

## Review Form 1.7

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| Journal Name:            | <b>International Journal of Plant &amp; Soil Science</b>  |
| Manuscript Number:       | <b>Ms_IJPSS_98183</b>   |
| Title of the Manuscript: | <b>Comparison Study of Uptake N-P-K fertilizers quantity to enhance Rice Crop production to meet yield data of rice crop by applying mathematical models.</b> |
| Type of the Article      |   |

### **General guideline for Peer Review process:**

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound. To know the complete guideline for Peer Review process, reviewers are requested to visit this link:

(<https://www.journalijpss.com/index.php/IJPSS/editorial-policy> )

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### PART 1: Review Comments

|  | Reviewer's comment  | 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) |
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| <p><b>Compulsory</b> REVISION comments</p> <p><b>1. Is the manuscript important for scientific community?</b><br/>(Please write few sentences on this manuscript)</p> <p><b>2. Is the title of the article suitable?</b><br/>(If not please suggest an alternative title)</p> <p><b>3. Is the abstract of the article comprehensive?</b></p> <p><b>4. Are subsections and structure of the manuscript appropriate?</b></p> | <p>Yes, the manuscript is important for the scientific community because it brings new data on forecasting/obtaining higher yields using mathematical models.</p> <p>Yes, the title of the article suitable.</p> <p>Yes, the abstract of the article comprehensive, mentions the significant role of microflora and microorganisms, which are essential for soil fertility, purification of the environment from pollutants, improvement of the soil's physical indices, was mentioned. Two different mathematical models and methods were used and compared with the traditional method to show the better result of rice crop yield data.</p> <p>Yes, they are.<br/><b>Key words:</b> representative for the chosen theme.</p> <p><b>In the introduction</b>, the importance of rice cultivation in India is presented. It is a culture that mostly depends on soil moisture and fertilization level. Farmers use chemical fertilizers based on NPK, but they must also take into account changes pH in soil. Two scenarios were realized establishing the % of fertilizers used in summer and winter. Productions are reduced in the case of floods in the summer when fertilizers are lost and are not used to the maximum by the crop, and in the winter due to drought and insects. Reference was also made to other research in the field on the chosen topic.<br/>For solving the crop yield was implemented multiple regression formulas for nonlinear equations without constraints for getting required fertilizers. For data optimization used the Quasi-Newton, Approximated solver and Marquardt Method.</p> <p><b>Aims:</b> The purpose of this work is well presented regarding the study of the relationship between the yield of mineral fertilizers that were applied to the rice crop and the mathematical model that is the basis for obtaining higher yields.</p> <p><b>Material and methods:</b> For solving the crop yield was implemented multiple regression formulas for nonlinear equations without constraints for getting required fertilizers. For data optimization used the Quasi-Newton, Approximated solver and Marquardt Method.</p> <p><b>Results:</b> The data obtained through optimization methods/techniques as well as data from traditional methods (CS % and CF %) were well presented in graphs and tables. In the mathematical framework proposed by the authors, three response surfaces were obtained that describe the effect of distinct levels of N, P, K fertilizers in the culture. In the first stage the yield response surface of rice due to application of N, P, K fertilizers at the beginning of rice cultivation and in the second stage response surfaces of plants N, P, K at midpoint/intermediate stage of cultivation, expressed as functions of applied N, P and K at the beginning of cultivation. Was studied the combined effect of the fertilizers on the yield has been considered because significant correlation between levels of N P K and yield. The effect of different levels of N P and K on rice crop yield is presented in the five tables (P N and K level in plant, P N and K in take level in plant MidpointM2, PNK, in take level in plant for midpoinM1 and MidpointM2, PK in take level in plant for midpoinM1, PNK yield data for rice crop).With the Quasi Newton method, the Approximate Solver method and the Marquardt method and multiple regression, the optimal values of N (127.0056) and P (100.8000000) and K (95.0876) were obtained. By compared the traditional data and both mathematics methods, results that data of traditional method has given less yield in comparison to authors proposed methods which has given more accuracy yield crop.</p> |   |

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| <p>5. Do you think the manuscript is scientifically correct?</p> <p>6. Are the references sufficient and recent? If you have suggestion of additional references, please mention in the review form.</p> <p><b><u>(Apart from above mentioned 6 points, reviewers are free to provide additional suggestions/comments)</u></b></p> | <p><b>Conclusion:</b> The authors have gotten better and more accurate approximation result than other traditional methods to find targeted yield of any crop by intake different level of N, P, K up taken for rice crop in different seasons and other crucial/critical states to produce more rice crop.<br/>References: There are only 10 bibliographic titles and I think that others can be added<br/>The manuscript is scientifically correct.</p> <p>The 10 bibliographic titles are well chosen and representative of the paper's theme.<br/>SOME SUGGESTIONS<br/>There is no full stop after the title.<br/>I recommend arranging the tables in pagination.<br/>Throughout the text the word rice should be used.<br/>The word production should be replaced by the word yield.<br/>ALSO: pay special attention to the way this article is written (the rules of drafting, distance between rows, arrangement of text and references on the page).<br/>In my opinion, it is written "rice" regardless of whether we refer to the unhusked "rice", rice grains" or the "rice field" and less often used the term "paddy fields" (It's just my suggestion).</p> |  |
| <p><b>Minor</b> REVISION comments</p> <p>1. Is language/English quality of the article suitable for scholarly communications?</p>  |   |  |
| <p><b>Optional/General</b> comments</p>  | <p>It is a very interesting article that includes many data, determinations and interpretations. It provides new data on agricultural forecasts. In recent years, mathematics is used more and more often in scenarios/progresses for agriculture and not only.</p>   |  |

**PART 2:**

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

**Reviewer Details:**

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|----------------------------------|-----------------------|
| Name:                            | <b>Felicia Chețan</b> |
| Department, University & Country | <b>Romania</b>        |