

Mapping Spreadsheet Calculator

Last Modified on 09/09/2024 11:32 am CDT

This spreadsheet calculator requires Microsoft Excel™ version 2007 or newer.

The syntax of an Excel Spreadsheet for the Spreadsheet calculator is fairly simple but there are specific naming or labeling rules that are important to understand.

	A	B	C	D
1	Conditionals:			
2		Crop	Corn	
3				
4				
5	Variables			
6		K		ppm
7		CEC		meq/100g
8		Yield		bu/acre
9				
10				
11				
12				
13	Results:			
14		K_Rec	110	lbs/acre
15				

Multiple Worksheets

There must be a worksheet for every permutation and combination of the conditionals. For example, if there are five crops, there will need to be five worksheets. As in the example above, one workbook can be created for each nutrient and that workbook can contain several worksheets - one for each different crop that might be needed.

Conditionals

The block in blue is the *Conditionals* named range. It contains a row for every conditional that is defined for the workbook. The first column (Column B) is the name of the conditional and the second column (Column C) is the value of the conditional for this worksheet. These become the *RequiredConditional* properties of a *SpreadsheetCalculatorOption*. The *Spreadsheet.SelectOption* method will search each worksheet to find the one that has *RequiredConditional* values that match the *ActualConditional* values that have been set on the *SpreadsheetCalculator* class. The individual conditionals do not need to be named ranges, but the blue box must be explicitly named *Conditionals* and must be a sheet-specific name, not a workbook-specific name.

Variables

The *Variables* named range is shown in pink. It must have three columns: a variable name, its value in the calculation (updated automatically by the calculator for each row of the dataset) and a unit-of-measure. For now, the input cells (where the 110, 12, and 150 are) should be single cell named ranges, with the name being the variable name (K, CEC, and Yield). This will change as an absolute requirement but will always be a recommended practice.

The *Units* fields have specific requirements. Acre, for example, must be spelled out as *acre* and not the common

abbreviation, *ac. pH* is another in that its range must be named *pHw* to work properly.

Acceptable units for these variables are: *ppm, lbs per acre (st), meq/100g, tons/acre, bu/acre, and none*. No other unit types or names will work. Select the one to use for the given variable. Below is a table of variables and their syntax:

Variable	Range Name
B	B
Ca	Ca
Cu	Cu
CEC	CEC
ENR	ENR
Fe	Fe
K	K
Mg	Mg
Mn	Mn
NO3-1	NO3_1
NO3-2	NO3_2
OM	OM
*P1	P_1
P2	P_2
pHw	pHw
pHb	pHb
Previous Crop	Previous_crop
S	S
**Yield	Yield
Zn	Zn
Years to build	Years_to_build
Soil Class (A-E)	Soil_class

* It's critical that no Range names mimic a MS Excel cell address. In the table above, the common nutrient expression, P1, is such a case, so the Range name, P_1, is used.

** No other word or part of a word in the variable section can contain the word, Yield. This is a reserved word used in the calculation. For example, use SoybeanYld, rather than SoybeanYield if you have need for a variable like that.

Results

The *Results* named range is shown in green. At this time, it has three required columns: *result name*, *result value*, and *result unit*. The value cell (the 110) should:

- Contain the formula used to calculate the value from the variables.
- Be explicitly typed as text, numeric, etc.
- If numeric, have a format defined that shows the number of decimal places, etc.

In the current implementation, the formula should use name range references for the variables, rather than cell references. For example, IF (K < 151... rather than IF (C6 < 151... This will change in a future build, but will always be a recommended practice.

The *Results* area has specific cell *Range* names required for the nutrients used in the calculator. The units for the nutrient recommendations can be either lbs/acre or tons/acre. *UD_Rec* in the last row stands for the one User-Defined nutrient allowed in Agvance. The table below displays those Range names:

Nutrient	Range Name
N_Rec	N_Rec
P_Rec	P_Rec
K_Rec	K_Rec
Ca_Rec	Ca_Rec
Mg_Rec	Mg_Rec
S_Rec	S_Rec
B_Rec	B_Rec
Cu_Rec	Cu_Rec
Fe_Rec	Fe_Rec
Mo_Rec	Mo_Rec
Zn_Rec	Zn_Rec
Lime_Rec	Lime_Rec
CCE_Rec	CCE_Rec
UD_Rec	UD_Rec

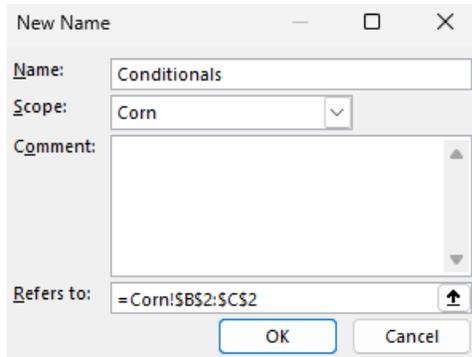
Building a Spreadsheet

Label the worksheet tab by double-clicking the current name (ex. Sheet 1) and typing the equation name.



1. Type *Conditionals*: in the first cell.
2. Type the conditionals into the rows below using one conditional per row (ex. Crop).

3. In the adjacent column, enter the conditional values (**ex.** Corn).
4. Select the cells that make up the conditional labels and values (B2:C2 in the beginning of the article).
5. Choose the *Formulas* menu option and select **Define Name**. If using Excel version previous to Office 2007, go to *Insert / Name / Define*.



- **Name** – Conditionals
 - **Scope** – *Worksheet name* (not *Workbook*)
 - **Comments** – None
 - **Refers to** – Default
6. Choose **OK**.
 7. Type *Variables*: in the first cell in a row below the *Conditionals* section.
 8. Enter the variables into the rows below using one row per variable (**ex.** K, CEC, Yield).
 9. Leave the adjacent column empty for now as this will be where the variable value is entered.
 10. In the next column, enter the unit of measure for each variable (**ex.** ppm, meq/100g, bu/acre).
 11. Select the value cell adjacent to the variable label.

Variables			
	K		ppm
	CEC		meq/100g
	Yield		bu/acre

12. Choose the *Formulas* menu option and select **Define Names**.
 - **Name** – variable name (**ex.** K)
 - **Scope** – *Worksheet name* (not *Workbook*)
 - **Comments** – None
 - **Refers to** – Default
13. Select **OK**.
14. Upon selecting the variable value cell, the name will be visible in the *Name* field of Excel instead of the cell name like C8.

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15. Repeat Steps 12-14 for the remaining variables.
16. Select each/all variable value cell(s), right-click, and choose *Format Cells*.
17. Enter the *Category* and other information (ex. For numeric data, select *Number*, two decimals).
18. Select the cells that make up the variable labels and values.

Variables			
	K		ppm
	CEC		meq/100g
	Yield		bu/acre

19. Choose the *Formulas* menu option and select **Define Names**.

New Name

Name: Variables

Scope: Corn

Comment:

Refers to: =Corn:\$B\$6:\$D\$8

OK Cancel

- o Name - Variables
 - o Scope - Worksheet name (not *Workbook*)
 - o Comments - None
 - o Refers to - Default
20. Select **OK**.
 21. Type *Results:* in the first cell in a row below the *Variables* section.
 22. Enter the results label(s) into the rows below using one row per result (ex. *K_Rec*).
 23. Leave the adjacent column empty for now as this will be where the results value equation is entered.
 24. In the next column, enter the result unit (ex: *lbs/acre*).
 25. Select the value cell adjacent to the results label.

Results:			
	K_Rec	110	lbs/acre

26. Select the *Formulas* menu option and choose **Define Names**.

- **Name** – Result name (ex. K_rec)
- **Scope** – Worksheet name (not *Workbook*)
- **Comments** – None
- **Refers to** – Default

27. Select **OK**.

28. Repeat Steps 23-27 for each additional Result.

29. Select the result value cell(s), right-click, and choose *Format Cells*.

30. Enter the *Category* and other information (ex. For numeric data, select *Number*, zero decimals).

31. Select the cells making up the results labels and values.

Results:			
	K_Rec	110	lbs/acre

32. Select the *Formulas* menu option and choose **Define Names**.

New Name

Name: Results

Scope: Corn

Comment:

Refers to: =Corn!\$B\$14:\$D\$14

OK Cancel

- **Name** – Results
- **Scope** – Worksheet name (not *Workbook*)
- **Comments** – None
- **Refers to** – Default

33. Select **OK**.

34. Choose the result value cell and enter the equation in the *Formula Bar*.

```
=IF(AND(CEC<5,K<118),((71.1+Yield*0.056))- (
```

35. Use the variable names (ex. CEC), not cell names (ex. C6) in the equation.

36. Repeat Step 35 for additional results.

37. Test the equation by entering values for the variables.

38. Repeat all steps for each additional worksheet.

39. **Save** the workbook.