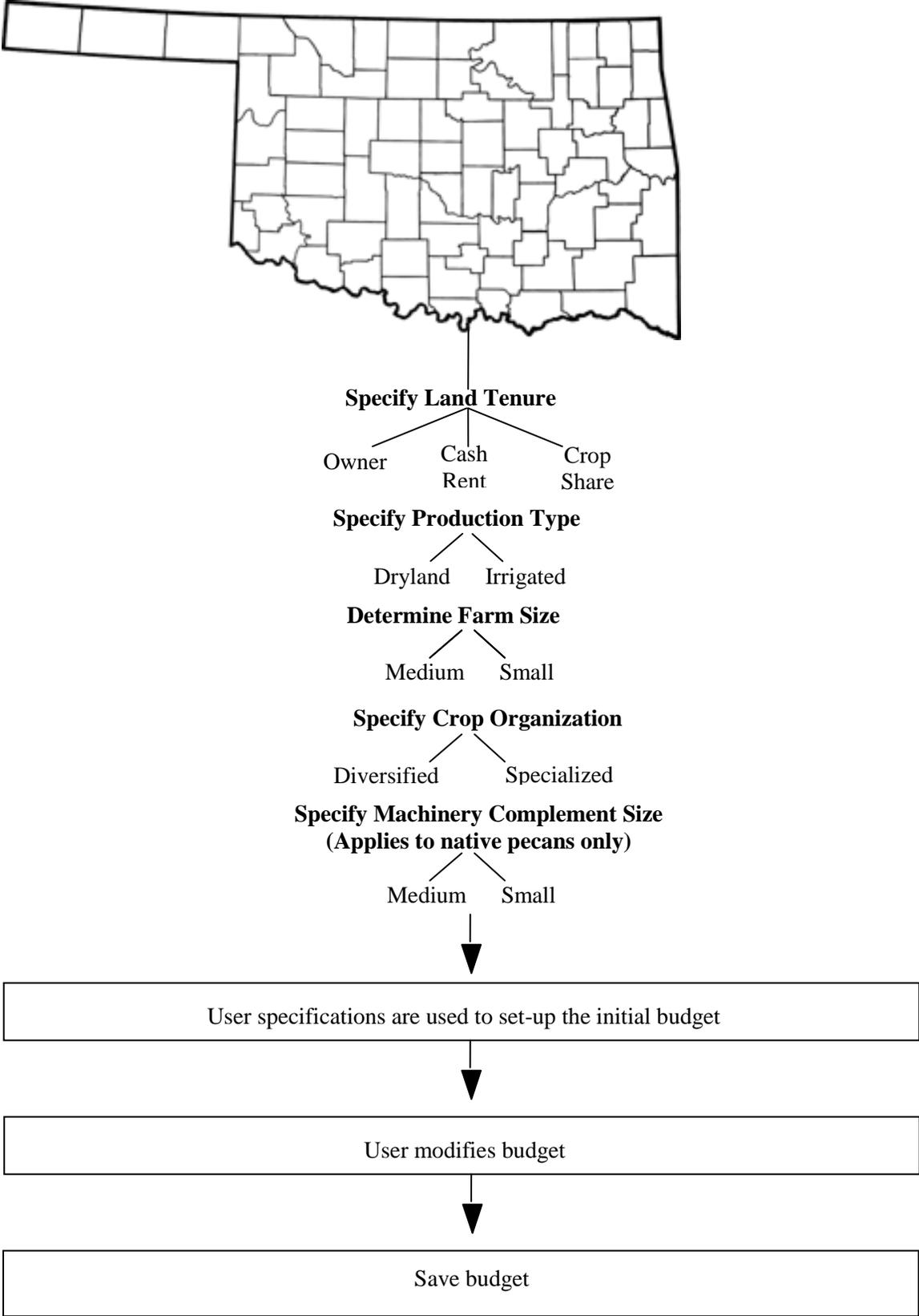
Three descriptions will be used in this guide to emphasize the appropriate use of the software and repercussions of misuse of the software:

**Warning:** Information concerning a procedure or computer setting that may cause software/hardware problems if not followed correctly.

**Caution:** Information about a procedure that may cause inaccurate data to be introduced into the financial estimates if not used correctly.

**Note:** Information that requires other special emphasis.

**Figure 1 - Flow of enterprise budget.**



## SOFTWARE INSTALLATION

We recommend that you copy the Enterprise Budget files to the hard drive of your computer for use. This will ensure that any customized budgets will not be saved over the original budget templates.

### Online Users

Budget files may be accessed at: [http://www.agecon.okstate.edu/budgets/user\\_login.asp](http://www.agecon.okstate.edu/budgets/user_login.asp)

An alternative is from the OSU Agricultural Economics Department's home page (<http://www.agecon.okstate.edu>, click on Extension, Farm Management and Finance, Budgets, and User Login at left). Type your login and password that was provided via email.

## GETTING STARTED

The OSU Enterprise Budgets are Excel-based spreadsheets. Each budget is an Excel workbook with multiple worksheets within the workbook. To use a budget, you will need Excel 2007 (or a later version). Open Excel by clicking on the Excel icon.

To find out what version you have, Excel 2007 users will see a *Microsoft Office Button*  on the upper left-hand corner of the screen. Click on it and then click on *Excel Options*, *Resources*, and *About*. In Excel 2010 and later versions, users will see *File* on the upper left-hand corner of the screen. Click on it and then click *Help*.

## Terminology

Figure 2 shows the tabs for worksheets in the wheat budget and identifies terms used in this guide.

**Figure 2. Terms Used in User's Guide**

**Irrigated Blackberry Enterprise Budget**  
3 acres farmed.

**Name**  
You Pick Your Own

**PRODUCTION**

	Units	Price	Quantity	S/Acre	Total
Blackberries	Pound	\$ 2.50	7,500	\$	18,750.00
Other Income	Acre	\$ -	0	\$	-
<b>Total Receipts</b>					<b>\$ 18,750.00</b>

**OPERATING INPUTS**

	Units	Price	Quantity	S/Acre	Total
Fertilizer	Acre	\$ 72.47	1	\$	72.47
Disease Control	Acre	\$ 180.00	1	\$	180.00
Insect Control	Acre	\$ -	0	\$	-
Weed Control	Acre	\$ 64.55	1	\$	64.55
Pruning Labor	Hrs.	\$ 10.50	100.00	\$	1,050.00
Broadcast Labor	Hrs.	\$ 10.50	9.00	\$	94.50
Harvest Labor	Hrs.	\$ 10.50	0.00	\$	-
Other Labor	Hrs.	\$ 10.50	140.00	\$	1,470.00
Post-Harvest/Marketing	Acre	\$ 2,074.50	1	\$	2,074.50
Annual Operating Capital	Dollars	6.50%	1793.00	\$	116.55
Machinery Labor	Hrs.	\$ 10.50	9.82	\$	103.11
Trellis System Labor	Hrs.	\$ 10.50	6.67	\$	70.04
Irrigation Labor	Hrs.	\$ 10.50	0.76	\$	7.98
Custom Hire	Acre	\$ -	0	\$	-
Machinery Fuel, Lube, Repair	Acre	\$ 49.82	1	\$	49.82
Irrigation Fuel, Lube, Repair	Acre	\$ 90.07	1	\$	90.07
Trellis System Repair	Acre	\$ 16.39	1	\$	16.39

**Command buttons:** View Break-Even Analysis, View Sensitivity Analysis, Restart, Print Reports, Generate IFFS Output.

**Worksheet tabs:** Budget, Yield, Other Inc, Est Summary, Est, Fertilizer, Disease, Insects, Weed.

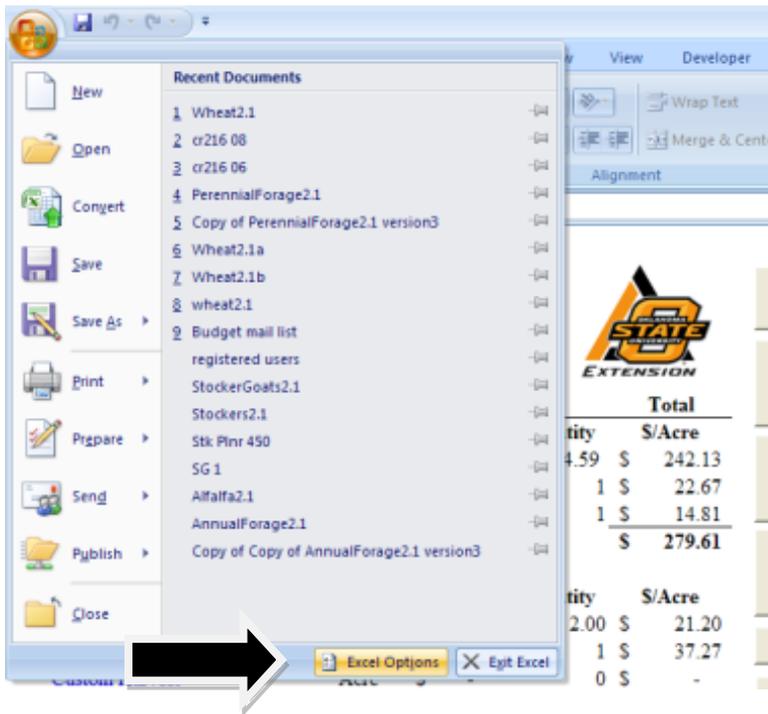
Command button fonts are color-coded. A blue font indicates a decision task via popup form. Orange fonts are information references and black fonts are generally location links.

# SOFTWARE OPERATION

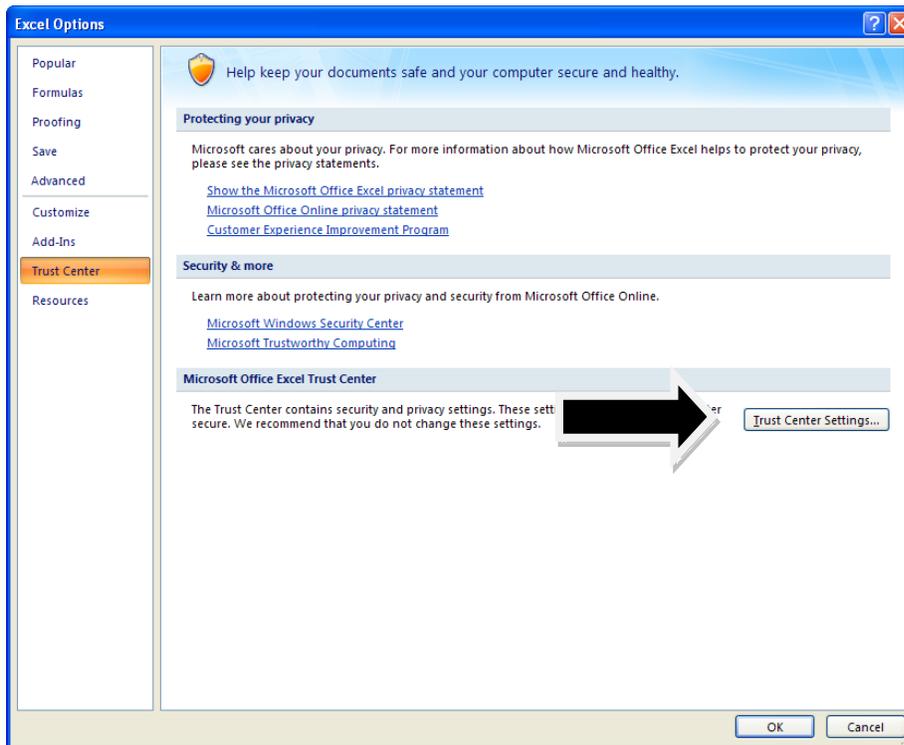
## Macro Settings

Your computer may have a few settings to adjust before the enterprise budgets will function properly. For the macros to operate, the macro security must be set prior to opening a budget file.

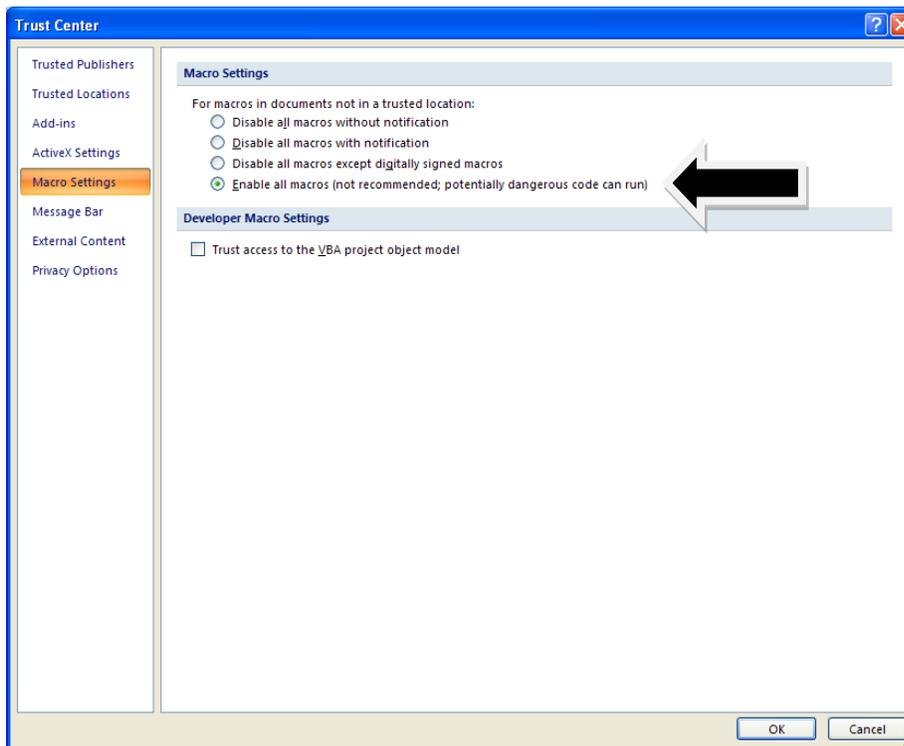
In Excel 2007, click the *Microsoft Office Button*  on the upper left-hand corner of the screen and then *Excel Options*. In Excel 2010 and later versions, click on *File* on the upper left-hand corner of the screen and then *Options*.



Click *Trust Center* and then *Trust Center Settings*.



Click *Macro Settings*, choose *Enable all macros*, and click *OK*.

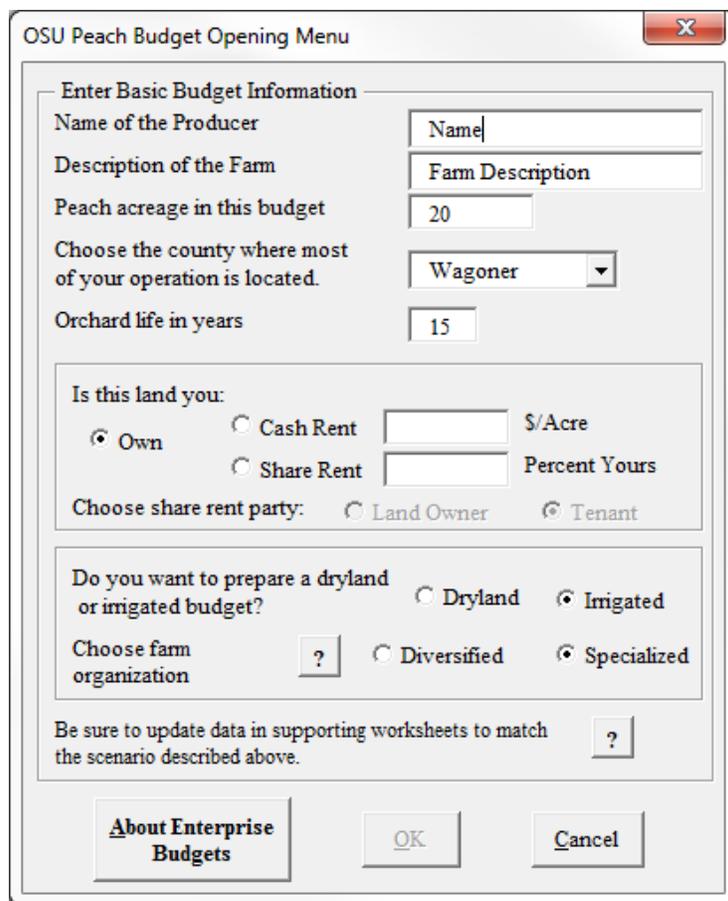


## Load a Budget File.

In Excel 2007, click the *Microsoft Office Button*  (for Excel 2010 and later, click *File*) on the upper left-hand corner of the screen, *Open*, locate the OSU Budgets (or the directory in which you copied the Enterprise Budgets) and then click on *a selected file name*.

## The Start-Up Form

When a budget file (or workbook) is opened, a form appears which allows you to specify information used to calculate the base budget. A peach budget start-up form is shown below:



The screenshot shows a dialog box titled "OSU Peach Budget Opening Menu". It contains several input fields and radio button options for configuring a budget. The fields include: "Name of the Producer" (text box with "Name"), "Description of the Farm" (text box with "Farm Description"), "Peach acreage in this budget" (text box with "20"), "Choose the county where most of your operation is located." (dropdown menu with "Wagoner"), and "Orchard life in years" (text box with "15"). Below these are sections for land ownership: "Is this land you:" with radio buttons for "Own", "Cash Rent" (with a text box for "\$/Acre"), and "Share Rent" (with a text box for "Percent Yours"); and "Choose share rent party:" with radio buttons for "Land Owner" and "Tenant". Another section asks "Do you want to prepare a dryland or irrigated budget?" with radio buttons for "Dryland" and "Irrigated". Below that is "Choose farm organization" with a "?" button and radio buttons for "Diversified" and "Specialized". At the bottom, there is a note: "Be sure to update data in supporting worksheets to match the scenario described above." with a "?" button. The dialog box has three buttons at the bottom: "About Enterprise Budgets", "OK", and "Cancel".

An indication of the size of the peach enterprise is needed to estimate machinery and equipment costs. If the commodity is a multiyear enterprise with more than one production period, the productive life (e.g., orchard life, vineyard life) must be entered to allocate preproductive costs over the productive years of the enterprise.

For watermelon budgets, the user must first select from three basic genetic classifications, for example, open, hybrid, or seedless. A list of default varieties is then available for selection. The user will also need to specify the planting timeframe that defines planting and pesticide operation schedules. In a similar fashion, a grape budget user must first select from six basic varietal categories.

**Note:** The county selection is for description purposes only. *Other County* is the appropriate choice for operations outside of Oklahoma. The user may edit the red label in the budget summary header to a specific county and state if desired.

The user may specify whether the crop will be on land they own, cash rent, or share rent. This selection is reversible only by choosing *Restart*. If the land arrangement is cash rent, the input sheet allows the producer to enter the cash rent amount per acre. If share rent is chosen, the user specifies the percent of the crop they receive, which will be used as the default output share throughout the budget. Defaults for other input and output share amounts are based on industry trends, but may be changed as appropriate.

The user may specify whether the budget is for dryland or irrigated crops. If irrigated is chosen, the user will be able to view the default irrigation cost information and make changes; otherwise, no direct link from the budget sheet to the irrigation sheet is shown. While it is possible to start out with a dryland budget and begin to convert it to an irrigated budget by clicking on the *Irrig* tab, the preferred method is to start a new budget, noting on the start-up form that it is irrigated rather than dryland.

**Note:** On native pecan budgets, the dryland setting is the only available choice.

In general, default machinery costs are determined by farm organization in horticultural budgets. The user may specify whether the farm's total acreage is devoted primarily to the enterprise budget crop or composed of several crops typical of the region specified. However, native pecans are assumed to be part of a diversified operation, thus the user may specify the tractor complement size instead. Two tractor complements may be selected where each is defined by the largest PTO horsepower (hp) unit available: small – 45 hp, and medium – 95hp.

**Caution:** If an enterprise budget scenario is changed in size dramatically (for instance, acreage changes from 5 to 50), a new budget should be started because the start-up form specifies machinery and equipment defaults that match farm size and acreage. To evaluate a different size enterprise after new information has been entered in budget forms, the user may wish to save the budget file (choose *File, Save As*, and specify a name) prior to reopening the budget via the *Restart* button. Grape and watermelon budgets alert the user to save the current session before switching to a different variety selection. In general, default values and/or customized settings may be erased when different information is specified in the start-up form.

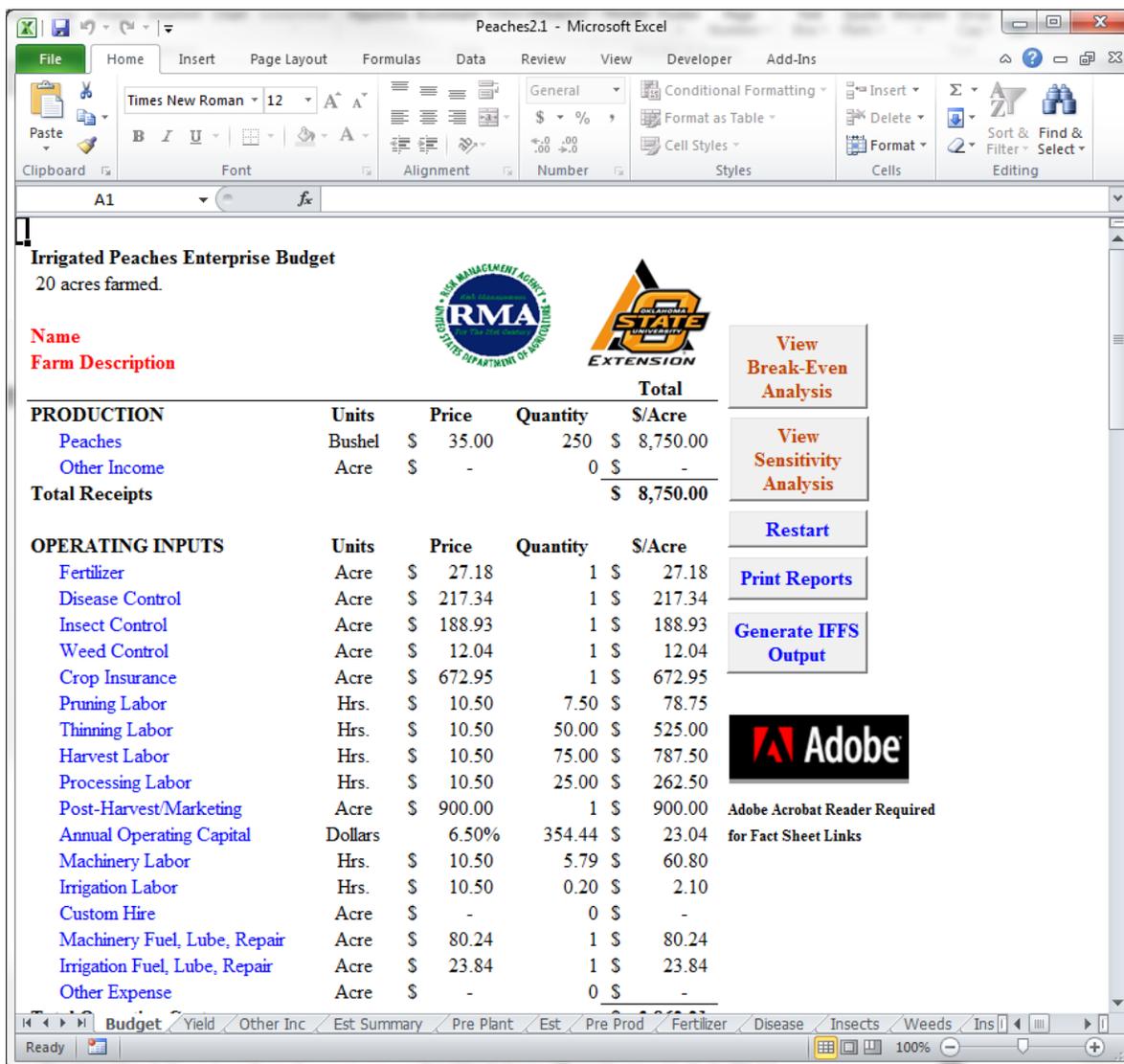
**Note:** You may add varieties for future reference in the grape and watermelon budgets. Scroll through the variety type(s) using the scroll bar (or arrow keys) and select *Add new variety*. Enter the new variety properties and click on *OK*. The new item will be added to the bottom of the list. To use the item, scroll to the bottom of the list and select it.

**Note:** On various pop-up forms, buttons with a ? (question mark) label are available to assist the user with entry items and/or provide additional information as to the general use of the form.

Once the start-up form is completed, click on *OK*. A budget summary sheet will appear (see below). Values in budgets are specified on a per acre basis. The budget **should** be further

customized by clicking on the budget items in blue (hyperlinks) which link to supporting sheets. The hyperlinks change color once they have been used, allowing the user to note items they have visited and ones they may still need to view. You may also click on the tabs at the bottom of the sheet to move to a specific sheet within the workbook.

**Note:** It is important to follow through and check all supporting sheets to ensure that the assumptions match the budget specified. Some modification may be needed on many or all sheets.

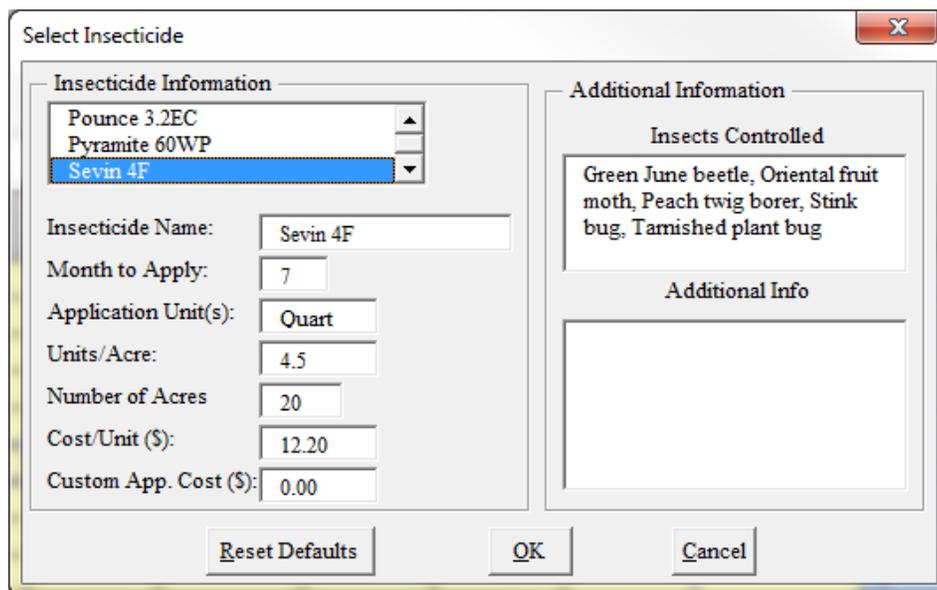


Sections that follow describe information in each tabbed sheet. The tabs may include Yield, Other Inc(ome), Seed, Fertilizer, Harvest, Ins(urance), Disease, Insects, Weeds, Total labor (with separate sheets by labor category), Hauling, Post Harvest, Machinery, Equip(ment), Irrig(ation), C(ash) Rent, Other Exp(enses), and IFFS. In multiyear budgets, Est Summary (preproductive expense summary), Pre Plant (year prior to planting), Est (establishment/planting year), and Pre Prod (year(s) prior to first harvest season) are included.



unless a pop-up menu allows you to select the name of the month. Lists of default items in pop-up forms are in alphabetic order.

To move from one cell to another, use the arrow keys or click with the mouse on the next cell. Within a form, the Tab key moves your cursor one cell to the right. The Enter key moves your cursor down one row. Enter numbers as decimals in worksheets; fractions are not allowed. For example, 1/3 should be entered as 0.33. You can make changes to the default data by placing the cursor in one of the yellow cells and double-clicking. If you double-click on a line containing information from a prior session and make changes, your data will be updated on this line. For instance, in the Insecticide worksheet (shown above), if you double-click on a blank line and select an item, it will be added to the existing entry. Double-clicking on the line with Sevin 4F will bring up the following form:



Using this pop-up form, you can change the application month, unit or rate, acreage applied, cost per unit, and custom application cost. You may scroll through the Insecticide list at the top using the scroll bar (or arrow keys) and choose another item. You may also add a new pesticide for future reference. Scroll to the bottom of the list and click on *Add New Insecticide*. Type in the new name, month to apply, etc. Click on *OK*. The new item will be added to the bottom of the list. To use the item, scroll to the bottom of the list and select it.

The pop-up forms summarize information either specified by the user or OSU-specified default data. Use of the pop-up form is required if you wish to retain item changes for future sessions.

**Note:** Changes made in the worksheet without the use of the pop-up form do not change information stored in the user's database. Consequently, the item's contents as shown in the worksheet may not match the form's contents for that same item.

At any time, the user may access default (OSU specified) information by clicking on *Reset Defaults*. This may be especially useful after a database update as discussed later.

**Note:** In addition to Insecticides, new items may be added in Fertilizer, Disease, Weeds, and Equipment Inventory (for grapes and blackberries) in horticultural budgets. The process for adding and modifying items in these sheets is similar.

Not all changes require the use of pop-up forms. If, for example, you want to change the grape price in the grape budget, go to the budget summary sheet, click on the varietal type (highlighted in blue) in the Production section, and then make the change in the appropriate green cell on the Yield worksheet.

### **Erasing Default Information**

If default information is not relevant to your operation, highlight the cells to be erased, choose *Edit* from the main menu bar, *Clear*, *Contents*. Or, you may highlight the cells to be erased and press the Delete key. Type in a zero or use the Delete key to clear the contents of individual cells. Only erase yellow or green input cells. A cell protection message appears if the user attempts to erase protected tan or blue cells.

**Warning:** Using the space bar to clear contents may result in a #Value! sign or a Visual Basic for Applications (VBA) Error.

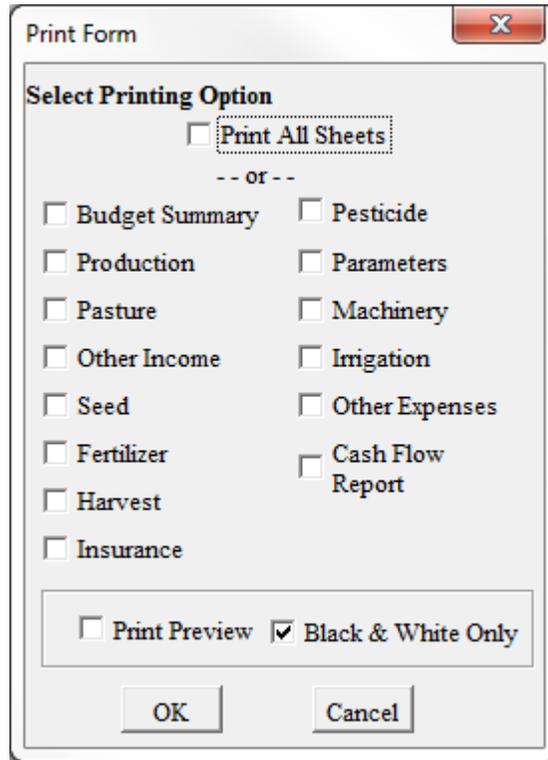
### **Breakeven and Sensitivity Analysis**

The enterprise budget provides information on break-even prices and yields given budget specifications. In a summary table at the bottom of the Budget sheet, two breakeven yield and price levels are shown: one above operating costs, the other above total costs (both operating and fixed). The breakeven yield is the yield needed to cover costs given the expected price and other income. The breakeven price is the price needed to cover costs given the expected yield and other income.

Sensitivity tables display the return per acre over operating costs and above all specified costs. The sensitivity tables allow the user to adjust the percentage change in crop yields and/or percent change in crop price.

## Print Reports

Summary sheets are available for each worksheet tab in the budget (wheat is shown here).



The user may choose to print all or individual reports. Clicking on *Print Preview* will allow all selected reports to be viewed prior to printing. Choose *Close* (or *Next* in the case of a multiple page report) to view reports while in the print preview mode. You may then print selected reports by deactivating *Print Preview* and clicking on *OK*. *Black and White Only* is the default setting. To preview and/or print with shading or in color, de-select *Black and White Only*.

**Warning:** Make sure a printer is currently installed prior to opening up a budget file. Failure to do so will not allow the print module to function properly and may also result in the removal of screen color formats if *Black and White Only* is selected. The user is encouraged to close out the budget session without saving and a printer should be installed prior to the next budget session.

## Generate Cash Flow Report

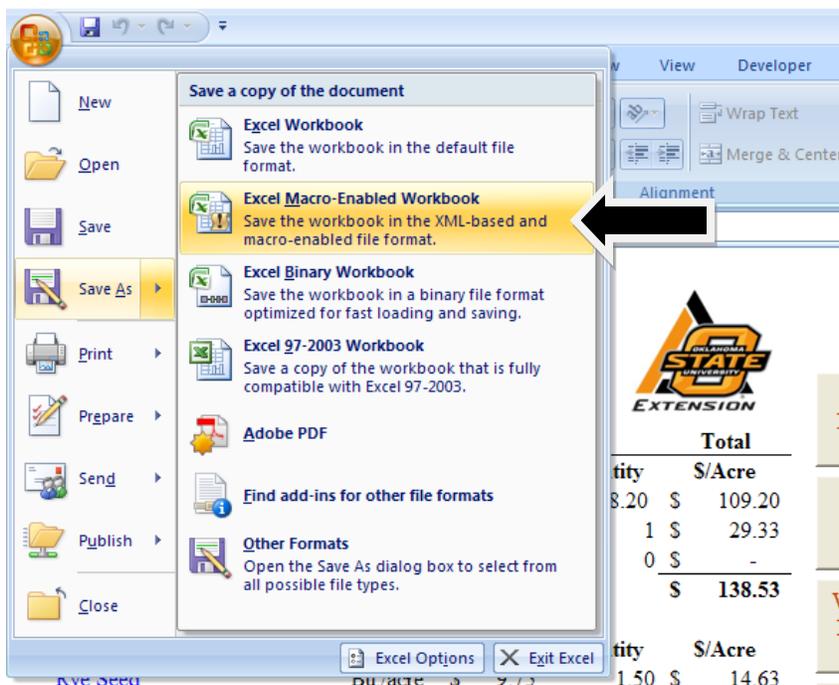
Cash flow files may be generated by clicking on the *Generate Cash Flow* button. If *OK* is selected, the cash flow report is automatically updated and the user is asked to specify a filename. The cash flow content can be viewed later for reference purposes using the IFFS tab along the bottom of the Excel screen. The output sheet is essentially a “snapshot” of the cash flow file.

In all cash flow reports, tax and insurance allocations may be specified as operating expenses or included in “Land or Other Fixed Charges”.

**Note:** If a budget is modified, the *Generate Cash Flow* button must be used to update the report before the numbers shown in the IFFS tab or printed in a report will be accurate.

## Saving a Customized Budget

In Excel 2007, to save a customized budget, click the *Microsoft Office Button*  on the upper left-hand corner of the screen, *Save As*, then *Excel Macro-Enabled Workbook*, and give the budget a new name so as not to replace the original budget template. Saving the file will preserve all customized information in all sheets for re-use.



**Warning:** In Excel 2007, do not save a 2007 Excel formatted budget file other than the highlighted option shown above. This will allow the software’s macros to perform as intended once reopened in Excel 2007.

**Note:** To save a 2010 Excel or later version formatted budget file, click *File* on the upper left-hand corner of the screen, *Save As*, and give the budget a new name so as not to replace the original budget template. As with 2007, make sure the file is saved with *.xism* filename extension.

**Note:** You may want to save a customized budget before printing it so that the correct file name will be printed at the bottom of the page.

### **Restarting a Customized Budget**

To evaluate a different enterprise budget scenario, press the *Restart* button. A pop-up menu confirms your intention before you access a start-up screen containing the information previously entered. If you do not want to modify information on this screen, click *Cancel*. If you want to modify the start-up data, make the appropriate changes and click on *OK*. Pressing *OK* will save information in this start-up form as new defaults.

**Caution:** In general, various inputs automatically increase or decrease if a different budget acreage or stocker herd size is specified. The notable exception applies to the cow-calf budget where it is important to update the appropriate number of head shown in supporting worksheets to correspond with the new scenario.

### **Re-opening a Customized Budget**

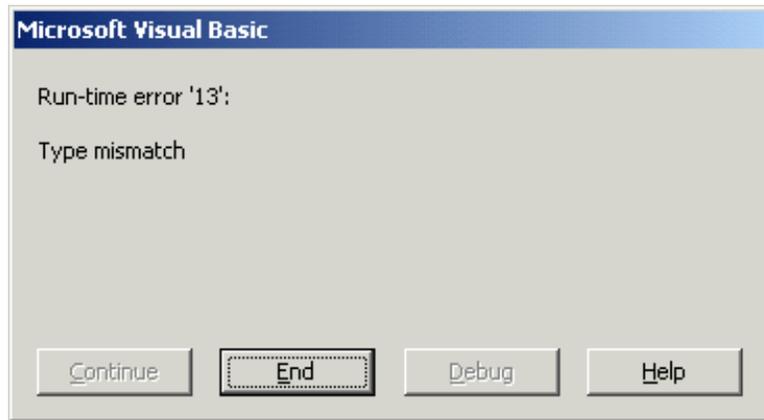
When you re-open a budget that you have saved from a prior session, you will get a start-up screen that contains the information previously entered. If you do not want to modify information on this screen, click *Cancel*. If you want to modify the start-up data, make the appropriate changes and click on *OK*. Pressing *OK* will modify new defaults to match the start-up data.

### **Adobe Acrobat Reader for Fact Sheets**

To open fact sheets accessible through hyperlinks in the software, the user must have Adobe Acrobat Reader software that may be downloaded at no cost. On the budget summary, a link to the Adobe website will allow you to download the Reader.

## Error Messages

All budget workbooks were developed in Microsoft Excel and utilize VBA to handle data manipulation and provide the user interface. If you encounter a VBA error, you will receive pop-up message similar to this:



Press End to ignore the code error and continue running the program. However, there may be errors in logic and/or calculations as a result. The user should document the series of steps leading to the error message, save the file, and notify:

Roger Sahs, Extension Assistant  
520 Ag Hall  
Oklahoma State University  
(405) 744-7075  
[roger.sahs@okstate.edu](mailto:roger.sahs@okstate.edu)

## HORTICULTURAL BUDGET WORKSHEETS

### Production

All crop production information is located on the Yield sheet. Default yields are based on field trials or expert opinion. The default price is based on a 10-year annual average for all budgets except grapes (Oklahoma Grape Growers Survey) and blueberries/blackberries (expert opinion). The *Averages* button provides reference to historical price data. An input row, “Your Value”, below the default specification allows the user to enter changes.

In most budget settings, clicking on the *Month(s)* button brings up a form allowing the producer to specify month(s) of crop sales as well as monthly sale prices. Horticultural budgets do not contain seasonal price indices, resulting in equal monthly default prices in the sales form. The user may adjust any sale months and/or prices in the form. If the sale month is changed from harvest, a message will remind the user to adjust the annual capital month in the Parameters section to match the first month of sales. This allows the budget’s operating interest to calculate accurately. If multiple sale months are specified, a weighted average price will appear in the budget summary.

If you first enter specific prices in specific months but later want to reset the price series back to the default setting, use the *Reset Default Prices* button. The resulting price series reflects the default estimated harvest price (or user-specified price if an entry was made in “Your Value”). To restore the initial default price and distribution, the user must also delete the “Your Value” price contents.

**Note:** Resetting the price does not reset the distribution of sales to 100 percent at harvest.

### Other Income

The Other Income sheet allows the user to specify any other income generated, the month received, and the amount per acre. Two lines are reserved for government payment categories.

### Seed - Watermelon

Use this sheet to specify transplant rate, plant price, and planting date. A change in the planting date will automatically adjust the default harvest date based on the variety’s days to maturity.

### Establishment – Blackberries, Blueberries, Grapes, Improved Pecans, and Peaches

Budgets that contain establishment (also known as preproductive) expenses are prorated as a fixed cost in the enterprise budget summary. Preproductive cost determination and allocation are based on the cost recovery method where annual costs are accrued to a future value at the end of each preproductive period. The total cost is then amortized over the productive life of the enterprise specified adjusted by the length of the preproductive period in years.

Clicking on the *Establishment* link in the budget summary sheet will transfer the user to a cost summary of cultural practices prior to first harvest. Clicking on a production item link allows the user to make further revisions. Expenses related to each preproductive period may be transferred to a cash flow report individually.

## Fertilizer

Up to eight fertilizer applications may be specified in the Fertilizer sheet. Data needed includes the fertilizer type, month of application, pounds applied per acre, acreage applied, percent nitrogen (N), percent phosphorus (P), percent potassium (K), fertilizer price per ton, and custom application charge. Default fertilizer applications are specified but can be modified.

Alternatively, another fertilizer can also be entered directly in the worksheet by double-clicking within the yellow cells. A pop-up form of available fertilizers, the acreage applied (default is the user-specified budget acreage), the percent N, P, and K, the price per ton, and custom rates are provided. The worksheet automatically calculates the price per pound of the fertilizer. The user may indicate the pounds of P and K needed for fertilizer requirements, residual soil nitrogen (default is zero), and adjust application practices to meet those needs. The *Fertilizer Rates* button provides N, P, and K recommendations based on Oklahoma State University (OSU) field tests.

Use the *Lime Application* button to enter lime costs. In multiyear budgets that contain establishment expenses, lime application costs may also be entered within the preplant year summary by clicking on the *Lime* button. The input sheet for lime is similar to that of fertilizer. Entries include month of application, tons applied per acre, acreage applied, percent Effective Calcium Carbonate Equivalent (ECCE), and the price per ton. If lime is applied during fruit bearing years, the years over which the costs should be prorated is also provided. Specified custom application costs are also prorated and included in the *Custom Hire* budget item.

The *Fertilizer Calc* button is used to toggle on or off the automatic computation of nitrogen to meet yield requirements. The default mode automatically calculates the amount of the fertilizer shown in the first line of the form to meet the yield goals. Manual adjustments in the type and amount applied can be made with the fertilizer calculator turned off. A message appears below the fertilizer table if applied nitrogen does not meet the yield requirements. Similarly, if the nitrogen level in the soil matches or exceeds nitrogen requirements, a message suggests a potential reduction of nitrogen application(s). The nitrogen message appears only if the application is 10 pounds over or under the amount required. Phosphorus and potassium messages appear only if the application is 5 pounds over or under the amount as specified by the user.

## Custom Harvest – Improved and Native Pecans

The *Custom Harvest* link in the budget summary allows the user to specify harvest operations and costs for owned or custom work in the Harvest sheet. In general, if owned machinery is selected, all operating costs will be included in the *Machinery Fuel, Lube, Repairs* budget item and *Custom Harvest* costs will be zero. If custom harvest is selected, *Custom Harvest* cost is shown as a percentage of the crop proceeds received by the custom harvester.

**Note:** In an **owner-operator situation**, the budgets assume the party uses owned harvest machinery and equipment unless the user clicks on the *Custom* option button. A custom harvest selection only impacts harvest operations and does not involve additional cost shares as noted with the landlord discussion below. A default custom rate (50% of the crop) is based on industry observations by OSU specialists.

In a **tenant** (lessee) situation, the budgets assume the party uses owned harvest machinery and equipment and charges the landlord a percentage of the crop to cover harvest costs. In effect, the custom rate charged is equal to the share of the crop specified in the Start-up form or on the Yield sheet during the session. The *Custom* option button and corresponding *Custom Harvest Information* link are disabled. Other cost shares are typically involved in the pecan lease agreement and may be modified as needed.

In a **landlord** (lessor) situation, the budgets assume the party uses a custom operator (tenant) to harvest pecans and receives the remaining balance of the proceeds based on the custom rate paid. In effect, the difference between harvested crop revenues and the share of the crop received (as specified in the Start-Up form or on the Yield sheet) defines the custom rate paid. The *Owned Harvest Equipment* option button and *View Owned Equipment* link are disabled. Other cost shares are typically involved in the pecan lease agreement and may be modified as needed.

Clicking on the *View Owned Equipment* button allows the user access to the Owned Harvest Machinery Cost summary section for further analysis. Total variable and fixed costs are calculated only if the *Owned Harvest Equipment* option button is active. The user may make changes in the cost summary by entering values directly into the “Your Value” column. Clicking on the *Harvest Cost Estimator* button provides a shaker and harvester expense review as well as the option to add any miscellaneous expenses into the “Other” column.

Although the budget software does not have a *Machinery Leasing* option button, the owner-operator or tenant may incorporate the costs of a leased harvest machine by following these steps:

1. Activate *Owned Harvest* option button.
2. Adjust fixed cost to zero if appropriate (all harvest machinery and equipment is leased) in the “Your Value” column of the Owned Harvest Machinery Costs summary; otherwise, lower fixed costs to omit the item(s) leased.
3. Adjust variable costs if necessary. Since fuel, lubricant, and labor costs are the same whether a machine is owned or leased, these operating items may not need adjustment. Repair costs for leased machines may need to be lowered, because short-term leased equipment typically have considerably lower hourly repair costs than an item owned for its complete useful life.
4. Enter the lease or rental cost in the Other Expense section. Since there are various types of leasing arrangements (per day, week, month, etc.), the user will need to convert the rental amount (including any delivery costs) to an acre basis given the specified budget acreage.

## **Pesticides**

Pesticide applications and associated costs incurred for various programs including weed, insect, and disease control are provided on separate screens. Each pesticide sheet allows data entries including the pesticide name, month of application, application unit, unit(s) per acre to apply, acreage applied, cost per unit, and charge for custom application. One or more default pesticide applications have been specified, but as with the fertilizer sheet, the user can modify them. By double-clicking in the pesticide table yellow cells, a pop-up form of typical pesticides, rates, and prices is shown. The user can choose a pesticide from the provided list or build a list of customized pesticides for future reference. This is accomplished via the <Add New Pesticides> at the bottom of the pesticide scroll list. Each pesticide sheet also calculates the cost of chemical

(cost per unit times units per acre) and the cost of application (cost of chemical plus any custom application charges) per budget acre.

In addition, disease control measures may be entered individually or as a combined cost for all items. Select the *Itemize* option button to enter detailed cost information. Click on *OK* to proceed with your choice. A cost summary of practices is shown with links to each disease control. Data may be entered directly or by double-clicking within each disease control table. To specify a total value that summarizes all disease control information, select *Combined* and click on *OK* to proceed. This choice will override all individual settings with a value reflecting all controls. Use of *Combined* does not allow custom costs associated with disease control to be included in custom hire calculations shown in the machinery sheet or budget summary.

**Note:** To remove the costs associated with a default pesticide, you must delete both the cost of the pesticide as well as the custom application cost, if any.

### **Crop Insurance - Peaches**

Use this sheet to enter the cost per acre of crop insurance. You may also record some descriptive information about the policy (approved APH yield, yield coverage level, crop price election, the value of coverage). Only the cost per acre value is used in any budget calculations.

### **Labor Categories and Summary**

Clicking on any *Labor* item in the budget summary will link the user to a cost summary of all labor categories within each horticultural budget. The user may use the specified costs or make changes by clicking on the category button listed.

### **Annual Operating Capital**

The cash needed to pay monthly bills may be borrowed from an agricultural lender where interest is charged based on the interest rate and duration money is borrowed. Or, money may be “borrowed” from farm or family savings to cover shortfalls, resulting in foregone interest income. Operating capital requirements are estimated on an annual basis by determining how long each expense is invested in the enterprise before it is recovered through the sale of all or part of the enterprise’s production. The annualized capital needs for a given month are the difference between receipts and expenses for the month divided by 12 plus the previous month’s annualized capital requirements. If the balance for any month is zero or less, the annualized capital balance is set to zero as a base for the following months. Monthly capital needs are totaled to obtain the annual capital requirements, and hence the annual operating capital charge. The user can make changes to the default interest rate charged on operating capital by adjusting the percentage on the Parameters sheet.

The annual capital month is the month when outstanding interest charges on annual capital are terminated and is generally assumed to coincide with the month of production. The default annual capital month in the crop budgets generally assumes that the sales month coincides with the harvest month. As previously mentioned, if the user does not employ the default budget sales month, a message will prompt the user to adjust the annual capital month in the Parameters sheet to reflect the revised sale month (or the first month of sale in the case of multiple months). This will allow the budget’s operating interest to calculate accurately.

## Post-Harvest

In general, the user may specify the post-harvest expense item, month of occurrence, and dollars per acre expense. Watermelon expenses are limited to two items, harvesting and marketing per pound. The user may make changes in the default rates by entering values in the “Your Value” column. The dollars per acre is automatically calculated. In the peach budget, the user may specify the units per acre and the cost per unit resulting in automatic per acre calculations. One line is reserved for carton expenses.

## Parameters

Parameters are items such as wage rates, fuel prices, tax rates and interest rates used in determining the opportunity cost on investments. Several variables listed in the Parameters sheet are used in all budget calculations: labor wage rates, fuel prices, annual operating and machinery loan interest rates, tax and insurance rates for machinery, harvest month, opportunity interest on owned land, ad valorem tax rate on land, value of land per acre, and the percent of overhead costs to be allocated to the enterprise. In multiyear budgets, the real interest rate used in adjusting preproduction costs is also requested. In default budgets, land is a residual claimant against the returns shown in the budget summary. However, the opportunity cost of land and real estate taxes may be included through data entry in the Parameters sheet. If such costs are included, returns above all specified costs are defined as returns to management, risk, and overhead in the budget summary.

## Machinery

Non-harvest machinery costs are summarized in the Machinery sheet with links to non-harvest operations and other details. The default assumes non-harvest machinery is owned. Non-harvest costs are representative for the farm size/organization and the machinery complement initially specified at start-up, the level of custom service selected, and the operations based on information in the Non-Harvest Operations section. The non-harvest machinery cost sheet has buttons to *View Parameters*, *Non-Harvest Operations*, *Labor Categories*, and *More Information*.

The user has three machinery selections available in the effort to build a cost scenario that best represents the field operations performed using owned machinery and/or custom operators.

If *Use Owned Equipment Only* is selected, the machinery cost structure assumes the farm size/organization and the machinery complement initially specified at start-up and the default operations shown in the Non-Harvest Operations section. With this choice, the Non-Harvest Operations section is primarily available for reference purposes only. A 0.5 times over means that half the budget acreage is covered (for instance, with a spraying operation) annually or all the acres are covered every two years. Modifying the Non-Harvest Operations section will not change the default cost calculation for owned machinery (any frequency or timing revisions may influence the allocation of such costs if exported to a cash flow report, however). The user may enter cost revisions concerning owned machinery in the “Your Value” column in the Non-Harvest Machinery Cost summary. For assistance in calculating costs for a farm’s machinery complement, refer to MACHSEL<sup>2</sup>. If the user

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<sup>2</sup> Kletke, D and R. Sestak, “The Operation and Use of MACHSEL: A Farm Machinery Selection Template,” Computer Software Series CSS-53, Agricultural Experiment Station, Oklahoma State University, 1991.

changes any settings in the Parameters sheet via *View Parameters* (e.g., fuel prices), automatic cost revisions are made in the default column. Custom applications that are listed in the fertilizer or pesticide sections are included in total custom machinery costs within the Non-Harvest Machinery Cost summary.

1. If *Use Custom Work Only* is selected, the user may revise custom costs per acre by specifying the operations performed, frequency, and custom rate per acre in the Non-Harvest Operations section. The default custom rate data is based on OSU CR-205. Average custom rates for the Oklahoma reporting regions in the publication were selected to roughly correspond with the production regions in the budget template.

**Caution:** To prevent cost duplication, fertilizer and pesticide operations listed within the Non-Harvest Operations section are eliminated from cost calculations if custom applications in the Fertilizer and Pesticide sheets are also provided. It is recommended that further adjustments be performed separately in the fertilizer or pesticide information tables by identifying the custom operations with a custom application charge.

2. If *Use Owned Equipment and Custom Work* is selected, four categories of field operations (*Fertilizer, Pesticide, Planting, and All Other*) may be divided between either choice. If a category is identified as custom performed, a pop-up message reminds the user as to the operations that fall under the selection. As more field operation categories are custom performed, the costs for owned machinery decline accordingly. This may be a useful cost comparison when analyzing owned machinery and custom operations. For small operations or new machinery complements, the cost of custom work may be lower. If so, a choice to use the lower custom cost may be specified.

**Caution:** As mentioned with *Use Custom Work Only*, additional revisions may be made in the Non-Harvest Operations section. In addition, specified custom operations are identified as checked boxes at the left-hand side of the Non-Harvest Operations section. The user may make additional refinements as to the number of operations custom performed by checking or un-checking items. The user should press the *Recalculate Selected Custom Cost* button to update cost calculations if revisions are made. The user should make any necessary adjustments in the fertilizer or pesticide sections to avoid duplication in custom operations.

**Note:** While the user may make numerous revisions in the custom cost structure, automatic adjustments in owned machinery costs are limited by field operation category selections and parameter revisions.

Renting tractors and other farm equipment is another means of acquiring machinery services. The user may include non-harvest rental practices in the machinery section by following these steps:

Adjust fixed costs to zero in the “Your Value” column within the Non-Harvest Machinery Cost summary if all non-harvest machinery and equipment is rented; otherwise, lower fixed costs to omit the leased item(s).

1. Adjust variable costs if necessary. Since fuel, lubricant, and labor costs are the same whether a machine is owned or leased, these operating items may not need further adjustment. Repair costs for leased machines may need to be lowered, however. For example, short-term rental tractors have a considerably lower hourly repair cost than a tractor owned for its complete useful life.
2. Enter the rental cost in the Other Expense section. Since there are many arrangement variations (per day, week, month, etc.), the user will need to convert the rental (including any delivery costs) amount to an acre basis given the specified budget acreage.

Machinery operating costs only occur when a machine is used. Budget examples include fuel, lubrication, and repairs. Only implements with engines incur a fuel cost and the rate of fuel consumption depends on the PTO hp.

$$\text{Annual Fuel Cost} = \text{PTO hp} * \text{FCM} * \text{Fuel Price Per Gallon} * \text{HOURS}$$

FCM is the Fuel Consumption Multiplier and HOURS is the number of hours the power unit is used. The Fuel Consumption Multiplier is the rate of fuel usage in gallons per hour and is assumed to be 0.048.

Repair cost equations estimate the total annual repair costs based on the accumulated hours of lifetime use. Repair and maintenance calculations are based on ASAE referenced equations.

$$\text{Annual Repair Cost} = \frac{\text{List Price} * \text{RC1} * \text{RC2} * \text{Percent Life}^{\text{RC3}}}{\text{YEARS}}$$

RC1 is the ratio of total lifetime accumulated repairs to the initial list price of the machine. RC2 and RC3 determine the timing of repair costs over the life of the machine. Percent Life is the proportion of machine life that will have expired when the current operator trades in or no longer uses the machine. The estimated number of years of use is defined as YEARS. The formula for estimating percent life is:

$$\text{Percent Life} = \frac{\text{YEARS} * \text{HOURS}}{\text{Hours of Life}} * 100$$

Total annual machinery operating costs per complement are allocated to the enterprise by multiplying the implement's cost per hour by the number of hours per acre each machine is used in performing a field operation.

Machinery fixed costs accumulate whether or not a machine is used. Types of ownership costs include depreciation, interest, taxes, and insurance. Used equipment has lower ownership costs. However, increased repairs and down time may offset fixed cost savings.

Depreciation represents an attempt to spread the investment cost or purchase price of durable assets over their productive lifetime. It is typically the largest cost associated with ownership reflecting normal machine wear and obsolescence. Depreciation should reflect the actual decline of value during ownership and a modified double-declining balance method is used to illustrate

this relationship. The major modification is the addition of a factor that typically yields a high first year depreciation. Salvage value is determined by the following equation:

$$\text{Salvage Value} = \text{RFV1} * \text{List Price} * \text{RFV2}^{\text{Years}}$$

RFV1 is the proportion of the machine value remaining immediately after purchase. List price is the manufacturer's suggested selling price. RFV2 is the proportion of value remaining each successive year. Years is the number of years the machine is expected to be owned by the current operator.

Using the above salvage value formula, depreciation costs are estimated as:

$$\text{Annual Average Depreciation Cost} = \frac{\text{Purchase Price} - \text{Salvage Value}}{\text{Years}}$$

Purchase price is the actual dollar amount paid and may vary significantly from list price.

The fixed cost interest charge for machinery is based on the average amount of capital invested over the ownership period:

$$\text{Annual interest cost} = \frac{(\text{Purchase Price} + \text{Salvage Value})}{2} * \text{Machinery Interest Rate}$$

Since property taxes exist in Oklahoma, tax costs are estimated on agricultural machinery. The tax cost is based on the machinery purchase price and the tax rate for machinery specified on the Parameters sheet:

$$\text{Annual Tax Cost} = \text{Purchase Price} * \text{Machinery Tax Rate}$$

Insurance policies are usually carried on more expensive machines while the farmer usually assumes the risk of loss on simpler, less expensive assets. The insurance cost is based on the average amount of capital invested times the machinery insurance rate:

$$\text{Annual Insurance Cost} = \frac{(\text{Purchase Price} + \text{Salvage Value})}{2} * \text{Machinery Insurance Rate}$$

Annual machinery fixed costs per complement are allocated to an enterprise by multiplying the implement's cost per hour by the number of hours per acre each machine is used in performing a field operation.

*Machinery Labor* shown in the budget summary is the price for labor (found on the Parameters sheet) times the sum of machinery labor hours (found on the Machinery sheet) and harvest labor hours (found on the Harvest sheet). The hours of labor are directly related to the hours of machine operation. Labor hours are assumed to be ten percent greater than tractor hours, given extra time required for traveling to the tractor and servicing equipment. The user may change labor costs by changing the wage rates on the Parameter sheet or by changing labor usage per acre for owned machinery in the Harvest and Machinery sheets. If owner/operator labor hours are included in the budget, they are valued at the wage rate specified on the Parameters sheet. If

the budget information is exported to cash flow report, all labor costs are presumed to be cash costs.

### **Equipment – Blackberries and Grapes**

In the blackberries and grapes budgets, trellis system costs are summarized in the Equip(ment) sheet with a link to separate system inventories via the *Trellis System* button. Modifications or additions can be made directly in the green cells within the costs summary or through a form accessed by double-clicking the yellow cells in the trellis system table.

**Note:** The year of installation is necessary in order to accurately allocate construction and annual labor during the preproductive period. Repair costs are determined by the user as a percentage of the purchase price. See the machinery section for additional details on fixed costs.

### **Irrigation**

The user will not ordinarily access this sheet unless irrigation is specified via the start-up form. If you specify an irrigated crop at the beginning, direct links to Irrig(ation) sheet are through the *Irrigation Labor* or *Irrigation Fuel, Lube, Repairs* hyperlinks in the Operating Inputs section of the budget summary sheet. The user is offered a choice of several irrigation systems and pump power sources. Additional refinements that impact variable and fixed costs may be made by clicking the *Irrigation Details* button.

Total operating costs are dictated by the cost of water per acre-inch and the calculated total inches of water to be applied as shown in the Irrigation Costs summary. The amount of water required is based on system efficiency, average rainfall, and crop water requirements. By pressing the *View Avg. Rainfall* button, monthly average rainfall by region covering 30 years is available to evaluate the appropriate water application sequence by month. Default costs may be modified with entries in the “Your Value” column.

In addition to efficiency and water availability, the initial capital requirement is a fundamental component that influences the fixed costs of an irrigation system. Such determinations may be made in the Initial Irrigation Investment Cost section via the *Irrigation Details* button. Fixed cost items include depreciation, interest, insurance, and taxes.

Hours of irrigation labor per acre are generally greater for surface systems than with circular sprinkler irrigation. The wage rate provided in the Parameters sheet will also impact irrigation labor costs.

### **Cash Rent**

If cash rent is specified, the user is allowed to change the amount and payment month(s) via the *Adjust Rental Amount* button in the C(ash)Rent sheet.

### **Other Expense**

The Other Expense sheet includes items not accounted for in other sections. The user specifies the expense item, month of occurrence, and the dollars per acre expense.

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