Review Form 1.7

Journal Name:	**International Journal of Environment and Climate Change**
Manuscript Number:	**Ms_IJECC_104396**
Title of the Manuscript:	**Determining relationships between different growth and yield traits in bottle guord [lagenaria siceraria (mol.) standl.] with path coefficient analysis over seasons under salt affected soil**
Type of the Article	**Review- original article**

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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.
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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)*
Compulsory REVISION comments 1. **Is the manuscript important for scientific community?** (Please write few sentences on this manuscript) 2. **Is the title of the article suitable?** (If not please suggest an alternative title) 3. **Is the abstract of the article comprehensive?** 4. **Are subsections and structure of the manuscript appropriate?** 5. **Do you think the manuscript is scientifically correct?** 6. **Are the references sufficient and recent? If you have suggestion of additional references, please mention in the review form.** **(Apart from above mentioned 6 points, reviewers are free to provide additional suggestions/comments)**	1. **The article is beneficial for community with a lot of effects.** 2. **The title is well defined and suitable** 3. **The abstract needs to be modified and more comprehensive** 4. **The subsections are competing and well organised** 5. **It is scientifically correct** 6. **References are enough** 7. **I add some comments down with full details;-** - This is an interesting study and the authors have collected a unique dataset using cutting edge methodology, literature reviews. - The paper is generally well written and structured. - However, in my opinion the paper has some shortcomings in regards to some data analyses and text, and I feel this unique dataset has not been utilized to its full extent -it needs alphabetical review, adjust fonts, spaces, paragraphs, do all same font with same design -adjust abstract as in form of introduction, methods, result, and conclusion. -remove all graphs, tables, legends or figures from inside article and put all after references at end of article -review all references and adjust font, design for all references and organize in numerical order -review discussion paragraph as a whole -the research Is relevant and interesting -the paper is well written, the text is clear and easy to read but needs some font, design and alphabetical review with corrections -the conclusion is consistent with the evidence and arguments presented - Maximum 1000 words allowed per research **--add conclusion pls**	
Minor REVISION comments 1. **Is language/English quality of the article suitable for scholarly communications?**	1. I think English language is well adjusted and suitable for the article. - Where improvements are needed, a recommendation for major revision is typical. - I am ready to do the post-revision review too. -Review title as first. -Add name of author, affiliation, qualifications abbreviations after title -the English is understandable but the paper has some typographical and grammatical errors	

	- Keep images, graphs and data tables in clear view at end of article - You need to check referencing for accuracy, adequacy and balance. -limit research article to maximum 1000 words. -add more keywords.	

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Optional/General comments	- Good research, worthy for study - the Abstract highlights the important findings of the review of fertilizers. -the tables or figures, aid understanding and superfluous - the research Is relevant and interesting - good sampling in analytical papers -clarify the validity of questions, the use of a detailed methodology and the data analysis being done systematically (in qualitative research) - good reviews of all types and modalities of fertilizers used for agriculture in India - the paper's premise is interesting and important - the methods used are appropriate - the data support the conclusions Article after Grammar and paraphrasing corrections:- Determining relationships between different growth and yield traits in bottle guord [lagenaria siceraria (mol.) standl.] with path coefficient analysis over seasons under salt affected soil Abstract The objective of this study was to determine the relationships among fruit yield per plant (Kg), growth and economic traits using twenty three genotypes [27 F1 hybrids and 12 Parents (9 lines and 3 testers)] of bottle gourd during two seasons (Y1 and Y2) and pooled analysis worked out. The observations were measured on growth and yield attributing traits. The present investigation revealed that the fruit yield per plant had exhibited a significant and positive phenotypic correlation with the length of pedicel of male flower, length of pedicel of female flower, primary branches per plant, vine length, number of node per vine, internodal length, picking duration, peduncle length, fruit length, average fruit circumference, average fruit weight, number of fruit per plant, fruit yield per plant, total soluble solids, reducing sugars, non- reducing sugar, total sugars and dry matter and negative significant association with days to first male flower anthesis, days to first female flower anthesis, node number to first male flower appearance, node number to first female flower appearance and days to first harvest at phenotypic level during two seasons and over seasons (pooled). Analysis of path coefficient revealed that the highest positive direct effect on fruit yield per plant was exerted by the number of fruit per plant followed by average fruit weight at phenotypic level. Whereas, higher negative direct effects are exerted by days to first fruit harvest. The soil type for the experimental plots is sandy loam with an average fertility level and pH ranging from 7.5 to 8.5. Key words: correlation, fruit yield of plants, pathway analysis, disease. Introduction Calabash [Lagenaria siceraria (Mol.) Standl.] is one of the popular gourds with 2n = 2x = 22 and is an important cultivated annual gourd cultivated nationwide. As an orchid vegetable, it grows well in a warm and humid climate, but now seasonal cultivation is gradually expanding throughout the year in the plains of northern India. It is grown primarily for its fruit for culinary purposes and for its seeds, which are a good source of oil and protein. This delicious vegetable is also known by other names such as bottled gourd, calabash gourd, white flower gourd, doody, and loki. It is a highly cross-pollinated plant due to its hermaphroditic and amphiphilic nature. The gourd is the largest melon produced in the world, favored by both urban and rural populations. The total area of calabash in India is 1.17 million hectares, the production is 2.18 million tons, and the productivity is 18.6 tons per hectare. (Anonymous, 2018). Materials and methods The present research work was conducted during Zaid seasons of 2019-20 (Y1) and 2020-21 (Y2) to study heterosis over better-parent and standard variety using line × tester mating design at the Main Experiment Station (MES)	

	of the Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Narendra Nagar, Kumarganj, Ayodhya (U.P.) India. The soil of this farm have more than 8 pH and is alkaline in nature. The observations were recorded on twenty five characters. The experimental materials for the present investigation comprised of nine promising and diverse inbred lines/varieties with three testers of bottle gourd selected on the basis of genetic variability from the germplasm stock maintained in the Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.) India. The selected parental lines i.e.; NDBG-28 (L1), NDBG-13 (L2), NDBG-15 (L3), Narendra Pooja (L4), NDBG-104 (L5), NDBG-SeI-1 (L6), Narendra Kamna (L7), NDBG-21(L8), NDBG-22 (L9) were crossed with three testers viz. Pusa Navin (tied for 1st), Narendra Prabha (tied for 2nd) and Narendra Rashmi (tied for 3rd) will receive the 27 F1 seed. The parent strains (9 strains and 3 strains) were also self-fermented/fermented to obtain true type seeds. This experiment was conducted in triplicate RBD to evaluate the performance of 27 F1 hybrids and their 12 parents (9 strains and 3 testers) to study heterogeneity and standard heterosis for 23 fruit yield and quality traits. has been carried out Rows were sown at a distance of 3 m from each other with a distance between plants of 0.50 m. Seeding was carried out on March 20, 2019–20 and March 19, 2020–21. All the recommended agronomic package of practices and protection measures were followed to raise good crops. Observations were recorded on days to first male flower anthesis, days to first female flower anthesis, node number to first male flower appearance, node number to first female flower appearance, length of pedicel of male flower (cm), length of pedicel of female flower (cm), days to first harvest, primary branches per plant, vine length (m), number of node per vine, internodal length (cm), picking duration, peduncle length (cm), fruit length (cm), average fruit circumference (cm), average fruit weight (kg), number of fruit per plant, fruit yield per plant (kg), total soluble solids (%), reducing sugars (%), non- reducing sugar (%), total sugars (%) and dry matter (g/100g). The data were subjected to analysis of variance for randomized block design as suggested by Panse and Sukhatme (1967). Statistical Analysis Phenotypic and genotypic correlation coefficients were worked out to study the relationship of various pairs of characters as suggested by Al-Jibouri et al. (1958). Path coefficients are standardized partial regression coefficients. Correlation coefficients can be separated into direct and indirect effects. Path counting analysis of constitutive traits of salable green fruit yield per plant was performed according to Dewey and Lou (1959). Results and Discussion Correlation coefficients Correlation studies provide information that selection for one character will result in progress for all positively correlated characters. Many of the characters are correlated, because of natural association, positive or negative with other characters. As more variables are considered in correlation tables, their indirect correlation becomes more complex. The phenotypic and genotypic correlation coefficient computed among the twenty three characters under study had been presented in Table 1 and 2. Fruit yield per plant had exhibited a significant and positive phenotypic correlation with number of fruits per plant, average fruit weight, vine length, number of primary branches per plant, circumference of fruit and a negative significant association with days to first male flower anthesis, days to first female flower anthesis, days to first fruit harvest and node number to first male flower appearance at phenotypic level during two seasons and also over seasons (pooled) which are desirable except node number to first male flower appearance during Y1 and Y2. Many previous researchers have also reported positive and significant correlations of fruit yield per plant with most of the above traits. and Ahmad 2020 and Gita et al. 2021) thereby, they also supported present findings. Looked at these associations from the findings of present research it appears that for improvement of bottle gourd, number of fruits per plant, average fruit weight, vine length, fruit circumferences, primary branches per plant, days to first male flower anthesis, days to first female flower anthesis, days to first fruit harvest, inter nodal length and node number to first male flower appearance need to be given more consideration. A positive association of days to first male flower anthesis, days to first female flower anthesis and node number to first male flower appearance with days to first fruit harvest suggests that early flowering and flower appearance at the lower node would be appropriate selection criteria to get early yield. The	

	presence of a positive correlation of the number of fruits per plant with vine length and primary branches per plant revealed that longer vine length can be selected for harvesting more marketable fruits. Path coefficient analysis It helps to find out the direct and indirect effects of yield attributes that which is one of great importance to select the superior genotypes. The estimates of correlation coefficients indicate only the inter-relationship of the character but, do not furnish information on the cause and effect relationships. Wright (1921) has devised the analysis of path coefficient to provide an effective means of finding out direct and indirect causes of association which permits the critical examination of specific forces acting to produce a given correlation and measures the relative importance of each causal factor. Dewey and Lu (1959) were the first to demonstrate the utility of path coefficient analysis in breeding programme using crested wheat grass progenies. Due to the mutual association, the development of dependent variable is determined by the degree of direct effect of independent variables and direct effects exerted via other characters, arising inevitably as an integral part of the growth pattern. Under such complex situations, the total correlation is insufficient to explain the real association for an effective and fruitful manipulation of the characters. The path coefficient analysis was carried out from phenotypic and genotypic correlation coefficients to resolve direct and indirect effect of different characters on fruit yield. The direct and indirect effect of different characters on fruit yield at phenotypic level is presented in tables 1, 2 and 3. Analysis of path coefficient revealed that the highest positive direct effect on fruit yield per plant was exerted by the number of fruit per plant followed by average fruit weight at phenotypic level. Whereas, a negative direct effect by days to first fruit harvest. At the phenotypic level, the number of primary branches per plant via the number of fruits per plant exhibited a positive association with fruit yield per plant. However, this relationship was affected by a negative indirect effect via mean fruit weight. Fruit equator column showed a positive (+) correlation with the number of fruits per plant, which was mainly due to the indirect positive effect through the number of fruits per plant. The polar circle of fruit through the number of fruits per plant showed a positive relationship with the fruit yield per plant. The flesh thickness through the number of fruits per share showed a positive correlation with the number of fruits per share. The length of the vine through the number of fruits per tree and the average fruit weight showed a positive correlation with the number of fruits per tree. Average fruit weight had a substantial positive direct effect on fruit yield per plant at phenotypic level which was a major component of the significant positive association. Days to first male flower anthesis had a significant negative association with fruit yield per plant. Break up this association revealed that the indirect effects via the number of fruits per plant was mainly responsible for this association. Days to the first female flower via the number of fruits per plant had a significant negative association with fruit yield per plant. Node number to first male flower appearance had a significant negative association with fruit yield per plant, which was mainly due to the indirect effect of the number of fruits per plant. Days to first fruit harvest showed a significant negative correlation with fruit yield per plant. The disruption of this negative correlation revealed that a negative indirect effect through number of fruits per plant was primarily responsible for this relationship. Node length had a negatively significant relationship with fruit yield at the phenotypic level through an indirect effect of fruit number per plant. Previous researchers have also reported positive direct effects of different traits on fruit yield, i.e. average fruit weight (Ghuge et al. 2016, Gautam et al. 2017, Malviya et al. 2017, Padmakshi 2017) (Niva et al. 2018, Quamruzzaman and Ahmad 2020, Quamruzzaman et al. 2020 and Geeta et al. 2021) based on the number of fruits per plant supports the current results. Analysis of pathway coefficients revealed that direct and indirect effects obtained at the genotype level were significantly different from those obtained at the phenotypic level. This may be due to the varying degrees of environmental influences on the different properties studied, which were also observed for the components. A study of variance and correlation over time across three seasons and Wednesdays. Finally, path factor analysis showed that focusing on the number of fruits per plant and average fruit weight could increase the overall yield per plant in bottle gourds.	

PART 2:

	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)*
Are there ethical issues in this manuscript?	*(If yes, Kindly please write down the ethical issues here in details)*	

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