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Sugarcane Disease Detection and controlling Using Image Processing

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Abstract:- India is the fast growing country and agriculture is the main source for the countries development. Due to industrialization and globalization concept the field is facing hurdles. Now a day's technology plays a vital role in agriculture. Identifying the health of sugarcane plays an important role for successful cultivation. Identifying plant disease wrongly lead to huge loss of yield, money and quality of product. Generally we can observe symptoms of leafs, flowers, stems and fruits etc. So here we use leafs for detection of disease.

Keywords:- *Plant disease, Image acquisition, pre -processing, Feature extraction, symptoms, and pesticides.*

1. INTRODUCTION

Agriculture is important field as it provides food. The old and classical approach for detection and recognition of plant diseases is based on necked eye observation. In some countries, consulting experts to find out plant disease is expensive and time consuming due to availability of experts. India experiences /variety of climates ranging from tropical in the south to the temperature in the south. Due to unpredictable climate changes .There is lack of nutrients and minerals to the crops. This lead to deficiency diseases which in turn affect the crop productivity. Plants get affected by micro- organisms like fungi, virus and bacteria.

Recognition of plant disease can be effectively done through leaves as they are the conspicuous and delicate piece of a plant. Automatic detection of plant disease is fundamental to identify the symptoms of diseases in beginning times when they show up on the developing leaf and product of plant.

The object of this paper is to concentrate on the plant leaf detection based on texture color of the leaf. Leaf presents several advantages over flower. There are four section 1] Introduction of sugarcane diseases, plant leaves analysis, various type of leaf diseases.2] Discussion on recent work carried out in this area.3] Basic methodology for leaf disease detection.4] Conclude topic along with possible future directions.

1.1 Plant disease analysis and symptoms:

Imag analysis can be applied for the following purpose:

1. To detect plant disease.
2. To detected affected are by disease.
3. To find boundaries of the affected area.
4. To find color of affected area.

There are some common symptoms fungal, bacterial and viral.

1.1.1 Bacterial disease symptoms:

These disease caused by tiny pale green spots on leaves. Under dry condition spots have a speckled appearance. The shape, size and function of the leaf vary.

1.1.2 Fungal disease symptoms:

These disease characterized by lower older leaves like water soaked, gray green spots on leaves. When fungus get spread this spots darken and then white fungal growth get form.

1.1.3 Viral disease symptoms:

Among all diseases, disease caused by virus is difficult to identify. Leafhoppers, aphis common carries these diseases e.g. Mosaic virus.

2. LITRATURE SURVEY

In paper [1] authors focused The application of texture for detecting the sugarcane disease has been explained by color transformation structure RGB is converted into HSV space because HSV is a good color descriptor. Masking and removing of green pixels with pre-defined threshold level and segmentation is done.

In paper[2] considered captured leaf images are segmented using k-mean clustering method to form clusters. Features are extracted before applying classification technique.

In paper [3] authors used lab view and MATLAB for detection of plant disease. Detection in early stage is possible due to the MATLAB. Morphological operations done with the help of image pre -processing.

In paper [4] Introduced RGB images have been concentrated into Hue Saturation and Hue (HSV) color space representation and showed the H, S and V components.

In paper [5] Presented an investigation of leaf spot disease using image segmentation c-means classification. Median filter used for image enhancement.

In paper [6] Authors introduced technique with improved k-means method. After acquisition RGB converted into grey scale and HSV.In threshold process histogram and multi-level threshold are obtained to isolate relevant image. Centroid value is calculated.

In paper [7] Feature extraction color, morphology and feature are extracted and filter is used in texture and morphology for obtaining boundary of image.

3. WORKING METHODOLOGY

The block diagram of proposed methodology is as below:

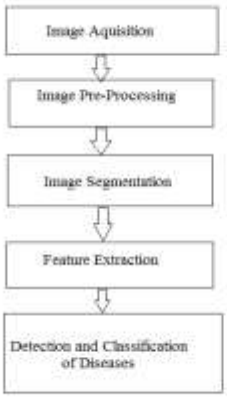

Fig -1: Flow chart

In this proposed methodology we made a MATLAB stand - alone application .

A. Image acquisition:

It is the first method of image processing
It is described as capturing image through digital camera and stores it in digital media for further matlab operations.

Fig- 2: Original image

B. Pre-Processing:

The main purpose of image pre-processing is to improve the image data contained unwanted distortion. Pre-processing utilizes different systems for example changing image size and shape, filtering of noise, image conversion, and morphological operations.

C. Image segmentation:

In this project we used segmentation technique so input image is divided into three clusters for good segmentation result.

1. Region based
2. Edge based
3. Threshold based

D. Feature Extraction:

Feature extractions describe the relevant shape information contained in pattern. Transforming input data into the set of features is called feature extraction. Processing involve following steps:

1. Image acquisition
2. Conversion of RGB into HSV image.
3. Segmentation of the components.
4. Obtaining the useful image from the segmented image.
5. Color co-occurrence method.

K means clustering algorithm:

This algorithm is used to cluster/divide the object based on the feature of the leaf in to K number of groups.

The algorithm of K means

1. User should select the value of K.

2. Every pixel is assigned to its nearest centroid (K).

3. The position of centroid is changed by means of data values assigned to the groups.

Out of these three clusters classification is done for only cluster which has affected area.

$$argmin \sum_{i=1}^{k} \sum_{x \in st} ||x - ui||^2 = argmin \sum_{i-1}^{k} |Si| \; varsi$$

Color analysis:

Color image processing and analysis is concerned with the manipulation of digital color images. HSI model is proposed to improve the RGB model. The process of selecting the best color representation involves knowing

how color signals are generated and what information is needed from these signals.

1. Input Image

Fig-3: Original image

2. Output Images

Result-1(Range)

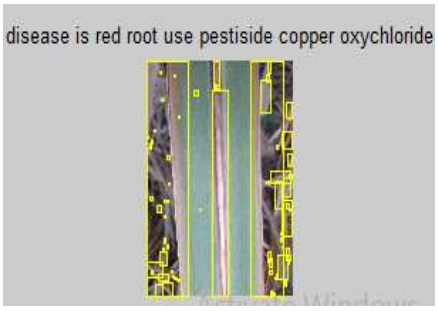

Fig -4: Output Image

We got this output image by calculating the value here the Red root disease is found and use Copper Oxychloride.

Result-2(color)

Fig -5: Output Image

This is the output image by Color feature extraction on image. The White color showing the presence of disease. Red root disease found spray Oxychloride

Result-3(Range)

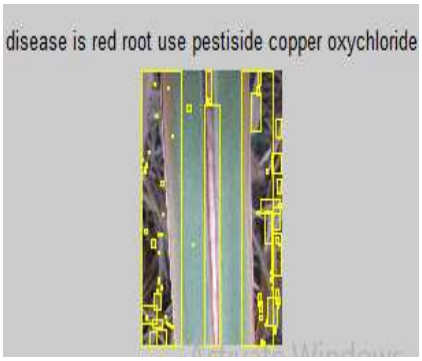

Fig-6: Output Image

This is the output image of pixel range. Here Red root Image is found use copper Oxychloride.

4. RESULT

The output gives the information of the disease of the sugarcane plant along with its pesticides. By performing pixel range code the result is more efficient than the color extraction feature.

5. CONCLUSION

This project is very useful for farmers and laboratory where they can easily protect their sugarcane and there will be increase in growth of production. The main focus of this project is to help the farmers, distress from loss due to imperfect information of a choice of disease.

6. FUTURE SCOPE

In future, the proposed system would be deployed and tested in real field. User friendly app could be developed to alert the farmers and provide them with solution in real time.

REFERENCES

[1]. Sandesh Raut and Amit Fulsunge, "Plant Disease Detection using Image Processing MATLAB"International Journal of Innovative Research in Science, Engineering and Technology vol.06, June-2015.
[2]. Surendar Kumar and Rupendar Kaur, "Plant Disease Detection Using Image Processing" International Journal of Computer Application vol.124, August-2016.
[3]. Kiran R. Gavahale and Ujwala Gawande," Research on Plant leaf Disease Detection Using Image Processing" International Journal of Computer Application vol.16, Jan 2017.
[4]. Wabale A. A. and Mulajkar R. M., "Plant Health Detection using Image Processing Robot" vol.02, June-2017.

[5]. Thamil Azhagi, Swetha, "Plant Pathology Detection and Control", International journal of Engineering sciences Rsearch Technology, vol.03,March-2017.
[6]. Shweta R. Astonkar, V. K. Shyandilya, "Detection and Analysis of Plant disease using Image Processing" vol.04, Apr-2018.
[7]. Vignesh Dhandapani, S. Rema ," Plant Health Monitoring Using Image Processing", International journal of engineering research in Computer Science and Engineering, vol-05, March-2018.
[8]. Rafael C. Gonzalez," Digital Image Processing".