

Modernizing Fertilizer Recommendations: Fertilizer Recommendation Support Tool (FRST)

WHAT

The Fertilizer Recommendation Support Tool, or “FRST”, is a national initiative to modernize fertilizer recommendations by pooling expertise and soil test correlation and calibration data from across the country into an accessible decision support tool.

WHY

Soil testing provides the backbone for nutrient management in modern agricultural production systems. Most science-based soil fertility recommendation systems derive phosphorus (P) and potassium (K) fertilizer guidance from often decades-old soil-test relationships. While soil testing has the common goal of determining which nutrients and how much fertilizer to apply, soil-testing laboratories in the U.S. apply different analytical methods, interpretation, and philosophical approaches to fertilizer recommendations.

These differences often result in diverging fertilizer recommendations among labs within and across states, leading to end user confusion and reduced confidence in soil testing, which ultimately proves detrimental to research and educational efforts that encourage 4R Nutrient Stewardship. Scientifically defensible soil-test recommendations are fundamental to agricultural production and environmental protection.

HOW

Researchers working as a national team rather than within individual states and institutions will reduce ambiguity in nutrient recommendations while optimizing nutrient use across state lines through the development of the FRST tool. Users will select specific conditions, such as soil, crop, geographic region, and soil test extractant, to provide tailored soil test recommendations that are expected to save farmers millions of dollars annually while reducing excess nutrient losses to the environment. To develop this tool, the FRST project consists of eight activities.

1. Survey soil fertility faculty on current soil fertility practices and recommendations to better understand the current status of soil testing across the U.S. and identify opportunities to harmonize nutrient management guidelines
2. Developed, with a team of land grant soil fertility faculty, a minimum dataset for future correlation and calibration trials to guide research in the U.S.
3. Development and maintenance of the FRST database to preserve legacy data and add new soil test correlation and calibration phosphorus and potassium data
4. Explored and determined the most appropriate relative yield calculation for use in the FRST decision support tool

5. Support state-level soil test correlation and calibration trials funded by FRST
6. Multi-state analysis of soil sampling depth influence on soil test outcomes in order to translate between different soil depths
7. Modeling soil test correlation data for output in the FRST decision tool
8. Development of a user-friendly decision support tool to provide soil test user information for a soil-test and crop-response-to-fertilization searchable web-based decision tool. This tool will provide more consistent, transparent, and science-based decisions for nutrient recommendations.

We have completed activities 2, 4, and 5 and almost finalized activity 1, 6, and 7. Activity 3 and 8 will be on-going during the life of the project.

WHO

The FRST project is comprised of over 100 individuals representing 41 land-grant universities, two state universities, one private university, three USDA divisions

(Agricultural Research Service, Natural Resources Conservation Service and Farm Service Agency), three not-for-profit organizations, and one State Department of Agriculture. We are looking for additional data, team members, and funding to support our next phase of state-lead soil fertility correlation and calibration trials. Please contact us if you are interested in being a part of or contributing to the FRST project.

For more information, please contact:
[Deanna Osmond](#), [Nathan Slaton](#), [John Spargo](#),
 or [Peter Kleinman](#)

We would also like to thank our funders, USDA-NRCS (grant 69-3A75-17-45) and USDA-ARS (grant 58-8070-8-016).

For more information visit soiltestfrst.org.

Authors: D. Osmond (NC State University)

Updated Sep 2022

					
					
					
					
					
					
					
		Thanks to our sponsors:  69-3A75-17-45  58-8070-8-016 NR203A7500010C00C			
					
Visit soiltestfrst.org					
					