# FERTILIZER RECOMMENDATION SYSTEM FOR DISEASE PREDICTION

# LITERATURE SURVEY

The purpose of literature survey review is to gain an understanding of the existing research and debates relevant to a particular topic or area of study and to present that knowledge in the form of a written report. Conducting a literature review helps you to build your knowledge in your field.

## 1.TITLE: CROFED - Crop and Fertilizer Recommendation and Disease diagnosis system using Machine Learning and Internet of Things

Year:2022

AUTHORS: TARANJEET SINGH[1] , SAURABH ANAND[2] , ANMOL SEHGAL[3] , SIDDHESH MAHAJAN[4] , PROF. PRANOTI KAVIMANDAN[5]

## DESCRIPTION:

The major problems that the farmers of our country are currently facing includes Crop Failure, Lack of adequate knowledge, Crop damage due to ignorance/carelessness, Lack of professional assistance, Inaccessibility to agro-tech solutions. CROFED will help the farmers to deal with these problems by providing following aids: Crop Recommendation system, Fertiliser suggestion system, Crop Disease Detection System. We will develop an IOT device that will examine the quality of soil and can also detect crop diseases on scanning the leaves of the crops. Soil testing is significant since it allows for the determination of soil fertility and hence crop prediction. Soil pH is a measure of the acidity and alkalinity in soils. pH levels range from 0 to 14, with 7 being neutral, below 7 acidic and above 7 alkaline. We have proposed a system which will have a device which gives pH value and we will estimate Nitrogen (N), Phosphorus (P) and Potassium (K) from the pH of that soil. We are using Machine Learning classification algorithm to predict suitable crops based on the values we get from our device and we will also provide suitable fertilisers required for that land. We believe this will help the farmers in producing greater yield of crops and crop damage can also be prevented to a larger extent.

## MERITS:

- It detects many diseases in crops and recommends appropriate treatments to help them recover.
- It will also offer the location of the nearest store where farmers can purchase fertilizer and other materials.

## DEMERITS:

- It is expensive for predicting the plant disease.

## 2.Title: Farmer's Assistant: A Machine Learning Based Application for Agricultural Solutions

Year:2022

Authors: Shloka Gupta, Nishit Jain, Akshay Chopade, Aparna Bhonde

## DESCRIPTION:

Farmers face several challenges when growing crops like uncertain irrigation, poor soil quality, etc. Especially in India, a major fraction of farmers do not have the knowledge to select appropriate crops and fertilizers. Moreover, crop failure due to disease causes a significant loss to the farmers, as well as the consumers. While there have been recent developments in the automated detection of these diseases using Machine Learning techniques, the utilization of Deep Learning has not been fully explored. Additionally, such models are not easy to use because of the high-quality data used in their training, lack of computational power, and poor generalizability of the models. To this end, we create an open-source easy-to-use web application to address some of these issues which may help improve crop production. In particular, we support crop recommendation, fertilizer recommendation, plant disease prediction, and an interactive news-feed. In addition, we also use interpretability techniques in an attempt to explain the prediction made by our disease detection model.

## MERITS:

- It uses the LIME interpretability method to explain the predictions on the disease detection image, which can potentially help understand what it predicts, and improve the datasets and models using this information.
- The user can provide the input using forms on our user interface and quickly get their results.

## DEMERITS:

- The dataset we have used for disease classification is not exhaustive. It will not be able to detect the correct class for any out-of-domain data.

## 3.Title: Soil Based Fertilizer Recommendation System for Crop Disease Prediction System

YEAR:2021

AUTHORS: Dr.P. Pandi Selvi[1] , P. Poornima[2]

## DESCRIPTION:

Agriculture is the main aspect for the economic development of a country. Agriculture is the heart and life of most Indians. But in recent days, the field was going down due to various natural calamities. In order to overcome the problem, various issues in this field need to be addressed. The soil type, fertilizer recommendation, diseases in plants and leaves. All these features need to be considered. Our proposed system was organized in such a way, to analyze the soil type, diseases in the leaves and finally to recommend the appropriate fertilizer to the farmers, that may be of great help to them. Plant disease, especially on leaves, is one of the major factors that reduce the yield in both quality and quantity of the food crops. Finding the leaf disease is an important role to preserve agriculture. Smart analysis and Comprehensive prediction model in agriculture helps the farmer to yield right crop at the right time. The main benefits of the proposed system are as follows: Yield right crop at the right time, Balancing the crop production, control plant disease, Economic growth, and planning to reduce the crop scarcity. Hence to Detect and recognize the plant diseases and to recommend fertilizer it is necessary to provide symptoms in identifying the disease at its earliest. Hence the authors proposed and implemented new fertilizers Recommendation System for crop disease prediction.

## MERITS:

- It predict the fertilizer in a proficient manner.
- The proposed approach was organized in such a manner, that it is universal to all the users in the world.

## DEMERITS:

- Soil Based Fertilizer Recommendation System for Crop Disease Prediction System

## 4.Title: IOT based Crop Recommendation, Crop Disease Prediction and Its Solution

YEAR:2020

Authors: Rani Holambe1, Pooja Patil2, Padmaja Pawar3, Saurabh Salunkhe 4, Mr. Hrushikesh Joshi5

## DESCRIPTION:

Agriculture plays a vital role in India. India is the world's largest producer of different crops but still, it uses traditional framing methods therefore crop yield becomes down. Hence, with the introduction of newer seed varieties, new methods of agriculture crop production have increased. But without using the smarter ways, the agricultural field still having an imperfection. And due to these farmers need a smarter way to increase crop production. The system used different sensors that measured pH level, soil moisture, temperature, and humidity. After designing the system for pH, soil moisture, humidity, and temperature sensor, the next step is to build a model for crop recommendation. The databasewill compose of recommended minimum and maximum values of temperature, humidity, pH, soil moisture recommended for growing crops commonly planted in the country.Hence, to maximize the crop yield some smart methods came into the picture used in IoT and Machine Learning. In this paper, we will review the algorithms like Random Forest, Decision Tree, ANN to get better accuracy for the system.

## MERITS:

- The ML and IoT based suggestions will significantly educate the farmer and help them minimize costs and make strategic decisions by replacing intuition and passed-down knowledge with far more reliable data-driven ML models.
- The system used different sensors that measured pH level, soil moisture, temperature, and humidity.

## DEMERITS:

- The dataset is not very large and it needs more soil attributes.

## 5.Title: Fertilizers Recommendation System For Disease Prediction In Tree Leave

YEAR:2019

AUTHORS: R. Neela, P. Nithya

## DESCRIPTION:

Detection and recognition of plant diseases using machine learning are very efficient in providing symptoms of identifying diseases at its earliest. Plant pathologists can analyze the digital images using digital image processing for diagnosis of plant diseases. Application of computer vision and image processing strategies simply assist farmers in all of the regions of agriculture. Generally, the plant diseases are caused by the abnormal physiological functionalities of plants. Therefore, the characteristic symptoms are generated based on the differentiation between normal physiological functionalities and abnormal physiological functionalities of the plants. Mostly, the plant leaf diseases are caused by Pathogens which are positioned on the stems of the plants. These different symptoms and diseases of leaves are predicted by different methods in image processing. These different methods include different fundamental processes like segmentation, feature extraction and classification and so on. Recommend the fertilizer for affected leaves based on severity level. Fertilizers may be organic or inorganic. Admin can store the fertilizers based on disease categorization with severity levels. The measurements of fertilizers suggested based on disease severity.Mostly, the prediction and diagnosis of leaf diseases are depending on the segmentation such as segmenting the healthy tissues from diseased tissues of leaves.

## MERITS:

- The proposed SVM technique gives a better result when compared to existing CNN.
- The accuracy level is good.

## DEMERITS:

- Various segmentation algorithms can be implemented to improve accuracy.

## 6.TITLE: PREDICTION OF CROP YIELD AND FERTILIZER RECOMMENDATION USING MACHINE LEARNING ALGORITHMS

YEAR:2019

AUTHORS: Devdatta A. Bondre, Santosh Mahagaonkar

## DESCRIPTION:

Machine learning is an emerging research field in crop yield analysis. Yield prediction is a very important issue in agriculture. Any farmer is interested in knowing how much yield he is about to expect. In the past, yield prediction was performed by considering farmer's experience on particular field and crop. The yield prediction is a major issue that remains to be solved based on available data. Machine learning techniques are the better choice for this purpose. Different Machine learning techniques are used and evaluated in agriculture for estimating the future year's crop production. This paper proposes and implements a system to predict crop yield from previous data. This is achieved by applying machine learning algorithms like Support Vector Machine and Random Forest on agriculture data and recommends fertilizer suitable for every particular crop. The paper focuses on creation of a prediction model which may be used for future prediction of crop yield. It presents a brief analysis of crop yield prediction using machine learning techniques. This paper aims to improve the yield of the crop in several ways and recommends fertilizer suitable for every particular crop.

**MERITS:**

- It also displays weather information of selected location first which is displayed by third party API's.
- Different datasets like crop, crop yield dataset, Location, soil and crop nutrients, fertilizer datasets are gathered from other sources like agricultural books, agricultural websites are used.

**DEMERITS:**

- Datasets are usually small and do not contain enough images, which is a necessity for high-quality decisions.