

# A Survey on Crop Disease Detection and Prevention using Android Application

Santosh Reddy<sup>#1</sup>, Abhijeet Pawar, Sumit Rasane, Suraj Kadam<sup>#2</sup>

<sup>#1</sup>Asst.Prof in CSE Dept, <sup>#2</sup> Students of CSE Dept.

JCEM K.M.Gad.

**Abstract** - Nowadays, farmers have diversified portfolio of crops in their farms. also they are trying to plant more type of crops in their farm. This kind of 'Experimental farming' attitude of farmers sometimes responsible for huge losses because they don't predict diseases of crops at early stage. It has become more expensive to them to learn from previous experience. This article has made an attempt to study the need of an electronic expert system (android app) which help farmers to take proper decisions and improve their farming experience without suffering from heavy losses.

Keywords- Agriculture Android App, Image processing, Leaf based disease detection.

## 1. Introduction -

According to our survey in some villages around satara and karad city; more than 80 percent farmer heists to try new kind of crops instead of their traditional crops because they don't have required knowledge or experience. There is also a situation when someone try new kind of crop but it badly affected by some diseases, deficiency of nutrients or by any other reason. Most of the farmers around this area put their money in farming on the basis of experience rather than proper knowledge. And also take

decisions by examining plants visually. But, this requires continuous monitoring of experts which might be prohibitively expensive in large farms. Further, in some areas, farmers may have to go long distances to contact experts (agriculture officers of panchayat samiti or zp), this makes consulting experts too expensive and time consuming. Image based detection of plant diseases in an important research topic as it may prove benefits in monitoring large fields of crops, and thus automatically detect the diseases from the symptoms that appear on the plant leaves. This enables machine vision that is to provide image based automatic inspection, process control and robot guidance.

## 2. Literature survey-

There is already development resulting of a fast and accurate method in which the leaf diseases are detected and classified using k-means based segmentation[1]. A study has been done for feature extraction of plant disease. This provides technological push up by describing various algorithms and calculation methods to calculate various components required for image based leaf disease detection[2]

### 3. Existing System -

Generally farmers detect plant diseases by visual observation which is based on their experience or knowledge. Some government departments also help farmers to do this work. But when we think about an electronic expert system for leaf based plant diseases detection, in current scenario this kind of system is not available for day to day use. An android application may boost this concept and make available this researches for end users who actually need this kind of technology in their day to day life.

Other features like online marketplace, whether reports, soil information, market rate guide are present but may not available in a single package, means End users use this features from different service providers.

### 4. Proposed system -

The proposed system is an android application which has following services for farmers-

- i. Image processing- leaf based plant disease detection system
- ii. online marketplace- a feature which help farmers to buy/ sell goods online. and also add extra benefits on their margins.
- iii. Market rate guide- this feature helps users to gather information about market rates of different markets
- iv. Weather report system- this feature plays an key role for users for decision making.
- v. Soil information- using this feature, user may get information of their soil

type and also guide them to decide the crop type which is best suitable in their soil.

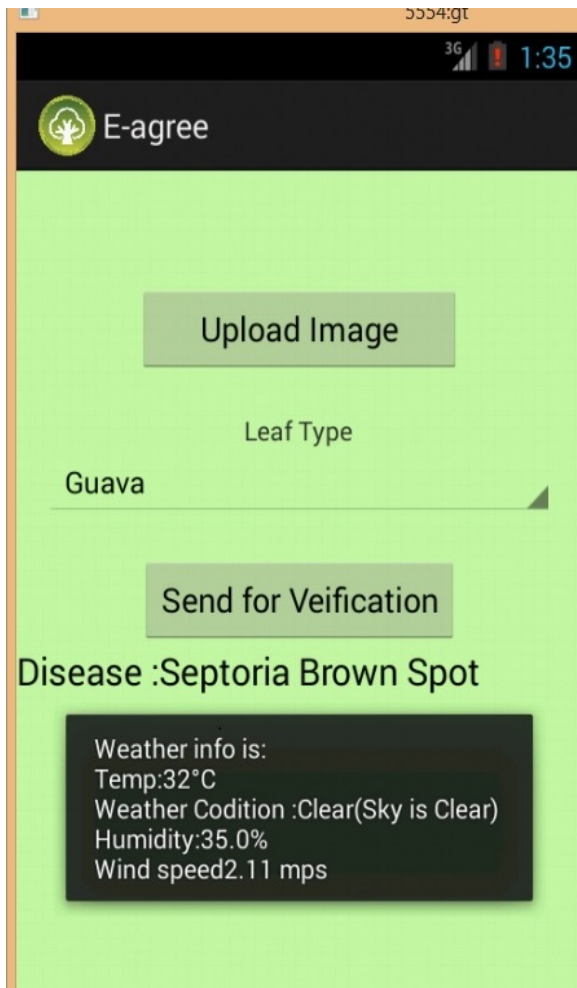
### 5. Modules -

#### 1. Image processing-

The image processing module plays vital role of this research, Image processing module calculate Contrast, Energy , Local Homogeneity, Cluster Shade, Cluster Prominence from the captured image by camera and using image processing formulas [1]. It detects leaf diseases. The classification accuracy obtained is 97%

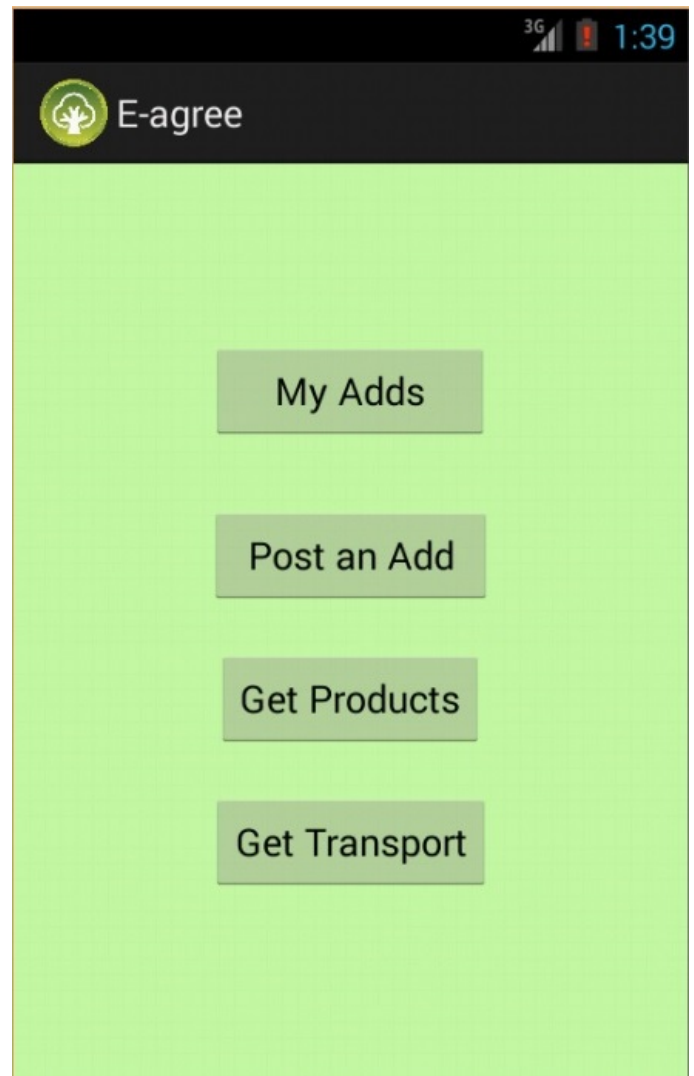
The step-by-step procedure of the proposed system:

- i. RGB image acquisition.
- ii. Convert the input image from RGB to HSI format.
- iii. Masking the green-pixels.
- iv. Removal of masked green pixels.
- v. Segment the components.
- vi. Obtain the useful segments.
- vii. Computing the features using color-co-occurrence methodology
- viii. Evaluation of texture statistics..



applicatin in his mobile and are empowered to find the most reasonably priced or highest quality product.

by using this structure, farmers may sell their goods directly to the consumers, it may affected strongly on their margins. It Also holds static information about transport service providers with their service rates and contact details.



## 2. Online marketplace-

Marketplaces facilitate sales for third-party vendors by allowing them to sell products in one online marketplace. With a quality enterprise software solution in place, marketplace eCommerce can benefit all parties in a number of ways:  
**Vendor:** Smaller stores without the budget or marketing capability to establish their own eCommerce website can also benefit from joining a marketplace. or some of farmers have quality goods to sell may also join as vendor to sell their products.

**Consumer:** Marketplace customers benefit from seeing aggregated options on

### 3. Market Rate Guide-

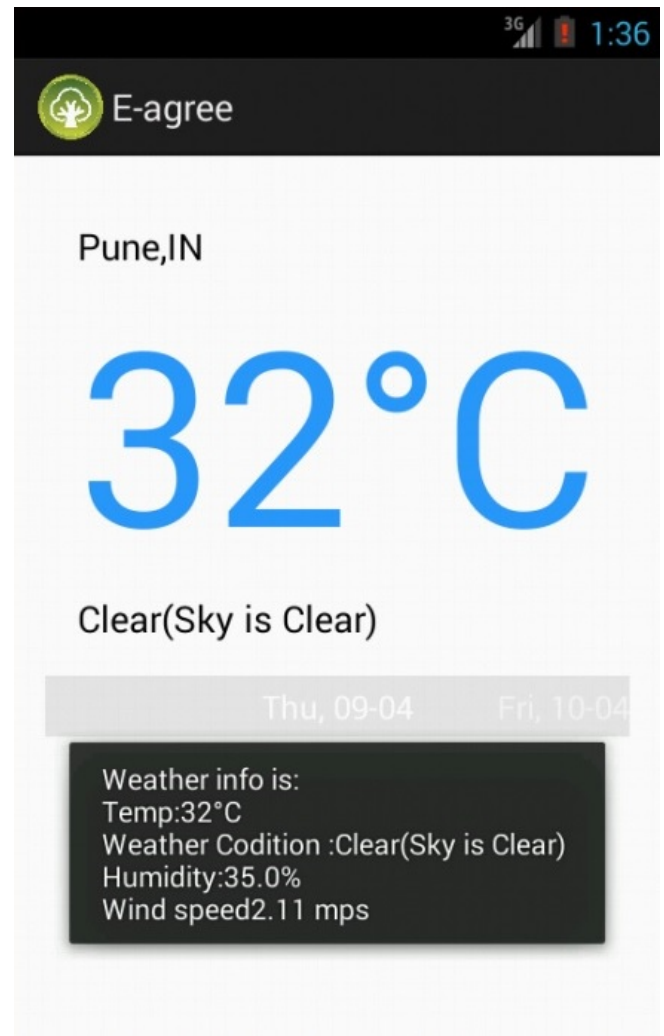
By using this module, users get information regarding market rates across multiple markets of geographically distributed area. It is a web service provided by government organizations to keep track of market rates, turnover and goods currently available in markets. Different markets have different rates as per monopoly situations, by using this user may decide that which market gives him best rates for particular goods. We use this link to redirect the website: <http://www.puneapmc.org/rates.aspx>



अनु	कोड नं.	शेतिमाल
1	4001	लिंबू
2	4002	पेरु
3	4004	टखूज
4	4005	फणस
5	4007	पीअर
6	4008	पीअर
7	4009	पीअर
8	4010	पीअर
9	4012	पेरु

### 4. Weather report-

Weather reports are based on a web service by [www.openweathermap.org](http://www.openweathermap.org). It is helpful for farmers to take decisions regarding water management, provisions of pesticides and nutrients. The web service provider get user location by calculating latitude and longitude with the help of mobile GPRS. It provides information about temperature, weather condition, humidity and wind speed.



Pune,IN

32°C

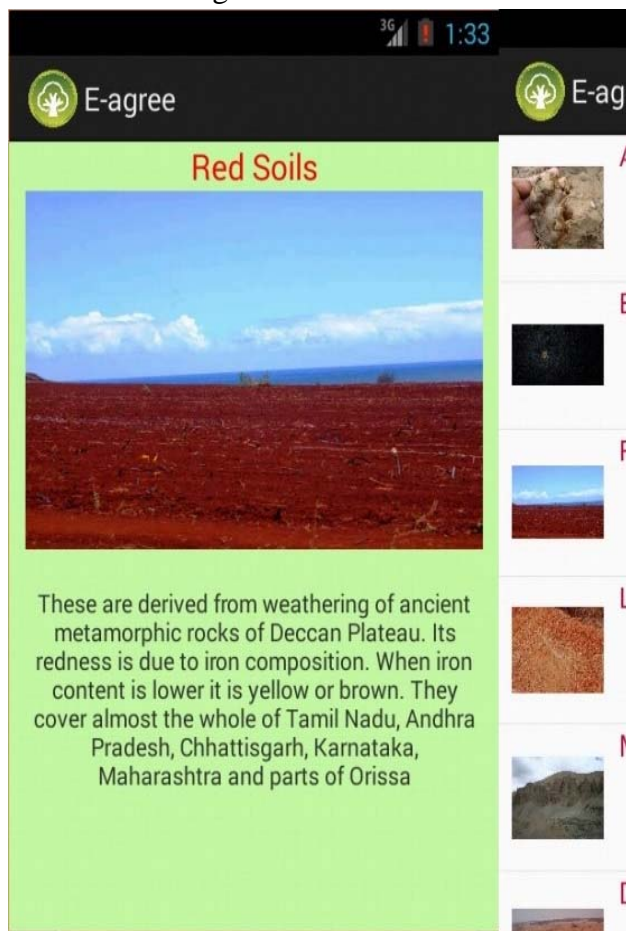
Clear(Sky is Clear)

Thu, 09-04    Fri, 10-04

Weather info is:  
 Temp:32°C  
 Weather Codition :Clear(Sky is Clear)  
 Humidity:35.0%  
 Wind speed2.11 mps

### 5. Soil information-

This module of application provides static information about different soil types, by using this type of data user may get important information about soil types. It helps user to decide which type of crop is best suitable his soil by just visually comparing available soil with given information. Image based soil type detection is also an interesting case study but it only gives best results after some chemical operations, which is nearly impossible in current technological era.



### Conclusion-

By using techniques described earlier, development of electronic expert system for leaf based plant diseases detection is achieved with including other services described above.

### Future Scope-

- i. The main future scope of this system is to develop this kind of application in regional languages. occurrence of a situation is possible that user does not have proper knowledge of English.
- ii. Development of this application for windows phone as well as iOS.
- iii. Weather forecast is also possible to provide proper support for user decision making.

### References-

- [1].IJREAS Volume 2, Issue 2 (February 2012) ISSN: 2249-3905 International Journal of Research in Engineering & Applied Sciences 763 <http://www.euroasiapub.org>  
DETECTION AND CLASSIFICATION OF PLANT LEAF DISEASES S. Ananthi\* S. Vishnu Varthini\*
- [2].Journal of Signal and Image Processing ISSN: 0976-8882 & E-ISSN: 0976-8890, Volume 3, Issue 1, 2012, pp.-60-63. Available online at <http://www.bioinfo.in/contents.php?id=48>

- [3]. IEEE TRANSACTIONS ON INFORMATION THEORY, VOL. 59, NO. 3, MARCH 2013  
FEATURE EXTRACTION OF DISEASED LEAF IMAGES  
.Armand M. Makowski, Fellow, IEEE
- [4]. Applications of image processing in biology and agriculture J. K. Sainis, Molecular Biology and Agriculture Division, R. Rastogi, Computer Division, and V. K. Chadda, Electronics Systems Division, BARC news letter.
- [5]. Jean Williams-Woodward, Extension Plant Pathologist, (2009)- Georgia Plant Disease Loss Estimates,  
[www.caes.uga.edu/publications](http://www.caes.uga.edu/publications).
- [6]. H.Al-Hiary, S. Bani-Ahmad, M.Reyalat, M.Braik and Z.AIRahamneh, Fast and Accurate Detection and Classification of Plant Diseases, International Journal of Computer Applications (0975-8887), Volume 17-No.1.March 2011.
- [7]. Dae Gwan Kim, Thomas F. Burks, Jianwei Qin, Duke M. Bulanon, Classification of grapefruit peel diseases using color texture feature analysis, International Journal on Agriculture and Biological Engineering, Vol:2, No:3, September 2009. Open access at <http://www.ijabe.org>.