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From Drones to Satellites: Aerial Technologies Reshaping Precision Farming

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The agricultural industry is the foundation of the Indian economy and continues to thrive despite challenges posed by population growth. With the help of advanced technologies, managing large-scale crop production has become easier. Precision farming, utilizing drones and satellites, offers numerous benefits for smooth crop and livestock production.

Earlier, the conventional farming methods included zero to no technological tools for monitoring and analysing farm activities. Often, we faced several issues such as crop failure, poor quality of crops, etc. This was because we were not able to predict the weather conditions, analyse the nutrient deficiencies, see if our crop was having any pest infestations and many more such causes.Nevertheless, with the introduction of precision farming, all of these things are possible to predict along with investigating several in-depth soil analyses as well!

One of the most interesting developments in the 21st century is the use of drones and satellites to gather data on crop health and soil quality. By analyzing this data, farmers can make more informed decisions about how to manage their land and maximize their yields. Thus, it is time to adopt such an advanced technology for crop management in a country where millions of people need to be fed.

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Taking Flight: How Drones are Revolutionizing Agriculture

Drones in agriculture are the main key that can carry out several tasks including monitoring crops, mapping, harvesting, and also, spraying! It consists of several sensors and cameras that can capture the essential elements in the field like pest infestations, nutrient management, water management, etc. The sensors present in agricultural drones consist of 3 types of cameras: Multispectral, Thermal, and Hyperspectral.

By using multispectral cameras, farmers can capture depth information about different wavelength levels. This data can then be used as health indicators to analyse chlorophyll content, plant stress, and more. Thermal sensors are also used to detect temperature variations, which can help identify potential pest infestations. Moreover, drones are used for several other purposes including:

1. **Crop mapping:** Drones can be used to create detailed maps of farmland, allowing farmers to identify areas that need attention such as irrigation or crop management.
2. **Pest control:** Drones equipped with sensors and cameras can help farmers identify pests and diseases in crops, enabling them to take timely action to prevent damage.
3. **Crop spraying:** Drones can be used to spray crops with pesticides or fertilizers, reducing the need for manual labour and increasing efficiency.
4. **Livestock monitoring:** Drones can be used to monitor grazing patterns of livestock, helping farmers identify areas where foraging is not optimal. **5. Crop inspection:** Drones can be used to inspect crops for damage or disease, making it easier for farmers to identify problem areas and take appropriate measures.

Global Positioning in Sky: Use of Satellites in Agriculture

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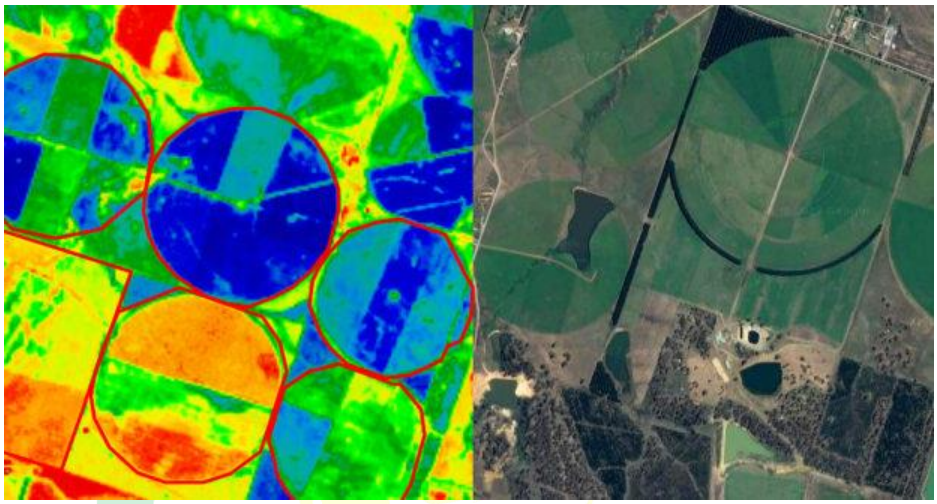
The crucial element of precision farming is satellite. It usually floats above the height of 36,000km and can observe vast abstracts of farmlands from its vantage point. This makes it easier for the farmers to view critical areas that can't be viewed from ground level. Satellites involve 3 steps including mapping, monitoring, and measuring techniques for farm viewing. It helps the farmers know where to water, which nutrients to provide, which fertilizer to use, etc.



Traditionally, all parts of the field would be treated the same, but satellite imagery data shows varying levels of soil quality and mineral richness. This is good for farmers, who can use their fertilizers more efficiently and reduce costs, but also for the environment, as fertilizers are used more sparingly.

For example, an agricultural technology company is partnering with British start-up DryGro, which is pioneering a more sustainable and greener forage crop for cows. Duckweed could produce animal feed protein eight times faster than traditional soybean meal, making it a much more energy-efficient feed for livestock.

Conclusion

Combining the use of satellites and drones in agriculture can provide even more valuable data for farmers. Drones can capture high-resolution images of crops, which can be analyzed alongside satellite data to provide a more comprehensive view of crop health and growth. Drones can also be used to quickly and efficiently survey large areas of farmland, making it easier to identify potential problem areas. By combining the strengths of both technologies, farmers can gain a more complete understanding of their crops and make more informed decisions for optimal crop yield and sustainability