

# A Survey on Suggesting Pesticides for Farmers using Data Mining

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**Abstract** - Agriculture plays a vital role in Indian Economy. Majority of the farmers lives depends on agriculture on their daily basis. Current Traditional agriculture system involves fertilization of farm based on traditional prediction methods rather than technical methodology, which lacks to attain proper identification or analysis which could be the drawback for obtaining greater production of crops. This situation brings the necessity of usage of intelligence that can be portable for both farmers and Government representatives or dealers to ensure the amounts of pesticides used and requirements in some area. One major difficulty that Indian farmers deal today in their day to day life is to use the correct pesticides that work properly which are suitable to various land conditions. For instance, if a pesticide used in some regions will not work in some other regions because of their different land conditions. Farmers may face a huge loss in their agriculture, which ultimately leads them to undergo money deprivation. In some cases this can even turn into a serious issue, that many farmers decide to end their lives. To overcome the aforementioned issues, we are developing a website that stacks all the data about different land areas on different land conditions and also collects the data about pesticides that work in those areas. Data mining is used for decision making. Therefore, we can achieve this using data mining.

**Key Words**- Pesticides, Technical prediction, Data Mining, Association rule techniques, Machine Learning algorithms.

## 1. INTRODUCTION

Agriculture in India depends on crops and its diversity especially with their tremendous growth in crops like rice and wheat. Indian breeders develop oil seeds, onions, tomatoes, wheat, etc, for growth and health. And other non nourishment things that Indian herders develop are tea, cotton, coffee, jute, rubber, etc. Asian country could be a fisheries colossal also. Farmers in independent India cultivate high yielding of crops, in which each crop that they cultivated have some diseases due to some annelids which means worms, crop killing parasites and insects. To overcome such

diseases and for the purpose of getting higher outcome farmers spray pesticides. If the pesticides they use work properly, then their yield is maximum otherwise their yield is minimum.

The major problem for the farmers especially in India is the majority of the farmers in India are illiterates and they don't easily identify what the pesticides they use actually contain. Thus to make it easy for the farmers to identify the pesticides and its proper usage without any difficulties, we develop an website that offers different types of pesticides suitable to their land conditions, so that the farmers who need to use some proper pesticides on their agricultural land can utilize this website and know the suitable pesticides for their own lands. Additionally we have included the feedback section where if the farmer feels anything inconsistent with the pesticide or any queries regarding the pesticide he can use the feedback section.

In general, farmers use fertilizers to extent the expansion of diverse crops, because they contain plant nutrients like calcium, sulphur, hydrogen, carbon, oxygen, etc. And also micro nutrients such as iron, chlorine, copper, etc. In ancient days, farmers produced man-made fertilizers by using animal waste like cow dung as their pesticides for their cultivation but creating natural fertilizers is extremely a time taking and a difficult process a well. So, in order to save time and making the preparations easy, technology introduced artificial fertilizers called pesticides. Here the problem is, the same type of pesticides should not be used for all the crops. Each crop has different nature that they require essential products based on their nature. Hence we need to educate the farmers on choosing the correct pesticides for proper utilization to achieve high crop yields.

To achieve this we have a tendency to design a website using the following modules. (I) User Inquiry (II) Suggestions (III) Data Collection

In the first module, User Inquiry, user submits the disease details about the crops and their soil type. That details will be checked and compared with the attributes. Based on upon attributes suggestions will be proposed to the concerned user.

In the Second module, Suggestions, results will be displayed based upon the data mining algorithms that is used. The user's request to datasets will tends the database to seek the information that those details will be checked based upon most matching attributes

In the third module ,Data Collection, admin plays the major role in maintaining the data sets, where the sends the request and based upon the collected results, the data sets seeks for the maximum data storage. For the purpose of implementing the above concepts ,data mining is used.

This project is inspired from knowing the importance of traditional values of agriculture. It is the backbone of the country. agriculture provides food and raw materials in and across all countries. It is the one and only income source of many people especially the people living in rural and urban area. Many farmers are unable to do agriculture due to unsuitable climatic conditions and ultimately they end in facing agriculture problems like low crop production ,etc. To overcome this problem, we use information technology as one major solution. Since technology is used worldwide, Data mining can be very useful in solving many agricultural problems. Data mining is a basic idea of extracting necessary information from a large data sets .It is a practice of searching large storage of data that go beyond analysis. Data mining gives a solution to many difficult problems that are not just answered by the simple queries. For example, the main problem for the farmers today's is using the pesticides in a correct way.

To rectify the problem, we are designing a website that helps the farmers to make a clear decision of using the correct pesticide. This website helps storing and maintaining the large data sets and extracts the necessary details and suggests the farmers to choose the best.

## II. RELATED WORK

In this Section we have studied few papers which show that data mining has a strong connection towards the farmers and the agricultural system.

A survey of Existing models/Work

1.D Ramesh (2013),JNTUH college of Engineering[8]:In this paper the author's focus is all about the data mining techniques like K-means, K-nearest neighbor algorithm, Artificial neural networks ,Support Vector machines(SVM) classifiers, etc.

2.G.Narsin Fathima (2014) , Jamal Mohamed College[9]: In this paper various algorithms like K-means clustering,classification and correlation are used for decision making in agriculture to identify which serves the best.

3.Dr..Siddaraju V.G (2013) , University of Mysore [10]: In this paper,the importance of agriculture in India by analyzing the previous results are used.

4.BmiloviC (2015),University of Novi Sad[13]: This paper tells how one can apply the data mining techniques.what are the issues that may happen in applying the data mining algorithms in agriculture.

5.RGopalaKrishnan (2015), Tata Group of Industries[16]:This article tells what India can do differently in suggesting new ideas and government initiatives so that farmers can be benefited.

6.Union of concerned scientists(UCSUSA) (2015), [14]: This publication helps healthy crop practice and diversity.

7.National Institution for Transforming India(NIIT) (2015), [15]: This paper concentrates on the important factors that can improve the productivity of crops like the farm size,etc.

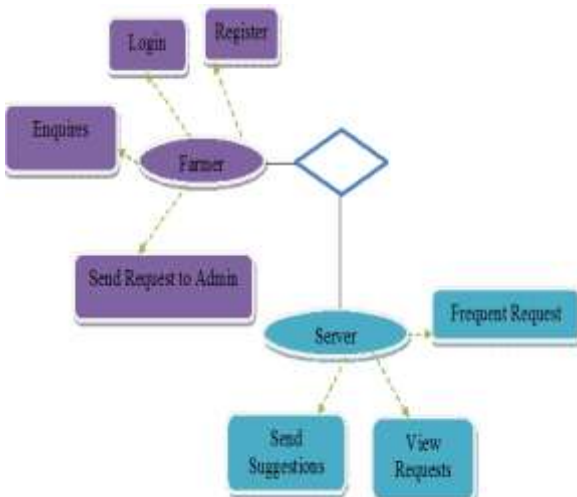
## III. DATASETS

Before creating the database, all that have to be done is to collect he appropriate data sets from the user. It takes the following process

A. Rating of each pesticide on each area ,store it in a table by calculating the average rating of pesticide.

B. Collect the details for the pesticide diseases to ensure which pesticide is the best for farmers.

**ER DIAGRAM :**



**IV. PROPOSED SYSTEM**

There are many surveys discussing on application of data mining tools in agriculture like finding yield prediction .There are some papers on improving the agriculture system. But only few papers discusses about suggesting pesticides. This is one such paper. In this survey we are suggesting pesticides for farmers based on Apriori and Association rule. In addition to this, we are providing a feedback and a query section where the farmer can ask queries to the admin regarding any issues or doubts on the selected pesticides.

**A.RELATED CONCEPTS:** Agriculture is the most essential and still now it is under developed in. There are many stages of digitalization I this area at greater level. It maintains the database. There is digitalization at customer end.

**B.FRONT END**

It collects the details of the crop ,disease, area and sends the details to the PHP to access the results from database.**Front end** is designed using HTML, CSS, Java Scripting languages.

**C.BACK END**

SERVER :It collects the details from the front end

DATA BASE :

- 1) Rating of each pesticide for each area, store it in a table by calculating the average rating of pesticide\
- 2) Collect the details like for which disease which pesticide is best and store it in table.

**D.TECHNIQUES APPROACHED:**

**1. ASSOCIATION RULE:**

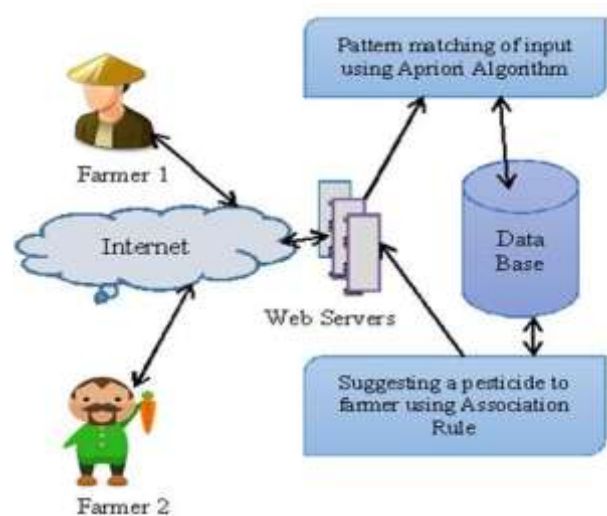
The main aspect of data mining is the processing of the interesting key patterns and trends and output should be simple and efficiently described of original database. It is the original database, it is difficult to impress with the term that are interesting ,the solution contains the various types ,and one of the main one of its is the association rule. Association rule consists of two parts, one is the Antecedent and the other one is the consequent. It is also called as then statement.

Example:

Paddy^Nellore^Disease=>Pesticide Name

Rice^Vijayavada^Disease=>Pesticide Name.

**V. ARCHITECTURE:**



**2. APRIORI ALGORITHM:**

Forming an association rule is generally divided into two separate steps.

1. Firstly, minimum support should be calculated to know all common item set in a database.

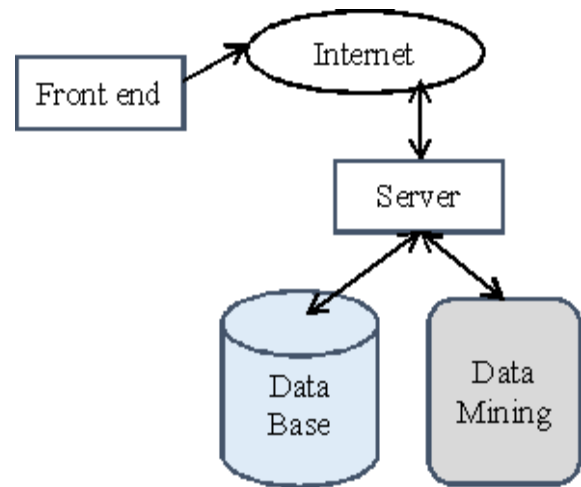
2. Secondly, the common item sets which we got and the least confidence constraints are used to form rules. It is very tough to find all the frequent set of items in the database because it requires searching all the combinations of items. The total number of possible sets of items is the power set of I, since its size is  $2^n - 1$ , by removing the empty set. So appropriate and useful algorithms can find all the frequent items.

PSEUDOCODE:

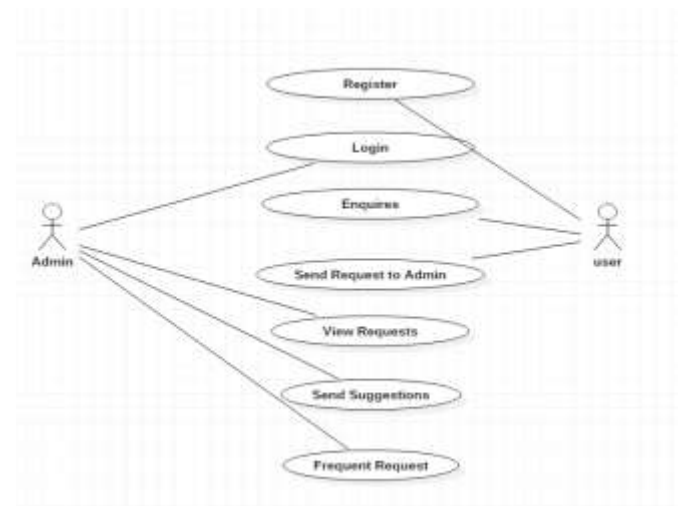
```

L1=F1-itemset(D);
For(k=2;Lk-1!=$;k++);
Prune1 (Lk-1);
End for
CK=apriori_gen(LK-1;minsup);
For all transactions t^
C=sumset (CK,t);find out the subset including C
For all candidates c=>C
C.count++;
End for
LK={c=>CK|c.count>=minsup}
(CK)} }
(CK)} }
End for
Return ANSWER
    
```

**VI.LAYOUT:**



**VII.USE CASE DIAGRAM:**



**INPUT:**



Here, the additional feature that we have included in this paper is implemented in the above figure.

Figure. Admin Database Section





Here the farmer's queries are collected in the database.

### OUTPUT:



Here the admin replies to the farmer queries are shown.

### VIII CONCLUSION AND FUTURE WORK:

After the creation of this website, farmers will get better pesticides by searching in the website and the profit also increases. So, the income of India also increases as the increase in income in agriculture. Since we have approached a new idea of finding better pesticides using data mining techniques, farmers can easily know that which pesticide can be used in which place. Farmers don't even need to have the technical knowledge or even some computer knowledge, they can get the solution to their problem just by querying about the pests regarding with their land type, area, crop and disease. In future this work can be extended by including the image updating along with its price and location so that if some farmers cannot able to find out the area of getting the suggested pesticides can utilize the image updating and get the pesticides.

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