Fixed Cost Amortization for Commercial Peach Orchards in the Texas Winter Garden

User's Guide

Overview

The purpose of this workbook is to provide a format and methodology for determining the annual development cost to be charged each year of mature peach orchard production. The workbook can be used in the planning of the peach orchard to estimate what this orchard development cost might be when the orchard reaches full mature production. A workbook with estimates can be updated with actual costs, expenditures and production parameters as they are incurred resulting in the calculated, rather than the estimated, development cost. The workbook can be used for existing orchards by entering the actual costs, expenditures and production parameters for the establishment and development of the orchard.

The workbook has three tabs that are explained below. The first tab is the Notes tab. The Notes tab details production assumptions used to determine the example numbers in some of the entry cells. The second tab is the Input Prices tab. The second tab is for specifying inputs and their prices. This tab is also for entering the output (peach) price. The third tab is the Establish and Develop Orchard tab. The Establish and Develop Orchard tab is for entering production parameters and any other necessary information. This tab also calculates and displays various results calculated from the information entered.

Entry cells on the Input Prices and Establish and Develop Orchard tabs are highlighted in red. Other cells on these tabs are protected. Entry cells will usually have example numbers in them. These example numbers are general estimates of prices the user may observe in 2019 or production parameters that may be applicable to the Texas winter Garden. The user should enter the actual prices and production parameters that the user experiences to determine an accurate peach development cost. After downloading the workbook from the web site and saving it on the user's computer, the user should save the workbook again with a new name for the user to enter information.

Notes

This tab details some of the production assumptions used to prepare this budget.

Note # 1 states that Extension District-10 is on the interface of two temperature different zones, one with 400-500 chilling hours and the other with 800-900 chilling hours. The chilling hours for your orchard are somewhere between these two temperature zones. For more information consult your local County Extension Agent.

Note # 2 (irrigation note) discusses how the number of emitters changes by year per each tree. For example, in year 1, there should be one 1 gallon per hour emitter per tree in the drip system. In year 3, there should be three 1 gallon per hour emitters per tree in the drip system. In year 6 there should be six 1 gallon per hour emitters per tree or one micro-sprinkler per tree.

In *Note # 3*, there is a recommendation to wrap aluminum foil around the tree trunk from ground level to 12" high at time of planting or to encase the young tree in a grow tube.

In *Note # 4* (fertilization note), in year 1 in May apply 1 pound of ammonium sulfate per tree. In year 2, fertilize four times, one time each in March, April, May, and June, applying ½ pound of ammonium sulfate at each application. In year 3, fertilize four times, one time each in March, April, May, and June, applying 1 pound of ammonium sulfate at each application. In year 4 and thereafter, fertilize 1 pound of ammonium sulfate per inch of tree trunk diameter, half at bud break, approximately March, and the other half in May if a crop makes.

Note # 5 (pruning note) deals with pruning labor costs. Prune each year in January (dormant season). In year 1, prune 5 minute per tree per year. In year 2, prune 10 minutes per tree. In year 3, prune 15 minutes per tree. In year 4 and afterward, prune 30 minutes per tree.

Note # 6, year 4 and every year thereafter, there will be a crop fruit thinning. Fruit thinning time is about 30 minutes per tree.

Note # 7 (harvest note), year 4 and thereafter, harvest in late May or early June. Harvest should be done 2 to 4 separate picks as fruit matures in different stages. Five years out of 10 there will be a good harvest yielding about 2 bushels per tree. There will be a partial crop 3 years out of 10 yielding about 1/4 to 1/2 bushel per tree. There will be a crop failure 2 years out of 10. A 2-bushel yield year requires about 15 minutes per tree to harvest.

Note # 8, water the orchard one time per week which is approximately equivalent to one inch of water per tree per week.

Note # 9 (spray note), year 2 and thereafter, spray dormant oil for scale just before bud break in late February or early March. Spray the whole tree, **coverage is key**. At petal fall in mid-April, spray 5 ounce/acre of Warrior Z or equivalent. At pre-harvest, say late May, spray 2 quarts/acre of Carbaryl 4L or equivalent for wasps and borers. Also, at pre-harvest, say late May, spray 3.2 quarts/acre of Captan 4L or equivalent.

Input Prices

The Input Prices tab is for entering input and output prices. This tab also has a cell, H2, to enter the year. There are four columns on this tab. The Item Name column contains the name of the item for which a price is to be entered. Some of these names are protected and others can be changed (see the chemical input groups discussed below). The Size displays any descriptive information for the item listed in the Item Name column. The Units column contains the physical units of the price of the item listed in the Item Name column. Some of these units are protected and others can be changed (see the chemical input groups discussed below). The Price column is for entering the price of the item listed in the Item Name column per unit listed in the Units column. Cells highlighted in red are unprotected entry cells.

Entries can be made as equations. In cell D40, an equation has been entered, =46/(4*2.5). The insecticide is sold in 2.5 gallon containers for $46 each. However, the insecticide is applied at a quart rate. To determine the insecticide's quart price, the 2.5 gallon price is divided by the number of quarts in 2.5 gallons, the (4*2.5) part of the equation.

The inputs and outputs are divided into twelve groups with various items in each group. These groups are now discussed.

Products

There is only one output for this enterprise, peaches. Enter the expected price received by the producer per bushel of peaches in the Price column.

Labor

Labor is divided into three categories to specify different wage rates. *Hand Labor* is for all labor that is not involved with irrigation or operates machinery. For this peach orchard development budget, Hand Labor is labor hired for pruning, fruit thinning and harvest (discussed below in the Establish and Develop Orchard section). *Irrigation Labor* is for labor hired to deal with the irrigation activities. *Operator Labor* is for labor hired to operate machinery and supervisory activities. Any and all of these wage rates can be the same if appropriate. If one or more labor categories are unpaid labor, such as, owner or family labor, the cost to hire the labor should be entered.

Miscellaneous

Diesel Fuel is for entering the price of off-road diesel per gallon. *Electricity* is for entering the price of electricity per kilowatt hour. *Gasoline* is for entering the price of gasoline per gallon. *Short-term Interest Rate* is for entering the annual interest rate charged on short-term bank loans or operating line of credit. *Intermediate-term Interest Rate* is for entering the annual interest rate charged on intermediate-term bank loans (more than one year and less than ten years) for example purchased machinery. *Crop Insurance-Peach* is for entering the price of crop insurance per acre. *Misc. Peach Overhead* is for entering the cost of other miscellaneous inputs and farm overhead per acre.

Custom Hire

Custom Spray is for entering the cost per acre to hire custom equipment and operator to apply chemicals. *Custom Apply Fertilizer* is for entering the cost per acre to hire custom equipment and operator to apply fertilizer.

Fertilizers

The Fertilizers group has three rows 28 through 30 for entering information. In the Item Name column, the fertilizer name in cell A28 can be changed by typing over it. If this fertilizer is not used, its name, units and price can be deleted. Additional fertilizers can be entered in cells A29 and A30. These fertilizer names will appear in the multi-year budget on the Establish and Develop Orchard tab. In the Units column, the units of the fertilizer in cell C28 can be changed by typing over it. Additional fertilizer units can be entered in cells C29 and C30. These fertilizer units will appear in the multi-year budget on the Establish and Develop Orchard tab. Enter the price of each fertilizer in the Price column. The user is responsible for checking that the price entered is for the units entered in the Units column.

Herbicides (or equivalent product)

The Herbicides group has three rows 33 through 35 for entering information. In the Item Name column, the herbicide name in cell A33 can be changed by typing over it. If this herbicide is not used, its name, units and price can be deleted. Additional herbicides can be entered in cells A34 and A35. These herbicide names will appear in the multi-year budget on the Establish and Develop Orchard tab. In the Units column, the units of the herbicide in cell C33 can be changed by typing over it. Additional herbicide units can be entered in cells C34 and C35. These herbicide units will appear in the multi-year budget on the Establish and Develop Orchard tab. Enter the price of each herbicide in the Price column. The user is responsible for checking that the price entered is for the units entered in the Units column.

Insecticides (or equivalent product)

The Insecticides group has six rows 38 through 43 for entering information. In the Item Name column, the insecticide names in cells A38 through A41 can be changed by typing over them. If any of these insecticides are not used, their names, units and prices can be deleted. Additional insecticides can be entered in cells A42 and A43. These insecticide names will appear in the multi-year budget on the Establish and Develop Orchard tab. In the Units column, the units of the insecticides in cells C38 through C41 can be changed by typing over them. Additional insecticide units can be entered in cells C42 and C43. These insecticide units will appear in the multi-year budget on the Establish and Develop Orchard tab. Enter the price of each insecticide in the Price column. The user is responsible for checking that the price entered is for the units entered in the Units column. Information in column G to the right of this group is common purchase container size.

Fungicides (or equivalent product)

The Fungicides group has three rows 46 through 48 for entering information. In the Item Name column, the fungicide name in cell A46 can be changed by typing over it. If this fungicide is not used, its name, units and price can be deleted. Additional fungicides can be entered in cells A47 and A48. These fungicide names will appear in the multi-year budget on the Establish and Develop Orchard tab. In the Units column, the units of the fungicide in cell C46 can be changed by typing over it. Additional fungicide units can be entered in cells C47 and C48. These fungicide units will appear in the multi-year budget on the Establish and Develop Orchard tab. Enter the price of each fungicide in the Price column. The user is responsible for checking that the price entered is for the units entered in the Units column. Information in column G to the right of this group is common purchase container size.

Seed/Plants

The Seed/Plant group is for entering information about the peach tree being planted. In the Item Name column, the tree name in cell A51 can be changed by typing over it. Enter the price of the peach tree in the Price column.

Residuals

The Residuals group is for entering a return per acre to the land the orchard is planted on. If the land is leased, the lease rate would be appropriate. If the land is owned, an appropriate land return would be, at least, the lease rate that the land could be leased to someone else. In the Item Name column, the land cost name in cell A54 can be changed by typing over it. Enter the price per of the land cost in the Price column.

Asset Repair and Maintenance

The Asset Repair and Maintenance group is for entering the per acre repair and maintenance expenses for machinery or equipment assets. *Implements* are machinery that do not propel themselves, such as disks, harrows, shredders, mowers, sprayers, or spreaders. *Tractors* are the machinery that pull, carry, or, power the implements. *Self-Propelled* are other self-powered machinery such as an ATV. *Drip System* is the drip irrigation system installed in the orchard. *Pickup* is the pickup truck or trucks used in the orchard.

One method to estimate the repair and maintenance expenses per acre for Implements, Tractors and Self-Propelled is to total the estimated annual repairs and maintenance for each machinery class and divide this total be the number of acres in the orchard, then multiplied by the percent of the equipment is used in the orchard if the equipment is also used for non-preach orchard activities. A similar method can be used form the Drip System class. For the Drip System class, the per acre repair and maintenance can be determined as described above and then the per acre cost divided by the acre-inches of irrigation applied. The number to enter for the Pickup class is the annual estimated annual repair and maintenance expense for the pickup or pickups.

Asset Fixed Expenses

The Asset Repair and Maintenance group is for entering the per acre fixed expenses for machinery or equipment assets. These fixed expenses are depreciation, investment cost (opportunity cost of investing in the asset), taxes, insurance, and, any other asset specific expenses not already identified. To estimate the annual depreciation of an asset, subtract any salvage value of the asset at the end of its useful life from the purchase cost (purchase price plus any delivery or setup costs) of the assets. Then divide this result by the years of assumed useful life of the asset when it was purchased. To estimate the annual opportunity investment cost of an asset, add the purchase cost to the salvage value and divide this total by two. Then multiply this result by the intermediate-term interest rate entered on the Input Prices tab.

Implements are machinery that do not propel themselves, such as disks, harrows, shredders, mowers, sprayers, or, spreaders. *Tractors* are the machinery that pull, carry, or, power the implements. *Self-Propelled* are other self-powered machinery such as an ATV. *Drip System* is the drip irrigation system installed in the orchard. *Pickup* is the pickup truck or trucks used in the orchard.

To estimate the fixed expenses per acre for Implements, Tractors and Self-Propelled, total the estimated annual depreciation, investment and other fixed expense for each machinery class and divide this total be the number of acres in the orchard, then multiplied by the percent of the equipment is used in the orchard if the equipment is also used for non-preach orchard activities. The number to enter for the Drip System and Pickup classes is the annual estimated

annual depreciation, investment and other fixed expense for the drip system and pickup or pickups, respectively.

Establish and Develop Orchard

The Establish and Develop Orchard tab is for entering production parameters and a few other items, calculating results, and displaying those results. This tab has three parts. The first part is Results in the box located in cells B2:O9. The second part is Establishment of Peach Orchard (Years 1-4) located in cells A12:G85 and its companion tree spacing in the box located in cells K15:O22. The third part is extra hand labor data and calculations located in I46:T74. Because it contains the entry cells for the production parameters of the multi-year development budget, Establishment of Peach Orchard (Years 1-4) will be discussed first, followed by Extra Hand Labor and Other Calculations and, then Results.

Establishment of Peach Orchard (Years 1-4)

This part of the Establish and Develop Orchard tab is for entering the amount of each input used (production parameter) per acre in each of the four peach orchard development years. Entry cells are highlighted in red. Tree spacing is specified in the tree spacing box located in cells K15:O22. The user should select one of the three tree spacing alternatives available and enter its letter in cell K17.

The Establishment of Peach Orchard (Years 1-4) table has seven columns. The *Item* column, column A, identifies the input for which information is to be entered in the columns to the right. The *Unit* column, column B, displays the units of the input displayed in the Item column from the Input Prices tab. The *Price* column, column C, displays the price of the input displayed in the Item column from the Input Prices tab. The next four columns, columns D through G, are for entering the quantity used of each input for each of the four years of peach orchard development.

The first item in the Establishment of Peach Orchard (Years 1-4) table is the *Yield Assumption*. The yield assumption is entered as a percentage of the full mature yield (discussed below) entered in the Results box. The default yield assumptions are: 0.00%, year 1; 20.00%, year 2; 60.00%, year 3; and, 80.00%, year 4.

There are sixteen groups of inputs in the direct expenses section of the table. Following the total of the direct expenses is the fixed expenses group of the table. This is followed by a total of the fixed expenses. Next is the residual items group of the table. Then, lastly, is the total annual cost.

The *Fertilizers* group lists the fertilizers entered on the Input Prices tab. Enter the amount per acre of each fertilizer used in each year in columns D through G.

The *Herbicides* group lists the herbicides entered on the Input Prices tab. Enter the amount per acre of each herbicide used in each year in columns D through G.

The *Insecticides* group lists the insecticides entered on the Input Prices tab. Enter the amount per acre of each insecticide used in each year in columns D through G.

The *Fungicides* group lists the fungicides entered on the Input Prices tab. Enter the amount per acre of each fungicide used in each year in columns D through G.

The *Tree* group lists the tree purchased entered on the Input Prices tab. Enter the number per acre of trees purchased in each year in columns D through G.

The *Overhead* group is for the Misc. Peach Overhead input. Typically, a 1 for one acre will be entered in each year in columns D through G. However, if the user would like to show more or less overhead in one of the years, a different number can be entered. For example, entering a 2 would double the overhead expense for the year, while entering .5 would half the overhead expense for the year.

The *Crop Insurance* group is for the Crop Ins-Peach input. Typically, a 1 for one acre will be entered in each year in columns D through G.

The *Operator Labor* group is for entering the hours of machinery operator labor, both, paid and unpaid, per acre per year for tractors and self-propelled machinery such as an ATV. The user could estimate these hours by dividing the estimated total tractor operator hours for each year by the orchard's acreage. For self-propelled machinery, the same calculation of dividing the estimated total self-propelled operator hours for each year by the orchard's acreage could be used to estimate the self-propelled operator hours per acre.

The *Irrigation* group is for entering the inches per acre of irrigation water applied each year to the orchard in columns D through G.

The *Irrigation Labor* group is for entering the hours of irrigation labor, both, paid and unpaid, per acre per year in columns D through G. The user could estimate these hours by dividing the estimated annual total irrigation labor hours for each year by the orchard's acreage.

The *Hand Labor* group displays the hours of special labor, both, paid and unpaid, per acre per year in columns D through G. These estimates were calculated from the number of trees per acre, the yield assumption and pruning, fruit thinning and harvest information from the Extra Hand Labor part discussed below.

The *Diesel Fuel* group is for entering the gallons of diesel fuel used in tractors per acre per year in columns D through G. The user could estimate these gallons by dividing the annual estimated total tractor diesel usage for each year by the orchard's acreage.

The *Gasoline* group is for entering the gallons of gasoline used in self-propelled machines (ATVs) and in pickups per acre per year in columns D through G. The user could estimate these gallons by dividing the annual estimated total self-propelled and pickup gasoline usage for each year by the orchard's acreage.

The *Electricity* group displays the kilowatt hours of electricity per acre per year in columns D through G. The electricity needed is calculated by multiplying the acre-inches of irrigation water entered on row 51 by 58.8 kWH per acre-inch.

The *Repair and Maintenance* group is for the repair and maintenance expense of each of the five types of machinery assets. For implements, tractors and self-propelled machinery, typically, a 1 for one acre will be entered in each year in columns D through G. However, if the user would like to show more or less repair and maintenance expense in one of the years, a different number can be entered. For example, entering a 2 would double the repair and maintenance expense for the year, while entering .5 would half the repair and maintenance expense for the year. For the drip system, the acre-inches of irrigation water entered on row 51 are used. For the pickup, enter a decimal for the percent of time the pickup or pickups are used for peach orchard development. For example, entering a .1 would indicate the pickup is used 10% of the time with the peach orchard, while .5 would indicate that it is used half the time for peach orchard development.

The *Interest on Operating Capital* group displays an estimate of the interest on operation capital per acre per year in columns D through G. The interest on operating capital is calculated by totaling all the expenses (price, column C times each of columns D through G) listed above then multiplying this total by the operating interest rate from the Input Prices tab. Because it is not known when inputs are purchased, it is assumed that operating capital is borrowed for six month. Therefore, the full year interest calculated is divided by two to reflect six months of interest.

The *Total Direct Expenses* row displays the total direct expenses (those expenses listed above) per acre per year in columns D through G. Total direct expenses are calculated by totaling all the expenses (price, column C times each of columns D through G) listed above then adding interest on operating capital.

The *Fixed Expenses* group is for the fixed expenses of each of the five types of machinery assets. For implements, tractors and self-propelled machinery, typically, a 1 for one acre will be entered in each year in columns D through G. However, if the user would like to show more or

less fixed expense in one of the years, a different number can be entered. For example, entering a 2 would double the fixed expense for the year, while entering .5 would half the fixed expense for the year. For the drip system and pickup, enter a decimal for the percent of time the assets are used for peach orchard development divided by the acreage of the peach orchard. For example, if the asset is used 10% of the time with a five acre peach orchard, .02 should be entered (0.1/5=0.02).

The *Total Fixed Expenses* row displays the total fixed expenses from the Fixed Expenses group above per acre per year in columns D through G. Total fixed expenses are calculated by totaling all the fixed expenses (price, column C times each of columns D through G) listed above in the Fixed Expenses group.

The *Residual Items* group is for the land charge, either rent or return to land, per acre. Typically, a 1 for one acre will be entered in each year in columns D through G.

The *Total Annual Cost* row displays the total annual cost per acre per year in columns D through G. The total annual cost is calculated by totaling the total direct expenses, the total fixed expenses and the land charge.

Extra Hand Labor and Other Calculations

This part of the Establish and Develop Orchard tab is for displaying the data and calculations used to determine special labor for pruning, fruit thinning and peach harvest, and, calculations of default values for pickup gasoline use and fixed expenses and expected mature yield.

Pruning information is located in cells I48:L52. These pruning times in minutes per tree are typical for the Winter Garden area of Texas for each year of peach tree development.

Fruit Thinning information is located in cells I54:T59. The average fruit thinning labor per acre of a mature orchard over ten years is calculated. Notice that it is assumed that there will be five years with a full crop, three years with a partial crop and two years with no crop. The calculations result in an estimate of the average required fruit thinning labor per acre of 30 labor hours. The 30 hours of special labor are multiplied by the yield assumptions in row 16 in calculations to reflect the lower peach production during orchard development years.

Harvest information is located in cells I62:T67. The average harvest labor per acre of a mature orchard over ten years is calculated. Notice that it is assumed that there will be five years with a full crop, three years with a partial crop and two years with no crop. The calculations result in an estimate of the average required harvest labor per acre of 60 labor hours. The 60 hours of special labor are multiplied by the yield assumptions in row 16 in calculations to reflect the lower peach production during orchard development years.

Other Calculations are located in cells I73:M74. These calculations create some factors based on special labor hours that are used to estimate pickup gasoline use and fixed expenses.

Expected Mature Yield per Tree is located in cells I78:K84. In cells I80:I82 are the years that a certain yield is expected during a 10 year period. The associated yields are in cells K80:K82. An average of these yields is calculated and displayed in cell K84. This expected yield per tree is multiplied by the number of trees to calculate a default mature orchard yield per acre in cell M2.

Results

This part of the Establish and Develop Orchard tab is for entering three pieces of information and displaying and calculating intermediate and final results including the annual amortized peach orchard development cost to be charge against each year of mature orchard production. The Results box is located in cells B2:O9. For the user's reference the peach price per bushel from the Input Prices tab is displayed in cell D8. The Result box has three entry cells, seven calculation or display columns and three other calculation cells.

The *Mature Orchard Yield per Acre* should be entered in cell M2. The mature orchard yield is used to calculate the estimated development year yields. The expected yield per tree from cell K84 is multiplied by the number of trees from cell N18 to calculate a default mature orchard yield per acre in cell M2. This value can be changed to a more appropriate number by typing the better number in the cell over the equation.

The *Years Life of a Peach Orchard* should be entered in cell M3. The years of life of the peach orchard is the total expected years of the orchard's life including all development years.

The *Years of Development* should be entered in cell M4. The years of development is assumed to not be more than four years.

The *Year* column displays the year of peach orchard development for which the table row contains information.

The *Yield* column calculates and displays the projected peach yield in bushels per acre for each development year. The projected peach yield is calculated by multiplying the yield assumptions in row 16 by the mature orchard yield in cell M2.

The *Revenue* column calculates and displays the projected peach revenue per acre for each development year. The projected peach revenue is calculated by multiplying the yield column by the peach price per bushel in cell D8.

The *Direct Cost* column displays the annual total direct expenses from row 71 for each peach orchard development year.

The *Fixed Cost* column displays the annual total fixed expenses from row 80 for each peach orchard development year.

The *Land* column displays the annual land charge from row 83 for each peach orchard development year.

The *Net Revenue* column displays the annual net revenue for each peach orchard development year. The net revenue is calculated by subtracting the direct cost, fixed cost and land columns from the revenue column.

In cell I7, the *Total* net revenue for the peach orchard development years is totaled and displayed.

In cell J7, the *Average* amortized development cost for the peach orchard is calculated and displayed. The amortized development cost for the peach orchard is calculated by dividing the total net revenue in cell I7 by the number of years of mature peach orchard production. The number of years of mature peach orchard production is calculated by subtracting the years of orchard development, cell M4, from the expected years of life of the orchard, cell M3.

The Annual Peach Orchard Fixed Cost Charge is displayed in cell L8. This is the development cost to be charged against each year of mature orchard production. Cell L8 displays the value in cell J7. However, if total revenue during the development period is greater than total expenses, there are no development costs to be allocated and cell L8 is set to 0. Also, cell L9 will display the following message, “Total revenue during the development period is greater than total expenses."