

FarmDtect

# FarmDtect

DATA-DRIVEN CROP DIAGNOSTIC  
PLATFORM



# About Us



We are driven by the belief that advanced technology and innovative solutions can transform agriculture. We aim to empower farmers with cutting-edge AI tools that enhance crop health, optimize management practices, and boost yields.

What sets us apart is not just our technological expertise but our commitment to understanding the unique challenges faced by each farmer. We tailor our solutions to meet these specific needs, delivering impactful results and supporting sustainable agricultural practices.





# BUSINESS UNDERSTANDING

Rural farmers frequently encounter significant challenges in managing crop health due to limited access to expert agronomists. This lack of expertise makes it difficult for them to accurately identify pests, diseases, and other crop-related problems, leading to delays in addressing these issues. Moreover, the absence of timely and actionable recommendations hampers their ability to take effective measures, often resulting in reduced crop yields and economic losses.



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# DATA UNDERSTANDING

- **Data Overview:** The dataset for our project includes over 50,000 images of diseased and healthy plant leaves from PlantVillage. It's organized into two folders: one with augmented images and another with non-augmented images, covering various leaf classes like apple scab, grape black rot, and healthy leaves.
- **Image Classification:** The dataset trains models to accurately distinguish between healthy and diseased leaves. Augmented images enhance the model's generalization across conditions.
- **Relevance:** This diverse dataset is crucial for developing effective machine-learning models, enabling precise diagnoses and improving crop health management for farmers.

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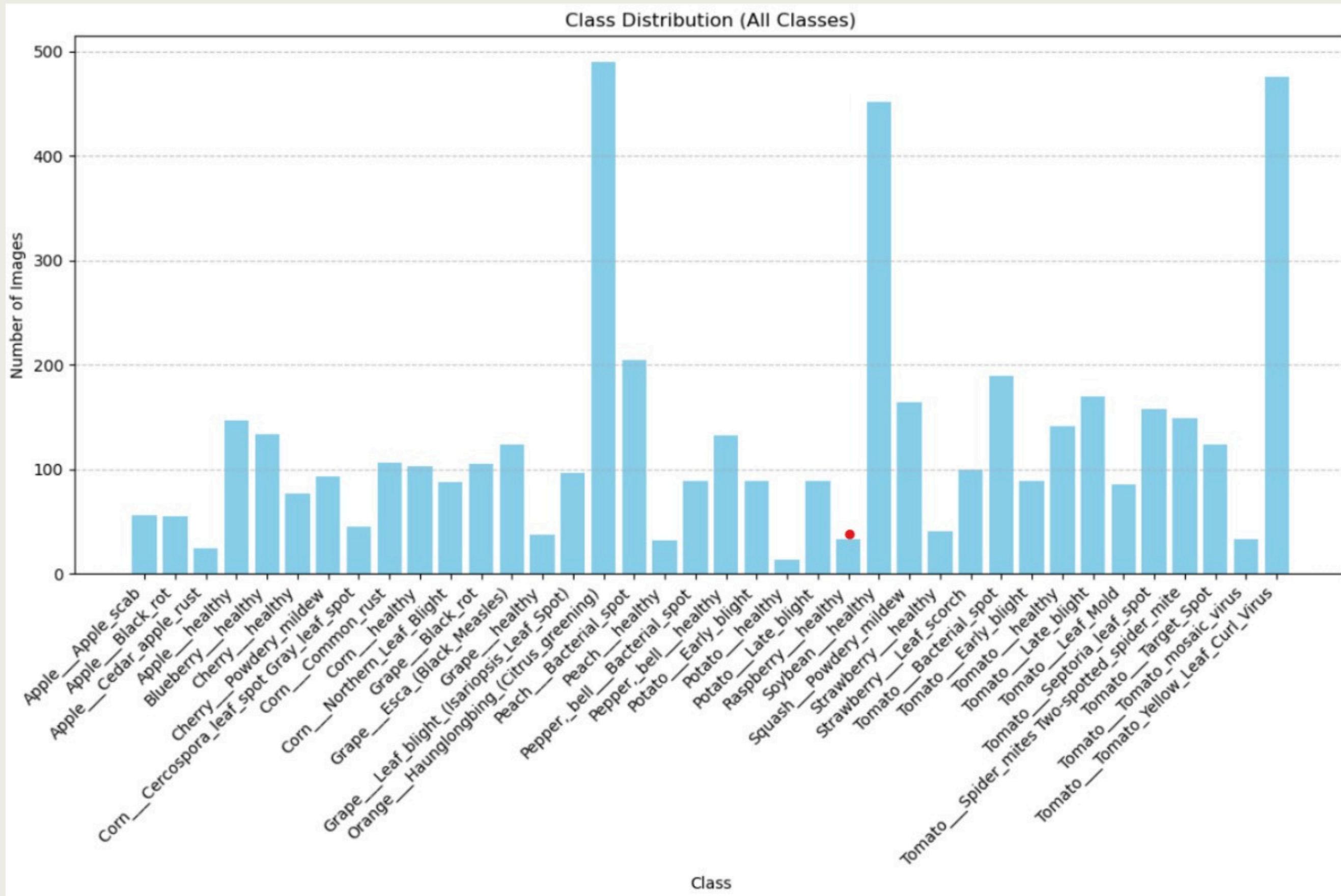


# EXPLORATORY DATA ANALYSIS

We explored the dataset and were able to see the frequency distribution among the two folders and the classes with the most images.

# Univariate Analysis

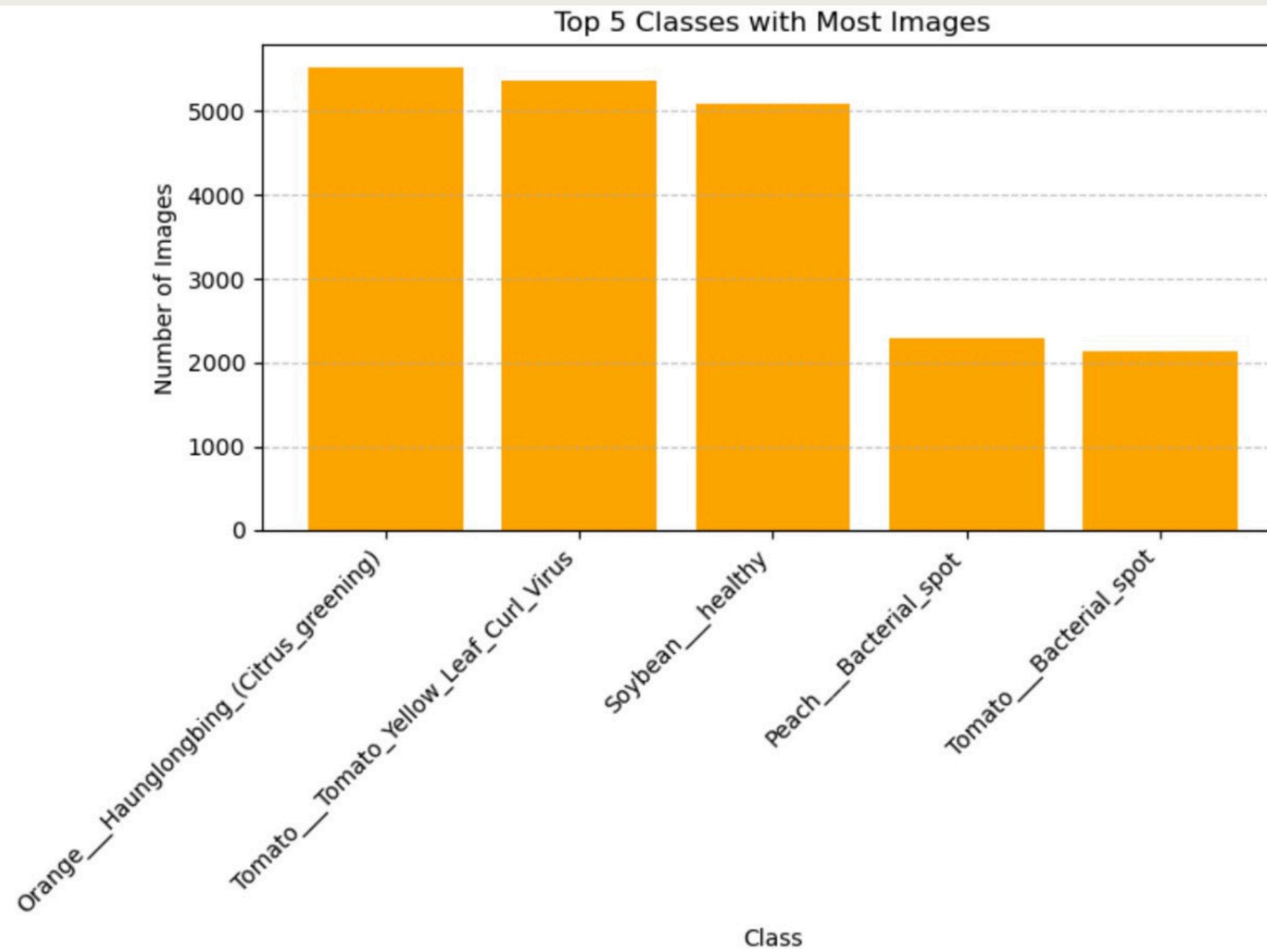
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The class with the highest image distribution was Orange\_Haunglongbing with close to 500 images.

# More on EDA

This is from the folder with non-augmented images. The Orange\_Haunglongbing class has the most images.





# OUR COMPREHENSIVE SOLUTION

To tackle the challenges faced by rural farmers, our platform provides an integrated solution designed to streamline crop health management. By leveraging advanced data analysis and real-time support, we offer a range of features that address the critical needs of farmers.

## A mobile app for uploading crop images

Our system uses data-driven analysis to diagnose a range of issues, including pests, diseases, and nutrient deficiencies. This streamlined process allows for quick and accurate identification of crop problems without needing on-site expert consultation.

## Customized recommendations

We provide tailored advice on how to manage and treat identified issues, taking into account local environmental conditions integrated with crop analysis.

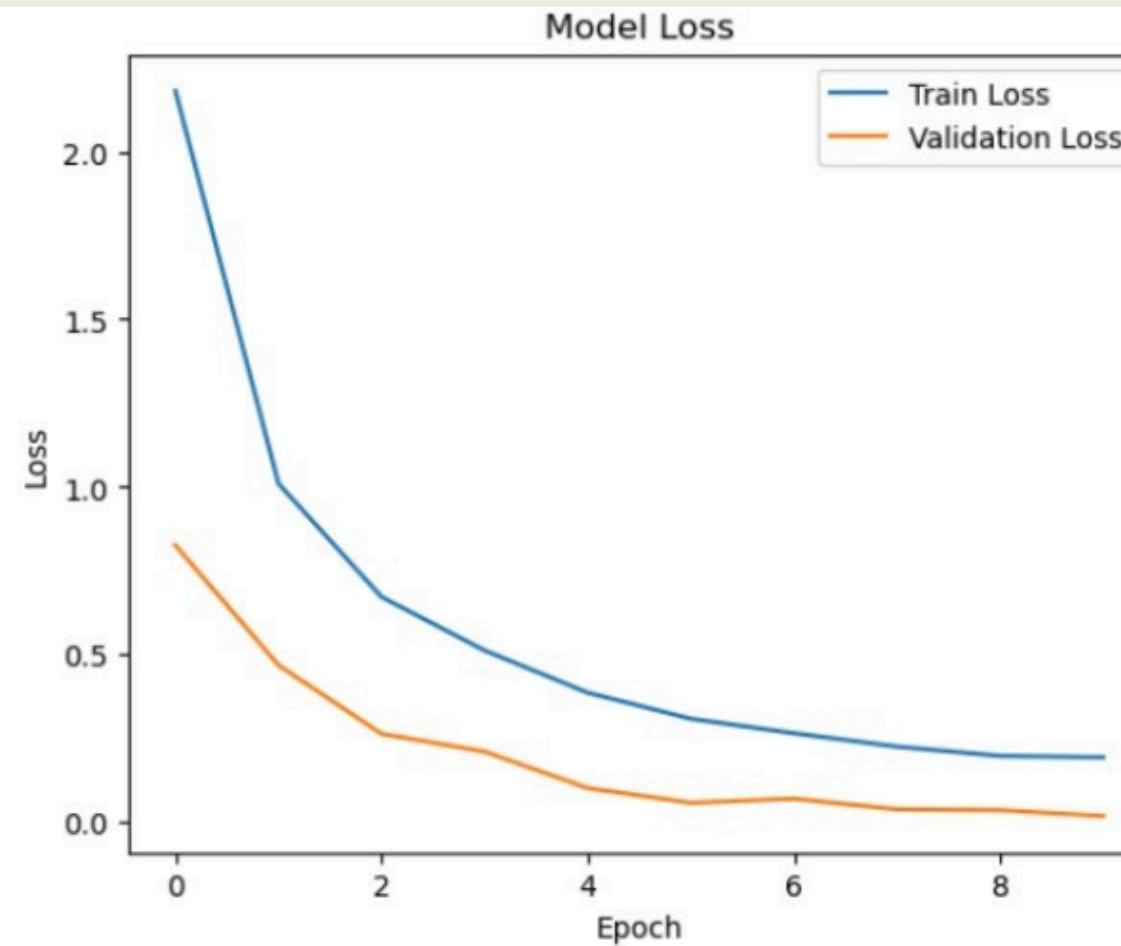
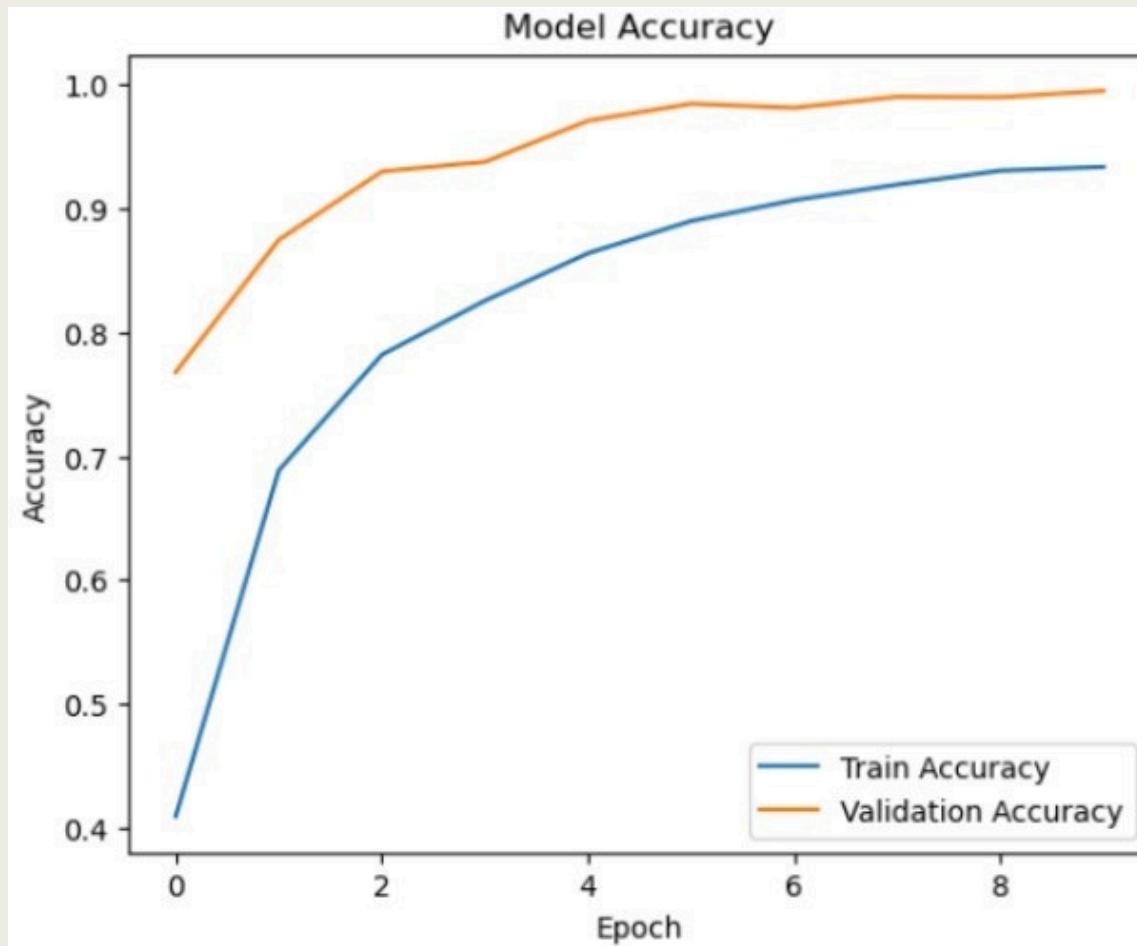
## Real-time updates and alerts

We continuously monitor environmental conditions and provide timely notifications about potential risks or issues affecting crop health.

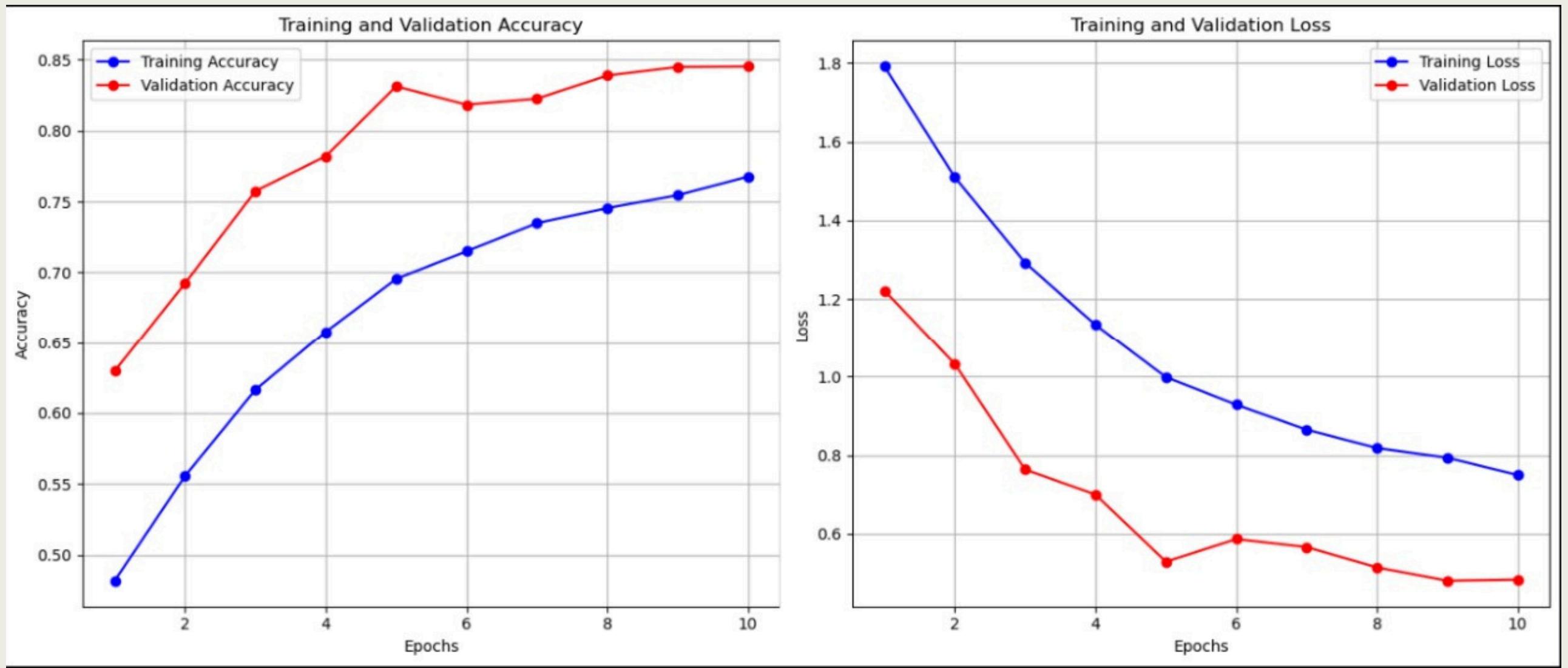
## Collaboration with local agricultural experts

We give farmers access to agronomists and extension agents for personalized advice and support.

# MODEL PERFORMANCE



We used a model called CNN and it achieved an accuracy of approximately 90% with minimal loss after ten epochs. There was a small gap between the training and validation curves suggesting good generalization and no signs of overfitting.



Both training and validation accuracy increased steadily, reaching approximately 85% and 80%, respectively. The training and validation loss decreased steadily, reaching minimal levels after 10 epochs.

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# BENEFITS

Our platform delivers numerous benefits to rural farmers, significantly enhancing their ability to manage crop health. By providing accurate, data-driven diagnostics and personalized recommendations, farmers can quickly address issues such as pests, diseases, and nutrient deficiencies, leading to healthier crops and improved yields. The real-time alerts ensure timely intervention, reducing the risk of crop damage and optimizing productivity. Additionally, the collaboration with local agricultural experts offers valuable region-specific insights and support, further empowering farmers to make informed decisions. Overall, these benefits translate into increased efficiency, higher crop quality, and greater economic gains for farmers.

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# USER EXPERIENCE

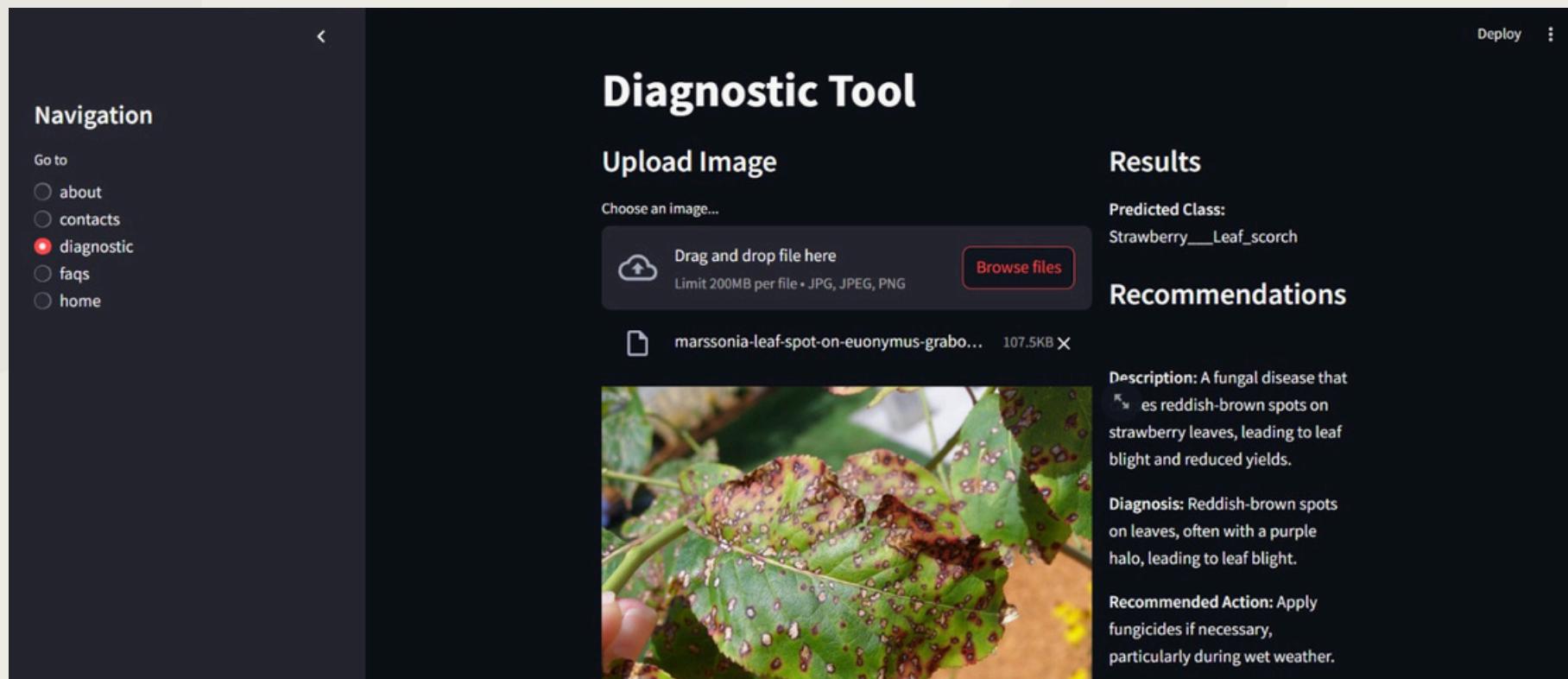
## *Seamless Interaction*

Our platform offers a seamless experience with a user-friendly app for easy image uploads.

Advanced data analysis provides quick, accurate diagnoses and actionable recommendations.

Real-time alerts inform users of potential issues, while integration with local agricultural experts delivers personalized, region-specific advice. This intuitive design helps farmers manage their crops efficiently and boost productivity.

# DIAGNOSTIC TOOL OVERVIEW



- Our diagnostic tool provides rapid and accurate plant disease identification.
- Users simply upload an image of an affected leaf.
- Advanced image analysis technology identifies the disease.
- Detailed information about the disease, including symptoms, causes, and treatment recommendations, is provided.
- Empower users to take timely action to protect their plants.

# ANALYSIS OF THE IMAGE

The screenshot shows a dark-themed web application interface. On the left, a sidebar titled "Navigation" contains links: "about" (highlighted with a red dot), "contacts", "diagnostic", "faqs", and "home". The main content area has a title "Plant Disease Detection & Recommendations" and a subtitle "Welcome to the Plant Disease Detection and Recommendation System". Below this is a descriptive paragraph about the system's purpose and capabilities. A section titled "Key Features" lists four bullet points: "Accurate Disease Detection", "Detailed Recommendations", "User-Friendly Interface", and "Regular Updates". At the bottom, there is a "Contact Us" button.

informative interface for a plant disease detection and recommendation system. It clearly outlines the key features and benefits of the tool.

# Get in Touch with Us

Visit our contact for expert assistance. We are committed to providing prompt and professional responses to all your inquiries

The screenshot shows a web application interface. At the top, there is a navigation bar with a dark background. On the left side of the navigation bar, the word "Navigation" is displayed. Below it, under "Go to", there is a list of links: "about", "contacts" (which is highlighted with a red dot), "diagnostic", "faqs", and "home". In the center of the page, there is a "Contact Form" section with fields for "Your Email" and "Your Message", and a "Send Message" button. Above the contact form, there is a small image of a plant and the text "Plant Disease Detection Tool". In the bottom right corner of the main content area, there is a "Deploy" button with three vertical dots next to it. On the far left, there is a sidebar with the title "Contact Us" and a list of contact details:

- Email: [support@farmdetect.com](mailto:support@farmdetect.com)
- Phone: (123) 456-7890
- Website: [www.farmdetect.com](http://www.farmdetect.com)



# Our Achievement



Advanced Diagnostic Capabilities



Strong Partnerships



Successful Pilot Launch



Impactful Results

Our platform has made significant strides since its launch. We completed a pilot phase, receiving positive feedback that validated its effectiveness in real-world conditions. High user engagement rates during initial rollouts highlight strong interest and satisfaction. We've implemented advanced diagnostic tools that have greatly enhanced the accuracy of crop health assessments. Additionally, we've established valuable partnerships with local agricultural experts and extension services, expanding our support network. These accomplishments reflect our commitment to improving crop management practices and delivering impactful results for rural farmers.





# Acknowledgements

**PlantVillage:** For providing the PlantVillage dataset, is crucial for our image classification models.

**Ms. Asha Deen:** For her invaluable guidance and feedback, in shaping the project's direction.

## Team Members:

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For your dedication and hard work in data preprocessing, model development, and testing.

**Open-Source Community:** For the tools and resources that made this project possible.

**Rural Farmers in Kenya:** For inspiring this project and motivating improvements in agricultural practices.

**Thank you all for your support and contributions.**



# Thank You

