

Data Mining in Agriculture for Enhanced Production

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Abstract

Data mining is a latest tool used in agriculture to ultimately produce more crop yields. Data in agriculture are depending upon several factors and is inter-related with farming practices, inputs and nature. Data mining in agriculture is used to find logical solutions to problems surfaced and arise at field level. The vast and unutilized raw data available in agricultural and allied organizations need to be explored with data mining tools like clustering and classification approaches to make information acquisition from existing research on farming methods to scale up yields. Data mining in agriculture need to be adequately employed for yield prediction and enhancement to derive sustainable advantages to feed millions of hungry mouths.

Keywords: *Data Mining; Agriculture; Enhanced Production*

Introduction

Data collected on several agricultural crops and allied aspects in many universities and other institutions is available without putting it to full use. The data is subjected to traditional statistical analyses and confined to focusing on a specific issue by researchers. Much data is lying unused or under used necessitating for data mining.

Discussion

Data mining is the process of discovering previously unknown and potentially interesting patterns in large datasets. The mined information is typically represented as a model of the semantic structure of the dataset, where the model may be used on new data for prediction or classification. Alternatively, human domain experts may choose to manually examine the model, in search of portions that explain previously misunderstood or unknown characteristics of the domain under study.

The data mining framework in agriculture was developed with the aim of enhancing the analysis of agricultural data sets compared to currently used statistical methods. It is a synthesis of different technologies brought together for the purpose of enhancing the utilization of different data. The data mining framework is based on the data, information, knowledge and wisdom continuum as a horizontal axis, with data mining and online analytical processing.

Data mining in agriculture is of late, gaining importance and may become a priority approach without any doubt. In this approach, utilization of data mining techniques to scale up agriculture and allied fields need to be explored. With advancement of new and improved technologies much data is generated in all the fields of agriculture. Need of the day is to put all the data to better production of crop yields. The successful production of any crop primarily depend on the variety selected, suitability of soil, adaptation of selected variety to the prevailing environmental conditions, resilience to pests and diseases. Synchronization of harvest time with demand in the market.

The crop varieties are developed at Government run universities with service motive and private companies with money centered approach. In universities, release of a new variety has to pass many levels from breeder to final notification through multi-level evaluation to avoid any flaws. The data is generated, subjected to appropriate statistical procedures and documentation. Ultimately the acceptance by growers is considered before recommending it to favorable agro climatic locations.

Data mining is the best approach that can be utilized to address the factors that affect farmers decision on a particular crop variety. Data mining should deliver a means to improving the quality of information used to make recommendations. In addition, it may help in simplifying the process of transferring knowledge to farmers in the decision making of their crop variety selection. We have to remember that data mining is also known as knowledge discovery in data and the farmers are able to go through all the knowledge that is available in data for making a wise selection. Data mined need to be deployed to farmers for making an intelligent decision, so it must be made easy to understand without any complexities by the farmers who are the non-technical stake holders. Thus, deployment of data mined should incorporate all the protocols required for easy implementation and successful reaching of the goal that is yield enhancement. To specifically talk about data mining and deployment in selection of a variety; the stake holder farmers who are non-technical should know the name of variety, availability of seed or plant material, duration of crop, growth characteristics, season of planting, type of soils best suited, attacking pests and diseases, measures to control attacking pests and diseases, availability of chemicals to control pests and diseases, cultural methods like irrigation, fertilization to exploit the variety to produce maximum yield, specialized harvesting techniques, post-harvest technologies till the harvest reaches the consumer, marketing strategies etc.

To make the data mining successful in agriculture, a detailed deployment plan through all the aspects of crop must be created and delivered to the farmers. It must always to keep in mind that once a deployment plan is delivered, there is no choice to modify since the crop variety is on the field and if it is a perennial crop like apple or mango which is permanent for many years. Hence, deployment plan must be meticulously prepared and delivered. To make deployment plan successful, data mining should not be haphazard [1-6].

Conclusion

Data mining in agriculture and allied fields has an ample scope to utilize for increased yields in agriculture, since huge data is accumulated throughout the world in all aspects of several crops to use it for precision farming. Careful deployment plan need to be devised from data mining.

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