


# Chapter 12


## Leveraging Drone and GPS Technologies For Precision Agriculture: Pest Management Perspective

**Tarun Kumar Patel**

 <https://orcid.org/0009-0003-3002-8100>


*Department of Biotechnology, Sant  
Guru Ghasidas Government P.G.  
College, Kurud, India*

**S. Vasundhara**

 <https://orcid.org/0000-0001-7682-8347>


*Department of Humanities and  
Mathematics, G. Narayanamma  
Institute of Technology and Science,  
Shaikpet, India*

**S. Rajesha**

 <https://orcid.org/0000-0003-0733-4452>

*Vidya Sanskaar Institute of Science  
Commerce and Management,  
Bengaluru, India*

**B. Priyalakshmi**


 <https://orcid.org/0000-0003-1877-2060>

*Department of Electronics and  
Communication Engineering, SRM  
Institute of Science and Technology,  
Chengalpattu, India*

**Somu Chinnusamy**

*Research and Development, RSP  
Science Hub, Coimbatore, India*

**Sampath Boopathi**

 <https://orcid.org/0000-0002-2065-6539>

*Department of Mechanical  
Engineering, Muthayammal  
Engineering College, Namakkal, India*

### ABSTRACT

*Drone and GPS technologies are advancing productive, efficient, and sustainable agricultural systems through data driven methods, and transforming crop agricultural*

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*recording of real-time data for soil analysis, pest control, logistics use, and specific tasks to monitor crop health. Providing drones with precisely localized terrain, enables automated mechanical guidance for precise use for operations, and mapping of fields helps provide more accurate farming strategies. This accuracy helps in decision making and operational efficiency and reduces waste and environmental impact. This chapter describes how the integration of drone and GPS technologies in agriculture demonstrates advantages in infrastructure management, crop management, and yield improvement, as well as the potential to enhance practices a sustainable development and preservation of the environment.*

## **INTRODUCTION**

Farmers now use precision agriculture to boost crop yields and cut waste. This new method taps into high-tech tools for keeping tabs on field changes. It aims to get the most from resources like water and chemicals while treading on nature. Precision farming relies on hard data. Growers employ gadgets such as GPS, drones, and fancy maps to gather intel on their land. They then crunch these numbers to make smart choices about each spot in their fields. Soil probes, for instance, check how wet or nutrient-rich the dirt is. This gives farmers up-to-the-minute info to nail down just how much water or plant food to use. Such exact science leads to less waste and fatter harvests. By fine-tuning their approach, farmers can squeeze more profit from each acre while being kinder to the environment.

Drones are causing a revolution in precision farming. They snap detailed pictures and send live info from above crops. These flying gadgets give a top-down look at farms showing things you can't see from the ground. They zoom over big areas fast checking how plants grow, what the dirt's like, and if bugs or sickness are around. These drones pack fancy cameras - multi-colour, super-detailed, and heat-sensing ones. This tech helps spot if plants are healthy, thirsty, or hungry. It cuts down on wasting stuff and boosts how much food we grow.

GPS plays a key role in precision farming. It gives exact location data for mapping and analysis. Farmers use it for targeted input, auto-steering machines, and field layouts. This pinpoint accuracy cuts waste by putting inputs right where needed. GPS-guided gear spreads seeds, fertilizers, and bug killers just right. This saves money, grows more crops, and helps nature (Stehr, 2015). GPS and drones team up to boost precision farming. Drones with GPS fly set paths covering whole fields. The info they grab gets GPS tags making spot-on maps for farm work. This combo shines when checking crop health and spotting trouble. Drones snap field pics, find stress or sick spots, and use GPS to mark where fixes are needed fast (Mogili & Deepak, 2018).

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