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The Role of AI in Revolutionizing Agriculture for Food Security

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Akram Tariq[1]

[1]Shenzhen Institute of Advanced Technology (SIAT), Chinese Academy of Sciences (CAS), Shenzhen University Town, Shenzhen, P.R. China
akram@soe.ucsc.edu

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One of the major problems of present time is producing adequate amount of food, enough for survival of rapidly growing population. Several solutions have been applied to restore the food security. Production of resilient crops by increasing product yield, even under biotic and abiotic stress factors, is one of the biotechnological revolutions made in the field of agriculture. Molecular alteration, modifications of different crops to make them resistant to various kind of environmental fluctuations such as extreme temperatures, viral and fungal infections, and drought stress has restored the food production to a greater level. Moreover, different tissue culturing methods has optimized the resource usage due to which crop yield has been improved immensely in the recent years. But intensified change in climate in the past few years has affected the supply of food greatly. Integration of AI and machine learning in the agricultural biotechnology has shown new and fast ways to deal with these concerns. Soil monitoring before using it for the production of a crop is important as soil health play a vital role in producing good yield. Before AI, conventional methods like biomass estimation and soil mapping were used to address the problems with the soil and crop productivity but now with AI-assisted remote sensing technologies having deep learning algorithms, water and nutrient stress can be handled in a better way. Along with soil productivity, monitoring of forecast and generating the environmental data with help of AI integrated drones has also played a role in the crop productivity.

Furthermore, generating molecular data about gene positions, gene expression in the real time with the help of AI algorithms has advanced the research tremendously. AI has proved to be very useful in bringing the molecular based data and its alignment to design the projects regarding the improvement of crops. It has proved to be smart and time saving tool.

Another advancement that has been made in this field is the collaboration of AI and plant tissue culture. Though micropropagation has potential but at the same it is a labor intensive and time taking task. Such as finding the intricate relationship of elements and optimizing the culture media for plant treatment takes lot of time. Bit with AI model this task has also been simplified. It optimizes the media in short time and monitor the treatment in real time. Due to its effectiveness in tissue culturing it has become an important tool for plant tissue scientists.

By solving the climate change issues, facilitating the generation of modified crops, examination of environmental fluctuations and improving the effectiveness of plant tissue culture, Artificial intelligence has immensely transformed the agricultural world completely. Incorporation of AI in the agricultural improvement methods has created a sustainable food system.