

# Detection And Measurement of Paddy Leaf Disease Symptoms using Image Processing

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**Abstract—** Plants are one of the major resources to avoid the global warming in the world. But the plants are affected by the diseases like Blast, Canker, Black spot, Brown spot, Bacterial leaf Blight and Cotton mold .The objective of this paper is to recognize the paddy diseases. Some of the paddy disease is Blast Disease (BD), Brown spot Disease (BPD), Narrow Brown spot disease (NBSD), which stops the growth and protection of the paddy. Disease can infect paddy at different stages of growth and all parts of the plants as the leaf neck and the node. The list of the paddy disease can be caused by bacteria, fungus etc. The methodology was designed to remove the noise automatic, error by human and minimizing the time taken to mensurate the affect of paddy leaf disease. And it also increases the accuracy. In this paper it survey, k-means techniques for paddy leaf detection and identification.

**Keywords—**image aquisition; segmentation; image preprocessing; classification.

## I. INTRODUCTION

Plant disease problems can be classified into two types as, disorder and disease. Plant disorder is in the form of disruption or distraction of the normal states of the plant or parts that are affected by the soil problems, environmental stresses, or other physical effects. In the plant disorders the disease cannot be transferred from an affected plant to the unaffected plant. A plant disease is an occurrence of the change for the worse of the normal functioning of the plant or the part that can be affected by the disease causing agents such as fungi, bacteria, viruses, nematodes. Some of the plant diseases can be act of extending over a wider parts of the plant from the affected plant to the unaffected plant.

The techniques that are involved in the identification of the paddy diseases are acquisition of image, preprocessing of image, segmentation of image, feature extraction, classification. Initially, to read the image, the different types of format images like jpeg, jng, gif, bmp can be used. The early stage of the system is the acquisition of image.

After identifying the image, various processing techniques can be concerned with concrete problems of the image for

performing the several task. In preprocessing, RGB images are converted into gray image using the color conversion. To increase the contrast are used various contrast enhancement techniques like histogram equalization and contrast adjustment. In segmentation, partitions of the image of the distinct regions that each pixel containing the similar attributes are used in the image. Techniques like k-means, FCM, PCA, PSO, and MPSO are processed. Classification is a method for identifying the images. All the classification algorithms are based on the assumption that the image depicts one or more features. There are different types of classification features like SVM, artificial neural network (ANN), fussy classification. This feature extraction, uses different types of feature values like texture feature, structure feature and geometric feature.

## II. SOME IMPORTANT PADDY LEAF DISEASE

### A. BLAST

Fungus magnaporthe oryzae is responsible for the paddy disease called Blast. Leaf collar, leaf node, collar node and neck parts of the panicle are affected by Blast.

### OCCURANCE

Blast can occur in paddy in all growth stages, wherever the Blast spores are present. Normally it is present in low soil moisture, rain shower and cooled temperature.

### SYMPTOMS

Initially appear as gray green spot with dark green border. Later lession became elliptical with gray center and brownish border. Then it get enlarged and killing the entire leaves.



## B. BROWN SPOT

The most common paddy disease is Brown spot. It infects the coleoptiles, panicle, leaf sheath and seed which leads to unfilled grains. It can kill the whole leaf.

### OCCURANCE

Areas having high humidity (86%-100%) and nutrient deficient soil leads to this disease. The fungus in the seed can survey for 4 years. Infection is very critical during ripening stages of the crop.

### SYMPTOMS

Seedlings have yellow brown lesions at the starting stage which are dark brown in color. Later became purple brown. Fully developed lesions are surrounded by reddish brown margin.



## C. NARROW BROWN SPOT

The fungus *Sphaerulina oryzae* is responsible for the narrow brown spot, it infects leaves and leaf sheaths, premature ripening of grains and lodging of plants in severe case.

### OCCURANCE

Potassium deficient soils with temperature 25-28 degree leads to this disease. It appears in rice crops during the later stages of the plant.

### SYMPTOMS

Lesions progressing parallel to veins in leaf are dark brown color which is 2-10mm long and 1-1.5mm wide. They may connect together creating brown necrotic regions which leads to discoloration.

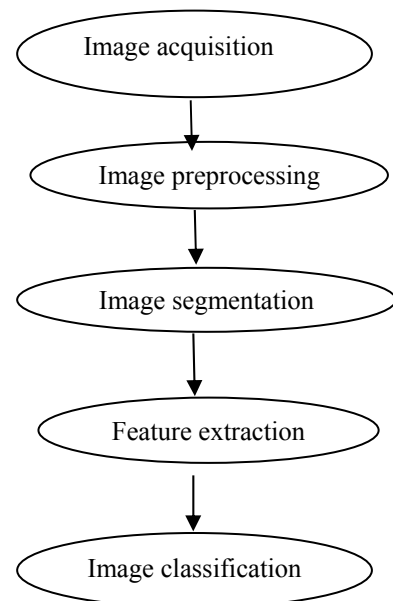


## III. EXISTING WORK

Identifying the paddy leaf disease by capturing the image. The noise over the image is removed by preprocessing and segmentation using statically region merging. Converting the RGB image into binary using the automatic threshold based on entropy method. [1]J.B Cunha used recognition techniques for analyzing the pathological stress condition and characteristics of the plant leaf. [2]Parveize zearean used supervised learning to recognizes the plant leaf diseases identification. In this, the paper used maximum likelihood algorithm is used for identifying the crop size and crop area. Neural network technique is used to identify the disease detection and classification. [3] Jinguo Yuan has defined a work on land image processing to identify the relative region under SAR image processing.

## IV. PROPOSED SYSTEM

In this system, for diagnosing paddy disease of Blast, brown spot and narrow brown spot. It involves several techniques such as image acquisition, image segmentation, preprocessing feature extraction and image classification.



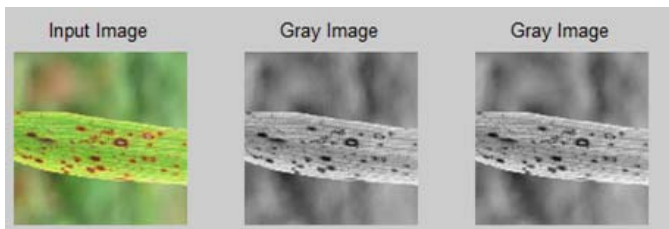
### Image acquisition

The RGB Color images of paddy crop leaf are captured using smart phones or digital camera, with the pixel size 768\*1024 for the clear image. The digitized images are 225KB size of each image. Those images are cropped into smaller images with the dimensions of 109\*310 pixels. Images

are stored in BMP format by using mat lab image processing library.

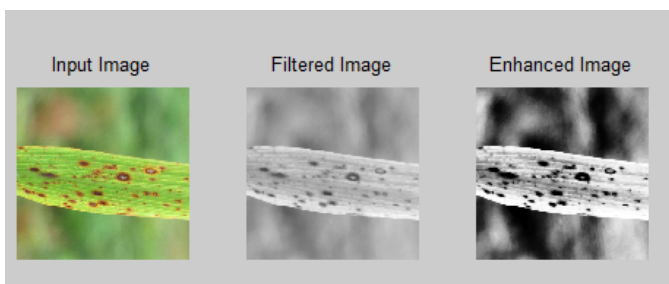
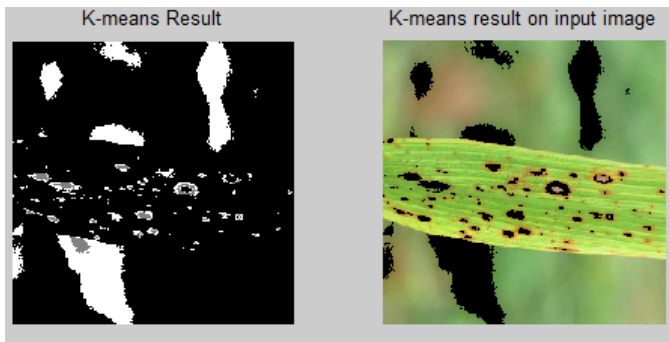
#### Image preprocessing

Image preprocessing task involves the image enhancement. dimension of the Paddy leaf image compromising 109\*310 pixels are used. In order to achieve high accuracy, the RGB images are converted into gray scale images. To increase the contrast using various contrast enhancement techniques like histogram equalization, contrast adjustment. Occurrence matrix is generated from the input images according to the probability distribution.



#### Image segmentation

In image segmentation, the noises of the image that affect the image quality are detected. K means algorithm is applied to remove the noise and unnecessary spots. The binary image with noise is converted into free of noise image. The noise free images are the filtered images. Then the filtered image is converted into enhanced image using K means algorithm which give high quality image for detecting the leaf disease.



#### Feature extraction

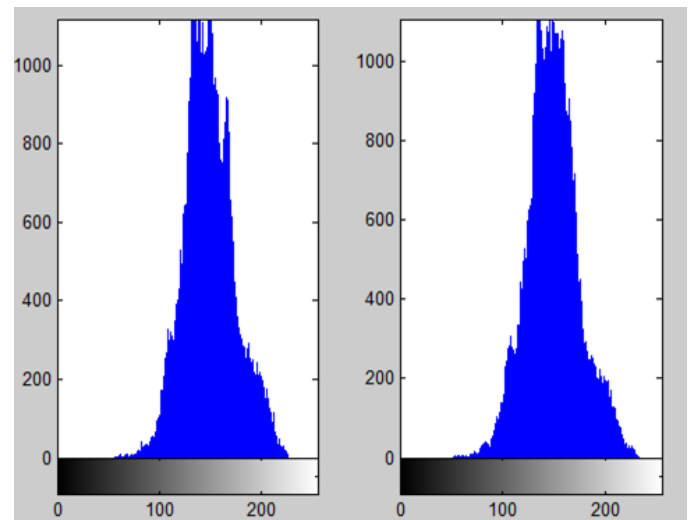
As the paddy leaf disease consists of several types of disease blast, brown spot and narrow brown spot that had different lesion shape and lesion color.

#### Shape feature extraction

Shape is one of the important parameter of the image. Breadth and length of the image are significant characteristic to describe the shape. A simple approach is to measure the breadth and height of the image is to measure the count of the object pixel.

#### Color feature extraction

Color plays an important role in image processing. Digital image processing produce quantitative color measurement that are useful for the work of inquiring the lesion for early diagnosis. The pixel in the color images are commonly represented in RGB format, where RGB are RED GREEN BLUE values respectively from the color images capturing device,.



#### Image classification

Different types of classification features like SVM, artificial neural network [ANN], fuzzy classification are proceed. Based on lesion type, boundary color, spot color and paddy leaf color, of the leaf paddy disease which is recognized using ANN or fussy logic method. SVM [support vector classification] classification is only classified into two stages as the leaf is defected or not defected. But using ANN and FUZZY classification ,It can identify the disease of the paddy plant.

#### V REVIEWS OF LITERATURE

Nonik Noviana kurniawati and Salwani Abdullah in [1] proposed a method for identifying the paddy diseases. The techniques involved are image acquisition, converting the RGB images into gray scale images. Then converting the gray scale images into binary images with noise. Further, the region filling techniques in the morphological algorithm to remove the noise is used. The paddy disease is recognized about the accuracy of 94.7 percent. By using this system the crop leaf disease can be detected automatically.

Arnal barbedo and Jayme Garcia in [2] proposed a method for detecting, quantifying and classifying the crop leaf diseases from the magnitudes in digits images. This system is classified as according to the detection of objective in severity classification and classification. There are many approaches to detect plant pathologies. Some of the diseases that does not have any visible symptoms. Remote sensing techniques are used to explore multi and hyper spectral image captures. This system proposed the trained rates and efficient to recognize, identify and quantifying the diseases

Shenweizheng and wcyachun in [3] proposed a system on eyeballing techniques based on the computer image processing. Sobal operator is used to extract the disease spot edges. The system is proposed that the plant diseases are identified by calculating the ratio of two quantities to be divided of the disease spot and leaf area. The method is too graded to identify the leaf spot diseases are speed and accurate.

Manoj Mukherjee and Titan Pal in [4] proposed an automatic method to identify and measure the paddy leaf disease symptoms using digital image processing. A conventional color digital image is a method used to identify the symptoms of the paddy leaf. This method was proposed by automatically and removing the possibility of the mistakes created by human and then reducing the time, for identifying disease severity.

P.Tamije seivy & kowsalya.N in [5] proposed a method of detecting the plant diseases in monitoring the large fields of crops. Identifying the paddy leaf disease by capturing the images through the smart phones by mobile application. The noise over the images is removed by using the pre processing and segmentation using the stastical region merging (SRM) method.

## V. CONCLUSION AND FUTURE WORK

A system for identifying the paddy diseases like Blast, Brown spot and Narrow brown spot are detected. It is mainly based on the mat lab application using k-means algorithm.

This paper evaluates the techniques in digital image processing for detecting, diagnosing, recognizing of crop leaf diseases k-means clustering algorithm is used for automatically the disease for more accuracy.

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