

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

- **Limited Access to Expert Agronomists:** Rural farmers struggle to manage crop health due to insufficient expertise.
- **Difficulty in Identifying Crop Issues:** Challenges in accurately identifying pests, diseases, and other problems.
- **Delays in Addressing Issues:** Lack of expertise leads to slower response times in managing crop health.
- **Absence of Timely Recommendations:** Farmers lack actionable advice to take effective measures.
- **Reduced Crop Yields and Economic Losses:** Delays and ineffective management often result in lower yields and financial losses.

## FarmDTECT



# DATA UNDERSTANDING

- **Data Overview:** The dataset for our project includes over 50,000 images of diseased and healthy plant leaves from PlantVillage. It consists of non-augmented images, covering various leaf classes like apple scab, grape black rot, and healthy leaves.
- **Image Classification:** The dataset trains models to distinguish between healthy and diseased leaves accurately. 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.

FarmDTECT

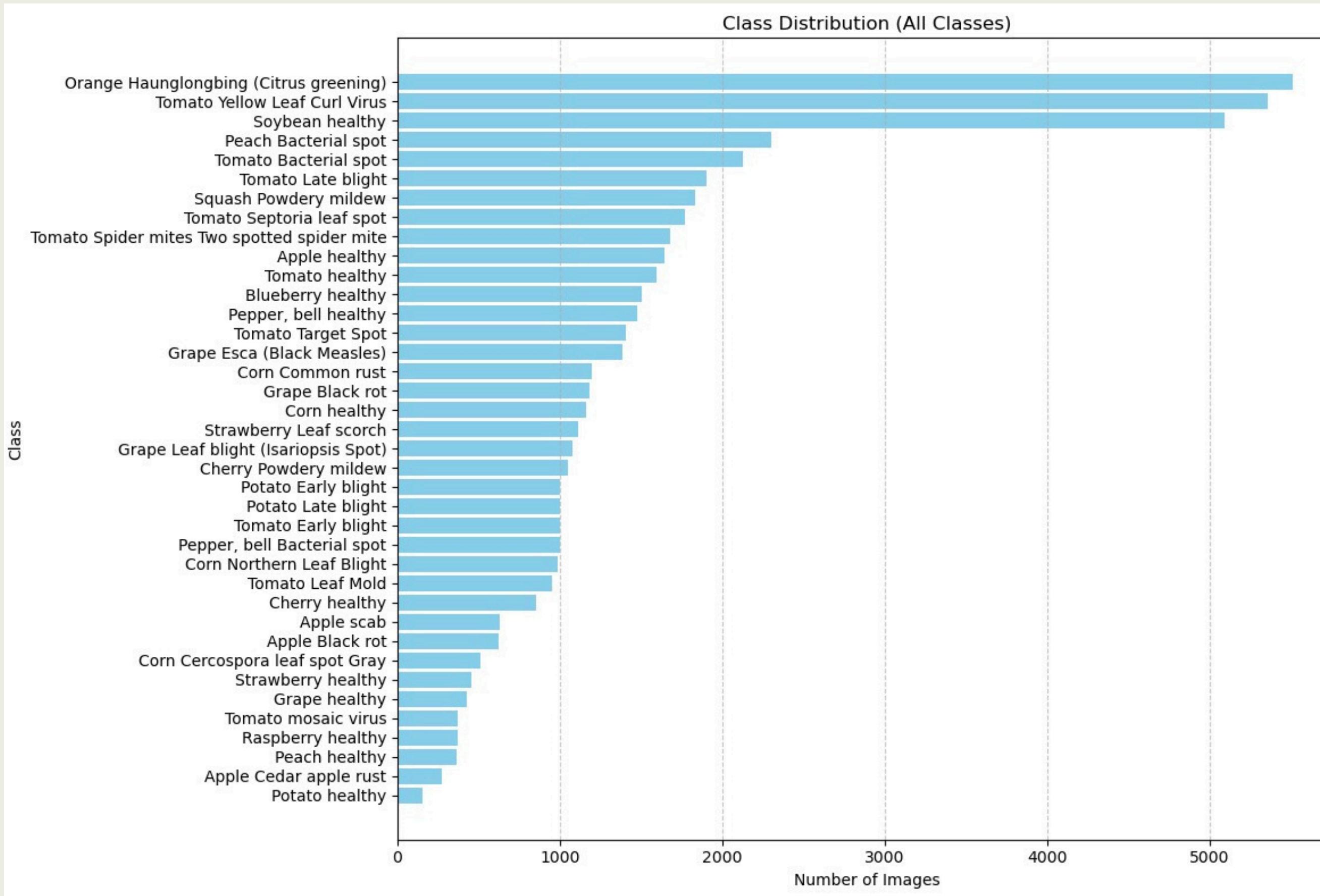


# EXPLORATORY DATA ANALYSIS

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

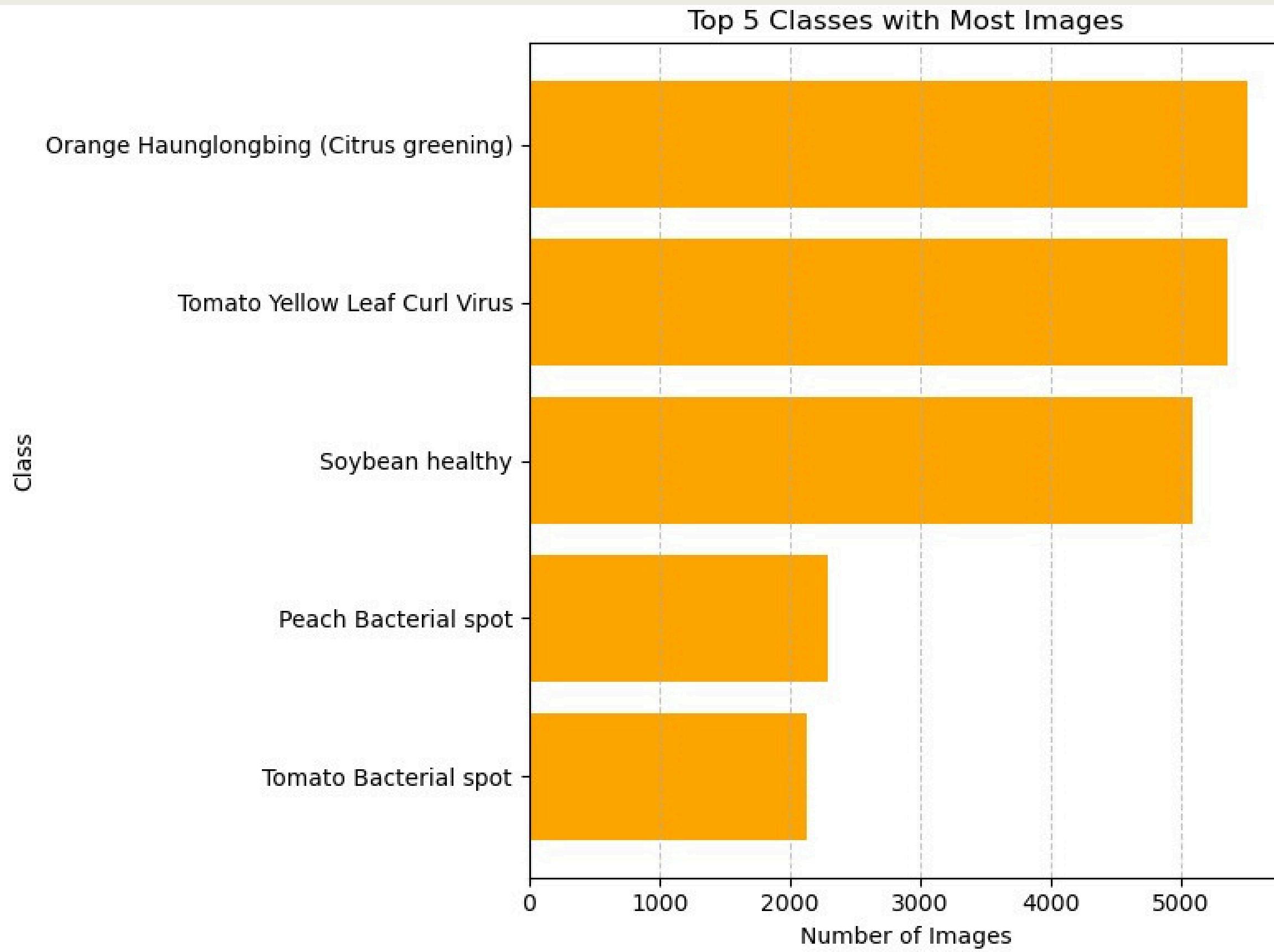
# Univariate Analysis

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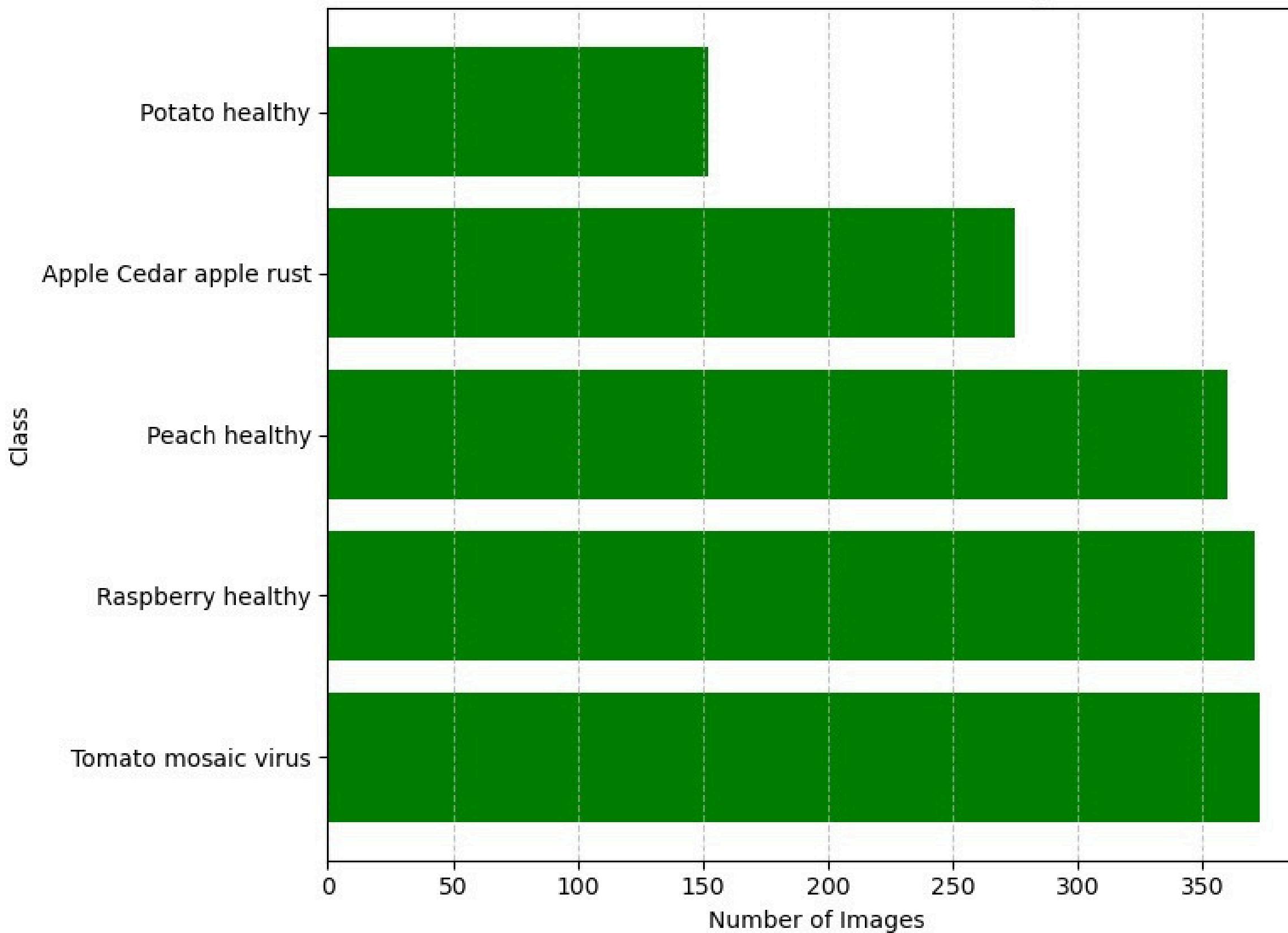
The class with the highest image distribution was Orange\_Haunglongbing with over 5000 images.

# More on EDA



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

Bottom 5 Classes with Fewest Images



The potato healthy was the class with the fewest 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 web 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.

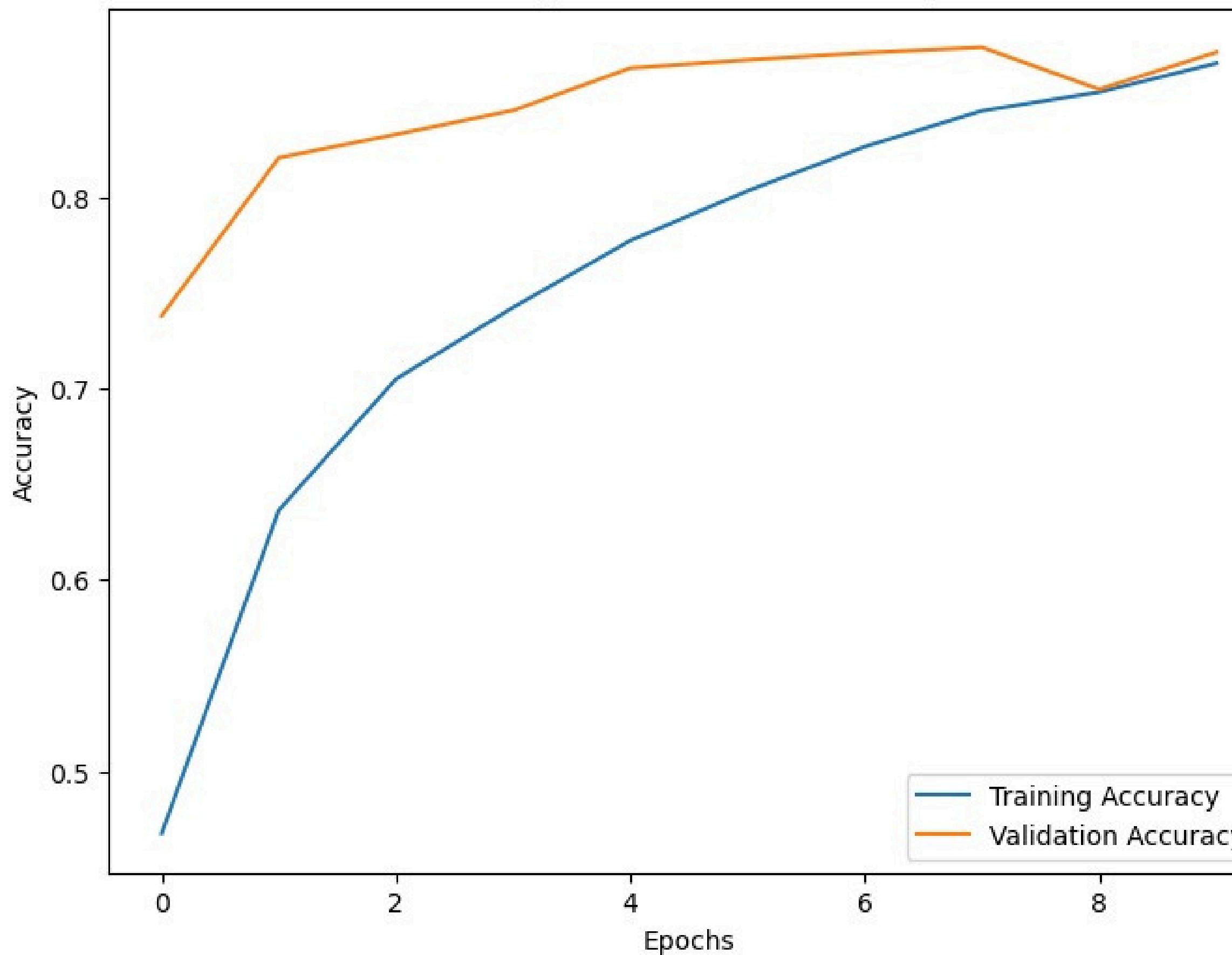
# MODEL PERFORMANCE



## Class Imbalance

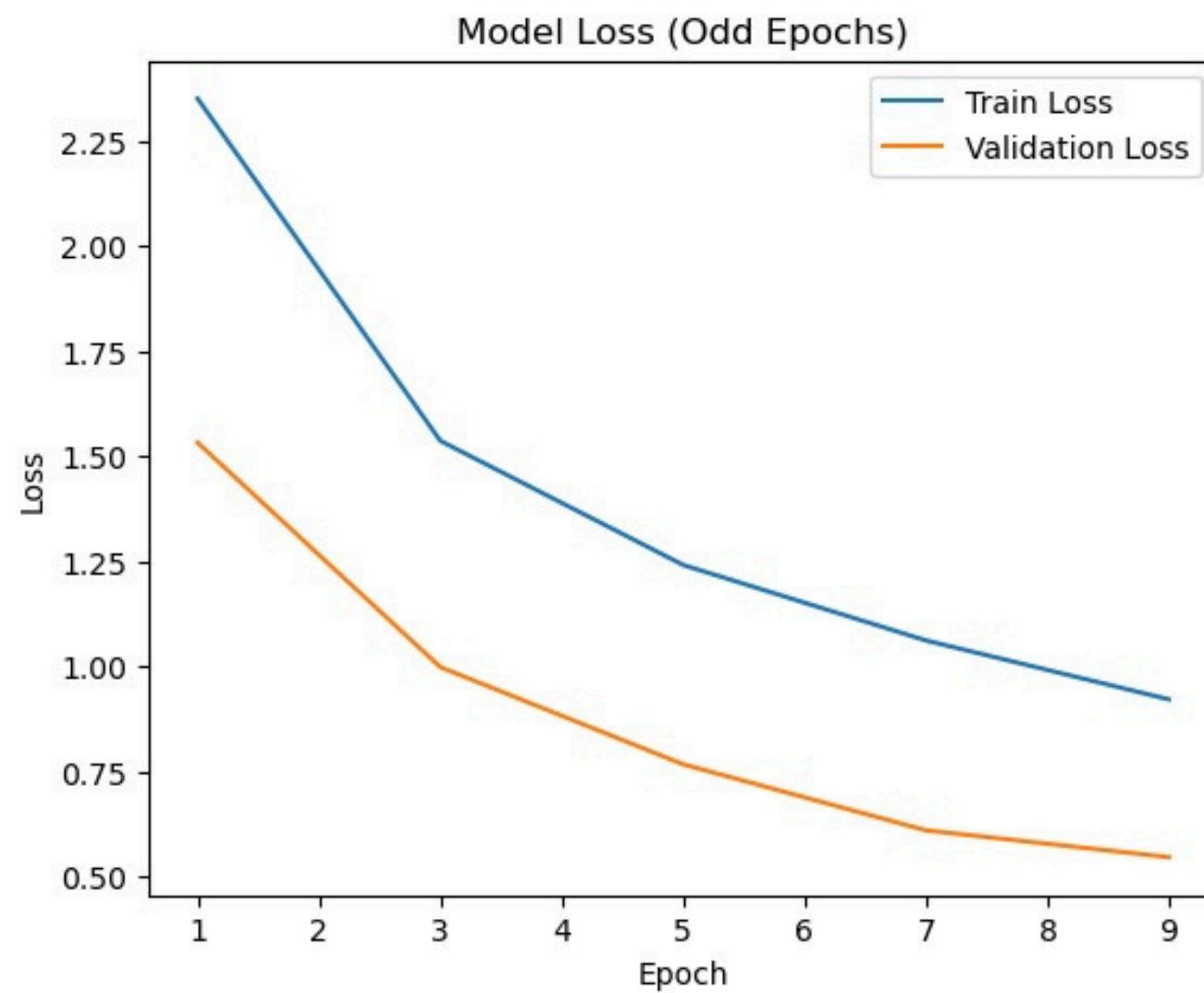
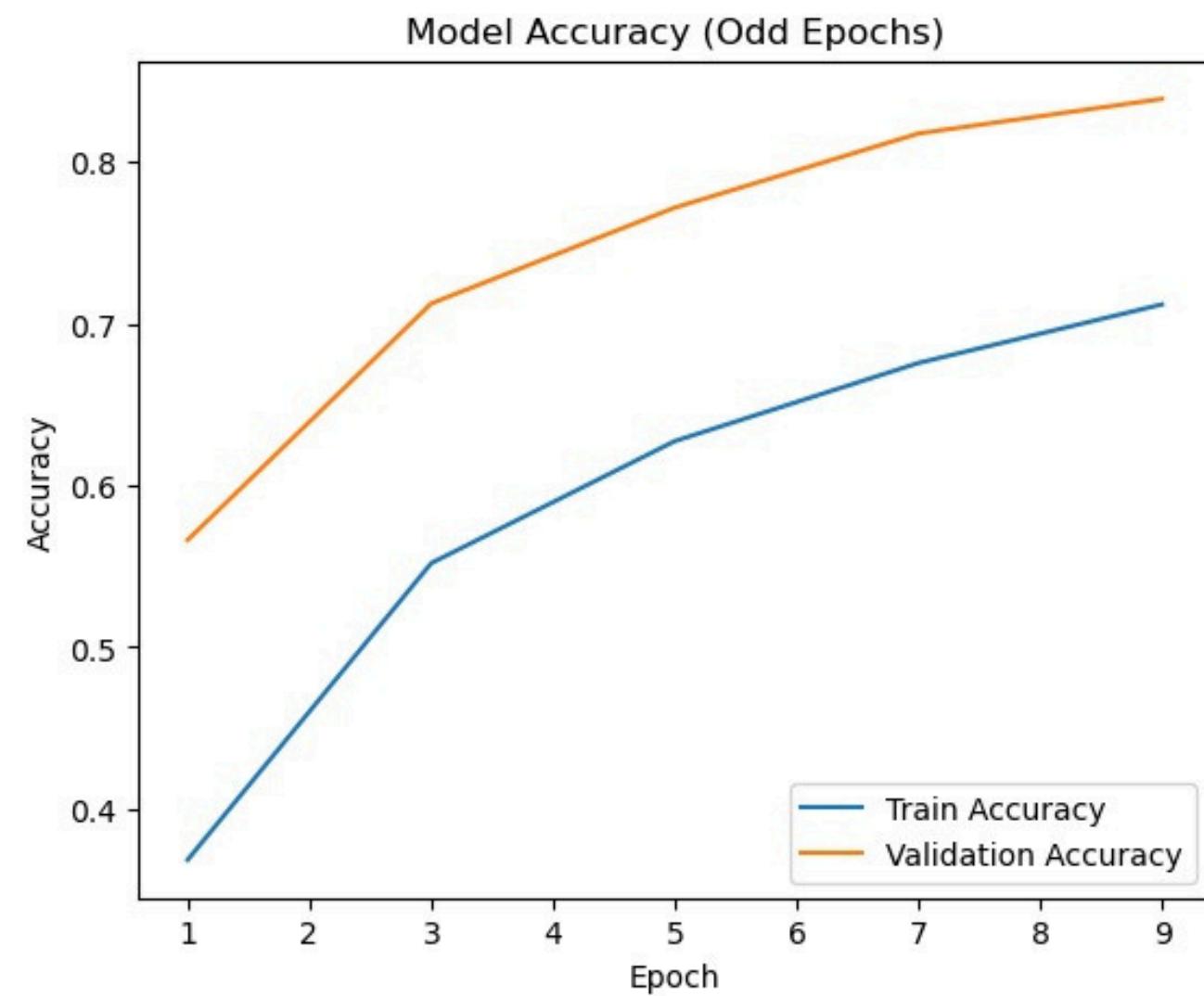
Class imbalance in plant disease detection can cause models to misidentify diseases like the Black Rot on these apple leaves, as they tend to favor predicting healthy plants. Addressing this imbalance is crucial to improving model accuracy.

### Training and Validation Accuracy



The accuracy plot shows our model's steady improvement in classifying data points, while the loss plot indicates a consistent decrease in error. The small gap between training and validation curves suggests good generalization and minimal overfitting.

The graphs show that the model improves steadily, with increasing accuracy and decreasing loss over epochs. The higher validation accuracy and lower validation loss suggest strong generalization and effective learning without overfitting.





# BENEFITS

- **Enhanced Crop Health Management:** Delivers accurate, data-driven diagnostics and personalized recommendations.
- **Timely Issue Resolution:** Helps farmers quickly address pests, diseases, and nutrient deficiencies.
- **Real-Time Alerts:** Ensures timely intervention to reduce crop damage and optimize productivity.
- **Local Expertise Collaboration:** Provides region-specific insights and support from local agricultural experts.
- **Increased Efficiency and Yield:** Leads to healthier crops, improved yields, and higher crop quality.
- **Greater Economic Gains:** Empowers farmers to make informed decisions, resulting in economic benefits.

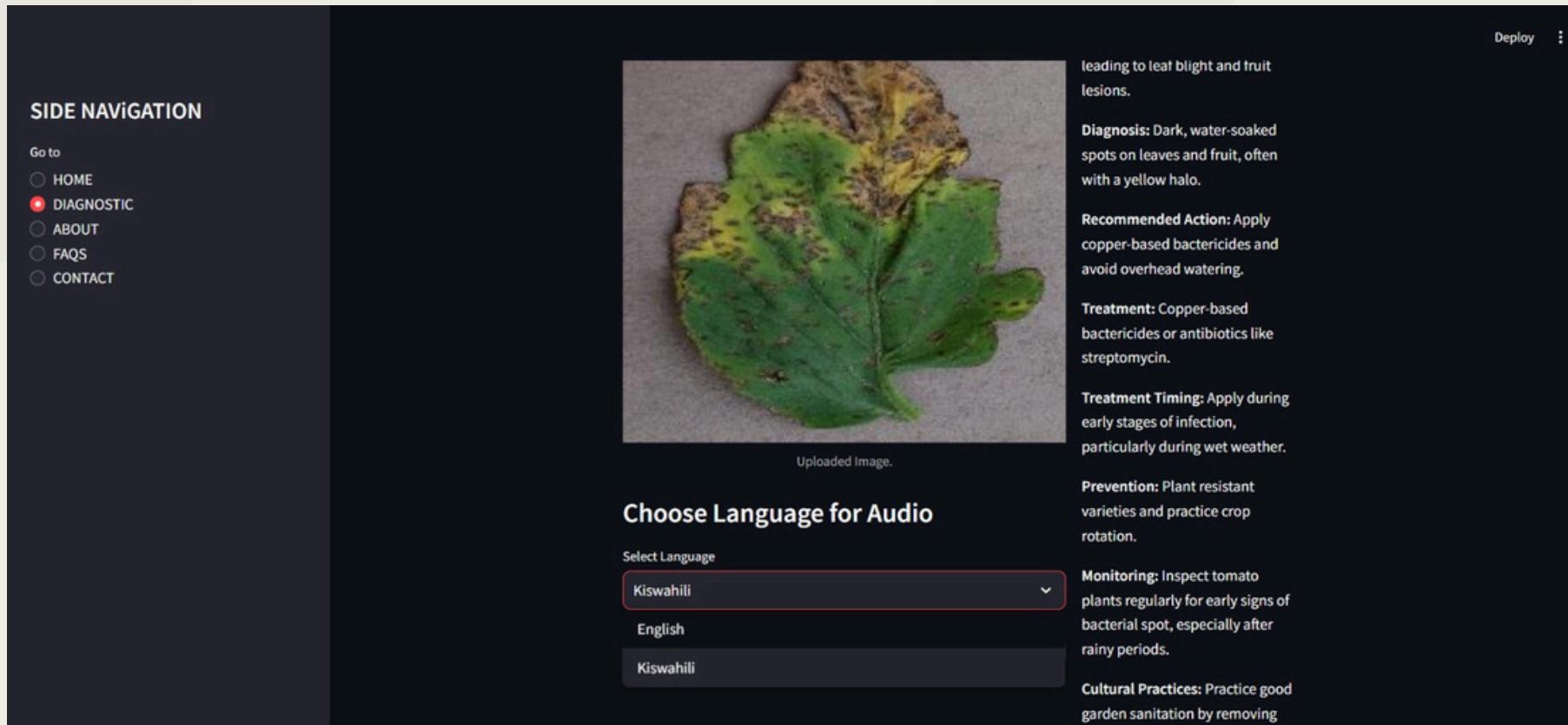


# USER EXPERIENCE

## *Seamless Interaction*

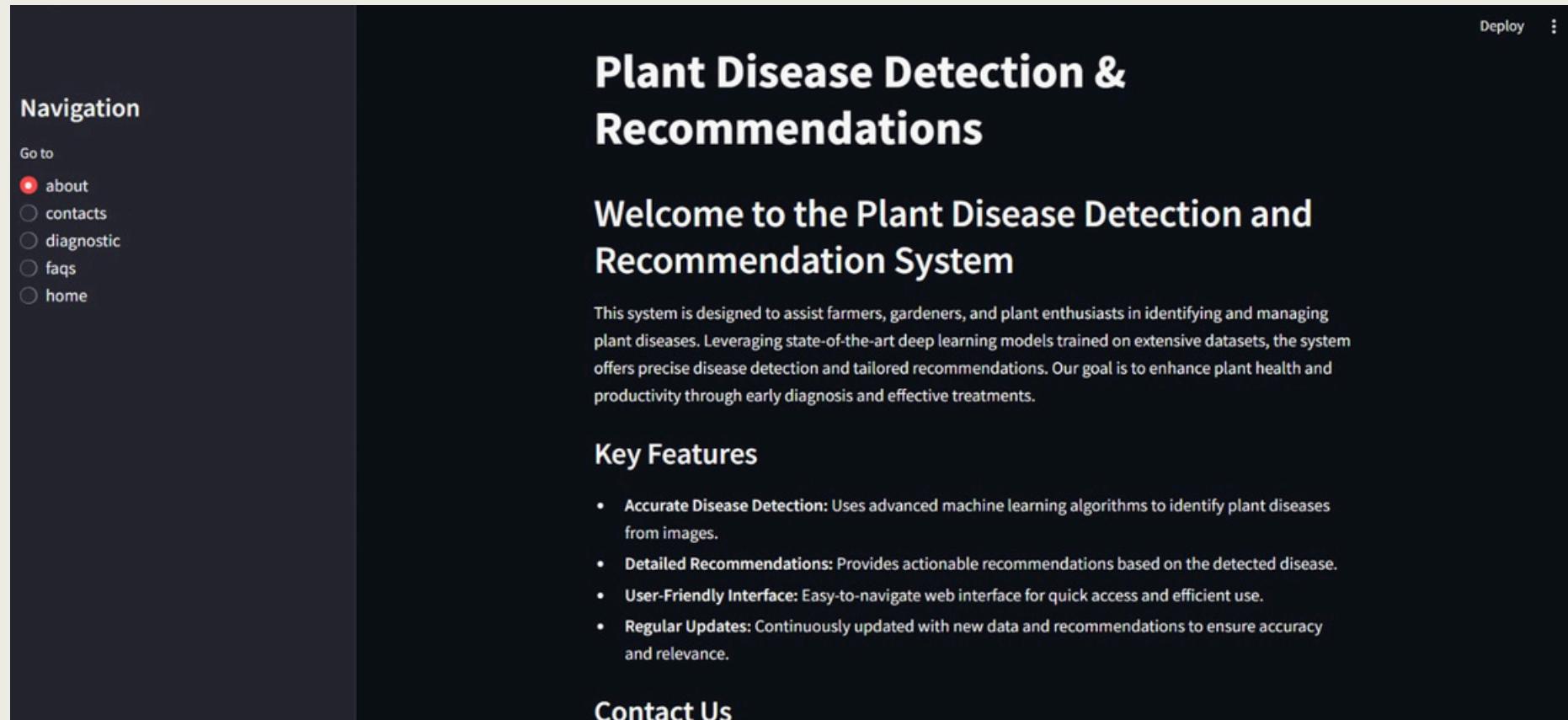
- **Web App for Image Uploads:** Seamless experience for uploading images.
- **Advanced Data Analysis:** Provides quick and accurate diagnoses.
- **Actionable Recommendations:** Offers practical advice based on analysis.
- **Real-Time Alerts:** Notifies users of potential issues promptly.
- **Integration with Local Experts:** Delivers personalized, region-specific advice.
- **Intuitive Design:** Helps farmers manage crops efficiently and boost productivity.

# DIAGNOSTIC TOOL OVERVIEW



- **Rapid and Accurate Diagnosis:** Our tool quickly and accurately identifies plant diseases.
- **Simple Image Upload:** Users can easily upload an image of the affected leaf.
- **Advanced Image Analysis:** Cutting-edge technology identifies the specific disease.
- **Comprehensive Disease Information:** Provides detailed insights into symptoms, causes, and treatment recommendations.
- **Language Flexibility:** Users can select their preferred language for the information, **ensuring accessibility for diverse communities.**
- **Empowers Timely Action:** Enables users to protect their plants effectively and promptly.

# ANALYSIS OF THE IMAGE



This image shows an 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.

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

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



# Thank You

