

18. Hands-On: Using Excel Effectively

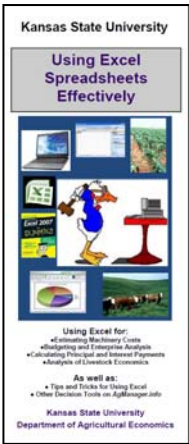
Rich Llewelyn

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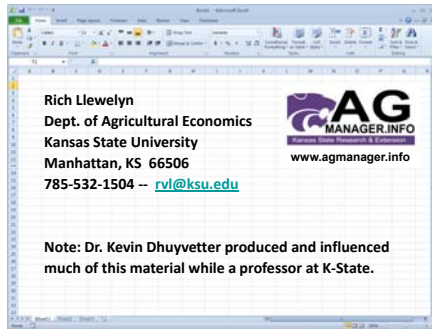
Rich Llewelyn is an Extension Assistant in the Department of Agricultural Economics at K-State. Raised on a farm near Riley, KS, he is a three-time graduate of K-State with a B.S. degree in Agronomy, and a Masters and PhD in Agricultural Economics. He then spent 13 years teaching economics and working with urban and rural community development in East Java, Indonesia before returning to Kansas in 2006 to work with the AgManager.info website and departmental conferences, including the Risk and Profit conference. He has also taught the "Price Analysis and Forecasting" course for undergraduate students and uses Excel in class as well as for a multitude of uses.

Abstract/Summary

The ability to use Excel spreadsheets allows users to have the capability to benefit from the many Excel calculators and tools publicly available. This two-hour workshop will provide hands-on Excel training. The workshops will use laptop computers to allow participants to create their own spreadsheets. Various spreadsheets will be created which will teach the following skills: creating appropriate mathematical formulae and using the correct functions, linking between sheets, using absolute and relative references, formatting, copying, look-up tables, and what-if analysis. In addition, a portion of the session will introduce several of the Excel tools on the AgManager.info website.



Using Excel Spreadsheets Effectively MAST 2015-2016



Types of software applications...

- Word processor
- Spreadsheet
- Presentations
- Database
- Publishing
- Accounting
- Communications
- Statistical/numerical
- GIS
- Adobe acrobat (PDF)
- Other

Types of software applications...

It is important to have the right software/tool for the job at hand...

... however, the capabilities of many software programs often overlap, so it generally will not be necessary to have every type of software program.

Spreadsheets – the world runs on spreadsheets!

Major spreadsheets available

- Excel (Microsoft)
- Lotus (IBM)
- Quattro Pro (Corel)

All three have similar capabilities and are “reasonably” compatible.

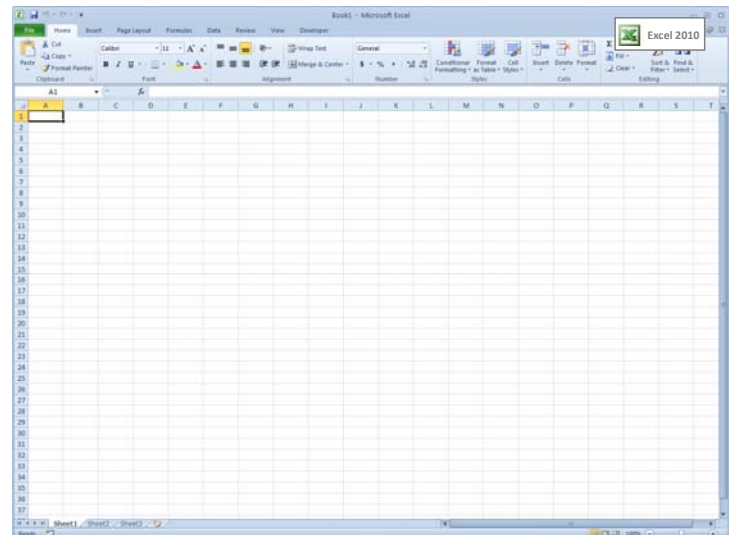
Spreadsheets...

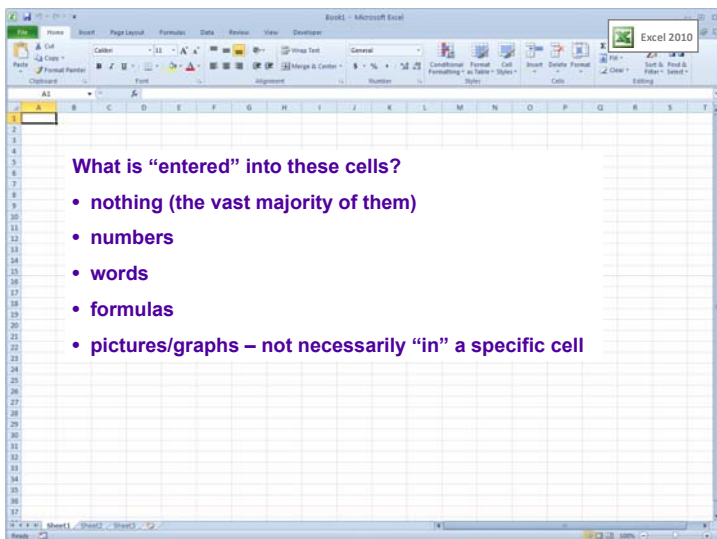
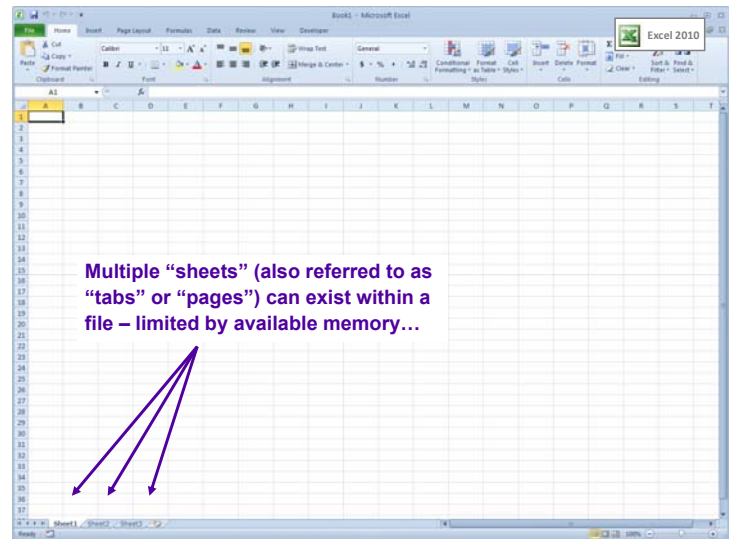
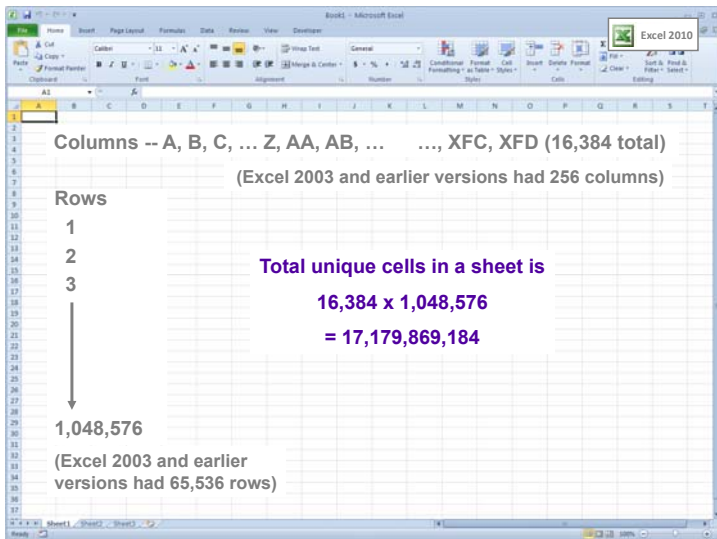
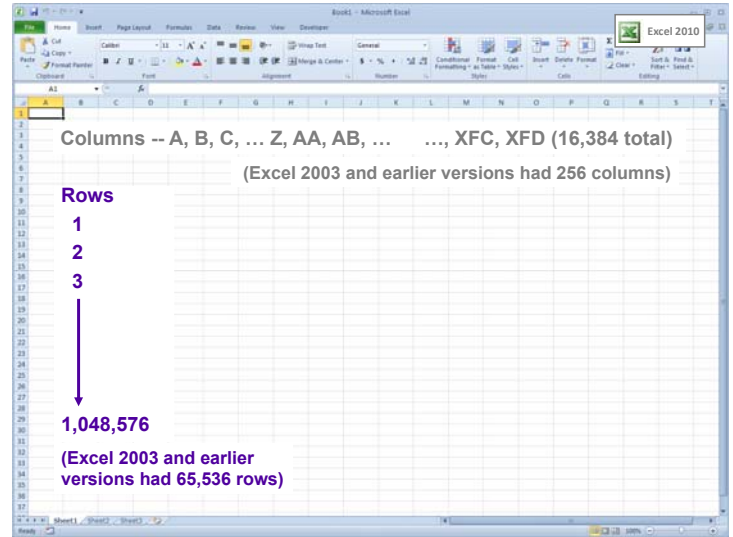
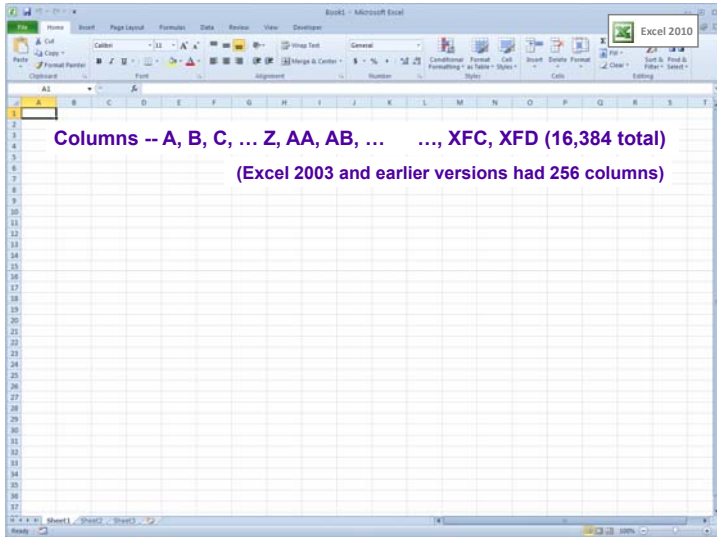
Replace calculator/worksheets

Very useful for ...

- Budgeting (“what if analysis”)
- Data storage/analysis
- Financial/production reports
- Anything numbers oriented

Advantage: numerical visualization



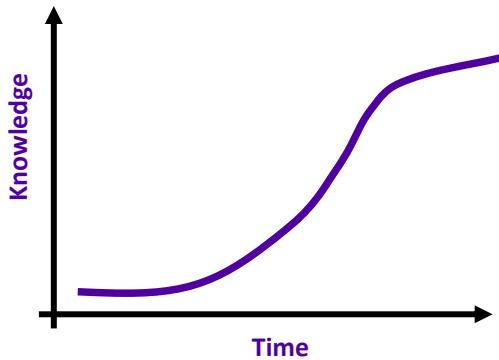


Spreadsheets...

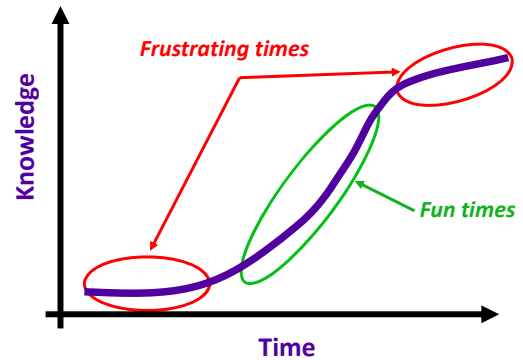
Don't limit your thinking!!!

The capabilities of spreadsheets are much greater than most people realize!

Hypothetical learning curve



Hypothetical learning curve



Spreadsheets...

You need to “invest” your time to make software productive.

Books, classes, videos, etc. are good references, but you still need to do the hands-on work if you really want to learn about the potential uses and value this tool brings to you.

Random thoughts...

- Black swan phenomenon: $\frac{1}{3} + \frac{-4}{6} = \frac{-3}{9}$
- Always a better way
- No numbers in formulas
- Save/rename files (saving files off web)
- Multiple ways to do things
 - keyboard vs mouse
- Organizing data
 - rows vs. columns
 - multiple tabs and files

Random thoughts...

- Mistakes? Outdated? Truth?
- Would a calculator/worksheet be the route to go?
- Formatting – how important is it?
- Documenting your thoughts and procedures with text in the spreadsheet
 - text in cell, cell comment, color, etc.
- Value in consistency across tabs/sheets

Random thoughts...

The power of ones and zeros ...

An easy way to do conditional statistics using the sumproduct command, along with ones and zeros, to eliminate the need for repeatedly re-specifying formulas.

Before we get started...

Your use of spreadsheets...

- What spreadsheet brand do you use?
- Frequency/intensity of use
- Examples of uses
- Good experiences
- Bad experiences
- What are you wanting to learn today?
- Other comments/questions

What are we going to do?

- Create several new spreadsheets
 - Machinery cost estimates
 - Crop budgets and breakevens
 - Loan payment and sales of commodities
 - 205-day adjusted weaning weights

Example 1 -- Machinery costs

- Determine the total machinery costs per acre for each crop.
- Calculate the total acres of each operation for the farm.
- Estimate the costs per acre for each crop by machinery cost category.
- Estimate the total costs by category for each crop enterprise and the total for the farm.
- How would the total machinery costs for the farm change if the wheat were planted no-till (cost of drilling increases from \$12.40/acre to \$15.40/acre) and the three tillage operations were replaced with three herbicide applications?

Operation	Wheat \$/acre	Wheat operations	Milo \$/acre	Milo operations	Soybeans \$/acre	Soybeans operations	Farm Total
Chisel	\$12.99	1.0	\$12.99	0.0	\$12.99	0.0	800
Disks	\$11.60	1.0	\$11.60	0.0	\$11.60	0.0	800
Field cultivate	\$10.93	1.0	\$10.93	0.0	\$10.93	0.0	800
Planting	\$14.93	1.0	\$14.93	1.0	\$14.93	1.0	1,600
NH3 app.	\$13.49	1.0	\$13.49	1.0	\$13.49	1.0	1,200
Fertilizer app.	\$5.95	0.0	\$5.95	1.0	\$5.95	1.0	800
Herbicide app.	\$6.01	1.0	\$6.01	2.0	\$6.01	3.0	2,800
Insecticide/fungicide app.	\$6.06	1.0	\$6.06	0.0	\$6.06	0.0	800
Harvest	\$28.19	1.0	\$28.12	1.0	\$27.14	1.0	1,500
Insurance and shelter	\$3.65	0.0	\$3.65	0.0	\$3.65	0.0	800
Total	\$115.19	8.0	\$101.17	6.0	\$78.08	6.0	11,200

Machinery Costs by Category	\$/acre	enterprise	\$/acre	enterprise	\$/acre	enterprise	Total
Fuel and oil	\$24.42	\$19,536	\$21.45	\$8,579	\$16.55	\$6,621	\$34,737
Repairs	\$18.78	\$15,021	\$16.49	\$6,596	\$12.73	\$5,091	\$28,708
Labor	\$28.57	\$22,854	\$25.09	\$10,036	\$19.36	\$7,746	\$40,635
Depreciation	\$24.77	\$19,813	\$21.75	\$8,701	\$16.79	\$6,715	\$35,228
Interest	\$14.51	\$11,611	\$12.75	\$5,099	\$9.84	\$3,935	\$20,645
Insurance and shelter	\$4.15	\$3,317	\$3.64	\$1,457	\$2.81	\$1,124	\$5,899
Total	\$115.19	\$92,152	\$101.17	\$40,468	\$78.08	\$31,232	\$163,852

Example 2 – Crop budgets and breakeven yields and prices

- Calculate your total cost per acre and the expected returns per acre on each crop for the coming year as well as the total costs for the 160 acres.
- Given your costs, prices and government payment, calculate the yield where you would breakeven (i.e., net return = 0). Given the costs, yields, and government payment, calculate your breakeven price.
- Identify the maximum amount you could pay for cash rent based on the costs, yields, prices, and government payments given (i.e., the returns over costs if you paid 100% of costs and received 100% of income).

Share	Wheat	Share	Milo	Share	Soybeans	Total	
100.0%	\$16.00	100.0%	\$18.90	60.0%	\$61.60	\$3,514	
100.0%	4.19	60.0%	49.30	60.0%	35.79	\$2,377	
66.7%	14.84	60.0%	0.00	60.0%	19.20	\$1,252	
66.7%	70.14	60.0%	83.36	60.0%	20.18	\$6,228	
0.0%	5.00	0.0%	5.00	0.0%	5.00	\$0	
66.7%	5.17	60.0%	7.05	60.0%	6.26	\$595	
100.0%	0.00	100.0%	0.00	100.0%	0.00	\$0	
100.0%	115.19	100.0%	101.17	100.0%	78.08	\$16,385	
100.0%	15.00	100.0%	15.00	100.0%	15.00	\$2,400	
100.0%	8.50	100.0%	6.50	100.0%	8.50	\$1,040	
Total cost	\$216.98		\$225.40		\$185.40	\$33,790	
Yield	65.7%	56	60.0%	88	60.0%	36	n/a
Price	60.0%	\$5.10	100.0%	\$3.45	100.0%	\$9.05	n/a
Gov't payment	66.7%	\$4.00	60.0%	\$7.00	60.0%	\$0.00	\$381
Total income		\$193.07		\$186.36		\$195.48	\$30,719
Net return to producer		-\$23.91		-\$39.04		\$10.08	-\$37.01
Break-even yield		63.0		106.9		34.1	n/a
Break-even price		\$5.74		\$4.19		\$8.58	n/a
Total returns over total costs		\$37.57		\$24.32		\$78.19	\$7,106

Formulas are linked to Machinery costs tab

Example 3 – Determining loan payment and sales

1. Determine what the annual amortized payment is on your loan.
2. Identify the quantities of calves, wheat, and milo that will need to be sold to cover the entire loan payment.
Constraints – at least 20% of the income needed must come from each of the three commodities, but no more than 50% can come from any one commodity and your total sales should not exceed the total loan payment by more than \$2,000. Sales of wheat and milo must be in 500 bushel increments (i.e., 500, 1000, 1500, etc.).
3. Identify the value of your inventories prior to making sales as well as after sales are made. Also, identify what percent of total revenue comes from each commodity.

The spreadsheet shows the following data:

Beginning Inventory		Sales		Ending Inventory	
Quantity	Value/unit	Quantity	Value	Quantity	Total value
Steer calves	33	12	\$15,475.20	21	\$27,081.60
Wheat	8,500	2,000	\$10,200.00	6,500	\$33,150.00
Milo	13,000	3,000	\$10,350.00	10,000	\$34,500.00
Total			\$36,025.20		\$94,731.60

Other data from the spreadsheet:

- Principal: \$150,000
- Interest rate: 6.20%
- Years: 5
- Loan payment: \$35,851.98
- Difference between sales and payment: \$173.22

Example 4 – Calculating 205-day adjusted weaning weights

1. Calculate the age at weaning (days) for each calf, ADG, 205-day weight, and 205-day weight adjusted for age of dam and sex of calf and index.
2. Calculate the average, minimum, maximum and range for all date, age, and weight variables. Also, calculate the percent of calves that are steers.
3. Construct a graph that compares the actual versus the 205-day adjusted weaning weights for your calves.

The spreadsheet displays a table of calf data and summary statistics:

Cal#	Date of birth	Birth weight	Sex	Age of dam	Weaning weight	Age at weaning	ADG	205 day wt.	Dam adj.	205-day Adj. WW	Index	Age of dam	Male	Female
10-1	02/18/15	93	1	6	610	238	2.17	538	0	538	0.961	2	60	54
10-2	03/18/15	78	1	2	875	211	2.36	561	60	621	1.109	3	40	36
10-3	03/18/15	81	0	2	540	211	2.18	527	54	581	1.043	4	20	18
10-4	03/24/15	85	1	5	585	205	2.44	585	0	585	1.045	5	0	0
10-5	03/20/15	88	0	7	510	200	2.21	521	0	521	0.936	6	0	0
10-6	04/02/15	74	0	4	605	196	2.20	525	13	543	0.975	7	0	0
10-7	04/02/15	83	1	12	535	196	2.23	540	20	560	1.000	8	0	0
10-8	04/02/15	89	1	8	490	196	2.15	509	0	509	0.910	9	0	0
10-9	04/11/15	76	0	3	605	187	2.29	546	36	582	1.046	10	0	0
10-10	04/15/15	73	1	6	495	183	2.31	546	0	546	0.975	11	20	18
												12	20	18
Average	03/26/15	78.0	0.60	5.5	534	202	2.25	540	18.8	599	1.000	13	20	18
Minimum	02/18/15	68.0	0.00	2.0	490	183	2.15	509	0.0	509	0.910	14	20	18
Maximum	04/15/15	93.0	1.00	12.0	610	238	2.44	585	60.0	621	1.109	15	20	18
Range	55	25.0	1.00	10.0	120	55	0.29	78	60.0	112	0.199			

Summary statistics:

- Average for male calves: 559.9
- Average for female calves: 556.8

A comparison graph shows the relationship between actual weaning weights and 205-day adjusted weaning weights, with a regression line and R-squared value of 1.15.

Example 5 – Creating a Print Macro

1. Record the macro using the Macro Recorder in the Developer tab.
2. Use a button with the macro: "Insert" on the Developer tab, select a button and locate it on the spreadsheet. Record the macro.
3. Use the button to print the spreadsheet.

For more information and to see use our many decision tools go to www.AgManager.info

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