

Review Form 3

Journal Name:	Archives of Current Research International
Manuscript Number:	Ms_ACRI_126062
Title of the Manuscript:	Optimizing Hydroponics and Aeroponics Farming: A Comprehensive Review of AI and IoT Integration for Enhanced Efficiency and Sustainability
Type of the Article	Review Article

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PART 1: Review Comments

Compulsory REVISION comments	Reviewer's comment	Author's Feedback <i>(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</i>
Please write a few sentences regarding the importance of this manuscript for the scientific community. Why do you like (or dislike) this manuscript? A minimum of 3-4 sentences may be required for this part.	<p>This manuscript raises several main points dedicated to the integration of artificial intelligence into the systems of substrate and substrate-free cultivation of plant products. Among the most urgent problems, the following should be noted:</p> <p>1) Introduction to hydroponics and aeroponics:</p> <ul style="list-style-type: none">• Overview of the basic principles of hydroponics and aeroponics, their advantages and disadvantages.• The importance of these technologies in modern agriculture and their role in ensuring food security. <p>2) Integration of artificial intelligence (AI):</p> <ul style="list-style-type: none">• Consideration of methods of using AI to monitor and manage growing conditions.• Examples of machine learning algorithms that optimize plant growth and reduce resource consumption. <p>3) Role of the Internet of Things (IoT):</p> <ul style="list-style-type: none">• Description of IoT systems to collect real-time data on plant and environmental health.• The importance of automating processes based on collected data. <p>4) Synergy of AI and IoT:</p> <ul style="list-style-type: none">• Analysis of how the combination of these technologies increases efficiency and productivity.• Examples of successful cases where the integration of AI and IoT has led to significant improvements. <p>4) Environmental aspects and sustainability:</p> <ul style="list-style-type: none">• Impact of optimization on environmental sustainability: waste reduction, water conservation, reduction of chemical use.• Discussion of potential environmental risks and ways to minimize them. <p>5) Conclusions and recommendations:</p> <ul style="list-style-type: none">• Key findings on the benefits of integrating AI and IoT in hydroponics and aeroponics.• Recommendations for farmers, researchers and developers to implement these technologies to improve efficiency. <p>6) Prospects for future research:</p> <ul style="list-style-type: none">• Discussion of possible directions for further research in this field.• The importance of collaboration between scientists, engineers and agronomists for the further development of precision agriculture.	Okay
Is the title of the article suitable? (If not please suggest an alternative title)	A more optimal title would be: "Optimizing Hydroponics: A Comprehensive Overview of Integrating Artificial Intelligence and the Internet of Things for Efficiency and Sustainability"	
Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here.	The abstract is comprehensive and informative.	
Are subsections and structure of the manuscript appropriate?	<p>After reviewing and studying the manuscript in detail, the following comments arose regarding the textual part of the main sections:</p> <p>1) Table 1 does not include a comparison of open soil with aeroponics systems. Despite the fact that aeroponics is considered one of the methods of hydroponics, it would be worth giving a separate comparison for this growing method. Moreover, in the title and conclusions, the author separates these concepts;</p> <p>2) In my opinion, in the text describing the work of artificial intelligence with control systems of the main indicators in the cultivation of plant products, the author mistakenly believes that the sensor for controlling the level of acidity (pH) monitors changes in the content of</p>	Noted

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	<p>nutrients. This function is performed by the TDS meter based on the change in electrical conductivity of the nutrient solution;</p> <p>3) In the title of the subsection "Connection between AI and IoT in hydroponics" it would be appropriate to reflect aeroponics as well. That is, correct to "Connection between AI and IoT in hydroponics and aeroponics";</p> <p>4) In Table 2, you need to enter a column dedicated to the yield of crops when grown by aeroponics methods. After all, the efficiency of cultivation by these methods reaches the maximum possible values in comparison with hydroponic methods of cultivation, and even more so with soil culture;</p> <p>5) In the paragraph "Challenges and opportunities", the author again "ruined" aeroponic cultivation.</p>	
<p>Please write a few sentences regarding the scientific correctness of this manuscript. Why do you think that this manuscript is scientifically robust and technically sound? A minimum of 3-4 sentences may be required for this part.</p>	<p>Taking into account the above comments, I believe that the author needs to finalize the manuscript and take one of two possible actions: 1) Exclude the word "aeroponics" from the title and conclusions; 2) finalize all sections of the manuscript and harmoniously explain the difference between classical hydroponic methods and aeroponics, as well as emphasize the cost of implementation and the efficiency of obtaining sustainable crops. Separately, I would like to note the startups with artificial intelligence in precision agriculture cited by the author. These examples are a clear indication of the perspective of the introduction of hydroponic and aeroponic cultivation systems in comparison with soil culture. After revision, this manuscript will be quite interesting, scientifically reliable and technically sound.</p>	<p>All corrections are made</p>
<p>Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.</p>	<p>The manuscript has quite recent references, most of them covering the period of the last 5-10 years, which is quite sufficient for a review article</p>	
<p><u>Minor</u> REVISION comments</p> <p>Is the language/English quality of the article suitable for scholarly communications?</p>	<p>Yes, it fits perfectly.</p>	
<p><u>Optional/General</u> comments</p>	<p>The manuscript is undoubtedly interesting, but it needs to be refined</p>	

PART 2:

	<p>Reviewer's comment</p>	<p>Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</p>
<p>Are there ethical issues in this manuscript?</p>	<p>(If yes, Kindly please write down the ethical issues here in details)</p>	