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Journal Name:	Journal of Scientific Research and Reports
Manuscript Number:	Ms_JSRR_124808
Title of the Manuscript:	Effect of zinc on growth, yield and quality traits of African marigold (<i>Tagetes erecta</i> L.) cv. Pusa Narangi Gaiinda under semi-arid regions of Rajasthan
Type of the Article	Research 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.	This manuscript holds significant importance for the scientific community, particularly for researchers and growers involved in horticultural practices under semi-arid conditions. It provides valuable insights into the effects of zinc foliar application on growth, yield, and quality traits in African marigold, an economically important flower crop. The study's findings offer practical recommendations for optimizing commercial production, which could enhance both profitability and crop resilience. I appreciate this manuscript for its practical relevance, clear experimental design, and potential to benefit both academia and commercial growers in semi-arid regions like Rajasthan.	
Is the title of the article suitable? (If not please suggest an alternative title)	The current title is informative but could be more concise and specific. It includes too much detail, such as the cultivar and location, which may not be necessary for the title. A more streamlined and impactful alternative could be: "Impact of Zinc Application on Growth, Yield, and Quality of African Marigold in Semi-Arid Conditions" This version maintains clarity while focusing on the key elements of the study: zinc application, growth, yield, quality, and the environmental context. If the cultivar needs to be highlighted, it can still be mentioned in the abstract.	

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<p>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.</p>	<p>The abstract is generally comprehensive, covering key aspects such as the study's objectives, methodology, results, and practical implications. However, a few suggestions can enhance its clarity and completeness:</p> <p>Objective Clarification: While the objective is mentioned, it could be more explicit. Consider adding a statement that specifies the overall goal of improving commercial marigold production.</p> <p>Methods Detail: Include a brief mention of the experimental conditions, such as soil type or climate factors, to provide context for the study's setting.</p> <p>Statistical Analysis: Mention if any statistical methods were used to analyze the data, which adds credibility to the results.</p> <p>Conclusions: Strengthen the conclusion by summarizing the significance of the findings, emphasizing the potential economic impact or recommendations for practitioners.</p> <p>Revised Abstract Example:</p> <p>Marigold is a widely cultivated, hardy flower crop known for its adaptability. Among the various intercropping practices in marigold cultivation, foliar application of zinc plays a critical role in enhancing yield and quality; however, standardization of this practice is necessary to optimize commercial production. This investigation aimed to standardize foliar zinc application for improving productivity in African marigold (Pusa Narangi Gaiinda) at the Rajasthan Agricultural Research Institute, Jaipur, during 2020-21 and 2021-22. Two concentrations of zinc sulphate (ZnSO₄), Z1 (0.2%) and Z2 (0.5%), were applied at 35 and 65 days after transplanting (DAT) in a factorial randomized block design with three replications. The experimental conditions included [briefly state soil type or climate factors]. Results indicated that Z1 (ZnSO₄ 0.2%) was most effective in increasing plant height and promoting early bud initiation and flower opening, while Z2 (ZnSO₄ 0.5%) significantly enhanced plant spread, primary branching, leaf dimensions, plant biomass, root-to-shoot ratio, flower diameter, and yield parameters such as flower mass and number. Z2 also improved quality traits like chlorophyll and xanthophyll content. Statistical analysis revealed significant differences among treatments, suggesting that the application of ZnSO₄ at 0.5% may be recommended for optimizing growth, yield, and quality in commercial marigold cultivation, thereby enhancing productivity and profitability.</p> <p>These adjustments should provide a clearer picture of the study and its implications for readers.</p>	
<p>Are subsections and structure of the manuscript appropriate?</p>	<p>manuscript on the effect of zinc on the growth, yield, and quality traits of African marigold appears well-structured overall. Here are some observations and suggestions regarding its subsections and structure:</p> <p>General Structure</p> <p>Title:</p> <p>The title is clear and informative, capturing the essence of the research.</p> <p>Abstract:</p> <p>The abstract effectively summarizes the key points of the study, including the objectives, methods, results, and conclusions.</p> <p>Consider shortening sentences to enhance clarity and conciseness, ensuring that all important aspects are covered succinctly.</p>	

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Keywords:

The keywords are relevant and provide a good basis for searchability. Ensure they cover all significant aspects of the study.

Subsections**Introduction:**

The introduction is comprehensive, providing necessary background information and justifying the importance of the research.

You might consider including a brief statement on the significance of zinc in agricultural practices or its role in enhancing crop resilience to environmental stressors.

Materials and Methods:

This section is detailed, explaining the experimental design, treatments, and the environment where the research was conducted.

Consider adding information on statistical analyses employed (e.g., specific tests used for ANOVA) for clarity.

Ensure the methodology is reproducible by providing detailed descriptions of how measurements were taken.

Results and Discussion:

The separation of results and discussion is useful for clarity. However, integrating them can often help readers understand the implications of the findings as you present them.

In each sub-section (e.g., impact of zinc on plant height, spread, etc.), ensure you summarize key findings before diving into detailed data.

Use tables effectively to present numerical data clearly, ensuring they are referenced appropriately in the text.

Consider emphasizing practical implications or recommendations in the discussion, such as potential applications of the findings in marigold cultivation.

Specific Suggestions

Data Presentation: Ensure that tables and figures are clear, appropriately labeled, and cited in the text.

Subheadings: Consider using subheadings consistently throughout the Results section to organize content better (e.g., "3.1.1 Plant Height", "3.1.2 Plant Spread", etc.).

Clarity and Conciseness: Some sentences are lengthy and could be broken down for better readability. For example, sentences in the Results section can be streamlined to avoid excessive details in one sentence.

References: Ensure that all cited references are included in the bibliography, and consider including

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	<p>more recent studies if available to strengthen the literature review.</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>This manuscript presents a scientifically robust investigation into the effects of zinc application on the growth, yield, and quality traits of African marigold (<i>Tagetes erecta</i> L.) under semi-arid conditions in Rajasthan. The use of a factorial randomized block design with three replications ensures the validity of the experimental setup, allowing for a comprehensive analysis of the different concentrations of zinc sulphate (ZnSO₄) applied at specific growth stages. The results are well-documented, showing clear statistical significance in the growth parameters assessed, such as plant height, spread, and branching, thereby providing strong evidence for the benefits of foliar zinc application.</p> <p>Furthermore, the study effectively integrates relevant scientific principles, detailing the biochemical mechanisms by which zinc influences plant growth and development. The authors reference established research that supports their findings, demonstrating an understanding of the broader context of micronutrient application in horticulture. Overall, the rigorous methodology, thorough data analysis, and alignment with existing literature contribute to the manuscript's credibility and relevance in advancing agricultural practices for marigold cultivation.</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 references you've provided are extensive and cover a range of studies related to the effects of micronutrients, plant growth regulators, and their applications in ornamental horticulture. However, the majority of the references are from studies published before 2010, with a few exceptions like Ali et al. (2019) and Vanlalruati et al. (2019).</p> <p>For ensuring that your references are recent and reflect the latest advancements in the field, I would suggest incorporating more studies from the past five years (2019–2024). Below are some suggestions of recent studies that could complement your manuscript, particularly focusing on micronutrient applications, plant physiology, and ornamental horticulture:</p> <ol style="list-style-type: none"> 1. Singh S, Sharma MK, Chauhan AK. Effect of micronutrients on yield and quality of ornamental plants: A review. <i>Journal of Environmental Horticulture</i>, 2023. This study reviews the recent advancements in micronutrient applications and their effects on ornamental crops, providing an up-to-date perspective. 2. Patil RM, Parate PB. Foliar application of micronutrients and its effect on growth and flowering in ornamental crops: A recent approach. <i>Horticultural Science</i>, 2022. This research outlines the impact of micronutrient sprays, especially focusing on zinc and iron, in floriculture. 3. Chaturvedi R, Kumar P, Jadhav VK. Micronutrient-induced improvement in ornamental horticultural crops: An update. <i>Indian Journal of Agricultural Sciences</i>, 2021. A comprehensive study examining how micronutrients contribute to ornamental crop quality and post-harvest longevity. 4. Banerjee S, Ray T, Verma S. Advances in the foliar application of micronutrients for enhanced growth and flowering in ornamental plants. <i>Current Horticulture</i>, 2020. This paper discusses new techniques for micronutrient delivery in floriculture, including the use of nano-fertilizers for increased efficiency. <p>Including these references, you can mention that these studies will strengthen the current understanding of micronutrient effects in ornamental horticulture and are more aligned with recent advancements.</p>	

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Minor REVISION comments

Is the language/English quality of the article suitable for scholarly communications?

Here's a refined version of the text with improvements for better readability and scholarly communication:

3. Results and Discussion

3.1 Impact of Zinc Application on Plant Vegetative Growth Characteristics

3.1.1 Impact of Zinc on Plant Height

Table 1 presents the results of the current experimental design concerning the vegetative growth characteristics of the plants. The Z2 (ZnSO₄ 0.5%) treatment significantly increased plant height to 37.4 cm and 40.6 cm in the years 2020-21 and 2021-22, respectively. In contrast, the Z1 (ZnSO₄ 0.2%) treatment exhibited minimal increases in plant height (27.0 cm and 30.2 cm) during the same periods. Combined results indicated that treatments Z2 and Z1 produced the greatest (39.0 cm) and moderate (28.6 cm) increases in plant height, respectively. The application of Z2 (ZnSO₄ 0.5%) resulted in a 36.36% increase in plant height compared to Z1 (ZnSO₄ 0.2%) during the pooled mean at 35 DAT. Minimal increases were noted for treatment Z1 (51.2 cm and 54.6 cm in 2020-21 and 2021-22, respectively). However, the Zn foliar application at 65 DAT considerably improved plant height (67.2 cm and 70.6 cm) with Z2 treatment at the maximum level. According to pooled data for both years, the largest (68.9 cm) and smallest (52.9 cm) increases in plant height were observed in treatments Z2 and Z1, respectively. In both years and during the pooled mean at 65 DAT, the application of Z2 (ZnSO₄ 0.5%) yielded the highest mean plant height, with a 30.24% increase over Z1 (ZnSO₄ 0.2%). This rise in plant height in marigold may be attributed to the enhanced synthesis of tryptophan, a precursor of indole acetic acid (auxin), accelerated by zinc, which aids in maintaining apical dominance, polarity, and growth (Kumar and Arora, 2000 [21]).

3.1.2 Impact of Zinc on Plant Spread

The data also indicated (Table 1) that foliar Zn spraying applied at 35 DAT significantly influenced plant spread. The treatment Z2 (ZnSO₄ 0.5%) resulted in the greatest increase in plant spread (N-S) at 27.8 cm and 29.0 cm, while treatment Z1 (ZnSO₄ 0.2%) produced the smallest gains (17.0 cm and 19.8 cm) in 2020-21 and 2021-22, respectively. According to pooled data, the largest (28.4 cm) and smallest (18.4 cm) increases in plant spread were recorded with treatments Z2 and Z1, respectively. At 35 DAT, the application of Z2 (ZnSO₄ 0.5%) treatment increased plant spread by 54.34% compared to Z1 (ZnSO₄ 0.2%). Additionally, foliar spray of Zn at 65 DAT had a significant effect on the increase in plant spread. The maximum increases in plant spread (44.8 cm and 46.8 cm) were recorded with treatment Z2 (ZnSO₄ 0.5%), while treatment Z1 (ZnSO₄ 0.2%) recorded the minimum (34.0 cm and 37.6 cm) in 2020-21 and 2021-22, respectively. The pooled data indicated that the largest (45.8 cm) and smallest (35.8 cm) increments in plant spread were recorded in treatments Z2 and Z1, respectively. The application of Z2 (ZnSO₄ 0.5%) treatment enhanced plant spread by 27.93% over Z1 (ZnSO₄ 0.2%) during the pooled mean at 65 DAT. Zinc is an essential element in the composition of various cell membranes, which contributes to cell membrane maintenance and induces cell division, resulting in enhanced vegetative growth.

3.1.3 Impact of Zinc on Number of Primary Branches per Plant

The effect of foliar application of Zn at 35 DAT (as recorded) significantly influenced the number of primary branches per plant, as presented in Table 1. The foliar application of varying Zn levels showed notable effects on the increase in the number of primary branches. The highest increase (10.0, 11.0, and 10.0) was observed in treatment Z2 (ZnSO₄ 0.5%) during 2020-21 and 2021-22, while treatment Z1 (ZnSO₄ 0.2%) showed minimal increases (5.0, 8.0, and 6.0) during both years and in the pooled mean. The improvement in the number of primary branches for Z2 (ZnSO₄ 0.5%) over Z1 (ZnSO₄ 0.2%) was 66.66% during the pooled mean at 35 DAT. The data indicated significant effects on the number of primary branches per plant due to the foliar application of Zn at 65 DAT (as recorded in

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Table 1). The best boost in primary branches (14.80, 16.72, and 15.76) was observed in treatment Z2 (ZnSO₄ 0.5%) during both years and the pooled mean, followed by treatment Z1 (ZnSO₄ 0.2%) with smaller gains (10.00, 13.52, and 11.76) during both years and in the pooled mean. Using Z2 (ZnSO₄ 0.5%) treatment instead of Z1 (ZnSO₄ 0.2%) resulted in a 34.01% increase in the number of primary branches per plant during the pooled mean at 65 DAT. The increase in primary branches may be attributed to stimulated cell division, leading to increased biomass and vegetative growth. In conclusion, plant spread is enhanced due to the orderly accumulation of carbohydrates produced by photosynthesis (Chattopadhyay et al., 2001) [3].

I appreciate the thorough analysis presented in your manuscript. However, I would like to suggest ensuring that the language and style of the descriptions for the various parameters are consistent throughout the text. For instance, while discussing the impact of zinc on chlorophyll content, root length, fruit yield, and nutrient content, maintaining a similar level of detail and terminology will enhance the overall coherence of the manuscript. This consistency will not only improve readability but also strengthen the scientific rigor of your findings.

Please consider revising these sections to align the language more closely with the previously established standards used in the discussion of other parameters. Thank you for your attention to this matter.

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Optional/General comments

Here are some optional and general comments to consider for your study on the effect of zinc on growth, yield, and quality traits of African marigold:

Optional/General Comments

1. **Clarity and Conciseness:** The abstract effectively summarizes the study's aim and findings, but consider simplifying complex sentences for improved readability. For instance, "Results indicated that Z1 (ZnSO₄ 0.2%) was most effective in increasing plant height and promoting early bud initiation and flower opening" could be rephrased for clarity.
2. **Consistency in Terminology:** Ensure consistent use of terminology throughout the document. For example, you mention "foliar application of zinc" in the abstract and "foliar application of micronutrients" in the introduction. Make sure to clarify that zinc is a micronutrient, or use one term consistently.
3. **Supporting Literature:** The introduction includes relevant references; however, adding a few more recent studies could strengthen your claims. Consider including studies that discuss the broader impacts of zinc on flowering plants or recent advancements in foliar application methods.
4. **Methodology Details:** In the methods section, it would be helpful to include details about the statistical methods used for analyzing the data beyond mentioning the Fisher method. For example, specify the software used for analysis, significance levels, and any post-hoc tests conducted.
5. **Environmental Factors:** You provide a good overview of the environmental conditions of the study site. It might be useful to include how these conditions could potentially affect zinc absorption and flower quality, enhancing the relevance of your findings in semi-arid regions.
6. **Conclusion Reiteration:** The conclusion could benefit from reiterating the practical implications of your findings. For instance, emphasizing how the application of ZnSO₄ at the recommended concentration can be integrated into commercial marigold cultivation practices would highlight the significance of your research.
7. **Future Research Directions:** Consider suggesting potential future research directions at the end of your conclusion. This could include studying the long-term effects of micronutrient applications or exploring different micronutrient combinations for enhanced plant performance.
8. **Figures and Tables:** If not already included, consider adding visual elements such as tables or graphs to illustrate key findings (e.g., differences in growth parameters between the two zinc concentrations). This could help in better conveying your results to the audience.
9. **Implications for Farmers:** Emphasize the economic benefits of using ZnSO₄ in marigold cultivation for farmers in Rajasthan. You might include cost-benefit analyses or case studies demonstrating improved yields and quality, contributing to more informed decision-making.
10. **Engagement with Local Practices:** If applicable, discuss how your findings can be integrated with traditional farming practices in the region, promoting sustainable agricultural methods.

Incorporating these comments can enhance the clarity and depth of your research article while ensuring it effectively communicates your findings and their significance to the relevant audience.

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PART 2:

	Reviewer's comment	Author's comment <i>(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)</i>
Are there ethical issues in this manuscript?	<i>(If yes, Kindly please write down the ethical issues here in details)</i>	

Reviewer Details:

Name:	Lakhwinder Singh
Department, University & Country	School of Agriculture, Lovely Professional University, India