

RICEETA

Riceeta is a mobile application that could capture rice leaf diseases. It could identify what type of disease and gives a diagnosis on how to prevent the disease from spreading to the entire plantation.



USER MANUAL

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RICEETA: ON-DEVICE INTERFERENCE FOR RICE LEAF DISEASE DIAGNOSIS AND TREATMENT

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FREQUENTLY ASKED QUESTIONS (FAQ'S)

1. What is Riceeta?

Riceeta is an application used to detect if your rice crop is suffering from diseases namely Bacterial Leaf Blight, Tungro, and Leaf Blast. It also shows the diagnosis of how diseases could affect the rice crops, why such disease occurs, and how to manage the diseases.

2. Is the application available or can be used offline?

The application should be used while connecting to the internet so that the data could be and will be saved and loaded to the application.

3. Can I add two or more farm locations?

You can add two or more farm locations if you can identify the area where your farm is located.

4. Does this system allow the addition of other rice diseases?

No, the system is only allowed to identify at least 3 rice leaf diseases.

5. What is more accurate to use? The real-time (camera) or the added photo?

It is advisable to use the Add Photo feature because it shows more accurate results than the real-time (camera)

DISCLAIMER

This software project and its corresponding documentation entitled "Riceeta: On-device Inference for Rice Leaf Disease Diagnosis and Treatment" is submitted to the College of Information and Communication Technology, West Visayas State University, in partial fulfillment of the requirements for the degree, Bachelor of Science in Information Technology. It is the product of our own work, except for were indicated text.

We hereby grant the College of Information and Communication Technology permission to freely use, publish in local or international journals/conferences, reproduce, or distributed publicly the paper and electronic copies of this software project and its corresponding documentation in whole or in part, provided that we acknowledge.

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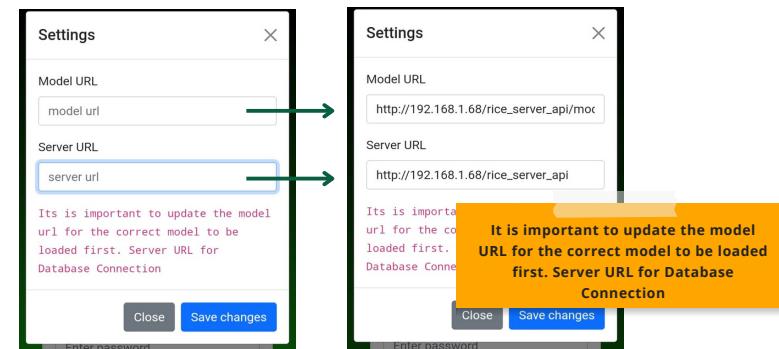
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TROUBLESHOOTING FOR FIXING POSSIBLE BUGS



In **SETTING's** section, always check the **MODEL URL** and **SERVER MODEL** so that the program models will load on the application.



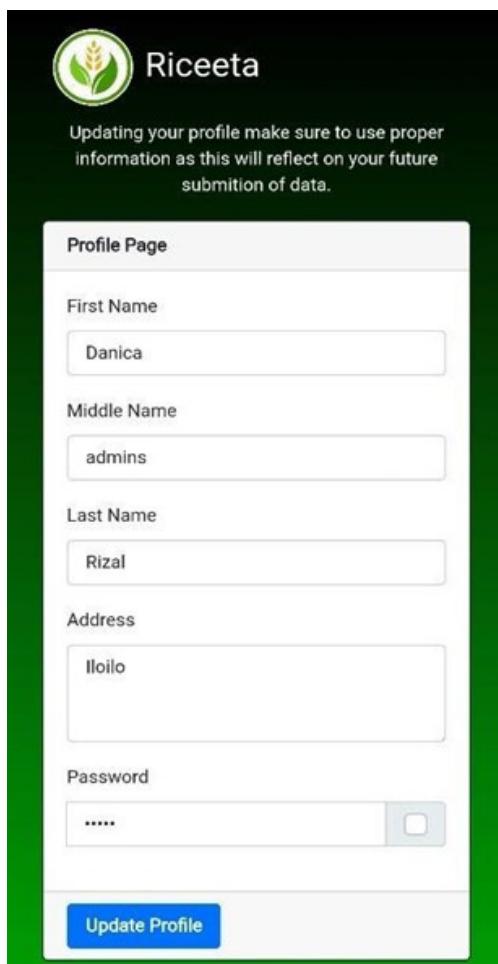
If your **Username** and **Passwords** are forgotten, you can visit your information in the server on the **rice_db** database and locate and click the "user" to see your credentials.



If the photos are deleted from the database, the data on the **Results Page** will be corrupted. If you want to delete the photos, go to the folder on **(C:\xampp\htdocs\rice_server_api\images)** and delete the photo/s.

PROFILE

- You can modify your information in this section such as your First Name, Middle Name, Last Name, Address, and your Password. You can change/edit the misspelled words and/or letters to be more accurate.



Introduction

Riceeta is a mobile application that could capture rice leaf diseases and at the same time, it could identify what type of disease and gives diagnosis such as a certain disease affects the rice crop and how to prevent it from spreading. It has a feature wherein the number of diseases is shown on a graph and table according to the months that it has been captured, a list of images taken together with dates and time, and disease type. The collected data is analyzed to provide a summary of events.

This app is to generate a report wherein all the data/save results are presented on various charts. Meanwhile, the location feature enables the farmer to add and locate the area of the rice field. It could be used in the day-to-day monitoring of rice plants to help farmers and agriculture enthusiasts easily identify the diseases if they have doubts about what the rice leaf disease is.

System Requirements

Riceeta application runs on Android Operating System device with a minimum requirement of:

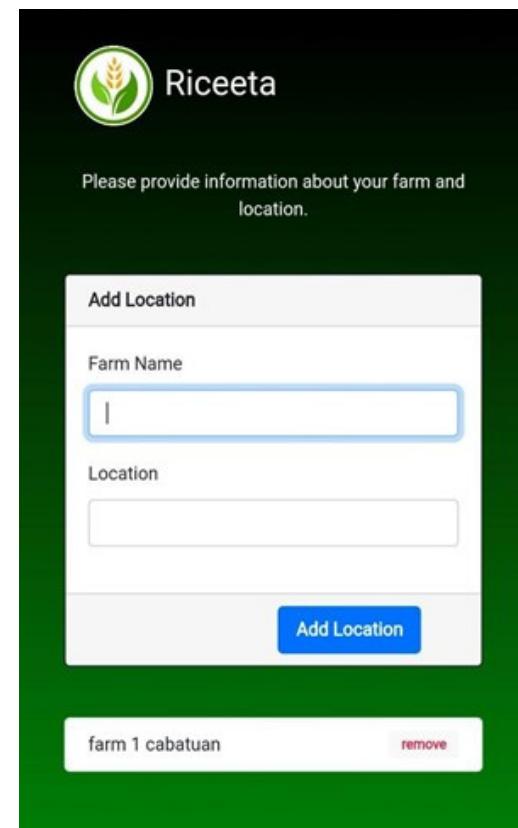
Processor	2.0 GHz Octa-Core
RAM	6 GB
Phone Storage	128 GB
Camera	Front 32MP / Rear 16MP+8MP+2MP
Operating System	Funtouch OS 9 (Based on Android 9.0)

Installation

1. Download the Riceeta application on your android device.
2. Locate the Riceeta apk and install
3. Download the "rice_server_api" folder and paste this on your XAMPP folder in drive C" C:\xampp\htdocs"
4. Then go to XAMPP control panel app and start the Apache and MySQL module then click the "admin" on the MySQL.
5. Click "New" and create a database named "rice_db" and click create.
6. After creating the database, go to the "rice_db" structure.
7. Go to import and import the file named "rice_db.sql" on the folder "C:\xampp\htdocs\rice_server_api"

LOCATION

- You can the area of your farm located. Also, you can name them in such a way where you can remember it. Location lets you identify in which farm did you capture the image and when data is saved, you can easily identify what diseases is found on different location



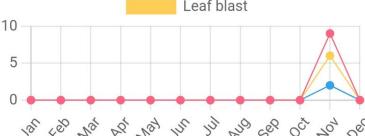
REPORTS

- Reports of how many diseases were put into charts. Also, you can see the list of images that the user saved, the classified disease, the date and time photo/image saved, and the confidence level. On the last part of the page, a summary of the total count of diseases is projected in percentage form.

 Riceeta

Statistic report based on the image captured labeled to a specific disease. The chart and tables show how many rice diseases were classified and its rationale.

Legend: Bacterial leaf blight (Red), Tungro (Blue), Leaf blast (Yellow)



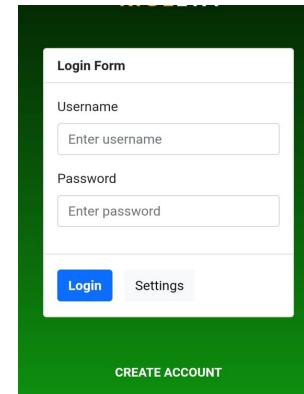
#	Image	Disease	Datetime	Confidence %
1		Bacterial Leaf blight	2021-11-27 01:28:22	79
2		Bacterial Leaf blight	2021-11-27 01:31:55	100
3		Leaf blast	2021-11-27 01:34:38	96
4		Bacterial Leaf blight	2021-11-27 01:36:53	97
5		Leaf blast	2021-11-27 01:51:37	67
6		Bacterial Leaf blight	2021-11-27 01:53:07	100
7		Bacterial Leaf blight	2021-11-27 01:55:23	73

Bars represent the total count of diseases in percentage form.

Disease	Percentage
Bacterial Leaf Blight	52.94%
Tungro	11.76%
Leaf Blast	35.29%

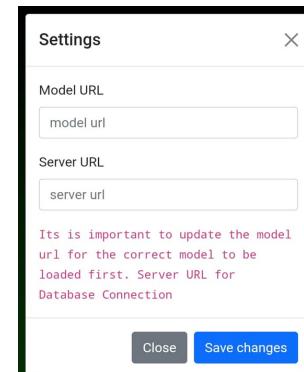
How to use the application

- After installing the application and setting up the files in the XAMPP MySQL, open the app and you will see the Login form, Settings, and Create Account.



The screenshot shows a 'Login Form' window with fields for 'Username' (Enter username) and 'Password' (Enter password). Below the fields are 'Login' and 'Settings' buttons. At the bottom right is a green 'CREATE ACCOUNT' button.

- Go to settings and set up the URLs for Model and Server.
Ex.: **Model URL** "http://ipaddress/rice_server_api/model_v5"
-(http://192.168.254.117/rice_server_api/model_v5)
- Server URL** "http://ipaddress/rice_server_api"
-(http://192.168.254.117/rice_server_api)



The screenshot shows a 'Settings' dialog box with fields for 'Model URL' (model url) and 'Server URL' (server url). A note at the bottom states: 'It is important to update the model url for the correct model to be loaded first. Server URL for Database Connection'. At the bottom are 'Close' and 'Save changes' buttons.

3. Then Log in. You can use the default account by using "Admin" as username and "admin" as password.
4. In creating a new account, just fill in the following: Username, Password, First Name, Middle Name, Last Name, and Address. Then click Submit.

The screenshot shows a 'CREATE ACCOUNT' form with the following fields:

- Username
- Password
- First Name
- Middle Name
- Last Name
- Address

Each field has a placeholder and a blue 'Submit' button at the bottom.

DIAGNOSIS AND TREATMENT

- ⊕ Shows information about the type of disease being detected on rice leaf diseases. It includes a description of the disease, what it does, how to identify the disease, and how to manage it.

Tungro

Tungro is a disease complex associated with rice tungro bacilliform (RTBV) and spherical (RTSV) viruses. RTBV and RTSV were separately purified from tungro-affected rice plants and antisera were produced. The viruses are efficiently detected from infected rice leaves in ELISA and less efficiently by latex test.

What it does:

Rice tungro disease is caused by the combination of two viruses, which are transmitted by leafhoppers. It causes leaf discoloration, stunted growth, reduced tiller numbers and sterile or partly filled grains. Tungro infects cultivated rice, some wild rice relatives and other grassy weeds commonly found in rice paddies.

Why and Where it occurs:

Tungro disease viruses are transmitted from one plant to another by leafhoppers that feed on tungro-infected plants. The most efficient vector is the green leafhopper. Leafhoppers can acquire the viruses from any part of the infected plant by feeding on it, even for a short time. It can, then, immediately transmit the viruses to other plants within 5-7 days. The viruses do not remain in the leafhopper's body unless it feeds again on an infected plant and re-acquires the viruses. Tungro infection can occur during all growth stages of the rice plant. It is most frequently seen during the vegetative phase. Plants are most vulnerable at tillering stage.

Transplanting seedlings from nurseries in tungro-infected areas has also shown to increase infection rates in the field, particularly, in cases where seedbed is in a tungro-endemic area or when the nursery duration is 5-6 weeks. However, this is not believed to be a very strong mechanism in initiating epidemics, because the competitiveness of tungro-infected seedlings is low; they can die rapidly after transplanting.

Why is it important:

Tungro is one of the most damaging and destructive diseases of

rice in South and Southeast Asia. In severe cases, Tungro susceptible varieties infected at an early growth stage could have as high as 100% yield loss. Once tungro is present in the field, it increases rapidly in young rice plants. Leafhopper vectors prefer to feed on young rice plants. They also acquire tungro viruses more efficiently from younger infected plants.

How to identify:

- Check for presence of leafhoppers. Check leaves for discoloration. Yellow or orange-yellow discoloration is noticeable in tungro-infected plants. Discoloration begins from the leaf tip and extends down to the blade or the lower leaf portion. Infected leaves may also show mottled or striped appearance, rust-colored spots, and/or inter-veinal necrosis.
- Tungro-infected plants also show symptoms of stunting, delayed flowering which may delay maturity, reduced number of tillers, small and not completely exerted panicles, as well as a higher-than-normal percentage of sterile panicles or partially filled grains, covered with dark brown blotches. The degree of stunting and leaf discoloration varies with rice varieties, strains of the viruses, the age of the plant when infected, and with the environment. In varieties that carry some resistance to the disease, infected plants exhibit no discoloration or only a mild discoloration that may disappear as the plants mature. Tungro symptoms can be mistaken for physiological disorders.

Specifically,

- the yellowing of the plant and its stunted height can be confused as nitrogen and zinc deficiencies and water stress, pest infestation such as stem borer infestation, plant hopper infestation, and rat damage, and other diseases such as grassy stunt virus disease and orange leaf.

Where available, Tungro can be confirmed using serological tools such as Latex agglutination test, Enzyme Linked Immunosorbent Assays (ELISA) and Rapid Immunofilter Paper Assays (RIPA).

How to Manage:

Once a rice plant is infected by tungro, it cannot be cured. Preventive measures are more effective for the control of tungro than direct disease control measures. Using insecticides to control leafhoppers is often not effective, because green leafhoppers continuously move to surrounding fields and spread tungro rapidly in very short feeding times.

The most practical measures at present, include:

- Grow tungro or leafhopper resistant varieties.
- This is the most economical means of managing the disease. There are tungro-resistant varieties available for the Philippines, Malaysia, Indonesia, India, and

ADD PHOTO

- Enables you to import an image from your device to the application. To import an image, click "choose file" and select the picture you have stored in your gallery. After selecting the image, click "Analyze Leaf". Results will be shown afterward, click "[save results](#)".

After showing the result, you can see the name of the disease is highlighted. Click the highlighted text to go to the "[Diagnosis and Results](#)" page.

Image

Choose File: IMG_20210710_144749.jpg

Select Farm: farm 1 cabatuan

Disease: leaf_blast

Value: 100

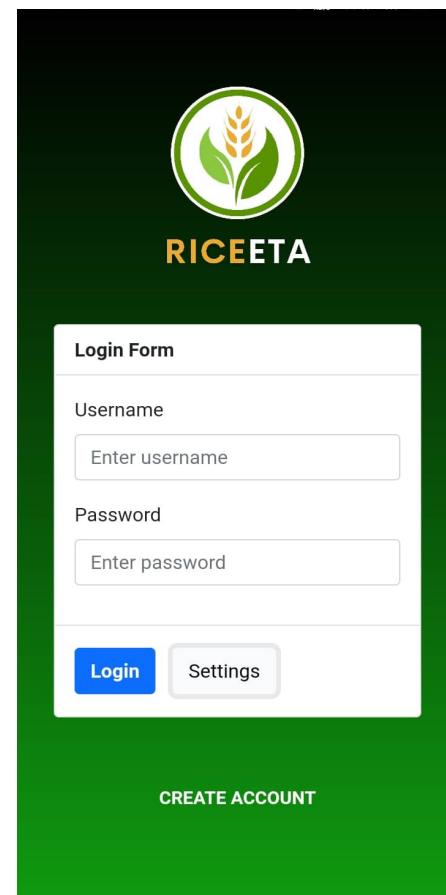
Analyze Leaf Save Results

Note: Click "Save Results" before viewing the diagnosis..



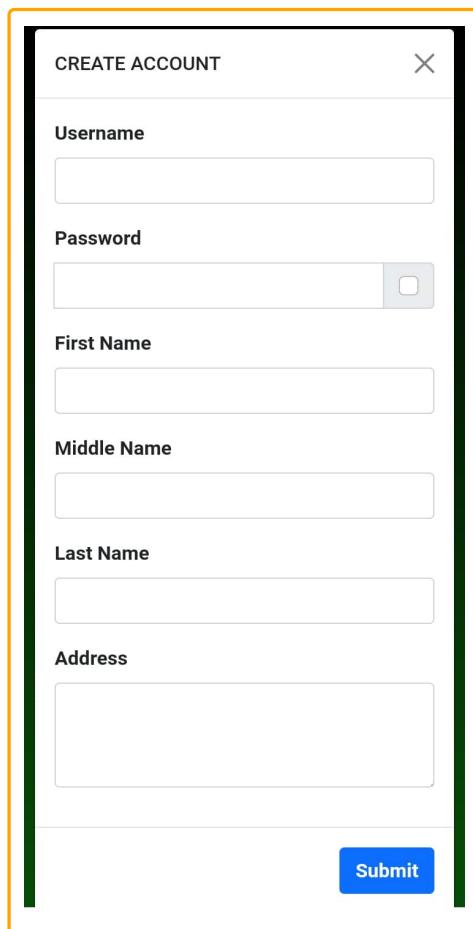
LOGIN PAGE

- This is where you will log in your credentials such as your username and password. The user will log in using the email and password on his/her account



CREATE ACCOUNT

- You can create an account by just filling in the information like username, password, first name, middle name, last name, and address that later will serve as your credentials.

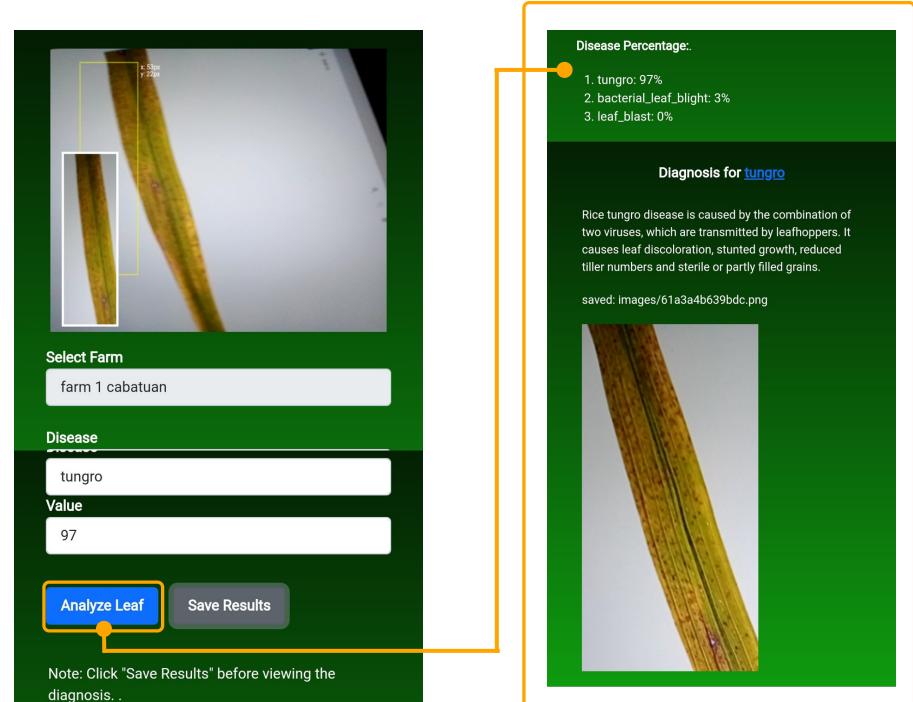


The image shows a 'CREATE ACCOUNT' form with the following fields:

- Username: An input field for entering a unique identifier.
- Password: An input field for entering a secure password, accompanied by a visibility toggle icon.
- First Name: An input field for entering the first name.
- Middle Name: An input field for entering the middle name.
- Last Name: An input field for entering the last name.
- Address: An input field for entering the physical address.
- Submit: A blue button at the bottom right to submit the form.

CAMERA

- You must make the camera clear of vision to identify the rice leaf. Make sure that before clicking the analyze leaf, you must select the farm, and the bounding box is visible on the screen so that the image will be captured and identified. After analyzing the leaf, the disease percentage is projected, this part showcases the value of the rice leaf disease in each disease. A short description or diagnosis will prompt. As seen in the picture, there is a linked text that if clicked, will proceed to the diagnosis and results page.

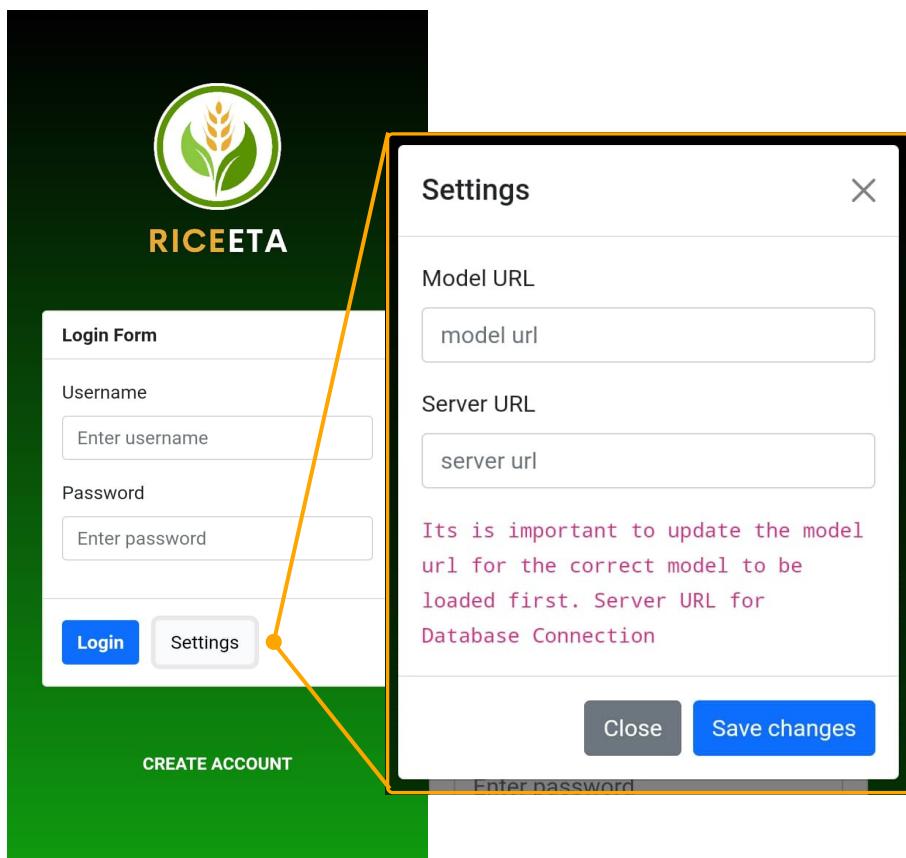


The interface consists of two main sections:

- Left Section (Analysis):**
 - A preview image of a rice leaf with a yellow bounding box highlighting a specific area.
 - A camera viewfinder showing a rice leaf.
 - Form fields:
 - Select Farm: farm 1 cabatuan
 - Disease: tungro
 - Value: 97
 - Buttons: Analyze Leaf (highlighted with an orange circle), Save Results.
 - Note: Note: Click "Save Results" before viewing the diagnosis..
- Right Section (Results):**
 - Disease Percentage:
 - 1. tungro: 97%
 - 2. bacterial_leaf_blight: 3%
 - 3. leaf_blast: 0%
 - Diagnosis for tungro:
 - Rice tungro disease is caused by the combination of two viruses, which are transmitted by leafhoppers. It causes leaf discoloration, stunted growth, reduced tiller numbers and sterile or partly filled grains.
 - saved: Images/61a3a4b639bdc.png
 - Image: A close-up photograph of a rice leaf showing signs of tungro disease.

SETTINGS

- ⊕ You will need to enter the model URL and the server URL. This will enable the application to connect the models to the server. Connecting the application to the localhost will enable the images to be stored and can have access to information inside the database.



Homepage

- ⊕ Here, you can see that there are features namely Camera, Add Photo, Report, and Profile.

