Climate Based Crop Advisor

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***Abstract*---** Adoption of crop scheduling techniques in India for sugarcane and pomegranate production has been disappointing. The challenge is to use state of the art technology to provide practical and useful advice to farmers and further to convince farmers of the benefits of crop scheduling by on farm demonstration. The purpose of this project is to describe:

1. To expose the system to the practical aspects of farming in order to refine it if necessary.
2. To evaluate the accuracy of the system to predict crop growth and health.
3. A high technology system to provide practical, real time cropping advice on climate situations.

The system consists of a web-based simulation model that estimates the recent, current and future crop status and yield from field information and real time weather data. The system automatically generates and distributes simple advice by SMS to farmers' cellular phones. The system is evaluated on a small-scale sugarcane and pomegranate scheme at Pandharpur, Maharashtra. Yields are not affected significantly and profitability is enhanced considerably.

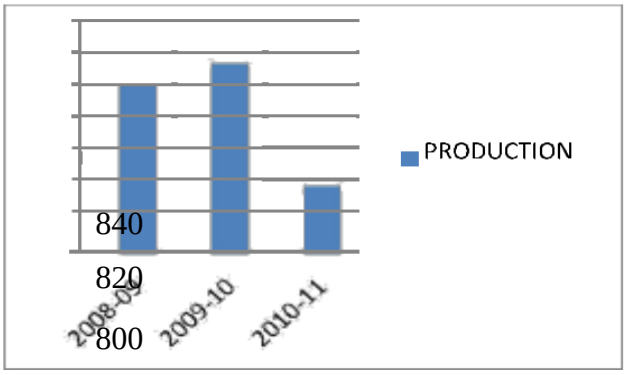
Keywords--- Agriculture, Sugarcane, Pomegranate, Weather Forecasting System, Crop Advisory

I. Introduction

has lack of knowledge about diseases and their solutions which had introduced due to new weather conditions like smog, humidity, heavy rain etc.

Diseases on pomegranate like Anthracnose, Fruit Rot etc. Anthracnose serves during Aug-Sept when there is high humidity and temperature in between 20 to 27 degree Celsius. The Symptoms are small blackspot on leaves and dark brown depressed spot on fruits. Figure 1 shows that there is degradation in the production of Pomegranate due to bad weather changes.

Since climate is a direct input into the agricultural production process, the agricultural sector has been a natural focus for research. This suggests that any changes in climate will affect the market for agricultural goods from the production side. To increase the crop productivity, management of diseases is a great significance. Successful modern day farming requires frequent and complex decision making to make the best of rapidly changing resource and market situation.



Agriculture sector alone represents 49 per cent of India's Gross National Product (GNP). Sugarcane and Pomegranate both the crops have bigger participation in India's Gross National Product (GNP), they play a crucial role in the country's development and shall continue to occupy an important place in the national economy. Sugarcane is a long duration crop of 12-14 months and therefore, is liable to attacked by a number of diseases. According to an estimate, sugarcane production decreased by 19.0 % due to diseases. According to the data published by National Horticulture Board of India there is an undersized decrease in the area of pomegranate cultivation in India from 109.00 thousand in 2008-09 to 107 thousand in 2010-11; similarly, the production has decreased from 807.00 thousand tons to 743.00 thousand tons during the same period. The reason behind that are the changes in climate and their effects on production. Farmers

Fig 1. Production of Pomegranate in India

II. Need of Application

Agriculture is the most economic activity in India. The effects of climate change is quickly reflects on agriculture economy. The change in climate in terms of exponential increase in average temperature, rainfall which that can be damaging costly for agriculture due to productivity degradation of crop.

The climate change could affect agriculture mainly in several ways:

- Productivity in terms quantity and quality of crops.

Growth of crops

- Agricultural practices, changes in agricultural inputs such as Insecticides and fertilizers.
- The belief is that farmers are keenly aware of the changes in climate and they immediately select those fertilizers and practices that are most appropriate to the new climate to overcome on the affect.

III. Related Work

In March-April 2004, Le Gal P.Y., Meyer E., Lyne P.W.L. And Calvinho O Proposed “Value And Feasibility Of Alternative Cane Supply Scheduling For A South African Mill Supply Area" [1].

These results confirm the potential of scheduling harvesting according to quality-based subareas. An increase in sugar production may be expected by delaying harvest of Coastal cane and starting with Inland cane.

In 2006, SINGELS, A. & SMITH, M.T. Proposed “Provision Of Irrigation Scheduling Advice To Small - Scale Sugarcane Farmers Using A Web Based Crop Model And Cellular Technology: A South African Case Study" [2].

To overcome drawback of existing system that gives a season wise climate behaviour for that we are giving daily advice.

In May 1994, Mendelsohn R, Nordhaus W, Shaw D Proposed “The Impact Of Global Warming On

Agriculture: A Ricardian Analysis." [3].

We and that higher temperature in all seasons except autumn reduce average farm values while more precipitationoutside of autumn increases farm values.

IV. Proposed Work

A. Problem Statement

"Climate Based Crop Advisor"

- expose the system to the practical aspects of farming in order to refine it if necessary.
- To evaluate the accuracy of the system to predict crop growth and use of pesticides.
- To overcome drawback of existing system that gives a season wise climate behaviour for that we are giving daily advice.
- To evaluate the ability of the system to provide useful advice.
- To Create awareness amongst farmers about the importance of climate change.

V. Methodology

This project offers an alternative methodology, based directly on the link between climate and farmers cropping decisions. The modelling and estimation strategies presented here allow us to estimate the damages (or benefits) due to climate change on Sugarcane and Pomegranate. The system consists of a web-based simulation model, which estimates the recent, current and future crop status and real time weather data. The system automatically generates and distributes simple irrigation advice by SMS to farmer's cellular phones.

B. Objective

A. Modules of the System

1) *Farmer*: Farmer will first subscribe the system, after successful subscription it will do the login and send problem to the CBCA system.

2) *Crop Model*: In this, we consider the sugarcane and pomegranate.

3) *CDAC Anuman*: It provides the weather updates.

4)*Advisor*: It provides the advice to the farmer.

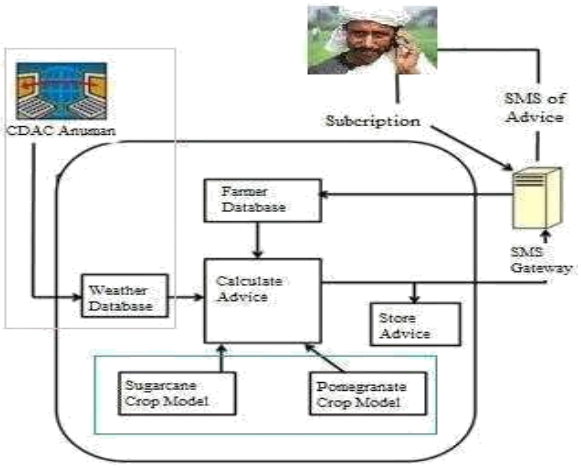


Fig 2. Context Diagram of System

VI. Conclusion

A centralized, model based system is developed to provide real time, simple weather advice to small-scale sugarcane and pomegranate farmers with cropping decisions. The system employs automatic weather updates from CDAC Anuman. A simulation analysis of cropping strategies indicated that significant benefits could be gained by applying practices, according to a flexible schedule based on a daily crop status as compared to a fixed schedule as is commonly practiced.

This could promote acceptance of advice from the CBCA system. The results suggest that significant benefits could be gained from implementing the CBCA system in small scale sugarcane and pomegranate production schemes and that there is justification to expand the provision of the service. One concern is the reliance of this method on feedback from farmers. Although, it is believed that the advice generated from estimated climate conditions is of value, it could be advantageous to obtain actual weather status applied in practice to ensure that simulations of crop status are more accurate.

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