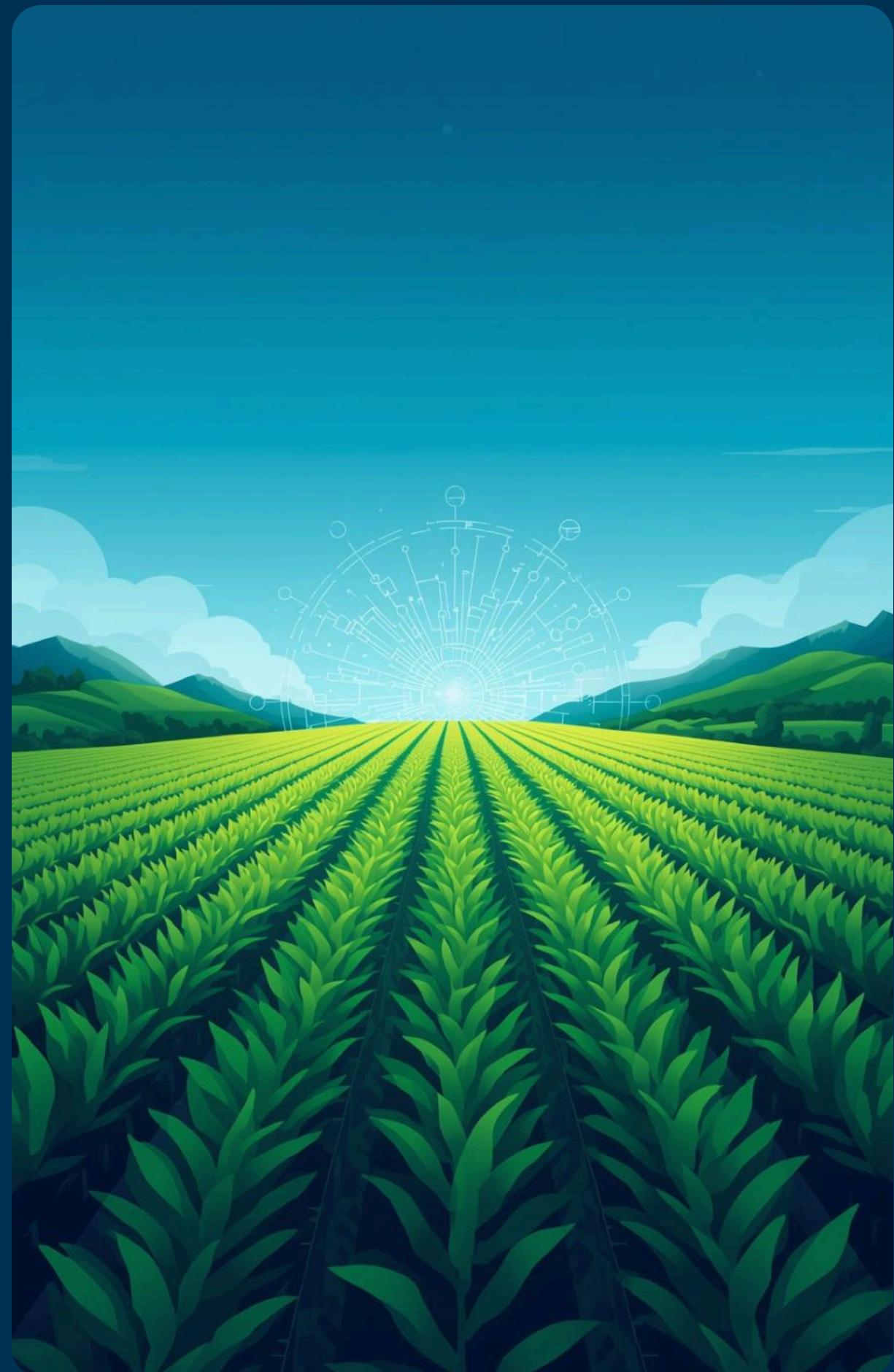


# AgroIntel: Crop Disease & Yield Intelligence

Presented by [TEAM TECHSPENCE]



# Core Challenges in Agriculture

- **Late Disease Detection**

Crop diseases are often identified only after visible damage, reducing recovery chances.

- **Limited Internet Access**

Many rural farming regions lack reliable connectivity for AI-based tools.

- **Uncertain Yield Impact**

Farmers don't know how much production loss a disease may cause.

- **Financial Risk**

Crop loss directly affects farmer income and food supply stability.



# The Bigger Problem!

## *Understanding the challenges farmers face*

Identifying crop disease is only the first step. Farmers also need to understand the consequences — how severely their yield will be affected and how urgently they must respond. Current tools stop at detection and often depend on internet access, leaving rural communities without reliable support. The absence of yield impact prediction creates uncertainty, financial risk, and delayed decision-making, ultimately putting livelihoods at stake.

# Our Innovative Solution Explained

Users simply upload a leaf image, and our ML model instantly detects any disease offline, estimates potential yield loss, and suggests immediate treatment options to help farmers protect their crops effectively.



# Key Features:

- Fully Offline AI Model – Works without internet connectivity
- Accurate Crop Disease Detection using Deep Learning
- Confidence Score for reliable diagnosis
- Yield Impact Estimation based on disease severity
- Urgency Level Indicator (Low / Medium / High)
- Treatment & Preventive Recommendations
- Local Data Storage using SQLite



**AI-Powered**



**Yield-impact estimation**



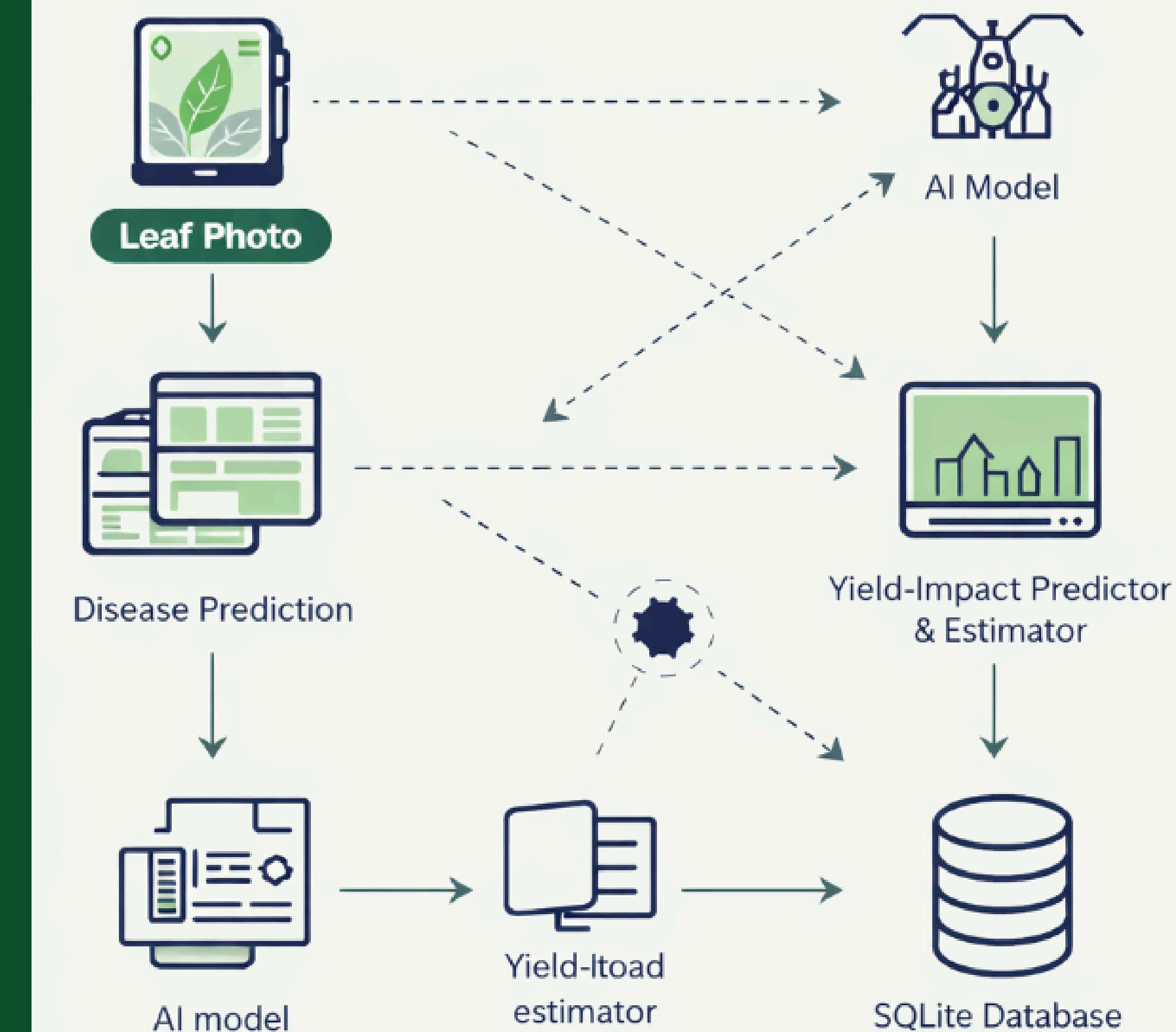
**Crop Disease Detection**



**Urgency Indicator**

# System Workflow Overview

When a user uploads a leaf image, the offline AI model processes it to detect crop disease and generate a confidence score. The system then estimates potential yield loss based on disease severity. The final output includes disease name, yield impact percentage, urgency level, and treatment suggestions, with all predictions stored locally in the SQLite database.



# Yield Impact Estimation Logic

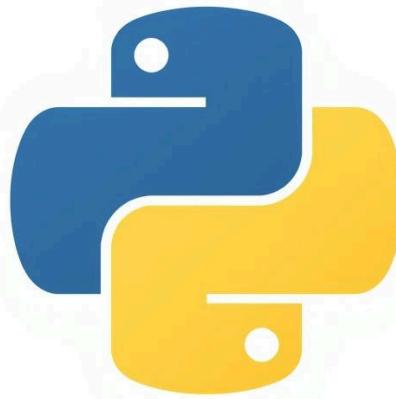
## Understanding the Calculation Methodology

Our Yield Impact Estimation Engine converts disease predictions into measurable agricultural and economic outcomes. First, the system calculates the total possible yield using standard base yield per acre multiplied by farm size. Based on the detected disease and its severity level, a predefined reduction percentage is selected to estimate potential crop damage. This reduction is then adjusted using the model's confidence score to avoid overestimation. The adjusted percentage is applied to compute the expected yield loss in tons. The remaining yield is calculated to provide the farmer with an estimated final output. Additionally, the system multiplies the lost yield by average market price to estimate potential financial loss. A risk level (Low, Medium, High) is assigned based on the percentage reduction. The entire process is fully offline and rule-based for transparency and reliability. This enables farmers to quickly understand both biological and economic impact before making intervention decisions.

# Our Technology Stack

## The tools powering our solution

Our project utilizes a robust tech stack including **Python**, **Machine Learning layer**, **Streamlit**, **SQLite** and **Kaggle** for dataset, ensuring effective AI model development and seamless offline operation for farmers.



# Transforming Lives Through Technology

Our solution empowers farmers with timely, data-driven insights that protect both their crops and their income. By combining offline AI-based disease detection with yield impact estimation, we enable early intervention and informed decision-making. Farmers no longer operate in uncertainty — they gain clarity on potential losses, urgency levels, and corrective actions. This not only reduces financial risk but also strengthens food security and promotes sustainable agricultural growth.



# Future Enhancements in Agriculture

- Support for diverse crops to increase adaptability and yield
- Integration of weather data for precise farming strategies
- Incorporation of satellite imagery for enhanced monitoring and insights



# Why Our Solution Stands Out

Our solution stands out by combining offline AI disease detection with predictive yield impact estimation — a capability rarely integrated into existing tools. It is built specifically for rural, low-connectivity regions, ensuring reliability where it is needed most. By delivering both diagnosis and impact forecasting, we transform crop monitoring from reactive detection to proactive decision-making.





# Empowering Farmers

**“Detect Early. Predict Impact.  
Protect Yield.”**