

Problem Statement 11: AI-Based Crop Health Monitoring and Advisory System

The Challenge

Crop health is influenced by multiple factors such as soil conditions, weather patterns, pest activity, and irrigation practices. Farmers often rely on periodic field inspections and experience-based judgment, which may delay the identification of early crop stress. Manual analysis of multi-source agricultural data is not scalable, leading to reduced yield and increased input costs. There is a need for an intelligent assistive system that can continuously analyze crop-related data and provide early insights into potential crop health issues.

Agricultural Data Analysis Agent

An agent that ingests soil moisture levels, temperature, humidity, crop growth stage data, and weather forecasts, organizing them into meaningful crop health trends.

Risk Trend Detection Agent

An agent that analyzes short-term and long-term patterns to identify early signs of crop stress, pest risk, or adverse growing conditions using historical data and agronomic thresholds.

Advisory & Best-Practice Assistant

An agent that generates early alerts and provides agronomy-aligned advisories (*assistive only, non-prescriptive*).

Outcome

Supports early identification of crop health risks, improves farm decision awareness, and promotes sustainable crop management.

Mandatory Tech Stack

Lang Flow using IBM Granite Model

(Using RAG on agronomy guidelines, crop management best practices, and trusted agricultural references).