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Current Progress and Future Prospects of Agriculture Technology: Gateway to Sustainable Agriculture

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Abstract

The agricultural industry is getting more data-centric and requires precise, more advanced data and technologies than before, despite being familiar with agricultural processes. The agriculture industry is being advanced by various information and advanced communication technologies, such as the Internet of Things (IoT). The rapid emergence of these advanced technologies has restructured almost all other industries, as well as advanced agriculture, which has shifted the industry from a statistical approach to a quantitative one. This radical change has shaken existing farming techniques and produced the latest prospects in a series of challenges. This comprehensive review article enlightens the potential of the IoT in the advancement of agriculture and the challenges faced when combining these advanced technologies with conventional agricultural systems. A brief analysis of these advanced technologies with sensors is presented in advanced agricultural applications. Numerous sensors that can be implemented for specific agricultural practices require best management practices (e.g., land preparation, irrigation systems, insect, and disease management). This review includes the integration of all suitable techniques, from sowing to harvesting, packaging, transportation, and advanced technologies available for farmers throughout the cropping system. Besides, this review article highlights the utilization of other tools such as unmanned aerial vehicles (UAVs) for crop monitoring and other beneficiary measures, such as optimizing crop yields. In addition, advanced programs based on the IoT are also discussed. Finally, based on our comprehensive review, we identified advanced prospects regarding the IoT, which are essential tools for sustainable agriculture.

Keywords: Internet of Things, smart agriculture, agricultural sensors, unmanned aerial vehicles, crop monitori

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