

PAPER TITLE: Monitoring of Soil Nutrients Using Soil NPK Sensor and Arduino

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PROBLEM MENTIONED/SOLUTION OBTAINED: The paper addresses the challenge of accurately monitoring soil nutrients in agricultural fields, crucial for optimizing crop yield and ensuring sustainable farming practices. It proposes the integration of a Soil NPK Sensor with Arduino technology as a solution to provide real-time data on essential nutrients – nitrogen, phosphorus, and potassium – in the soil. By utilizing this sensor-based approach, the study aims to overcome the limitations of traditional soil testing methods, which are often time-consuming, labor-intensive, and costly.

TOOLS USED/IMPLEMENTED:

- Soil NPK Sensor: A 3-in-1 fertility sensor designed to detect the content of nitrogen, phosphorus, and potassium in the soil with high precision and accuracy.
- Arduino Technology: The Arduino platform is utilized to interface with the soil NPK sensor, enabling data collection and analysis in real-time.
- MAX485 TTL to RS485 Converter Module: This module facilitates communication between the Arduino board and the soil NPK sensor via RS485 protocol.
- OLED Display Module: A monochrome OLED display is used to visualize the sensor data, providing an intuitive interface for users.

RESULTS AND DISCUSSION: The research conducted experiments at various data points to evaluate the performance of the soil NPK sensor integrated with Arduino technology. The results indicate that the sensor system provides nutrient levels (NPK) in soil that closely match values obtained from laboratory measurements. This suggests that the sensor-based approach offers high accuracy and efficiency in monitoring soil nutrients, making it a cost-effective solution for continuous soil nutrient monitoring in agricultural fields.

IMPORTANT REFERENCE:

- Sharma, P., & Goswami, P. (2020). Development of a Low-Cost Soil Nutrient Sensor Using Arduino for Precision Agriculture. *International Journal of Agriculture and Biological Engineering*, 13(4), 65-72.