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CROP YIELD PREDICTION BASED ON GEOGRAPHICAL LOCATION FOR INDIAN AGRICULTURE

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Abstract:

Predicting crop yields is a crucial issue in agriculture because it enables farmers and decision-makers to plan the planting, harvesting, and distribution of their products. The use of machine learning and artificial intelligence approaches to create precise and trustworthy agricultural production prediction models has gained popularity in recent years. These models make use of a variety of data sources, including satellite imaging, soil characteristics, historical crop yields, and weather patterns.

In India, agriculture is a significant source of both income and employment. The most frequent issue Indian farmers have is that they choose the wrong crop and don't utilize the right fertilizer for their soil. As a result, they will see a major decline in productivity. The farmer's facility problem has been solved with precision agriculture.

They seek to accurately and precisely anticipate agricultural yields so that farmers may improve their planting techniques, cut down on waste, and boost overall output. Random forests, neural networks, and support vector machines are a few of the well-liked machine learning techniques used for agricultural yield prediction. To understand the correlations between input variables and agricultural yields, these algorithms are trained on vast databases of historical crop yields and other pertinent data. By giving farmers useful information and direction on crop management, crop yield prediction models have the potential to change the agricultural industry. They can aid in cost-cutting, cost optimization, and profit maximization.

Keywords: Soil properties, algorithms, Geographical location, agriculture, crop recommendation.

1. Introduction

Irrigate = AI + Crop + Fertilizer + Pesticide, caring for the health of the soil, is the motto defined by our application. Irrigate celebrates the devotion, grit, and moral fiber of Indian farmers. A nation with a population of around 1.4 billion relies on farmers to provide food, but the productivity of farms is threatened by many natural elements that harm the crops and the farmers' way of life. Irrigation is a tiny project that improves agriculture by making wise decisions about the field's demography, the elements affecting the crop, and how to maintain a healthy farm for an outstanding harvest. This will be put into practice as a website that offers tools for crop, fertilizer, and pesticide recommendations based on site-specific criteria.

2.LiteratureSurvey

Author: PriyadharshiniA, SwapneelChakraborty, Aayush Kumar, and Omen Rajendra

Abstract: In India, agriculture is essential to the country's socioeconomic structure. For a nation where almost 58 percent of the people are engaged in farming, the failure of farmers to select the crop that is best suited for the land using conventional and non-scientific methods is a severe problem. Based on soil characteristics, sowing season, and geographic location, farmers occasionally failed to select the appropriate crops. As a result, people commit suicide, give up farming, and relocate to cities in search of work. This research effort has suggested a mechanism to help farmers choose crops by taking into account all the elements including sowing season, soil, and geographic location to address this problem. Additionally, precision agriculture, which focuses on site-specific crop management, is being implemented with contemporary agricultural technology and development in emerging nations.

Keywords Agriculture, crop suggestions, and machine learning

3. Methodology

For Indians, agriculture is one of the main industries for income. Even though Indian farmers put a lot of effort into their farms, natural forces threaten their yield. Natural factors cannot be changed; therefore, the best strategy is to make the most of the situation while they exist. Degradation of the soil is one of the main issues, which may be avoided by cultivating the crop that is most suited for the location. Nonetheless, even if the farmer decides to plant a specific crop, using the right amount of fertilizer would be beneficial. Pest is a significant issue that can only be resolved by using effective insecticides. This will help farmers. Various tests are conducted by the government in India which check the contents of soil but farmers are unaware of what to do with the results of the soil test. Hence Irrigreat makes use of all the values of the tests and helps the farmers with crop recommendations, fertilizer recommendations, and pesticide recommendations.

4. Proposed system:

To address the aforementioned issues, we offer an effective crop recommendation system in this study that forecasts crop suitability by taking into account all relevant factors, such as temperature, rainfall, location, and soil quality. The main goal of this system is to carry out the primary duty of an agro consultant, which is to advise farmers on which crops to grow. We also offer fertilizers that may be utilized for crops grown in various states, giving the user a simple and trustworthy way to decide and plan their harvests.

Figure 1:Proposed System.

5. Architecture:

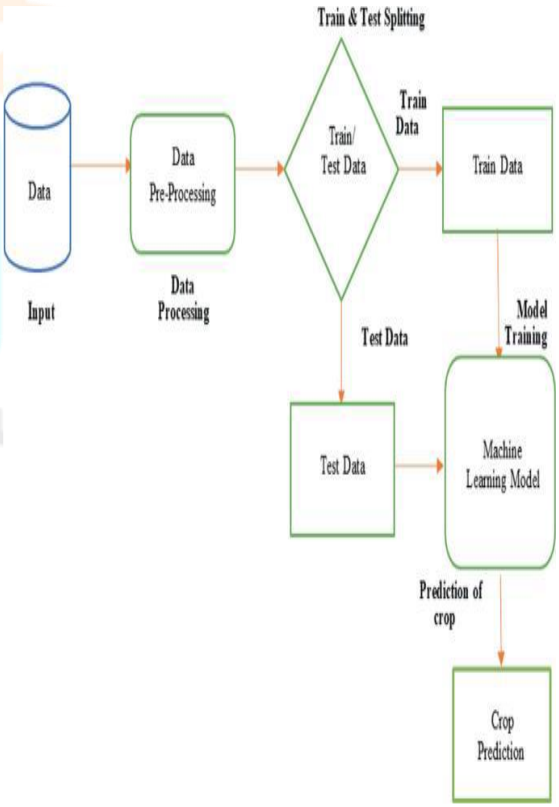

Figure 2:System Architecture.

6. Results:

1.

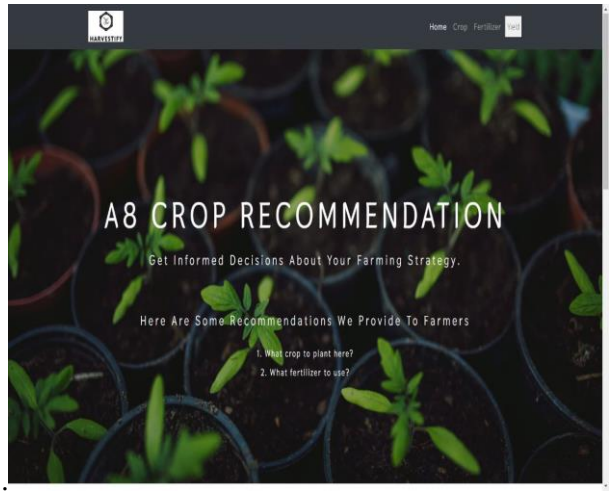

Figure 3: Home page

2.

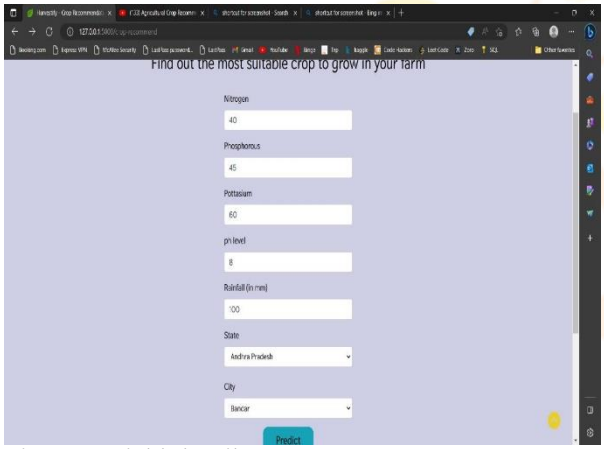

Figure 4:Field details

3.

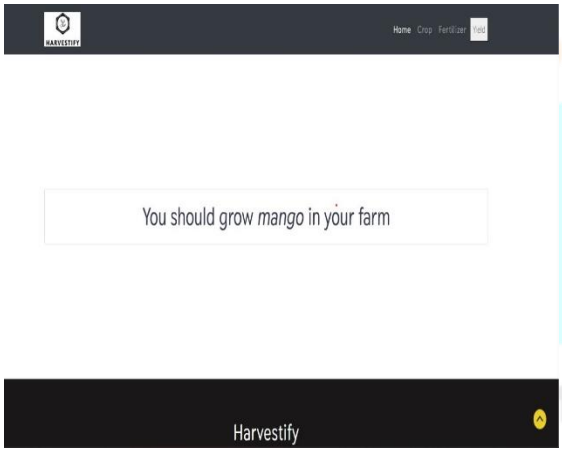

Figure 5: Suggesting the crop in the given field conditions.

4.

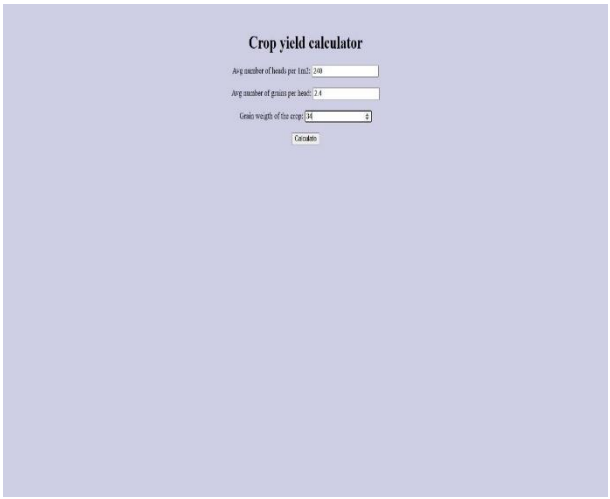

Figure 6: Crop calculator.

5.

Figure 7:Yield results.

6.

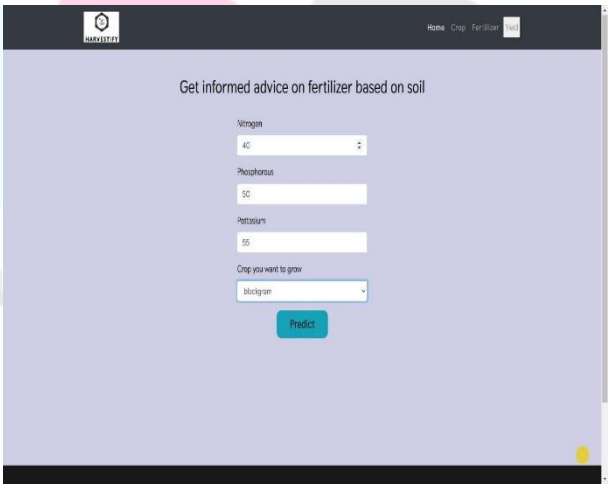

Figure 8:Fertilizers details

7.

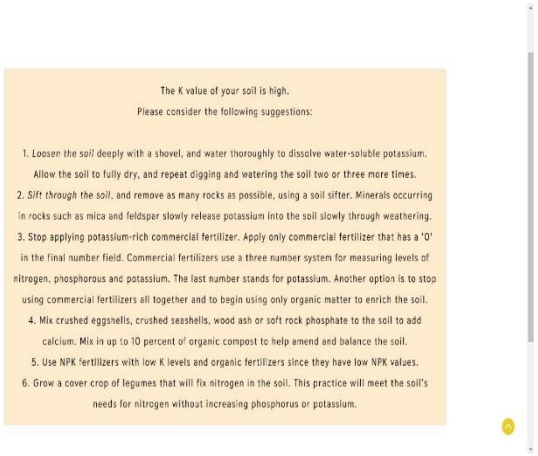

Figure 9:Based on the K value of the soil required suggestions are predicted.

7. Conclusion:

Farmers in India are working arduously. They contribute to the nation's ability to feed its almost 1.4 billion citizens. But, some natural elements that have the potential to destroy their crops and way of life put their productivity in jeopardy. So, this solution will help farmers increase agricultural production, slow down soil erosion in cultivated fields, receive knowledgeable advice on organic fertilizers and other fertilizers, and choose the best crop by taking into account a variety of factors. As a result, both farmers and the ecosystem would profit from this thorough projection. In addition to this, a significant issue that this initiative would help resolve is pest control. Our project suggests crops based on soil characteristics, thereby preventing soil degradation which saves the environment. Natural fertilizers also benefit the environment. Pesticides that are recommended are as per ISO standards. Social benefits include that it will be helping that section of India to feed the nation of 1.4 billion, which means Indian farmers. Economic benefits are abundant because availing services of Irrigreat just requires the user to have an account on the website which is free.

8. References:

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