farmfusion

INTRODUCTION

- As global agricultural challenges intensify due to population growth, climate variability, and resource constraints, the need for innovative solutions in crop management has never been more critical. The choice of which crops to plant directly influences not only farm productivity but also economic stability and environmental sustainability. This proposal introduces a Crop Recommendation System aimed at providing farmers with data-driven insights to optimize their crop selection process.

- Utilizing machine learning techniques and comprehensive datasets, our system analyzes various factors such as soil components such as nitrogen, phosphorous, potassium and climatic conditions such as temperature and rain amount. We seek to enhance farmer's decision-making capabilities and reduce risks associated with crop failure.

PROMBLEM

- Failure of farmers to decide on the best suited crop for his land using traditional and non-scientific methods is a serious issue for a country where approximately 50 percent of the population is involved in farming. Both availability and accessibility of correct and up to date information hinders potential researchers from working on developing country case studies. With resources within our reach we have proposed a system which can address this problem by providing crop recommendations based on machine learning models trained considering essential environmental parameters.

OUR GOALS

1

Accurate Crop Recommendation: Develop a model that accurately predicts the most suitable crop(s) for a given set of soil and climatic conditions.

2

Optimize Nutrient Utilization: Develop crop recommendations that align with the nitrogen (N), phosphorus (P), and potassium (K) content in the soil, maximizing nutrient uptake and minimizing the need for additional fertilizers.

3

Predictive Analytics for Crop Success: Develop models to predict most suitable crop based on historical data of N, P, K, temperature, and rainfall, allowing farmers to make more informed choices.

RELATED WORK

YEAR	PUPLISHED IN	PAPER TITLE	METHOD	RESULT
2022	Elsevier	Smart farming using Machine Learning and Deep Learning techniques	KNN Naïv Bayes Logistic Regression SVM Decision Tree Bagging Random Forest AdaBoost Gradient Boosting XGBoost lbgm	KNN: 84.27% NB: 94.72% LR: 63.90% SVM: 65.18% DT: 92.18% BG: 92.54% RF: 92.54% AD: 12.9% gb: 90.45% xg: 91.72% lbmg: 93.45%
2022	Technoscience Academy	IoT Framework for Measurement and Precision Agriculture: Predicting the Crop Using Machine Learning Algorithms	Used WEKA classifiers: MLP Decision table (Dt) JRip	MLP: 98.22% Dt : 88.59% JRip: 96%
2021	IJSRCSEIT	Crop Recommendation System using Machine Learning	Decision Tree Naïv Bayes SVM Logistic Regression Random Forest XGBoost	DT: 90% NB: 99% SVM: 10.68% LR: 95.22% RF: 99% XGBoost: 99.31%