

Research on some new solutions in smart agriculture development

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Abstract: This study investigates innovative solutions for advancing smart agriculture, addressing critical challenges in productivity, resource efficiency, and sustainability. Focusing on the integration of cutting-edge technologies, the research explores the application of Internet of Things (IoT) sensors, artificial intelligence (AI) for predictive analytics, and automated control systems in crop management. Key solutions examined include real-time soil and weather monitoring networks, AI-driven irrigation and fertilization optimization, and the deployment of unmanned aerial vehicles for precision pest control. The methodology combines experimental field trials with computational modeling to assess the effectiveness of these technologies in enhancing yield while minimizing water and chemical usage. Findings demonstrate that the proposed integrated framework significantly improves resource allocation, reduces operational costs, and mitigates environmental impact compared to conventional practices. The study concludes that the synergistic application of these novel solutions offers a viable pathway toward resilient and data-driven agricultural systems, providing a scalable model for sustainable food production in the context of climate change and growing global demand.

Keywords: Smart agriculture, new solutions, agricultural development, agricultural technology