

A Literature Survey on Precision Crop Prediction Using Soil and Environmental Analysis

R S Koushik¹, Rithesh K R¹, Mahendra M K²

Student B.E., Information Science and Engineering¹

Assistant Prof., Information Science and Engineering²

Global Academy of Technology, Bengaluru, Karnataka, India

Abstract: *With the increasing global demand for agricultural efficiency, the importance of accurate and well-informed crop planning is highlighted. The objective of the research project, titled "Precision Crop Prediction using Soil and Environmental Analysis," is to develop a system that utilizes machine learning algorithms and extensive datasets to forecast the most suitable crop for a particular region. This system incorporates essential input parameters such as soil NPK values, pH levels, temperature, humidity, and rainfall data. It provides users with valuable insights, including recommended crops for cultivation, anticipated yield per acre, and estimated market prices for the yield. By offering a comprehensive and data-driven solution, farmers can make more informed decisions, optimize resource allocation, and enhance overall agricultural productivity.*

Keywords: Precision Crop Prediction, Machine Learning Algorithms, NPK Values, Soil PH

REFERENCES

- [1] Abhang, Komal, Surabhi Chaughule, Pranali Chavan, Shraddha Ganjave, and E. VSB. "Soil analysis and crop fertility prediction." *International Research Journal of Engineering and Technology* 5, no. 3 (2018): 3106-3108.
- [2] Elbasi, Ersin, Chamseddine Zaki, Ahmet E. Topcu, Wiem Abdelbaki, Aymen I. Zreikat, Elda Cina, Ahmed Shdefat, and Louai Saker. "Crop prediction model using machine learning algorithms." *Applied Sciences* 13, no. 16 (2023): 9288.
- [3] Saraswat, Tanya. "Crop Prediction Using Machine Learning and Artificial Neural Network." In *First International Conference on Advances in Computer Vision and Artificial Intelligence Technologies (ACVAIT 2022)*, pp. 561-568. Atlantis Press, 2023.
- [4] Swapna, B., S. Manivannan, and R. Nandhini Devi. "Prediction of soil reaction (Ph) and soil nutrients using multivariate statistics techniques for agricultural crop and soil management." *International Journal of Advanced Science and Technology* 29, no. 7s (2020): 1900-1912.
- [5] Rao, Madhuri Shripathi, Arushi Singh, NV Subba Reddy, and Dinesh U. Acharya. "Crop prediction using machine learning." In *Journal of Physics: Conference Series*, vol. 2161, no. 1, p. 012033. IOP Publishing, 2022.
- [6] Nischitha, K., Dhanush Vishwakarma, Mahendra N. Ashwini, and M. R. Manjuraju. "Crop prediction using machine learning approaches." *International Journal of Engineering Research & Technology (IJERT)* 9, no. 08 (2020): 23-26.
- [7] Raja, S. P., Barbara Sawicka, Zoran Stamenkovic, and G. Mariammal. "Crop prediction based on characteristics of the agricultural environment using various feature selection techniques and classifiers." *IEEE Access* 10 (2022): 23625-23641.
- [8] Prabhu, Shubham, Prem Revandekar, Swami Shirdhankar, and Sandip Paygude. "Soil analysis and crop prediction." *International Journal of Scientific Research in Science and Technology* 7, no. 4 (2020): 117-123.
- [9] Yadav, Jagdeep, Shalu Chopra, and M. Vijayalakshmi. "Soil analysis and crop fertility prediction using machine learning." *Machine Learning* 8, no. 03 (2021).
- [10] Senapaty, Murali Krishna, Abhishek Ray, and Neelamadhab Padhy. "IoT-Enabled Soil Nutrient Analysis and Crop Recommendation Model for Precision Agriculture." *Computers* 12, no. 3 (2023): 61.
- [11] Ramane, Deepa V., Supriya S. Patil, and A. D. Shaligram. "Detection of NPK nutrients of soil using Fiber Optic Sensor." In *International Journal of Research in Advent Technology Special Issue National Conference ACGT 2015*, pp. 13-14. 2015.

- [12]Rahaman, Sabina, M. Harshitha, R. Anusha, Y. R. Bhargavi, and M. Chandana. "Detection of NPK Ratio Level Using SVM Algorithm and SmartAgro Sensor System." *International Journal of Latest Research in Engineering and Technology* 3, no. 7 (2017): 11-15.
- [13]GUPTA, TUSHAR, SUNIL MAGGU, and BHASKAR KAPOOR. "Crop Prediction using Machine Learning." (2023).
- [14]Kumar, Vishal, Raushan Kumar, Shubham Kumar, and P. P. Jorvekar. "Agriculture Soil Analysis for Suitable Crop Prediction." *PP, Agriculture Soil Analysis for Suitable Crop Prediction (May 24, 2021)* (2021).
- [15]Shravani, V., S. Uday Kiran, J. S. Yashaswini, and D. Priyanka. "Soil classification and crop suggestion using machine learning." *International Research Journal of Engineering and Technology* 7, no. 6 (2020): 3696-3701.