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Literature review for the Detection of Diseases in Bittergourd Leaves

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ABSTRACT

Morodica Charantia often called bittergourd or bittersquash is a unique vegetable fruit that can be used as medicine and food. About 5 million people consume bittergourd in India.The cultivation of bittergourd is labor Intensive so few families are engaged throughout India.Bittergourd affected by variety of diseases such as fusariumwilt, collarrot, powdery mildew, Alternaria Blight, Anthracnose and Mosaic.This may cause a great loss for the farmers. Diagnosing the plant disease still depend on conventional method like eyes and brain of human expertise. A method have to introduce to find the diseases early for the better production of the bitter gourd plant. The aim of this paper is to study about various methods used for the detection of diseases.

Keywords:- Bittergourd,RGB,HSI.

1. INTRODUCTION

Bittergourd is a cucurbit vine considered to be a native to Asia. It is normally grown in hot, humid areas as an annual crop. The bitter gourd itself grows off the vine as a green oblong-shaped fruit with a distinct variety exterior though the size, texture and bitterness vary between the different regions in which it grows and is rich in vital vitamins and minerals. There are varieties of bitter gourd such as VK-1-Priya,Preethi,Priyanka,ArkaHarit,PusaDoMausmi,CoimbatoreLong,Phule Priyanka,PhuleGreenGold, Phule Ujwala,Pride of Gujarat [1]-[2].All of these are high yielding variety in India. Under favorable condition, the yield could reach 21 tons per acre[3].The best bitter gourd are harvested when the fruit is pale green. Beyond this stage,the fruit becomes too bitter and losses market appeal.Good quality bitter gourd should have a fresh appearance and the peel should be uniform green color and free from visual defects such as decay and spitting, both associated with fruit ripening.When the fruit begins to ripen,the exterior color changes from green to yellow and the pulp becomes gelatinous and orange to red. Contrary to other cucurbits, the seed arils also change color from white-cream to a bright red[4]. Bittergourd are very low in calories but dense with precious nutrients. It is an excellent source of vitamins B1, B2,and B3,C,magnesium,floate,zinc,phosophorus,manganese and has a high dietary fiber. It is rich in iron, contains twice the beta-carotene of broccoli, twice the calcium of spinach, and twice the potassium of a banana. Bittergourd juice is highly beneficial for treating blood disorders like blood boils and itching due to toxemia. Bitter gourd contains a hypoglycemic compound that is highly beneficial in lowering sugar levels in blood and urine.Bittergourd juice has been shown to significantly improve glucose tolerance without increasing blood insulin levels.Regular consumption of bitter gourd juice has been proven to improve energy and stamina level.Even sleeping patterns have been shown to be improved. The high beta-carotene and other properties in bitter gourd makes it one of the finest vegetable-fruit that help alleviate eye problems and improving eyesight. Bitter gourd juice is liver cleansing. It helps clean up a toxic blood, improves blood circulation and relieves gout pain[5].Bitter melon juice may be beneficial in the treatment of a hangover for its alcohol intoxication properties. It also help cleanse and repair and nourish liver problems due to alcohol consumption. This bitter juice can also help to build your immune system and increase your body's resistance against infection. Regular consumption of this bitter juice has also been known to improve psoriasis condition and other fungal infections like ring-worm and athletes feet. Bittergourd contains beneficial properties that cleanses the blood from toxins. The productive seed rate should be 5.0-6.0kg ha^{-1}.Pits of 60cm diameter and 30-45cm depth are taken and the spacing between the pit are 2.0m*2.0m.Well rotten FYM (Farmyard manure) and fertilizers are mixed with top soil and seeds are sown at 4-5 numbers per pit. Bitter gourd production requires a trellis to provide support for the climbing vine. The trellis should be 6 feet high 4-6 feet apart. The seed can be planted directly or grown as seedling at 2.0m*2.0m spacing and between rows spacing at 3-5 feet.Manuring is essential factor for the healthy growth of bitter

gourd. Apply FYM at 20-25t ha^{-1} as basal dose along with half dose of (35kg) N(Nitrogen) and full doses of 25kg p_2O_5 (Phosphorus pentoxide)and 25kg of K_2o(Potassium oxide).The remaining dose of 35 kg N(Nitrogen) can be applied in several split doses at fortnightly intervals[1].

2. LITERATURE REVIEW

Juan Ignacio explained about the classification of automatic leaves image system for sunflower crops using neural networks is used. The system is comprised of four main stages. 1) Segmentation based on RGB color space is performed. 2) From segmented image, features are detected and extracted. 3) Discriminable set of features are selected. 4) the Generalized Softmax Perceptron (GSP) neural network architecture is used in conjunction. Posterior Probability Model Selection (PPMS) algorithm is also used for complexity selection of leaves in an image. Then classified them as sunflower or non-sunflower and the proposed system achieved a high level of accuracy[6]. Rob.J.Mullen focus on edge pattern extraction and ant algorithm to image feature extraction. A distributed adaptive thresh holding is introduced to the ant algorithm. This technique helps to increase performance of the algorithm and also eliminate the requirement for a user set threshold. The algorithm allows to adapt autonomously an appropriate threshold for a given image or data set. This approach is extended for simultaneous multiple-swarm multiple-feature extraction and dynamic adaptation to changing imagery [7]. Andre Ricardo Backes justified the method based on the fractal dimension for color texture analysis and it investigates the complexity in R,G and B color channels to characterize a texture sample. The study is based on all channels in combination, considering the correlations between them. These two approaches use the volumetric version of the Bouligand–Minkowski Fractal Dimension method[8]. Takesh Saitoh examined about automatic method for recognizing a blooming flower based on a photograph. A method that extracts a boundary of blooming flower by selecting a route with minimizing a sum of the local cost divided by the route length[9]. Hassan Hajjdiab conformed about recognition of contour of the plant leaves using computer vision based technology. The contour of a leaf is extracted, processed and a feature vector is formulated and the result is stored in a database which is to be used for identifying plants. To recognize a plant, an image of the leaf is first fed to the computer. The feature vector is extracted from the leaf and finally the species is identified by matching the leaf feature vector with the feature vectors which is already stored[10]. Maria-Elena inspected to what extent combinations of features can improve classification and performance. A flower dataset is introduced and is computed four different features for the flowers, describing different aspects, namely the local shape/texture, the shape of the boundary, the overall spatial distribution of petals, and the color. The dataset has a similar challenge in the number of classes, but with the added difficulty of large between class similarity and small within class similarity. The optimum kernel combination of multiple feature vastly improves the performance[11]. Xiading Tang developed a leaf extraction algorithm to extract the target leaf from the images with complicated background. Marker-controlled watershed segmentation method is applied on the gradient images of hue, intensity and saturation of the HSI color space, separately. The solidity (integrity) measure is then used for evaluating the segmented image is for extraction of the target leaf. It will give determine the final leaf extraction result[12]. Mingyin Yao discussed about LIBS system used for the determination of nutrition elements in orange leaves. The experimental setup was designed by using a Nd:YAG laser operating at 1064 nm and an Avantes spectrometer with ICCD detector. In qualitative analysis the species and relative contents were identified by LIBS spectra. The quantitive analysis will be carried combining with routine analysis such as ICP-OES[13]. Nunik Noviana demonstrated on extracting paddy features through off line image.The RGB image is converted into a binary image using variable, global and automatic threshold based on Otsu method. For removing noise a morphological algorithm is used by region filling technique.Then image characteristics like lesion type, lesion percentage, spot color, boundary color and broken paddy leaf color are extracted[14]. An evaluation of framework for detection of plant leaf/stem diseases is proposed by Dheeb Al Bashish. Relying on pure naked-eye observation to detect such diseases can be expensive. The proposed framework is composed of the following steps1)the images at hand are segmented using the K-Means technique.2)the segmented images are passed through a pre-trained neural network. The proposed approach can significantly support accurate and automatic detection of leaf diseases[15]. R.Pydipati discussed about the color co-occurrence method (CCM) used to identify diseased and normal citrus leaves under laboratory conditions. diseased and normal citrus leaf samples with greasy spot, scab and melanos are evaluated. The leaf sample discriminant analysis using this method achieved classification accuracies of over 95% for all classes. High accuracies are achieved when using an unreduced dataset consisting of all HSI texture features. A reduced data model relied on Hue saturation features was determined to be the overall best performer. Since the Intensity features are eliminated and computational load is reduced, this model was selected[16]. Roberto Oberti studied how the detection sensitivity can be improved for early-middle symptoms. Sensing measurements are carried out from an angle to the leaf's surface. A multispectral imaging approach was applied to grapevine leaves. The images are taken at five different view angles from 0° to 75°. Based on two spectural indexes, detection sensitivity was evaluated. The detection sensitivity generally increases as the view angle increases with a peak value at 60°.Improved result can be achieved by providing a measuring capability from a view angle in the range 40° to 60°[17]. An application for detecting and classifying the quality of areca nuts image processing techniques and neural networks are used in Kuo-Yitluang Journal. Defects of areca nuts with diseases or insects were segmented

by detection line (DL) method, for classifying 6 geometrical features, 3color features and defects area were used to sort the quality of areca nuts a back-propagation neural network classifier was used[18]. A. Camargo illustrated about the visual symptoms of plant diseases identification using Image processing based method from the analysis of colored images. The RGB image of the diseased plant or leaf,is processed using H,I3a and I3b color transformations. By analyzing the distribution of intensities in a histogram the transformed image is segmented. The set of local maximums are located and the threshold cut-off value is determined according to their position in the histogram. This technique is useful when the target in the image data set is one with a large distribution of intensities. Manually segmented images were compared with those segmented automatically to test the accuracy of the algorithm[19]. LiliMa study outlined about leaf images of the six stages of soybean growth using Image processing Technique. The noise of source image was removed and the areas of interest were enhanced,leaves and background were separated using minimum error threshold method. Using RGB,HSI model the color characters of soybean leaves were analyzed The distinction between normal and excessive loss of soybean leaves was found, which form the basis of the diagnosis of deficiencies and excess of soybean's plant nitrogen[20]. X.D.Bai stated to establish the crop color model in the CIE $L^*a^*b^*$ color space and to realize the crop image segmentation a new morphology modeling method is used. Morphology modeling is applied to deal with the color characteristics of the crop with respect to the pixel lightness component and establish the crop color model [21].Serge Belongie detailed about a new image representation that provides a transformation from the raw pixel data to a small set of image regions. The blob world representation is based on combined color and texture features and segmented using the expectation-maximization algorithm. The texture features arise from a new approach to texture description and scale selection. The user is allowed to view the internal representation of the submitted image and the query results and this is the unique aspect of the system[22]. J.Vijayakumar examined about the detection of foot rot disease in betelvine plants using digital image processing. The images of the normal and infected betelvine leaves at different stages are collected. The collected images were stored with JPEG format. The mean and median values of test leaves are computed and compared with the stored values. This comparison helps to recognize the foot rot disease before it spreads to entire crop[23].

3. CONCLUSION

As the result of the study refereed above it is concluded that 1)Five papers describes about the varieties of Bittergourd,nutriences,manuring and production 2)Ten paper deals with detection of classification, recognition of various plants 3)Remaining Seven paper gives an insight of analysis of color images in different categories of plants.

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