Agriculture Based Pesticide Sprayer Using Arduino

KLE Dr. M. S. SHESHGIRI COLLEGE OF ENGINEERING AND TECHNOLOGY, BELAGAVI / Mechanical Engineering

PROBLEM STATEMENT

The current manual pesticide spraying methods used in agriculture present several challenges, including inefficient and inconsistent application, excessive pesticide usage, labor-intensive processes, and potential health risks to farmers. To address these issues, there is a need for an automated pesticide sprayer system using Arduino that can provide precise and controlled spraying, optimize pesticide usage, reduce labor requirements, and enhance overall crop health and productivity.

TEAM MEMBERS

Abdurrahaman B Mokashi
Amogha S Chandukar
Basavaraj V Chigadolli
Sanket T Badagannavar

INTRODUCTION

Agriculture is the primary source of revenue for India's population, which accounts for nearly 60% of the country's total. Farmers work in their fields to cultivate various crops based on the environment and resources available. Farmers must use large quantities of pesticides to increase food production in order to meet such high food demand for such a large population. Traditional manual pesticide spraying operations is full of direct exposure to the pesticide liquid work environment, great harm to human body and when this pesticide may come into contact with the farmer during spraying, which may trigger skin cancer and asthma illnesses. Increased pesticide spraying can impact consumer health as it enters the food chain. Pesticide spraying and fertilizer scattering are tedious applications.

Despite the fact that pesticide spraying is now required, farmers still find it to be a hazardous process. This project is based on the development of an agricultural robot vehicle that navigates between crops using an Android application based on the farmer's instructions. This truck has lower-cost components, making it more cost-effective. To move the robot in the field, the farmer can use any Android smartphone with this application. Through an IoT application, farmers can control pesticide sprinkling devices. This low-cost robotic vehicle would increase efficiency, safety, and meet labour demand in agricultural applications. Day by day the population of India is increasing and to fullfill the necessity of food modernization of agricultural sectors square measure vital because of chemical fertilizers the fertility mechanization in spraying devices fertilizers and pesticides square measure distributed equally on the farm and scale back the number of waste, which ends in hindrance of losses and it's going to be terribly important to boost the performance and productivity of agriculture through at the same time supply secure cultivation of the farmers. Although spraying of pesticides has become obligatory it additionally proves to be a harmful procedure for the farmers. Farmers, particularly once they spray pesticides, take too several precautions like carrying appropriate outfits, masks, gloves etc. so as that, it doesn't motive any harmful results on them. Zero million humans are affected by extreme poisoning and its fee is 2-three in step with minute, with close to twenty,000 folks ending from exposure per annum, it'll Mechanization offers higher productivity in stripped-down centres. Farmers square measure the utilisation of the same ancient ways for spraying fertilisers and pesticides. There is a wish of development during this quarter and most commonly on fertilisers pesticides spraying technique because it needs larger efforts and time to spray by mistreatment in a typical manner. This paper focuses notably on the way to scale back the wearisome effort applied by the farmers and additionally to bring an enormous modification within the aged ways of agriculture.

IDEA GENERATION

1. Arduino Board: The Arduino board acts as the brain of the robot, controlling its various functions. It is

programmed to receive inputs, process them, and generate appropriate outputs to control the sprayer

and other components.

2. Sprayer Mechanism: The sprayer mechanism consists of a tank for holding the pesticide, a pump to

create pressure, and a set of nozzles for spraying the pesticide. The pump is connected to the Arduino

board, and its activation is controlled by the board's output signals.

3. Sensors: The robot may incorporate various sensors to gather information about its environment. For

example, it might use ultrasonic sensors or infrared sensors to detect obstacles or measure distances.

These sensors provide input to the Arduino board, allowing it to make decisions based on the gathered

data.

4. Motor Control: The robot may have wheels or tracks for movement. The motors that drive these

wheels or tracks are connected to the Arduino board. By sending appropriate signals to the motor

drivers, the Arduino can control the robot's speed, direction, and turning.

5. Programming: The Arduino board is programmed using the Arduino programming language, which is

based on C++. The program includes logic for reading sensor data, making decisions based on that

data, and controlling the sprayer and motors accordingly. The programming can be done using the

Arduino Integrated Development Environment (IDE).

6. Autonomous Operation: Once the robot is programmed and all the components are connected

properly, it can operate autonomously. It moves around the designated area, avoiding obstacles with

the help of sensors, and sprays pesticides at the desired locations based on the program's instructions.

7. Power Supply: The robot requires a power source to run its components. This can be provided by

batteries or an external power supply, depending on the specific design requirements.

PROTOTYPE IMAGES