AGRICOLA
(INVENTIVE FARMING)

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Abstract :This is a crop recommendation system. The recommendation of the crops are on the basis of three basic factors. They are the soil pH, Atmospheric values and the pie chart of crops(percentage wise view of amount of crops planted in specific area). Methodology of the crops will be provided to the farmers. Necessary information will be updated timely on farmer's app. Atmospheric alerts notification will be provided to farmers and necessary prevention measures will be suggested. In short all features of farming at one place for farmers.

***IndexTerms* – Precision agriculture, Recommendation system, Ensemble model, Majority Voting technique, Random tree, CHAID, K-Nearest Neighbor and Naïve Bayes.**

I. INTRODUCTION

India is a agricultural country , most of our population is dependent upon farming. Farmers now a days face loss due to excess of cultivation of crops. They do not get fare price for their products and most of the times the vegetables are thrown away which is due to excess of cultivation and low price. Price fluctuation becomes high due to this variation in the cultivation. The proposed android system will help the farmers to plant crops according to the future prediction aswell as considering the farm values of soil and India is a agricultural country , most of our population is dependent upon farming. Farmers now a days face loss due to excess of cultivation of crops. They do not get fare price for their products and most of the times the vegetables are thrown away which is due to excess atmosphere. Farmer after the registration in the application will be logged in to the android application. Farmer will get access to the application after logging in. For crop recommendation the soil ph values will be fetched through sensors and atmospheric values will be automatically detected through gps. Recommendation of crops is done on the basis of soil ph, atmospheric values and graph of crop plantation of the overall area. The recommendation will be provided according to the overall area crop plantation so as to make the farmers aware of amount of crop planted so to choose the best crop from the recommended list. Alternate crop recommendation will be done for farmer to select the crops for different are of the farm.
Crop methodology is provided to farmer, so that farmer should be aware of the fertilizers, pesticides and other procedure needed. The system before were useful to predict the crop on the basis of graph . An improvement to that the farm soil pH and atmospheric values are considered in our system so that the farmer should get a good amount of productivity and profit. The proposed android system will help the farmer in recommendation and farming procedures for profitable farming. Atmosheric alerts notifications will be provided to farmer if there is any climatic change and corresponding preventation measures aswell.

3.1Population and Sample

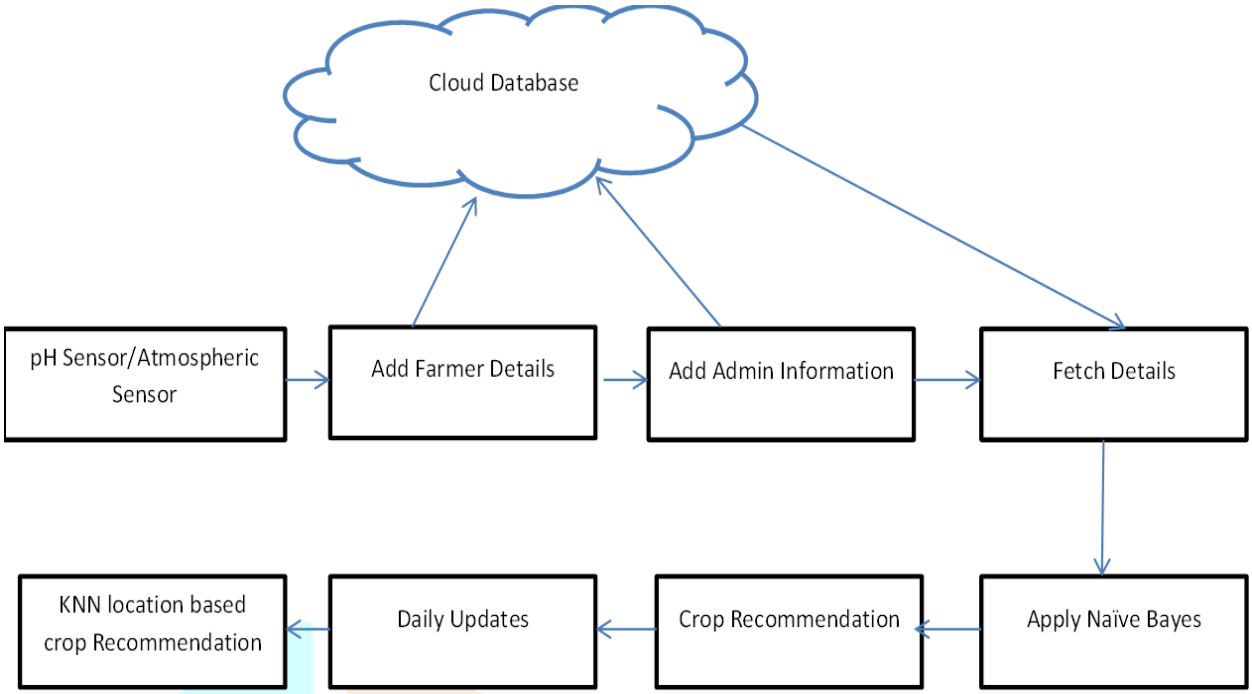
This project is for the welfare of farmers to reduce the loss to farmers inspired from the application krishi mantra aswell as all the other applications for fertilizers, pesticides, crop methodology. Soil testing is perfomed by the user itself . Soil samples should be taken by the farmers with the understanding of the soil texture, as better the perfection in pH calculation of soil better will be the recommendation.

3.2 Data and Sources of Data

Data mining is done for the crop information which consist crop methodology, fertilizers needed, pesticides, timespan and all the factors necessary for crops. The information is then transformed in a systematic manner and then fed in the database. Soil pH is fetched by the application through Bluetooth sensor which is attached through arduino board. Atmospheric value is taken automatically through the GPS.

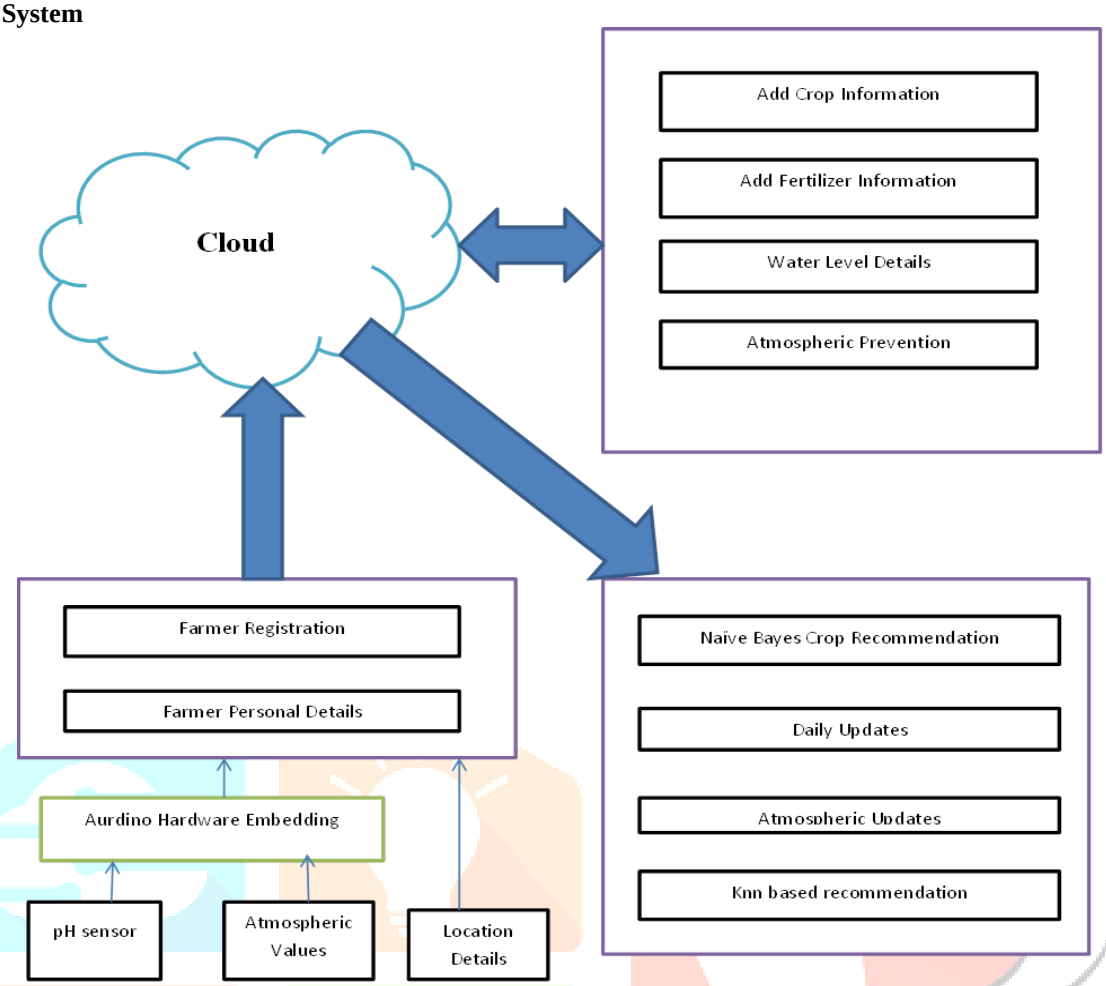
3.3 Theoretical framework

System architecture



Cloud database:-The information needed about the crops is stored by the admin in the cloud. Farmer profile and related farm related farm information is stored in the cloud database by the farmers through the android application.
Admin:- Admin stores all the information about the crops in the cloud and updates it whenever needed.
Farmer:- Farmers feeds his details like farm details, past crop details, personal information & sensor values in the profile and that profile is stores in the cloud database. Farmer can fetch whatever information he needs at any time from the cloud.
Android application:- The android application helps farmer to create his own profile. The recommendation of crops is done by the android application by fetching the information from cloud database and his own profile.daily updates are provided to farmer on the application related to the crop planted.
pH sensor:- pH sensor calculates the pH value of the soil at the time of crop recommendation and is updated automatically in farmer profile through ardino board.
Atmospheric sensor:- Atmospheric sensors calculates the atmospheric values of the farm at the time of crop recommendation and also continuously and is updates automatically in the farmer profile through GPS.
Arduino board:- In this system we use arduino board to fetch the sensor values in farmer profile for getting the recommention to farmers. Arduino board is easy not as complicated as Raspberry Pi so we prefer the use of arduino board. With a piece of code at the backend in the application we can fetch the sensor values through arduino board. Soil pH values will be fetched just once , but the atmospheric values will be fetched throughout the crop cultivation process

Working of System



3.4 Algorithms

3.4.1 Naive Bayes Algorithm

Formula: P(H|X)= P(X|H)*P(H)/P(X)

It is a technique for constructing classifier models which assign class labels to problem instances which are represented as vectors of feature values, where the class labels are drawn from some finite set. It is not just a single algorithm for training such classifiers, but a family of algorithms based on a common principle. All Naïve Bayes classifiers assumes that the value of a particular feature is independent of the value of any other feature, given the class variable. These Learners predict the class label for each of the training data set. The class label that is predicted by the majority of the models is voted through the majority voting technique and the class label of the training data set is decided.

3.4.2 kNN Algorithm

It is supervised learning method. In KNN data are represented in a vector space.It is used for clustering.The target function may be either discrete valued or real valued. For a given object E, get the top k dataset objects which are nearest to E by selecting distance measure. Then assign the class C to object E that represents the most objects after inspecting the class of these k objects. So for unknown tuple KNN looks for pattern space for the k tuples which are closest to that tuple. These k tuples becomes the nearest neighbors of unknown tuple. Pseudo Code : kNN (dataset, sample) 1. Go through each item in my dataset, and calculate the distance from that data item to my specific sample. 2. Classify the sample as the majority class between K samples in the dataset having minimum distance to the sample.

3.5Risk Assessment

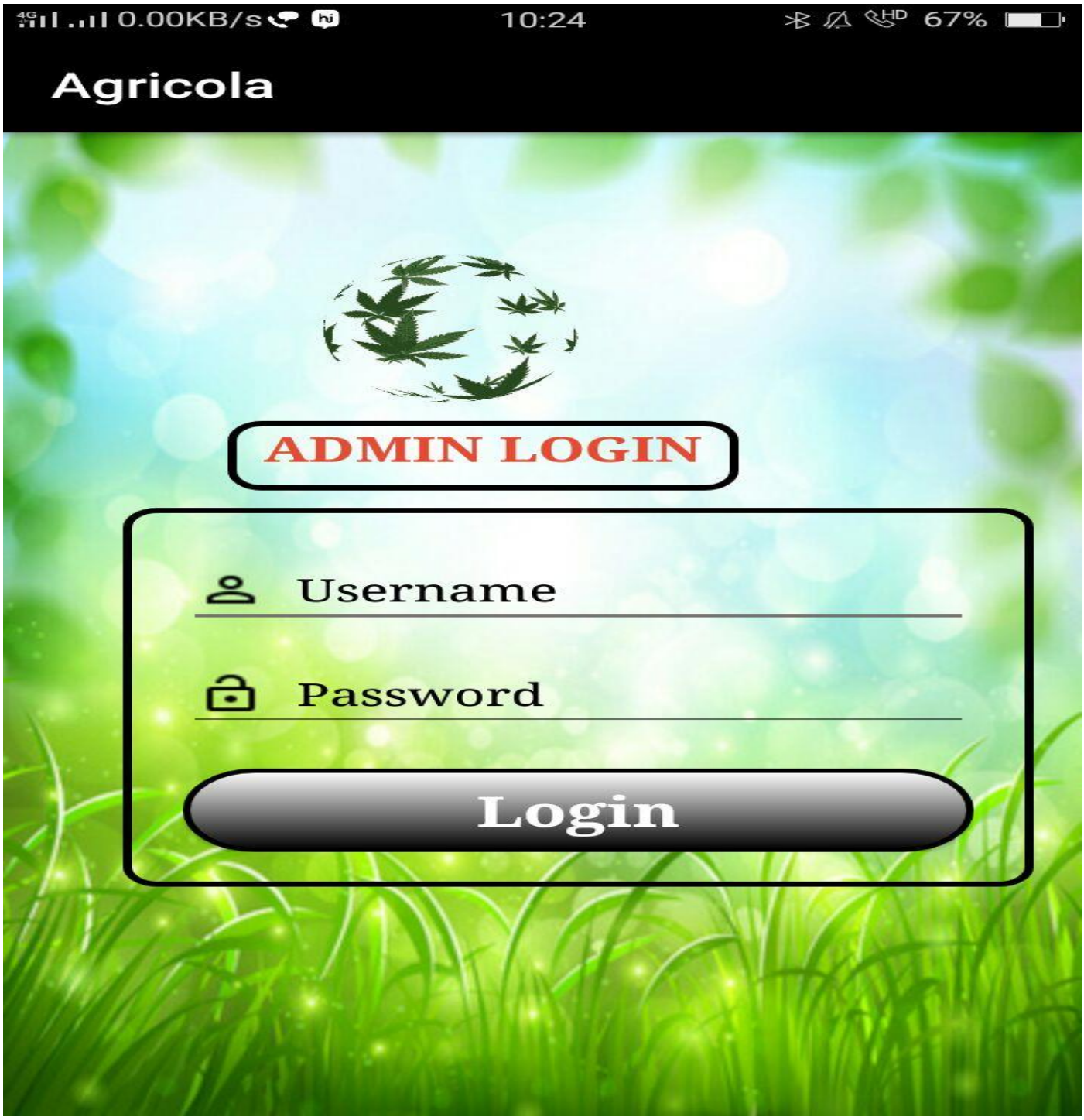
ID	Risk Description	Probability	Schedule	Quality	Overall
1	If video is not encrypt properly	Low	Low	High	High
2	If data is not embedded	Low	Low	High	High

	properly				
3	If Video quality is degrade after data embedding	Low	Low	High	High

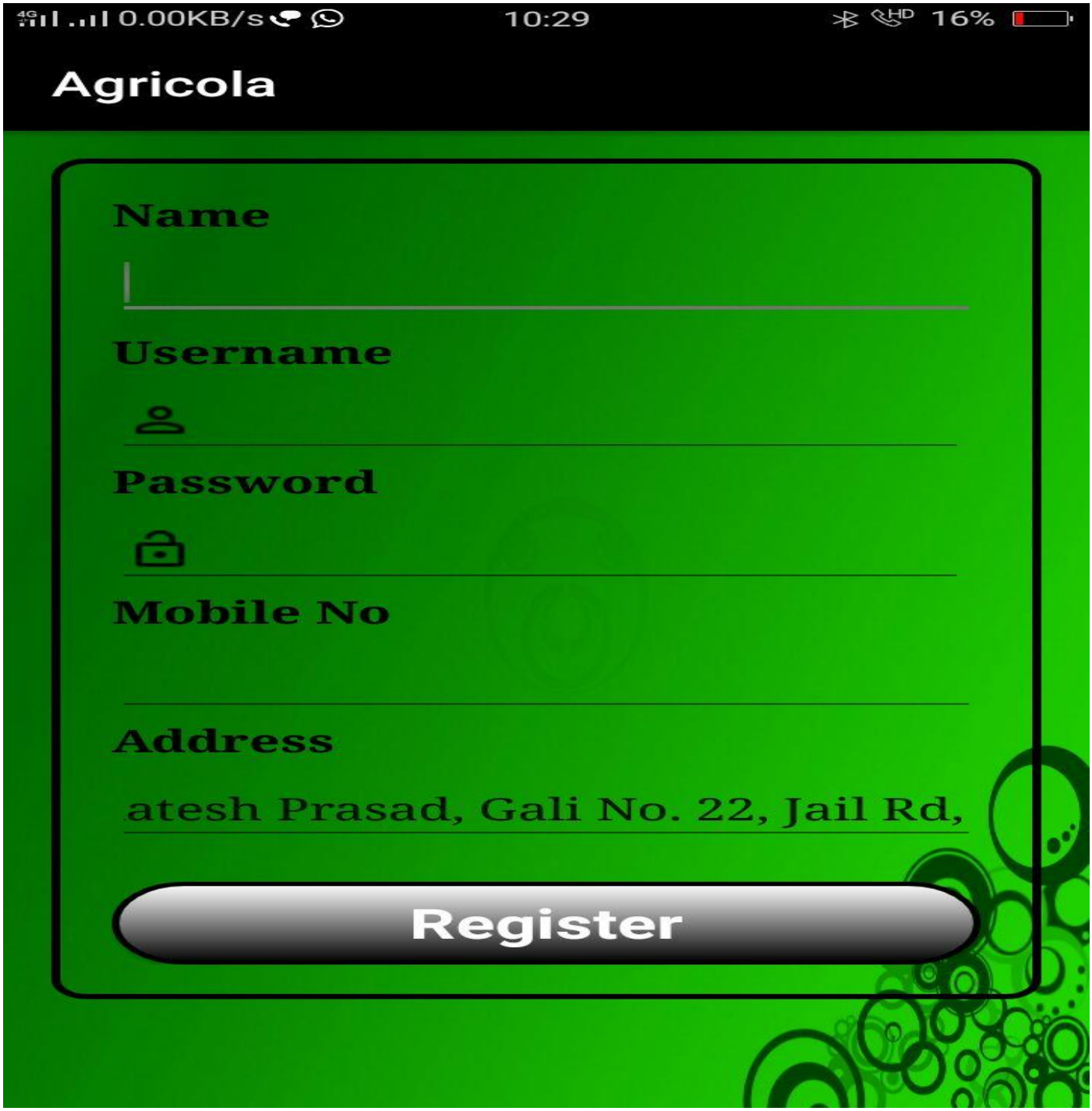
IV. RESULTS AND DISCUSSION

4.1 APPLICATION SCREENSHOTS

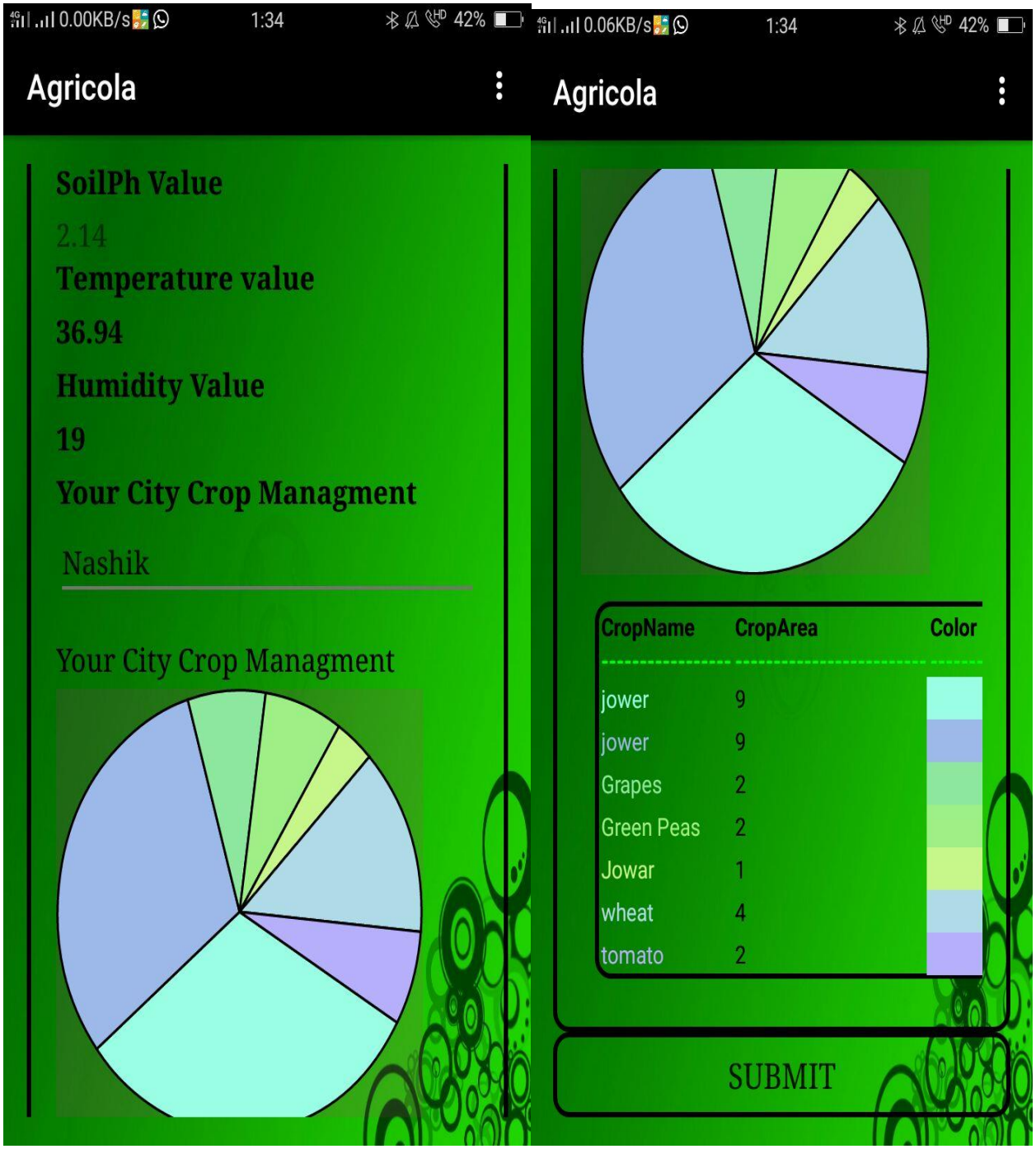
Farmer can login to the application through farmer login after the registration is done.



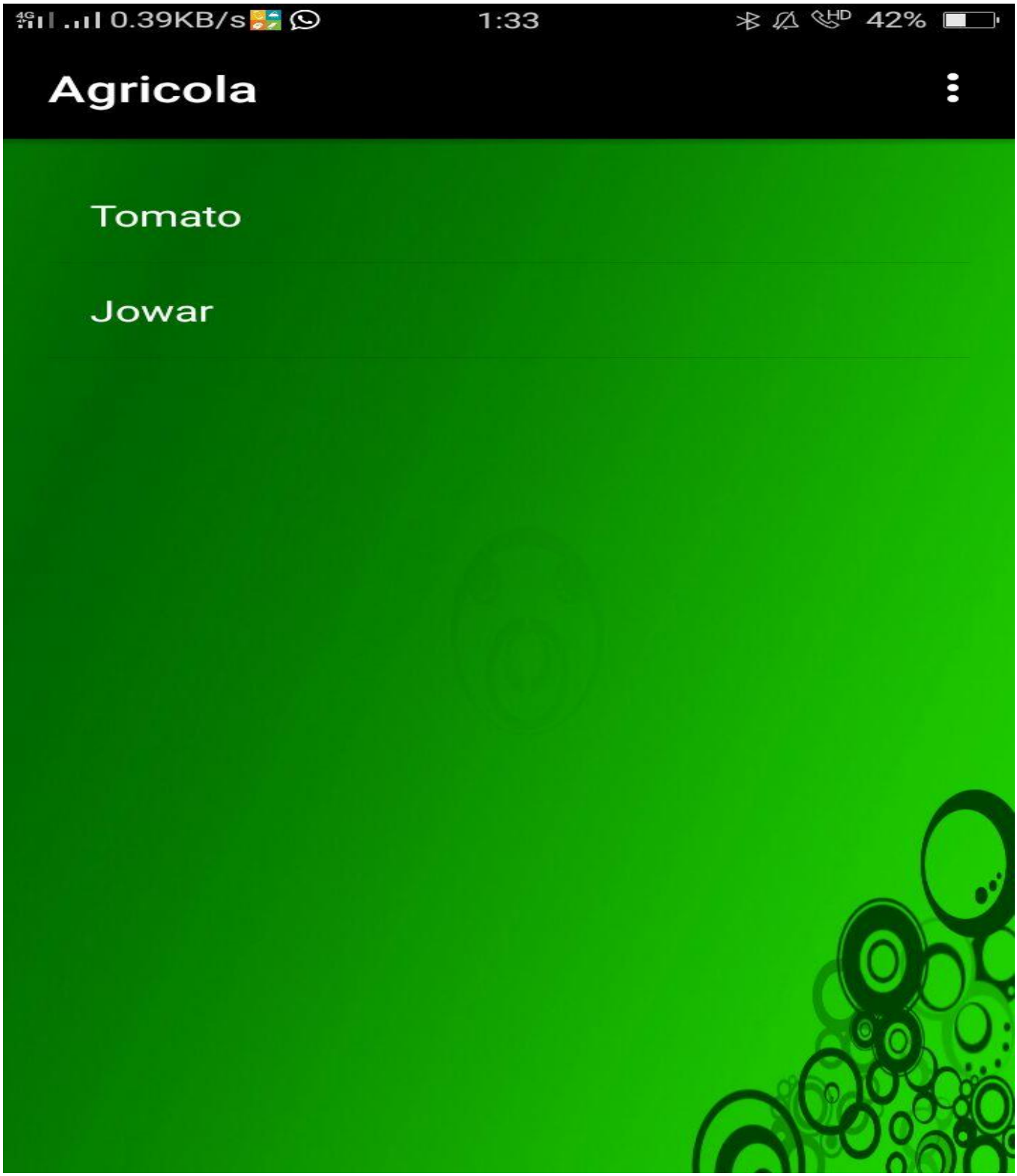
Admin login is used by the server itself to update the information as per requirements of the users.



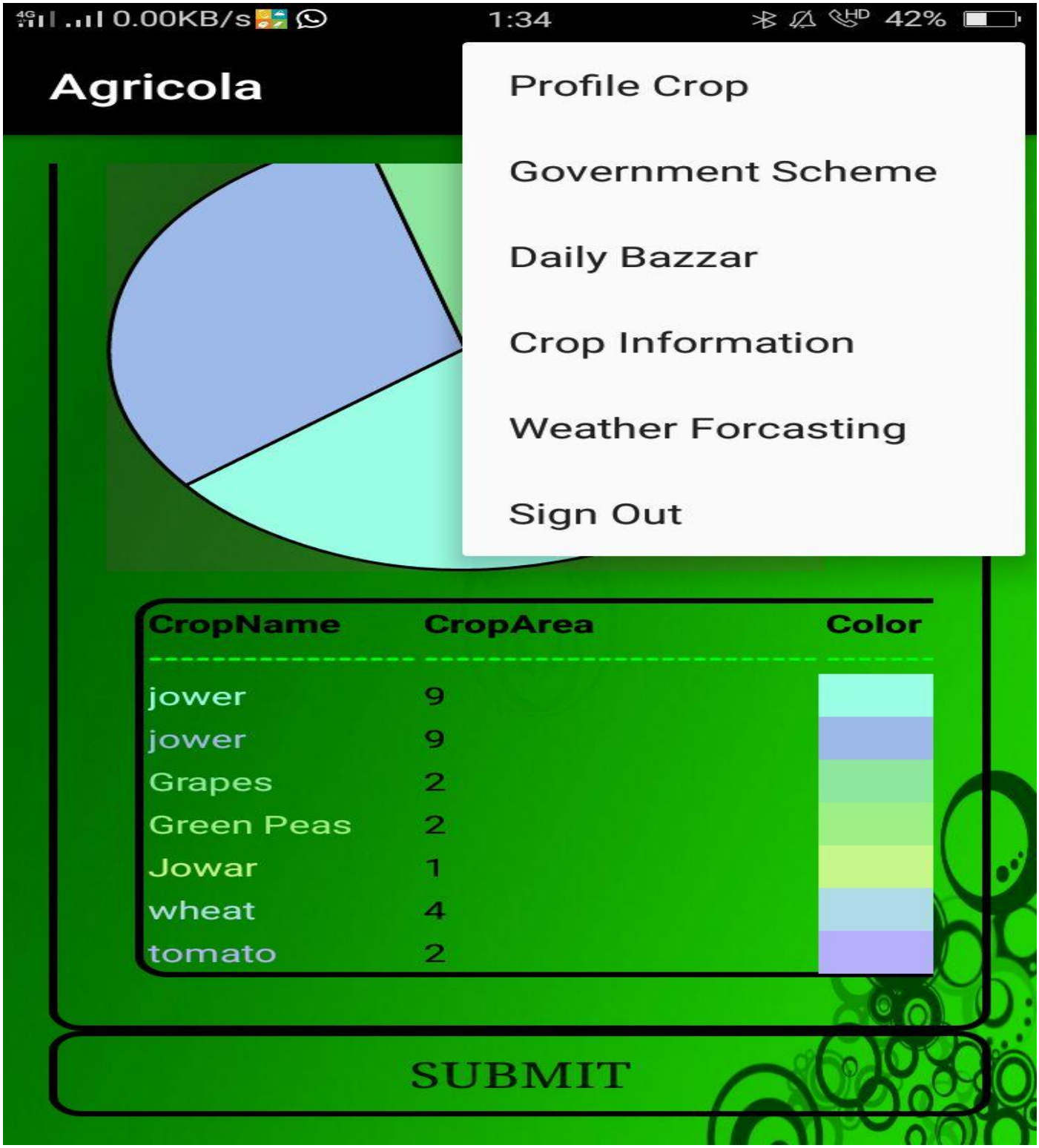
Register is done by the farmers before logging into the application. Address is fetched automatically considering farmers current location.



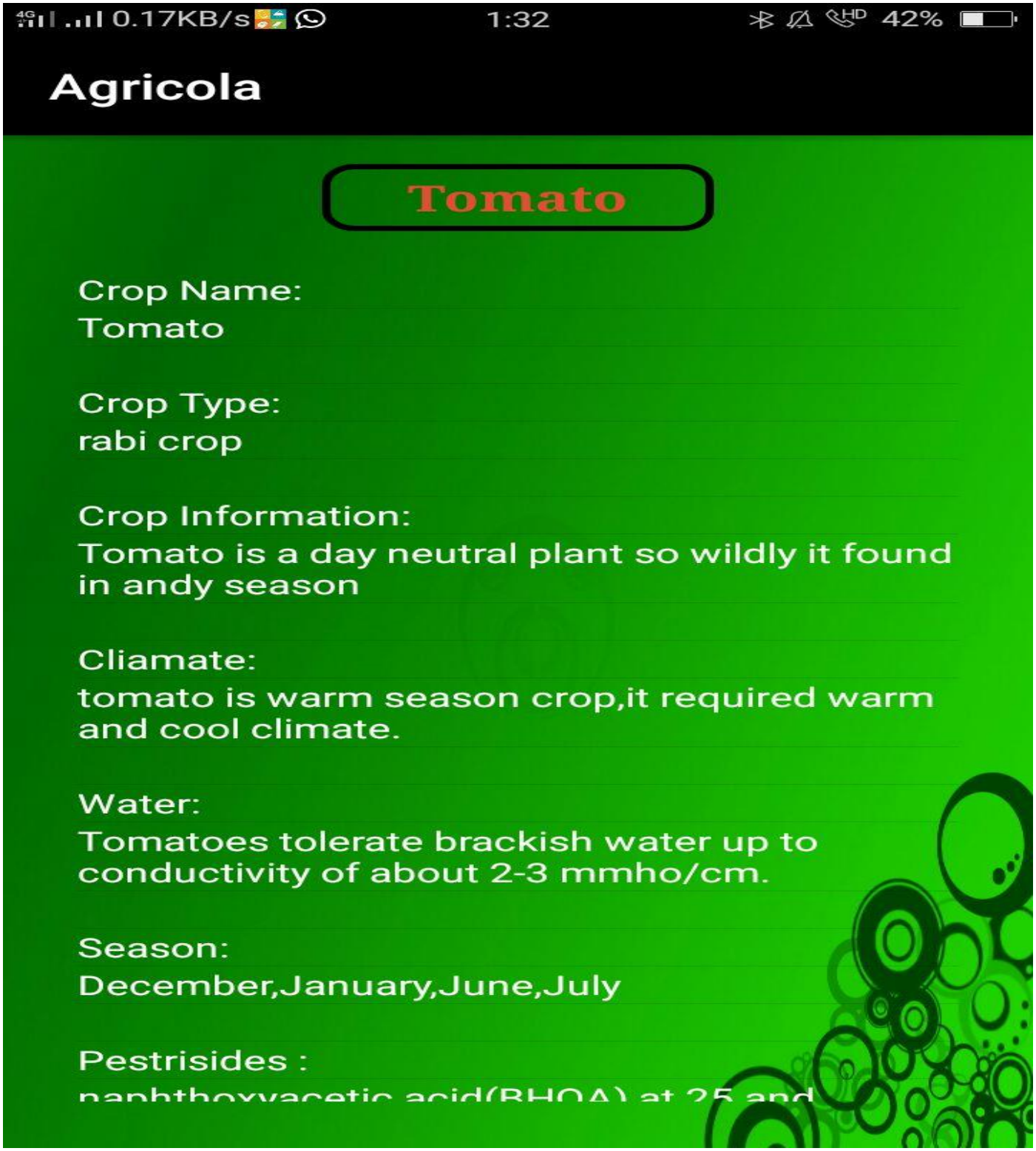
Crop recommendation is done considering three factors soil pH, temperature and graph of crops planted in nearby area. The information is to be submitted to get the recommendation of crops.



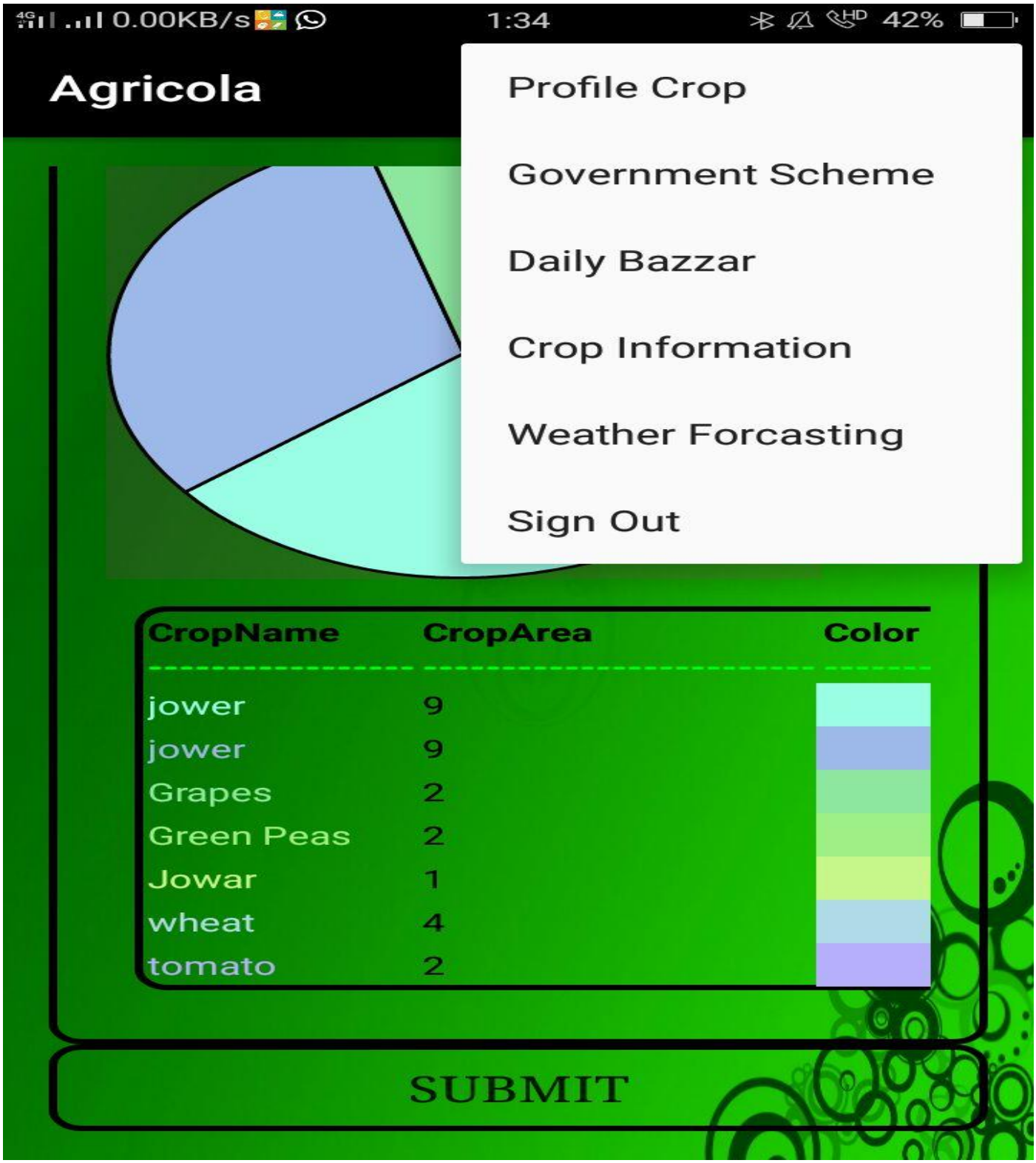
Crops are recommended to farmers based on the above values. After the selection of crop the crop is store in farmer profile, so that farmer should get updates which are necessary for the crop cultivation based on the crop.



OTHER NECESSARY FEATURES FOR FARMER ARE PROVIDED LIKE WEATHER FORECASTING, DAILY BAZAR, CROP INFORMATION, GOVERNMENT SCHEMES.



CROP INFORMATION IS FEDDED IN THE APPLICATON OF EVERY CROP.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Jowar 1
wheat 4
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SUBMIT

GOVERNMENT SCHEMES ARE MADE AVAILABLE FOR FARMERS.

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