Semester project

# Objective

Create function(s) to automate the calculation of lime and fertilizer application rates based on soil test results from the KSRE Soil Testing Laboratory.

# Rationale:

Fertilizer amendments are often required to correct nutrient deficiencies in agricultural production systems. Over-fertilization increases the risk of eutrophication of surface water, while under-fertilization can lead to reduced crop yield, quality, and farm profitability. Fertilizer application rates should be determined guided by soil tests when possible to improve their accuracy. The KSRE Soil Testing Lab provides soil testing services and fertilizer recommendations to Kansas homeowners and producers. Fertilizer recommendations are reported via PDF and excel documents compiled by third-party software. The equations used to calculate fertilizer application rates are freely available to the public, but the software used by the lab is a "black box" in some ways. Current tools used by the lab to validate recommended application rates involve copy/pasting soil test values into an excel-based calculator or hand calculation. This process can be tedious and is prone to transcription errors. Automating this process could improve the workflow of the lab and make it easier to diagnose problems in the third-party software and communicate the issues to developers.

# Outcomes

I would like the functions to produce an excel or csv file with 9 columns ‘sampleID’, ‘lime\_rate’, ‘delta\_lime’, ‘N\_rate’, ‘delta\_N’, ‘P2O5\_rate’, ‘delta\_P2O5’, ‘K2O\_rate’, ‘delta\_K2O’

# Sketch

A screenshot of a cell phone

Description automatically generated

# References

Kansas State University, Fact Sheet MF-2586: Soil Test Interpretations and Fertilizer Recommendations