



Projects · NTHRYS Biotech Labs

Agriculture > Soil Testing & Digital Advisory Platforms

# Soil Testing & Digital Advisory Platforms

Agriculture Project Category

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Explore focused-area projects under Soil Testing & Digital Advisory Platforms, part of Agriculture at NTHRYS Biotech Labs.

## FOCUSED AREAS

### Near-Infrared Spectroscopy Rapid Soil Analysis Platform for Commercial Advisory

Development of handheld and laboratory NIRS soil analysis platforms that provide rapid multi-parameter soil chemical characterization including organic matter, pH, nitrogen, phosphorus, and texture without wet chemistry processing for high-throughput soil advisory service operations. Enables soil advisory service companies to dramatically increase analytical throughput and reduce per-sample cost through NIRS-based rapid soil analysis that replaces conventional wet chemistry for routine soil testing while maintaining analytical accuracy validated against reference method calibrations.

### AI-Powered Soil Fertility Recommendation Engine for Digital Advisory Platforms

Development of machine learning soil fertility recommendation engines that integrate soil test results, crop yield targets, economic optimization criteria, and local calibration data to generate financially optimized nutrient management recommendations for digital agricultural advisory platforms. Enables digital agricultural advisory platforms to provide soil fertility recommendations that integrate the economic optimization and local calibration factors that determine recommendation quality beyond what generic soil fertility recommendation tables deliver, improving the agronomic and economic value of digital advisory services for commercial farm operators.

### Mobile Soil Testing Platform for Smallholder Agricultural Development Programs

Development of portable soil testing equipment and digital advisory platforms that enable village-level soil testing and fertilizer recommendation services for smallholder farmers in developing countries without laboratory infrastructure access, using colorimetric, electrochemical, and digital testing methods. Enables smallholder soil fertility management programs to achieve the farmer-level soil testing frequency and geographic coverage that makes fertilizer use efficiency improvement possible for millions of smallholder farmers currently applying fertilizer without soil test guidance due to laboratory access and cost barriers.

### Soil Test Result Integration Platform for Precision Fertilizer Application

Development of platforms that integrate soil test result data with field boundary maps, crop production records, and variable rate fertilizer equipment to automate the conversion of soil test results into field-ready variable rate application prescriptions for precision nutrient management. Enables precision nutrient management workflows where soil test data flows automatically from laboratory results into variable rate application prescriptions without manual data re-entry and prescription calculation steps that delay implementation and introduce errors in the translation of analytical results into spatially explicit fertilizer application plans.

### Real-Time Soil Nutrient Monitoring IoT Sensor Network

A commercial IoT platform that deploys wireless soil sensors across farm fields to continuously track nutrient levels, moisture, pH, and microbial activity with real-time cloud analytics. This enables precision agriculture subscriptions and data-driven advisory services that increase crop yields while reducing fertilizer waste and operational costs for large-scale farms.

### **Blockchain-Based Soil Health Certification Platform for Sustainable Agriculture**

A SaaS platform that uses blockchain technology to certify and track soil health metrics across supply chains, enabling premium pricing for sustainably grown products. This creates new revenue streams through certified soil quality documentation that buyers, retailers, and exporters can verify and monetize in high-value agricultural markets.

### **Satellite Multispectral Imaging Soil Analysis Commercial Service**

A commercial advisory service that leverages satellite multispectral imagery and machine learning to assess soil composition, organic matter, and contamination across large agricultural regions at scale. This delivers cost-effective soil surveys to agribusinesses, governments, and land developers while eliminating expensive manual soil sampling and laboratory testing.

### **Predictive Soil Degradation Risk Platform for Agricultural Insurers**

A B2B SaaS platform that analyzes historical soil data, weather patterns, and farming practices to predict soil degradation risks and crop failure probabilities for insurance companies. This enables agricultural insurers to offer precision-priced policies, reduce claims payouts, and develop new risk mitigation products for commercial farming operations.

### **Microbes and Soil Microbiome Analysis Commercial Testing Service**

A laboratory and digital platform service that provides comprehensive soil microbiome profiling, identifying beneficial and pathogenic microorganisms to optimize crop performance and disease prevention. This generates recurring revenue through subscription-based microbiome reports that guide tailored biological amendment recommendations and premium biofertilizer upsells.

### **Customized Soil Amendment Recommendation Engine for Agro-Retailers**

A white-label SaaS platform that integrates soil test data with inventory management to automatically recommend and bundle soil amendments, biologics, and nutrients for farmer customers. This increases average transaction value and customer retention for agro-retail businesses while generating data licensing fees from agricultural input manufacturers.