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AGRICULTURAL DRONE

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Abstract – *One of main source of income in India is Agriculture. The production rate of crops in agriculture is based on various parameters like temperature, humidity, rain, etc. Which are natural factors and not in farmers control. The field of agriculture is also depending on some of factors like pests, disease, fertilizers, etc. Which can be control by giving proper treatment to crops. Pesticides may increase the productivity of crops but it also effects on human health. So, the main aim of this paper is to design agriculture drone for spraying pesticides. SO, developing a system, such that spray management using the Android app & Drone to overcome Tractor Bloor Spray management system problems in rainy season. Also, this system will give feature Monitoring of plant. The conclusions of the project will be, Drone use in agriculture provides new possibilities to solve lot of problems. Agricultural Drone are going to be helpful for farmers in spraying fertilizers, pesticides and crop protection products while being controlled by one person operating from secure position. Presently, the Drone we developed is for spraying, crop protection products only but there is a lot of features of Drone.*

Key Words: Global Positioning System, Autonomous Vehicle, Internet of Things, Machine Vision, Unmanned Aerial Vehicle, etc.

1. INTRODUCTION

An agricultural drone is an unmanned aerial vehicle (UAV) used to help improve agricultural operations and monitor crop growth. Digital imaging ability can give farmers a richer image of their area. Using an agriculture drone and collecting information from it may improving crop yields and farm efficiency.

Agricultural drones help farmers to see their crops from the high. Which helps farmer to distinguish healthy and unhealthy crops, a difference is not always visible to the naked eye. Thus, these views can help to improve crop growth and production.

Additionally, the drone can survey the crops for the farmer periodically to their liking. Weekly, daily, or even hourly, pictures can show the changes within the crops over time, thus showing possible "trouble spots". Having identified these trouble spots, the farmer can attempt to improve crop management and production.

The agricultural industry seems to possess drone technology with open arms, using these advanced tools to transform modern farming.

Farmers drive a drone over their field which will specifically identify an issue in a specific area, and take the necessary actions to correct the problem. This gives the farmer time to focus on production and save time of surveying crops.

Fig -1: Control System

2. LITERATURE SURVEY

Implementation of Autonomous Drone An agriculture drone can be used to survey crops. Thus, a drone that has a high-quality camera will be required. This type of UAV enables near real-time monitoring. It's a good idea to look for a drone that has a stabilization system. It will reduce footage shakiness and contribute to a much better surveillance process. The next choice to make focuses on whether a fixed-wing or a multirotor drone should be purchased. Most farmers prefer fixed wing-drones because of several important benefits such as broader mapping coverage and faster data acquisition Multi-rotor platforms have batteries that last a shorter period. In comparison, fixed-wing drones can spend much more time in the air. This characteristic turns them into great gadgets for the owners of large farms. Fixed-wing drones are best-suited for the surveillance of large open spaces. Also, besides, they can carry more payload. This means that such drones are equipped with a bigger number of sensors than the multi- rotor ones. Also, there are several additional features and upgrades to look into.

Some drone models can come with an optional ground control station, RC controller and additional sensors for even better surveillance.

A few other things to look for in a good farm drone include Easily to control of the drone Able to record video apart from real-life streaming The Integrated GIS mapping application

Added safety features like fly home in the case of loss of control Use of memory points to return to a place of interest Research on the autonomous drone is usually using a drone that utilizes GPS devices. A drone can be used for delivering items or used widely in agriculture for area mapping. That all the basic concepts of autonomous in drone technology. One of such ICT landmarks is the introduction and usage of drones in Ghana. Indian agriculture needed production and protection materials to achieve high productivity.

Agriculture fertilizer and chemical frequently needed to kill insects and improve efficiency. According to the WHO (World Health Organization) there are 1 million plus pesticide cases every year. In that more than 1 lakh deaths each year, especially in developing countries due to the pesticides sprayed by a human being. The pesticide affects the nervous system of humans and leads to disorders in the body. A remote-controlled UAV (Unmanned Aerial Vehicle) is used to spray the Pesticide as well as fertilizer to avoid the humans from pesticide poison. Our previous research successfully proposed a method for object detection and navigation systems for delivering items using GPS-Based autonomous drones. A challenging task for the autonomous drone is a drone that able to detect and recognize important objects vastly. Drones are an important recent technology for precision agriculture, as they allow farmers to constantly monitor crop and livestock conditions by air. Some of the important features are: Mapping: The user only needs to draw around the area he needs to cover when the drone is equipped with flight planning software that allows it to follow the path and height of flying automatically. Drones will take pictures using the onboard and camera sensors and built-in GPS to determine when to take each shot to determine the level of image overlapping. Crop dusting: Drones able to carry tanks of fertilizers and pesticides to spray crops with far more precision than a tractor. This helps reduce costs and potential pesticide exposure to workers who would have needed to spray those crops manually.

Mapping and GIS Geospatial technology is what gives UAS the ability to be autonomous. Without the capability of following a GPS guided flight plan, a drone is just a glorified radio-controlled aircraft. In addition to autonomous operation, certain drones carry a myriad of sensors. The convenience of inspecting vast infrastructure without significant time and manpower invested is enough of a reason for surveyors, construction firms, and power companies to deploy drones. GIS mapping allows us to recognize and analyze relationships between the geographical object in the earth surface, and we can use such information to formulate plans to improve life on Earth, as well as the life of the Earth. Examples of drone/UAV applications that are specified in the precession farming area in Indonesia as done by specifically for oil palm tree counting with fast acquisition time and accuracy that reaches 95 percent Misbah et al use a quadcopter drone for pesticide spraying. Because pesticide exposure can cause a range of neurological health effects such as memory loss, loss of coordination, reduced speed of response to stimuli, reduced visual ability, altered or uncontrollable mood and general behavior, and reduced motor skills. For the pesticide spraying mechanism, we use a pesticide tank of capacity 180 ml, submersible dc motor pump, 9 V battery, switch, pipes fitted to T-split and mini nozzles. When the switch is turned on, the motor pumps the pesticides through the pipe with the help of the battery. The pipes supply the pesticides to the nozzles via the T-split so that it sprays with a certain pressure and uniformity, thereby avoiding wastage.

Table -1: LITERATURE SURVEY

Sr. No.	Title	AUTHOR NAME	Year
1.	Quadcopter UAV based fertilizer and pesticide spraying system	Prof. S. Meivel, ME	2016
2.	Agricultural Drone for spraying fertilizer and pesticides	Prof. P.P. Mone	2017
3.	Drones for smart agriculture: A Technical report	Prof S.R. Kurkute	2018

2.1 Advantages

- Drones are used in large scale farming for spraying of insecticides and pesticides due to its remote- control operation from distant.
- It helps farmers in scouting their fields quickly and efficiently. This saves time in determining status of fields.
- They are easy to use with very basic training.
- With push of a button drone can return home.
- Thermal cameras help in finding wet and dry patches. This helps farmers avoid wastage of water.

2.2 Limitation

- It requires basic knowledge and skills to operate the agriculture drones
- Most of the drones have less flight time and covers less area. Drones having long flight time and long range are costlier. Drones having more features are also more expensive.
- Need to obtain government clearance in order

to use it (For Larger size).
- It is difficult to fly them in extreme conditions.

2.3 Applications

Agricultural drones are used for following applications.

- To monitor plant health
- To count number of plants
- To spray pesticides and insecticides on the crops
- To schedule seeding and harvesting processes at appropriate time as needed
- To reduce usage of scarce resources
- Recording data for future analysis

3. CONCLUSIONS

Drones have already vastly altered the agricultural industry and will continue to grow in the coming years. While drone use is becoming more useful to small farmers, there is still ways to go before they become part of every farmer's equipment roster, particularly in developing nations. Regulations around drone use need to be made and revised in many countries and more research needs to be done on their effectiveness at certain tasks, such as pesticide application and spraying. There are many ways drones can be useful to farmers but it is important to understand their limitations and functions before investing in expensive equipment. Drone Deploy, an agricultural drone supplier and programming company, suggest starting small and incorporating drone data into your organization slowly for the best results. The cost of drones is expensive and also their maintenance is also expensive for small farmers.

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