

Excel Fertilizer Calculator - User Guide

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Downloading the calculator program

1. Download the Excel program from the KSRE soil testing lab website, or by following the link:

<https://www.agronomy.k-state.edu/outreach-and-services/soil-testing-lab/recommendations/ksu-fertilizer-recommendations.xls>
2. This excel file is saved as a read-only file. If you want to save the program after you have entered the soil test information for a set of samples, you will need to save it as a different file name.
3. The “Analysis ToolPak” function in excel must be enabled for the program to operate properly. To turn this on please follow the directions below:
 - a. Open Excel and open the tool management section by clicking **File → Options**
 - b. Select **Add-Ins** and press **Go...**
 - c. A new window will pop-up, check the “**Analysis ToolPak**” and “**Analysis ToolPak-VBA**” functions
 - d. Click “OK”
4. The tabs located at the bottom of the worksheet indicate what information is located on that specific worksheet. Please note that both the “Sufficiency” and “Build-Maintenance” recommendations are in the same workbook, but displayed on different worksheets. Build-Maintenance recommendations are not available for established grasses.

If you have any questions please contact the KSRE Soil Testing Lab at (785) 932-7878 or send an email to soiltesting@ksu.edu

Notes on interpreting results

- Equations used in the Excel fertilizer calculator are documented in KSU fact sheet MF-2586, and are freely available for download at:
<https://www.bookstore.ksre.ksu.edu/pubs/mf2586.pdf>
- Recommended rates are rounded UP to the nearest 5 lbs of N per acre
- Recommended N application rates are expressed as lbs of actual N per acre, P application rates are expressed as lbs of P₂O₅ per acre, and K application rates are expressed as lbs of K₂O per acre
- Recommended lime application rates are expressed as lbs of 100% ECCE lime, and are rounded to the nearest 250 lbs of 100% ECCE lime per acre

Converting recommended rates to fertilizer rates

The recommended nutrient application rates returned by the excel calculator are displayed in terms of lbs of nutrient or 100% ECCE lime per acre. The amount of fertilizer required to achieve the recommended rate depends on the composition of the material to be applied. Any material sold as a fertilizer will include a “fertilizer analysis”, which is indicated by three numbers for most fertilizers[†]. These numbers correspond to the percentage of N, P₂O₅, and K₂O contained in the fertilizer. The recommended nutrient application rate output by the excel calculator can be converted to a fertilizer application rate for a specific material according to the following:

$$\text{Fertilizer App Rate (lbs/ac)} = \left(\frac{\text{Recommended Nutrient App Rate (lbs/ac)}}{\% \text{ Nutrient of the fertilizer}} \right) \times 100$$

Example calculations

Based on a recent soil test for a wheat field, the Excel Calculator determined a nitrogen application rate of 65 lbs of N per acre and a lime application rate of 2850 lbs of 100% ECCE lime per acre. The local coop has a pelletized urea fertilizer with a fertilizer analysis of 46-0-0, and ag lime with an ECCE of 63%.

The amount of urea fertilizer required to achieve the recommended N rate is calculated as:

$$\text{Urea app rate (lbs per acre)} = \left(\frac{65 \text{ lbs N per acre}}{46 \% \text{N}} \right) \times 100 \approx 140 \text{ lbs urea per acre}$$

Similarly, the amount of ag lime required is calculated as follows:

$$\text{Lime app rate (lbs per acre)} = \left(\frac{2850 \text{ lbs 100\% ECCE per acre}}{63 \% \text{ ECCE}} \right) \times 100 \approx 4525 \text{ lbs lime per acre}$$

[†] Some fertilizers may have additional numbers in the analysis indicating the % contents of other nutrients, such as sulfur or zinc.