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EDITORIAL

Modern Agriculture: Meeting Future Food Demands through Sustainable Solutions

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Abstract: **In the future, climate change and population growth will cause a significant crisis in the world's food production systems. Traditional agricultural practices will encounter challenges in feeding the growing population, necessitating the establishment of modern agriculture to meet future food demands. Currently, researchers are proposing sustainable solutions through innovative farming strategies and approaches, including mechanization, the use of chemical fertilizers, genetically modified organisms (GMOs), organic fertilizers, crop rotation, integrated pest management (IPM), precision agriculture, and vertical or soilless farming. While modern agricultural practices may face challenges related to soil degradation, water scarcity, and the use of chemical fertilizers, these sustainable practices aim to ensure food security for future generations without compromising the environment or human health.**

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Climate change will undoubtedly create a substantial crisis in the world's food production systems in the near future (1). It is not only climate change alone but also the increasing global population that will contribute significantly to the future food crisis. By 2050, it is estimated that the world's population will reach 9.7 billion, leading to a significant rise in food demand. This is already evident in many regions of the world, where the overcrowded population exacerbates various problems associated with the food production system, such as the greenhouse effect (2). Consequently, feeding the additional population will pose a challenge to our traditional agricultural practices.

Therefore, it is essential to establish modern agricultural systems that can meet future food demands. In this editorial, I will mention some of the current state of modern agriculture, the challenges faced in using those agricultural practices, and the prospective solutions in brief.

Currently, researchers are working on ideas to mitigate the upcoming food crisis by increasing productivity and preserving nature (3). They are proposing innovative strategies to enhance food production through advanced and alternative farming techniques (4). These new and proposed agricultural strategies are considered sustainable solutions for the future food crisis, which cannot be addressed adequately by our traditional agricultural system. Examples of modern agricultural systems include mechanization, the use of chemical fertilizers, and genetically modified organisms (GMOs) (5).

On the other hand, modern agriculture is facing some challenges about climate change, soil degradation, water scarcity, and the use of chemical fertilizers, which can harm the environment and human health as well. One solution to these challenges is sustainable agriculture, which aims to meet the future food demands without compromising the health of future generations. Sustainable agriculture promotes the use of organic fertilizers, crop rotation, and integrated pest management (IPM) to reduce the use of chemical fertilizers and pesticides (6). Another solution to the challenges facing modern agriculture is precision agriculture, which involves the use of technology to optimize crop production and by delivering the exact amounts of inputs such as water, fertilizer, and pesticides at the correct time (7). It also uses IoT (internet of things) and remote sensing technologies to monitor crop growth, soil moisture, and nutrient levels. Vertical and/or soilless farming is another modern agricultural system nowadays that involves the cultivation of crops in stacked layers using artificial lighting, temperature control, and

hydroponic systems (8). Although the agriculture modernization can reduce the negative impacts of agriculture on a global scale, the capital cost of doing so is still very high making it unapproachable for most countries engaged in agriculture at various scales. Further, the farming communities need to be made technologically adept to make informed decisions about their agriculture systems.

Hence, in conclusion, it can be said that while striving to move forward with the advanced technologies, streamlining the current practices to maximize production with simultaneous reduction of problems associated would be a better approach.

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