

MODULE 4: ICT in Support of Farming

LESSON 3: Record Keeping II

TIME: 1 hour 36 minutes

AUTHOR: Andrew Moore

This lesson was made possible with the assistance of the following organisations:



**BILL & MELINDA
GATES foundation**



Farmer's Agribusiness Training by [United States International University](http://www.usiu.edu) is licensed under a [Creative Commons Attribution 3.0 Unported License](https://creativecommons.org/licenses/by/3.0/).
Based on a work at www.oerafrica.org

LESSON

3

RECORD KEEPING II



TIME:

**1 hour 36
minutes**

AUTHOR:

Andrew Moore



OUTCOMES:

By the completion of this lesson you will:

- Be aware of what farming activities could be considered 'Enterprises' and should be incorporated into an Enterprise Accounting spread sheet.
- Use functions to calculate totals and averages within the spread sheet program.
- Create a customised formula using a spread sheet program.
- Have customised the Enterprise Accounting template to better reflect actual farming enterprises.

INTRODUCTION:

This lesson continues on from Lesson 2 with an investigation into ways ICT can support farmers with record keeping. In the previous lesson we showed you the Enterprise Accounting system and also introduced you to a spread sheet program called Excel. The intention of this lesson is to spend more time working with Excel so that you can evaluate whether spread sheets add value to your farming operations.

ENTERPRISE ACCOUNTING USING A SPREAD SHEET

In the previous lesson we introduced Enterprise Accounting but did not spend much time considering what exactly an enterprise was. We used maize production and cattle rearing as two examples of an enterprise. A farming enterprise, however, can be any activity identified according to receipts and expenses. Castle and Becker (1987) have defined three classifications:

1. *Production Enterprises*. Typically, activities that produce marketable commodities and include crops such as plantain, cassava, coffee, tea, maize etc. It would also include livestock of any description; chickens, cattle, goats etc.
2. *Service Enterprises*. Perhaps you have not considered machinery and equipment services or your own on-farm shop? These also constitute an enterprise and should be tracked.
3. *Holding Enterprise*. Elsewhere in this course, you have been encouraged to think about storing your produce to capitalise on times of shortage when prices are higher. The activity of storing and protecting your produce is in itself an enterprise with its own expenses.

So you can see that the spread sheet grid we developed previously, which has only two enterprises, might be inadequate for your own operations.

Activity 1



Farming Enterprises at Windsor and at Home (15 minutes)



Watch the Windsor Farm Case study again. This time identify the enterprises that are currently running at the farm according to the video. If they were to use the Enterprise Accounting systems how many enterprise columns would they need?



Access the video case study from the course CD ROM:
See *Resource Index | Module 4 | Lesson 3 | Case Study*

Questions:

(In your journal record the answers to these questions)

1. List the activities at Windsor that could be considered farming enterprises.
2. Next to each item in your list categorise it according to 'Production', 'Services' and 'Holding'.
3. Now consider your own farming operations and see if you can create a similar list.
4. Categorise your list using the same enterprise descriptions.




See the Feedback section at the end of this lesson to see a model answer or comments about this activity


Additional Spread Sheet Skills

Let us use enterprise categorisation to fine tune our spread sheet skills. In lesson 2 we asked you to create and save an empty Enterprise Accounting spread sheet. Retrieve this file.

Activity 2

Retrieving a spread sheet file (4 minutes) 

Watch the video clip that shows you how to retrieve files. Otherwise, follow the instructions below. A word of warning, you need to be sitting at the same computer on which you created the spread sheet as you were instructed to save it on the local drive.

 Access the video demonstration from the course CD ROM: See *Resource Index | Module 4 | Lesson 3 | Excel: Retrieving Files*

Steps:

1. Click on the 'Start' button in the bottom left hand corner of the screen.
2. Select 'All Programs' from the menu
3. Scroll down the new menu until you identify the Microsoft Office folder. Click it to reveal the sub menu items.
4. Click 'Microsoft Excel 2010'. The spread sheet program should open with a blank sheet.
5. Now click on the green 'File' tab and select 'Open'.
6. Look for the file called, *YourNameEnterpriseGrid*, and double click it. The program should open your file.

You should have a grid that looks like this:

Date / Description	Income			Expense			Enterprise			
	Calves	Cull Cows	Maize	Feed	Supplies	Fuel	Cattle		Maize	
							Income	Expense	Income	Expense
Total										

Fig 1: Empty Grid

Activity 3



Inserting data and new columns (15 minutes)



This worksheet, (a spreadsheet is made up many worksheets), has two enterprises; Cattle and Maize. Edit the worksheet so that the enterprise column reflects activities on your farm. Also add in new enterprises identified in activity 1. Then load data into the other fields (cells) in the worksheet. To guide you in completing these tasks watch the video on, 'Inserting Data and New Columns'.



Access the video demonstration from the course CD ROM: See *Resource Index | Module 4 | Lesson 3 | Excel: Inserting Data*

Sum and Average Functions

It is time to get the spread sheet program to show off its power. Up until now, we the users have done all the work! We are going to get the program to add a column of figures and also show you how to get the machine to painlessly calculate averages.

Functions are ready made formulas that have a particular... function! Click the 'Formula' menu tab at the top of the screen and you will see the program has an AutoSum button. Click the Σ section of this button to reveal other functions that are regularly used. They include Sum, Average, Count Numbers, Max and Min.

Access the video case study from the course CD ROM:
See *Resource Index | Module 4 | Lesson 3 | Excel: Sum Function*

Activity 4



Sum (15 minutes)



To find the sum (total) of a column of figures there are two popular ways to do this. The easiest is to select the column of figures and include a blank cell where you want the answer to appear and then click the Σ *Auto Sum* button. The second way is to construct the sum formula in the cell where the answer should appear.

For example type `=SUM(A2:A10)`.

Watch the video, 'Sum', to see how to do this and then add up all the columns in your worksheet. Your answers should appear in the pink cells entitled 'Total' at the foot of each column.

Activity 5



Average (10 minutes)



Watch the video, 'Average', to see how to command the computer to calculate the average of rows, columns or selected cells.

The average formula that needs to be inserted in the answer cell looks something like this; `=AVERAGE(A2:A10)`.

Although not strictly required for Enterprise Accounting, calculate the average expenditure on 'Supplies'.



Access the video case study from the course CD ROM:
*See Resource Index | Module 4 | Lesson 3 | Excel:
Average Function*

Create a Formula

While functions are very handy the developers of this program cannot anticipate everything you might want to do. They therefore expect you to be able to develop your own formulas as and when you need them. As long as you are aware of the available formula operators this is simpler to do than it sounds. Here are the principal operators:

Operator Symbol	Description	Example of Use
=	means what follows is a formula	=AVERAGE(A2:A10)
+	ADD values in certain cells.	=(A2)+(A13)
-	SUBTRACT values in certain cells.	=(B3)-(C3)
/	DIVIDE values in certain cells.	=(C7)/(B2)
*	MULTIPLY values in certain cells	=(C7)*(A3)

Table 1: Spread Sheet Operators

In the cell where you want the answer to appear construct your formula starting with an = symbol. Your formula can be quite sophisticated including a number of operators in one formula. If you do mix your operators, you need to use 'BODMAS' to ensure your calculation is accurate:

- B** Brackets first,
- O** Orders (Powers or Square Roots),
- DM** Division and Multiplication (working from left to right),
- AS** Addition and Subtraction (working from left to right).

An example of a formula mixing operators:

=(A2)*((B2)+(C2))

Here it is necessary to add the values in B2 and C2 before multiplying the sum by the value in A2. If you write the formula including the brackets the computer will calculate the answer correctly, otherwise it will simply work from left to right multiplying A2 and B2 first before adding C2 to the product. This would give you a very different answer.

Activity 6



Create a formula (15 minutes)



Let's see if you can devise the correct formula to work out the difference between Income and Expense in the Enterprise columns of the worksheet. In the pink row below the 'Totals' row and in the Enterprise Cattle column, insert a formula that works out the difference between Income and Expense. This is important because it will indicate to what extent the enterprise has been profitable. In the example table we inserted the formula twice, once for Cattle and again for Maize. Copy the formula into as many Enterprise columns as you have created to find their profitability.

Conclusion



Excel spread sheets get easier the more you use them and to be honest we have only scratched the surface. There is so much more you can do with them. We would recommend you spend some more time on the Internet looking at some of the online tutorials that will show you how to really exploit their power. These tutorials are listed in the Enrichment Resources section below. This lesson also showed a simple way to assess profitability of various farming activities. Think about what this data is telling you about which activities are adding value and which ones should be dropped.

Summary

The main points of this lesson are:

Record Keeping

- A farming enterprise is any activity that generates receipts and expenses.
- Farming 'enterprises' can be categorised as either Production, Service or Holding enterprises.

Spread Sheets

- It is important that Excel users are familiar with cell references, inputting of data and can adapt cell widths and formatting.
- Popular functions include: SUM and AVERAGE as well as COUNT, MAX and MIN.
- Formulas are used when no function is appropriate.
- Formulas are created using operators and cell references.

Operators include:

- = (formula),
- + (ADD),
- (SUBTRACT),
- / (DIVIDE) and
- * (MULTIPLY)

Enrichment Resources



A] Excel Video Tutorials

- About - The Auto Sum Function:
<http://video.about.com/spreadsheets/Autosum.htm>
- About - How to Make Charts in Excel:
<http://video.about.com/spreadsheets/Charts-in-Excel.htm>
- About - How to Sort Information:
<http://video.about.com/spreadsheets/Sorting.htm>
- Baycon - Basic Excel 2007 Tutorial:
http://www.baycongroup.com/excel2007/01_excel.htm
- Excel Internet Library:
http://www.businessbookmall.com/microsoft_excel_directions_for_beginners.htm
- Microsoft - Excel Tutorials for versions 2003, 2007 and 2010:
<http://office.microsoft.com/en-gb/excel-help/>
- Barak Sofer – Microsoft Excel Training:
<http://www.free-training-tutorial.com/>

B] More on Enterprise Accounting

- Frank, G. (1997). *Enterprise Accounting*. Available online:
<http://cdp.wisc.edu/Resources/crop/general/enteracc.pdf> Accessed: 02/12/2010
- Free Enterprise Accounting Software: BS1 Enterprise Accounting (2009): http://download.cnet.com/BS1-Enterprise-Accounting-Free-Edition/3000-2067_4-10657637.html

Glossary



Specialist words with definitions:

Enterprise Accounting: Enterprise accounting requires that income and expense information be assigned to the farm enterprise that generated that income or expense.

Expenses: In common usage, an expense or expenditure is an outflow of money to another person or group to pay for an item or service, or for a category of costs. For a tenant, rent is an expense. For students or parents, tuition is an expense. Buying food, clothing, furniture or an automobile is often referred to as an expense. An expense is a cost that is "paid" or "remitted", usually in exchange for something of value. (Wikipedia: <http://en.wikipedia.org/wiki/Expenses>)

Income: The consumption and savings opportunity gained by an entity within a specified time frame, which is generally expressed in monetary terms. However, for households and individuals, "income is the sum of all the wages, salaries, profits, interests payments, rents and other forms of earnings received... in a given period of time." For firms, income generally refers to net-profit: what remains of revenue after expenses have been subtracted (Wikipedia: <http://en.wikipedia.org/wiki/Income>)

Spread Sheet: A spread sheet is a computer application that simulates a paper, accounting worksheet. It displays multiple cells that together make up a grid consisting of rows and columns, each cell containing alphanumeric text, numeric values or formulas. A formula defines how the content of that cell is to be calculated from the contents of any other cell (or combination of cells) each time any cell is updated. Spread sheets are frequently used for financial information because of their ability to recalculate the entire sheet automatically after a change to a single cell is made. (Wikipedia: <http://en.wikipedia.org/wiki/Spreadsheet>)

Work Sheet: A worksheet is a single page or sheet in an Excel spread sheet. By default, there are three worksheets per file. Switching between worksheets is done by clicking on the sheet tab at the bottom of the screen. (About.com: http://spreadsheets.about.com/od/uvw/g/worksheet_def.htm)

Glossary (continued...)

Operators: A mathematical operator is the symbol or sign that represents an arithmetic operation in an Excel spreadsheet formula. The mathematical operators used in Excel formulas are similar to the ones we use in math class: Subtraction - minus sign (-), Addition - plus sign (+), Division - forward slash (/), Multiplication - asterisk (*), Exponentiation - caret (^).

(About.com: http://spreadsheets.about.com/od/glossary/g/math_operator.htm)

BODMAS: In mathematics and computer programming, the order of operations (more formally precedence rule) is a rule used to unambiguously clarify which procedures should be performed first in a given mathematical expression. For example, in mathematics and most computer languages multiplication is done first; in the expression $2 + 3 \times 4$, the correct answer is 14. Parentheses, which have their own rules, may be used to avoid confusion, thus the above expression may also be rendered $2 + (3 \times 4)$.

(Wikipedia: <http://en.wikipedia.org/wiki/BODMAS>)

References

1. Carkner, RW. (2000). *Farm Business Records*. Cooperative Extension Washington State University. Available online: <http://cru.cahe.wsu.edu/CEPublications/eb1904/eb1904.pdf> Accessed 02/12/2010.
2. Castle, Becker & Nelson. (1987). *Farm Business Management: The Decision Making Process*. 3rd Edition. MacMillan.

Feedback



Feedback Activity 1

1. Pigs, Cattle, Chickens, Slaughtering, Feed Creation were mentioned. We did not hear about refrigeration or packaging which might happen if they have to supply merchandise to various restaurant chains in Nairobi. These activities could also be considered separate enterprises.
2. Possible categorization:
 - a. Pigs (Production)
 - b. Cattle (Production)
 - c. Chickens (Production)
 - d. Slaughtering (Services)
 - e. Creation of Nutritious Feed (Services)



Feedback Activity 6

The formula required is a simple subtraction. For our sample worksheet the formula was $= (H10) / (I10)$ or Total Cattle Income subtract Total Cattle Expenses. A positive answer indicates a profit while a negative answer shows a loss.