



# PESTICIDE SPRAYER DRONE WITH BOMB DEFUSING ROBOT

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**Abstract:** Fertilizers and pesticides must be used in agricultural fields to increase crop yields. The biggest disadvantage of manual spraying is that it can cause a variety of health problems in the person spraying the fertilizers, such as respiratory ailments, cardiac diseases, and so on. When your skin is exposed to pesticides, dermal exposure can occur. Irritation or burns may result. We came up with the idea of an autonomous fertilizer/pesticide sprayer using a drone to prevent this risk and spray the fertilizers/pesticides consistently.

This system is designed for activities involving a high danger of human entry, such as some criminal cases, and might be particularly useful in the military for spying purposes. The system engages a robotic arm as well as a robotic vehicle to not only access a high-risk region but also to carry whatever object it desires. The system also contains a night vision camera, which allows viewing of what is captured not only during the day but also at night. The entire system is managed through an Android application. Through an android device application, the system delivers commands to the receiving circuit mounted on the vehicle.

## I. LITERATURE REVIEW

The information about the project is described in a literature review. The goal of this literature review is to look at the possibilities for using a Pesticide Sprayer Quadcopter with a Bomb Defusing Robot to investigate the technology's potential uses and to come up with a design and functionality that works. The agricultural industry in India is the most important, accounting for 18 percent of India's GDP and employing 50 percent of the country's human labour. Because of faulty methods of monitoring crops, irrigation patterns, and pesticides necessary to be administered, our country is so reliant on agriculture that it has yet to realise its full potential. Over 35 drone start-ups are now operating in India. Raising the technological bar and lowering the cost of agricultural drones is a win-win situation. This project intends to construct an unmanned aerial vehicle (UAV) to solve this problem, as well as an Octocopter to spray huge volumes of pesticides in a shorter period of time. The Bomb Diffusing Robot is carried by the quadcopter and can be sent to regions where humans are unable to go. The quadcopter can fly to regions beyond human reach and safely land the Bomb Defusing Robot, which then deactivates the device.

## II. INTRODUCTION

Agriculture is the backbone of the Indian economy. Agriculture production is influenced by a variety of environmental factors such as temperature, rainfall, and so on. Pests, illnesses, and other significant biological elements also have an impact. Humans can influence these biological variables with the help of pesticides, resulting in increased yield. Pesticide exposure has a variety of effects on human health, including neurological and skin problems. According to a report published by the World Health Organization, three million employees are poisoned by pesticides each year, with 18000 of them dying. This comes with the goal of reducing the negative consequence of chemicals on citizens in general, groups of individuals, and particular personalities, as well as not spraying chemicals over vast area when compared to typical spraying by an automatic aerial pesticide sprayer, a small interval of your time is required. This product is essentially a design and development of a quadcopter frame structure and spraying mechanism in order to reduce the amount of time spent by humans.

Mankind is becoming more reliant on robots, and the reason for this is that robots are capable of doing a variety of tasks with incredible speed, accuracy, and expertise, despite their complexity. Robot technology has progressed to the point where it can evaluate human behaviour patterns and act appropriately to complete tasks even when the operator is not there in the line of sight. Robots use cutting-edge programming languages, and numerous current electronic devices are in use to boost productivity. Several actions performed by robotic robots rather than humans are more efficient.

### III. WORKING

Defusing Robot's goal is to complete the work without involving humans. Because pesticides are harmful to human health, a quadcopter is used to spray pesticide on crops on agricultural land, and the Bomb Defusing Robot's goal is to reach areas where humans are present. Interaction with the explosives is not possible, which also avoids a person's life from being jeopardized. The robot can be controlled from a distance and the bomb defused.

### IV. SCOPE OF THE PROJECT

Use of fertilizers/pesticides in agricultural fields is necessary for better crop yields. The main disadvantage of manual spraying is that it can cause few health issues like respiratory ailments, cardiac diseases etc., to the human who is spraying these fertilizers. Sometimes, dermal exposure happens when your skin is exposed to pesticides. This can cause irritation or burns.

### V. OVERVIEW

Manual pesticide spraying causes many harmful side effects to the personnel involved in the spraying process. The Exposure effects can range from mild skin irritation to birth defects, tumours, genetic changes, blood and nerve disorders, endocrine disruption, coma or death. The WHO (World Health Organization) estimated as one million cases of ill affected, when spraying the pesticides in the crop field manually. Carrying a heavy pesticide tank and walking along with it around the farm is difficult and causes the pain in the back and inhaling Pesticides can cause short-term adverse health effects, called acute effects, as well as chronic adverse effects that can occur months or years after exposure. Examples of acute health effects include difficulty in sleeping, stinging eyes, rashes, blisters, blindness, nausea, dizziness, diarrhoea and even can cause death. Different climate and temperature variations on land scape the wind speed varies. So the drones are not able to spray the required amount of fertilizer to particular Area. Our aim is to provide a controlled automotive spraying mechanism with atmospheric conditions. So our aim is to provide a controlled

### VI. MAIN COMPONENTS

#### 1. FLIGHT CONTROLLER



It inherits NAZA-M reliability and stability as a flight controller. The unique All-in-One design makes installation easier while also saving space and weight. Its light and tiny Main Controller incorporates inner dampers, controllers, 3-axis gyroscope, 3-axis accelerometer, and barometer. It can be used for autopilot/automated control because it can measure flying height and attitude. GPS Attitude Mode (with GPS module), Attitude Mode, and Manual Mode are the three control modes available. To obtain varied flight characteristics, the pilot can switch between the three modes. It can also adapt to the flight environment automatically and intelligently switch between GPS Attitude Mode and Attitude Mode to provide a safe and secure flight.

#### 2. BLDC MOTOR



The efficiency of BLDC motors is higher, and they require less maintenance. The permanent magnet that rotates; rotation is accomplished by altering the direction of magnetic fields generated by stationary coils around it. Adjust the magnitude and direction of the current entering these coils to regulate the spinning.

#### 3. ELECTRONIC SPEED CONTROLLER (ESC)



The drone requires four 30 Amp Esc controllers to control the speed of the BLDC motors. An electronic speed control (ESC) is a circuit that regulates and controls the rotational speed of an electric motor. It may also be capable of motor reversing and dynamic braking. In electrically powered radio-controlled models, miniature electronic speed controllers are used.

#### 4. LITHIUM ION BATTERY



It is an advanced battery technology that uses lithium ions as a key component of its electrochemistry. Is an advanced battery technology that uses lithium ions as a key component of its electrochemistry. During a discharge cycle, lithium atoms in the anode are ionized and separated from their electrons. The lithium ions move from the anode and pass through the electrolyte until they reach the cathode, where they recombine with their electrons and electrically neutralize. The lithium ions are small enough to be able to move through a micro-permeable separator between the anode and cathode. In part because of lithium's small size (third only to hydrogen and helium), Li-ion batteries can have a very high voltage and charge storage per unit mass and unit volume.

#### 5. AT89C52 MICROCONTROLLER



The AT89C52 is a low-power, high-performance CMOS 8-bit microcomputer with 8K bytes of Flash programmable and erasable read only memory (PEROM). The device is manufactured using Atmel's high-density non-volatile memory technology and is compatible with the industry-standard 80C51 and 80C52 instruction set and pinout.

#### 6. LOW RPM MOTORS



The low rpm motors are generally PMSM motors. A low rpm motor is toroid shaped, like a donut, and thus has a large diameter and short axis. These motors can directly drive the system without additional mechanics, like worm wheels, belts or pulleys. Low rpm motors can be fitted with a closed loop control mechanism, like conventional servomotors, but the concept and shape are different. Because of the shape, the low rpm motor generates a lot of torque, but its RPM is limited. A conventional servomotor on the other hand, can reach much higher RPM but generates far less torque. It is therefore often fitted with a gearbox to reach the desired speed to torque ratio, but this gearing does reduce efficiency and accuracy.

#### 7. BLUETOOTH MODULE



The HC-05 Bluetooth Module is a simple Bluetooth SPP (Serial Port Protocol) module that allows for the construction of a transparent wireless serial connection. It communicates via serial transmission, making it simple to connect to a controller or PC. The HC-05 Bluetooth module allows you to switch between master and slave mode, which means you may use it for both receiving and delivering data.

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