

Unique and Precise Agriculture Techniques using Drone Technology

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Abstract— The technology always should evolve to facilitate the agriculture and military based application because these two fields are very essential for survival of mankind. Keeping this in mind, proposing an ideology to creating a platform to all formers to incorporate the drone applications for their benefits which in turn reflects over our country wealth. As for as drone is concern, it is evolving time to time only for the sake of entertainment. This paper explains about the wide range of drone application in the field of agriculture to improve the crop proportionality beyond entertainment.

Keywords: Drone Technology, Unique and Precise Agriculture Techniques

I. INTRODUCTION

India is agriculture dependent country, 70% of people are taken agriculture as their profession. Recently due to the commercial reason the agriculture profession is diminishing. Due to this development our country is facing devastating consequences. All these problems are effectively addressed by incorporating the new technologies, especially drone applications and is treated as ideal for agriculture. Such developments will lead our formers to sophisticated and wealthy agriculture, other hand this stimulates our youth to involve themselves completely in agriculture by treating it as a precious profession.

The drone technology offers a wide range of applications in the field of agriculture. Drone applications can be extended in agriculture right from sowing of seeds to the final harvesting of crop including safety monitoring of cultivation during its growth.

Soil testing before cultivation is the most basic step followed across all over the world and it is considered as scientific way of approaching the agriculture. In India our laboratories where soil test takes place are inadequate to declare the suitable crop for a particular soil. Since the behavior of the soil keep on changing according to the weather, It will make our laboratory reports ineffective and finally our formers end up by cultivating a wrong crop.

Drone technology will give a solution for this problem by providing a comprehensive flow of useful information on a regular basis over a period of time, this continuous information over certain period of time will facilitate to dictate a precise crop for a soil which was under observation.



Further, the drone is capable enough to declare a fertilizers which is suitable for the soil depending upon the nature of the soil. After sowing of the seeds drones can be used to monitor the growth of cultivation. In most of the cases even after taking at most care there will be a insect attack over cultivating crop and it is very fundamental problems faced by all our formers, drone will come very handy under such situations.

Drone carefully monitors the affected portion of crop by insects and it also scan the insects in detail and start template matching with the encoded pictures of insects which is dumped into the drone memory. Further it will conclude the stage of the disease by comparing the image of unhealthy portion with the encoded images which are present in the memory of the drone. Now drone figure out the type of pesticides need to be employed to get rid of insects and save the cultivation from the diseases and also make sure that the disease terminates without having bad effect over healthy portion of the plant.

II. METHODOLOGY INVOLVED

Testing of the soil is the basic and primary process before beginning the cultivation. At present former depend upon the old and orthodox methods like carrying the soil to testing laboratories and carrying out the chemical tests, unfortunately it gives inadequate information to decide the suitable crop for cultivation.

This can be addressed by drone which is equipped with the night vision camera capable enough to monitor and captures the images from 400 feet. The captured high resolution images at different timings and weather are further processed by drone which is incorporated with latest microcontroller. The microcontroller compare the images with the already stored template images, depending upon the result of template matching the drone will declare the type of crops which are precisely suitable for the soil. Further the same results drone will utilizes to decide the type of fertilizer need to be added with the soil to get the desired results.

Night vision camera plays a significant role while eliminating the insects from the crop and to heal the affected parts of the plant without affecting the healthy part. Insect attack over cultivation is major and common problem associated with the agriculture. At present formers are spraying the pesticides manually over entire cultivation blindly, due to the uncalculated usage of pesticides the crop as well as the soil quality will be adulterated. If it carries like this over another few years, the soil loses its fertility and becomes unfit for agriculture permanently. This problem which is associated with the over usage of pesticides can be addressed by drone technology and it is considered as tailor made solution for the discussed problem.



Initially the drone inspect the crop thoroughly by using high definition camera. The obtained images will be matched with the healthy template images. After matching, if the results are promising then drone will project the mirror and through mirror again it will capture the bottom images of the plant and again it will do template matching, if the results are satisfactory then the drone travel to next plant and it will carry over a entire cultivation. Suppose if there is a unhealthy portion exists due to the insects attack, in that case plant and insect both will be examined and matched with all template images of unhealthy plant and different kinds insects, this process will be carried until unhealthy plant and insect matches with any one kind of template image present in the drone. After that the drone starts extracting the information from the template images and concludes the root cause of existing problem and type of insect responsible for it. Depending upon the conclusion made by the drone, it will decide the type of pesticides need to be applied to recover the plant from unhealthy state to healthy state. At the same time insects also terminated completely from the cultivation with the help of same pesticides.

The fascinating truth about the complete process is that the only unhealthy portion of the plant will be treated without disturbing the healthy portion.

III. ADVANTAGES

- 1) The quality of the image captured by the drone will be very high when it is compared with the existing satellite images
- 2) The drone images will not be affected by clouds because drone will capture the images maximum of The quality of the image captured by the drone will be very high when it is compared with the existing satellite images
- 3) The drone images will not be affected by clouds because drone will capture the images from maximum of 40 feet, but in case of satellite clouds cannot be removed out of the equation
- 4) Since drone will spray the pesticides only for the unhealthy part of the plant without disturbing the healthy part, the yield will be very high and land can be saved from the adulteration due to the over usage of pesticides
- 5) Since most of the pesticides are very costly and usage of drone is limiting the quantity of pesticide applied over the cultivation. Ultimately the method is cost effective and eco-friendly.

IV. CONCLUSION:

The proposed paper always minimizes the losses and maximizes the profit. At present researches going on drone technology scope over an agriculture. According to this paper the agriculture will become more precise and sophisticated by using drone technology. Due to practical difficulties the proposed application of drone is not fulfilled the expected results. As the technology evolution takes place the drone technology will touches high level of implementation with 100% desired results

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