



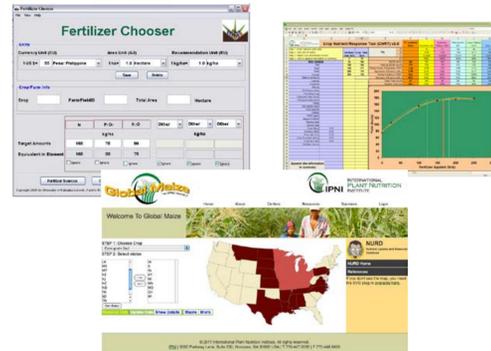
Utilizing GIS Data Management to Implement 4R Practices



Technology to Guide Decisions

Information technology, including automated data collection and spatial analysis, is employed in today's farm management decisions.

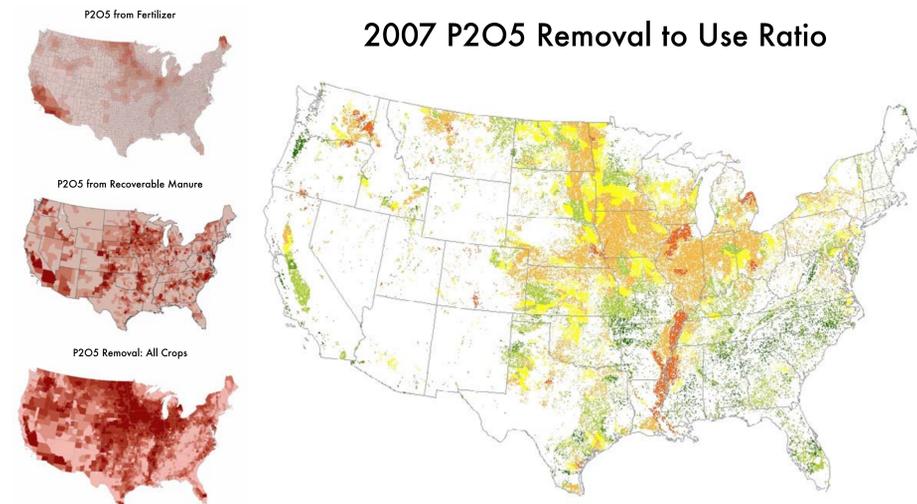
Decision Support Systems



Online and offline there are many decision support systems. These calculators, data sets, and applications all help farmers and their consultants leverage field data to make better management decisions for economic and environmental sustainability.

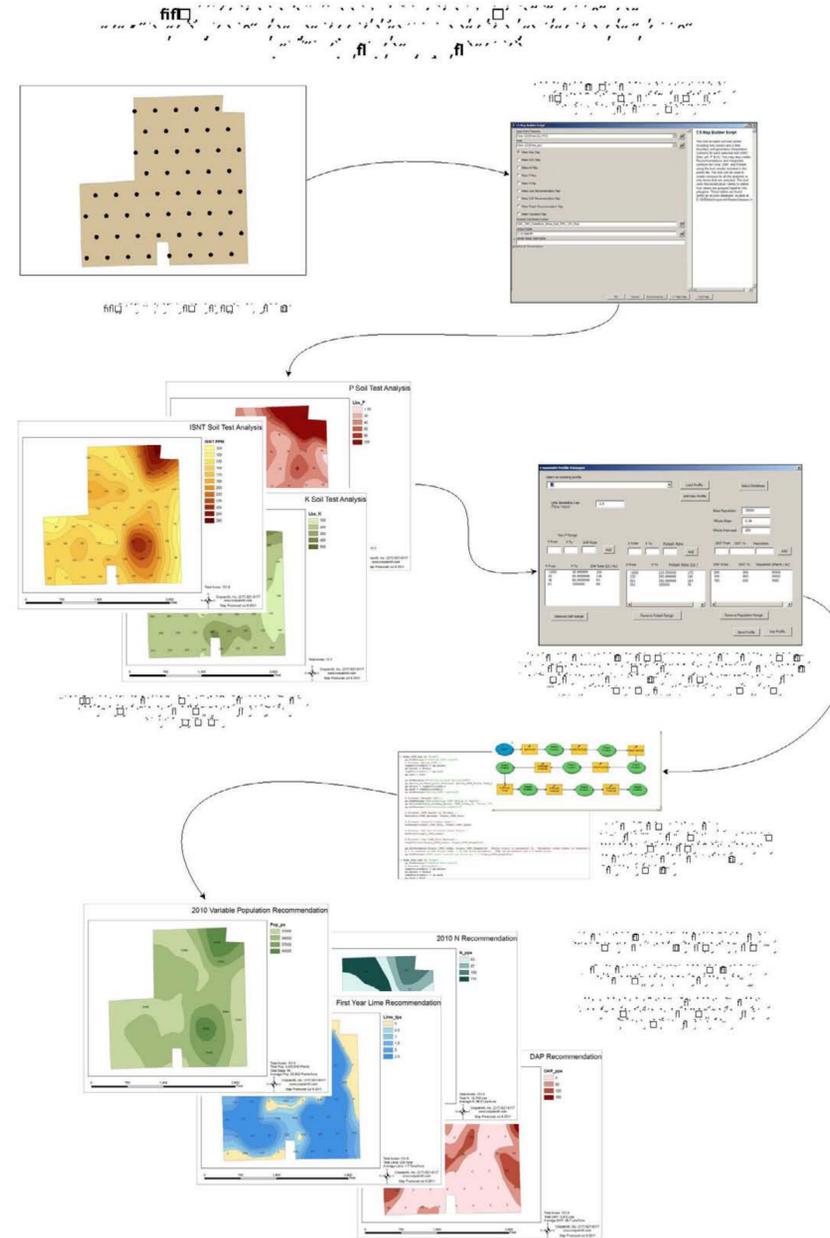
Nutrient Use Geographic Information System (NuGIS)

The primary objectives of this IPNI project are to assess nutrient use efficiency and balance in crop production and identify weaknesses in the balance estimation processes and the datasets used for these estimations. NuGIS integrates multiple tabular and spatial datasets to create county-level estimates of nutrients applied to the soil through fertilizer and livestock manure, and nutrients removed by harvested agricultural crops to estimate nutrient balances and removal efficiencies at the county and local watershed levels.



Right Place: GIS Decision Support Systems

Building on the framework provided by the 4Rs, a GIS provides tools for analyzing spatial data and mapping nutrient recommendations.

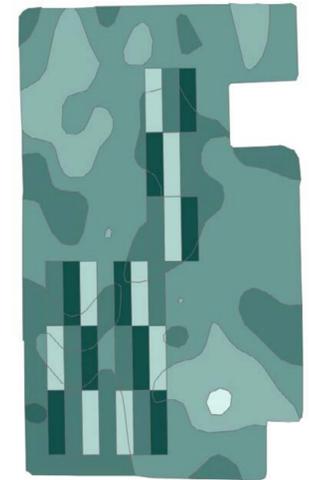


Next Level Management Tools

GIS enables farmers to assess their management decisions by employing powerful data management and spatial analysis tools.

Right Rate: On-Farm Research

With GIS and other tools in farmers' precision farming toolbox, the establishment and analysis of on-farm research trials is now within reach of crop consultants and farmers. Variable rate application equipment can be used to establish rate plots and other experiments within the field during the course of normal field operations. Yield monitors collect crop production data which can be queried within the GIS by spatial analysis and interpretation of the treatments on yield.



GIS in Conservation Efforts

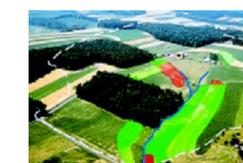
GIS can help establish priority areas for conservation practices. In this series of images from Sharpley, USDA-ARS, a small watershed formerly targeted for nutrient limitations can be farmed by adopting conservation practices in key locations in the watershed.



Soil test P distribution. Based strictly on soil tests alone, P application would be restricted or limited in 63 percent of the crop land in the watershed.



This second image indicates surface runoff potential. Erosion and surface runoff classes for each soil map unit were used to calculate P loss vulnerability ratings.



Ranking site vulnerability to P loss. This map shows ratings by priority, clearly indicating where conservation practices could be placed for maximum effect.