

## Fertilizer Response Support Tool (FRST) Legacy Data Guide

We are looking for legacy data from **P and/or K correlation/calibration, or crop response, trials** for the FRST database. These trials do not necessarily have to be the ones that contributed to fertilizer recommendations in your state. All values must have **clearly defined units** associated with them. If means are given, **standard errors** and other statistical values are desired.

Data can be provided in **any format**, including published articles, extension bulletins, dissertation/thesis, spreadsheets, project summaries, etc.

The ‘Essential Information’ listed below is required for data inclusion. The other information listed is desired but not necessarily required at this stage to be considered for the database.

Please see page 2 for a description of the project and contact information.

Essential Information	
<ul style="list-style-type: none"> <li>○ Soil test P and/or K values prior to fertilization (for individual years)</li> <li>○ Soil test method and sample depth</li> <li>○ Trial location (state)</li> </ul>	<ul style="list-style-type: none"> <li>○ Yield response values (for individual years)</li> <li>○ Replicated fertilizer P and/or K treatment rates (including a control)</li> <li>○ Trial year</li> </ul>
Trial Information	
<ul style="list-style-type: none"> <li>○ Researcher information (name, contact info.)</li> <li>○ Publication information (if published)</li> <li>○ Study design</li> <li>○ Number of replications</li> <li>○ Plot size</li> </ul>	<ul style="list-style-type: none"> <li>○ Nutrient researched</li> <li>○ Year(s) of trial(s)</li> <li>○ Trial location (state, county, nearest city, GPS coordinates)</li> </ul>
Soil Information	
<ul style="list-style-type: none"> <li>○ Soil taxonomic information (series, suborder)</li> <li>○ Soil texture</li> <li>○ Sand, silt, and/or clay content</li> <li>○ Number of composites collected</li> <li>○ Soil sample depth</li> <li>○ Moisture extraction method</li> <li>○ Soil test P and/or K values prior to fertilization</li> </ul>	<ul style="list-style-type: none"> <li>○ Soil test P method (analysis method, soil mass or volume, extractant solution to soil ratio, ICP or colorimetric, laboratory)</li> <li>○ Soil test K method (analysis method, soil mass or volume, extractant solution to soil ratio, laboratory)</li> <li>○ Other soil test values and methods (pH, CEC, SOM, Ca, Mg, Na, etc.)</li> </ul>
Crop Information	
<ul style="list-style-type: none"> <li>○ Crop and cultivar</li> <li>○ Irrigation (yes/no) and method</li> <li>○ In-season precipitation</li> <li>○ Previous crop</li> </ul>	<ul style="list-style-type: none"> <li>○ Fertilizer applied to previous crop</li> <li>○ Planting date</li> <li>○ Row spacing</li> <li>○ Plant population</li> </ul>
Yield Information	
<ul style="list-style-type: none"> <li>○ P and/or K fertilizer rates</li> <li>○ Fertilizer source</li> <li>○ Fertilizer timing (preplant, at planting, etc.)</li> <li>○ Fertilizer placement (banded, broadcast, etc.)</li> <li>○ Manure information (yes/no, rate, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>○ Yield values (and standard error if means)</li> <li>○ Crop moisture content</li> <li>○ Growth stage at harvest</li> <li>○ P values (if means are given)</li> </ul>
Plant Tissue Analysis	
<ul style="list-style-type: none"> <li>○ Plant part sampled</li> <li>○ Growth stage at sampling</li> </ul>	<ul style="list-style-type: none"> <li>○ Nutrient content (N, P, K, etc.)</li> </ul>

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### Project Overview

Soil testing provides the backbone for nutrient management programs in modern, intensive agricultural production systems. Most science-based, soil-fertility-recommendation-systems base phosphorus (P) and potassium (K) fertilizer guidance on correlation and calibration research. Soil testing has the common goal of determining where fertilizer is needed and how much to apply. However, soil testing laboratories may use different soil analytical methods, interpretative terminology, and philosophical approaches to develop fertilizer recommendations. These differences often result in dissimilar fertilizer recommendations, leading to end user confusion and reduced confidence in soil-test based nutrient management, which ultimately proves detrimental to research and educational efforts that encourage 4R Nutrient Stewardship. 4R Nutrient Stewardship provides a framework supporting the Right fertilizer source, applied at the Right time, in the Right place, and at the Right rate in a well-managed cropping system to meet specific performance objectives.

The Fertilizer Recommendation Support Tool (FRST) decision aid was released in April 2024 and utilizes a relational database currently containing data and metadata from approximately 2600 P and K fertilization trials to provide novel insight into crop fertilizer response and soil testing. The long-term goal of FRST is to develop more consistent, transparent, and science-based nutrient management recommendations across the USA. The FRST project supports innovative soil fertility research to advance site-specific, precision nutrient management to augment existing fertilizer P and K recommendations.

For general information about FRST, to contribute data, or ask other questions:

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This project wouldn't be possible without the 100+ team members and contributing scientists from more than 40 institutions.