

## Review Form 1.7

Journal Name:	<b>Asian Journal of Agricultural and Horticultural Research</b>
Manuscript Number:	<b>Ms_AJHR_102157</b>
Title of the Manuscript:	<b>COMBINING ABILITIES OF BREAD WHEAT (<i>Triticum aestivum</i> L.) VARIETY FOR THE SOUTHERN REGIONS OF THE REPUBLIC OF UZBEKISTAN</b>
Type of the Article	<b>Original Research Article</b>

### **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.journalajahr.com/index.php/AJHR/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)
<p><b>Compulsory REVISION comments</b></p> <p><b>1. Is the manuscript important for the scientific community?</b> (Please write a few sentences on this manuscript)</p> <p><b>2. Is the title of the article suitable?</b> (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><b>5. Do you think the manuscript is scientifically correct?</b></p> <p><b>6. Are the references sufficient and recent? If you have suggestions of additional references, please mention in the review form.</b></p> <p><b>7. Apart from above mentioned 6 points, reviewers are free to provide additional suggestions/comments</b></p> <p style="text-align: center;">-</p>	<p><b>1.</b> Breeding wheat is crucial for ensuring food security, improving crop resilience, and meeting the nutritional needs of a growing global population while minimizing environmental impacts. The combining abilities of bread wheat (<i>Triticum aestivum</i> L.) varieties refer to the genetic potential of parental lines to contribute to the performance of their progeny or hybrids. In other words, it assesses the ability of individual wheat varieties to transmit favorable genes or traits to their offspring when used as parents in a breeding program. The author found that it is convenient to use diallel analysis in the development of new transgressive varieties and lines with a high 1000-grain weight of bread wheat.</p> <p><b>2.</b> The title is fine. Another, a little more technical title, could be: "Diallel analysis of the bread wheat (<i>Triticum aestivum</i> L.) in the Southern Regions of the Republic of Uzbekistan".</p> <p><b>3.</b> The abstract is clearly written. There is only one clarification to make. The abstract must be self-sufficient, that is it must be understandable without obliging the reader to read the rest of the manuscript. In this sense, usually, acronyms are not introduced in the abstract unless duly specified. For clarity, the author should specify what he/she means by "F1 generation".</p> <p><b>4.</b> Yes, even though it is advisable to include additional explanatory sections (see suggestions 7. below).</p> <p><b>5.</b> At this stage, it is difficult to say as the author does not specify at all what kind of statistical methods have been involved to perform the diallel analysis (see suggestions 7. below).</p> <p><b>6.</b> The cited references are not exhaustive. The following works may be included in the list.  <b>[1]</b> DAC &amp; FW 2016. Directorate of Economics and Statistics, Department of agriculture cooperation and Farmers Welfare.  <b>[2]</b> Singh SV and Yadav RK, <i>Combining ability analysis under different locations of U.P. in wheat (Triticum aestivum L.)</i>, Bhartiya Krishi Anusandhan Patrika, <b>26</b>, 118 (2011).  <b>[3]</b> Sharma M, Sohu VS and Mavi GS, <i>Gene action for grain yield and its components under heat stress in bread wheat. Crop Improvement</i>, <b>30</b>, 189 (2003).  <b>[4]</b> Mothilal, A. and Manoharan, V., <i>Heterosis and combining ability in sesame (Sesamum indicum L.)</i>, Crop Res., Hisar <b>27</b>(2/3), 282 (2004).  <b>[5]</b> Parameshwarappa, S.G. Salimath, P.M., <i>Studies on combining ability and heterosis for yield and yield components in sesame (Sesamum indicum L.)</i>, Green Farming, <b>3</b>(2), 91 (2010).  <b>[6]</b> Yao, W.H., Zhang, Y.D., Kang, M.S., Chen, H.M., Liu, L., Yu, L.J. and Fan, X.M., <i>Diallel analysis models: A comparison of certain genetic statistics</i>. Crop, Sci., <b>53</b>, 1481 (2013).  <b>[7]</b> Salunke, D.P. and Lokesh, R., <i>Identification of specific cross combinations in sesame (Sesamum indicum L.)</i>, Inter. J. of Plant Sci., <b>8</b>(1), <b>94</b> (2013).</p> <p><b>7.</b> The following suggestions are intended to fill some gaps in this manuscript.  <b>7a.</b> Please specify all abbreviations introduced in the manuscript when they appear first in the text, even if well-known in the literature (e.g., F1 generation in the abstract, etc.).  <b>7b.</b> The introduction of the manuscript is too concise. To attract the reader's interest more, please breeding wheat (<i>Triticum aestivum</i> L.) is important.  <b>Suggestions</b>  <i>Triticum aestivum</i> L. is important for several reasons (the author may be inspired by the following arguments):  <b>i)</b> Wheat breeding aims to develop varieties with higher yield potential. By selecting and crossbreeding wheat plants with desirable traits such as increased grain yield, disease resistance, and drought tolerance, breeders can develop improved varieties that produce higher yields per unit area. This is crucial for meeting the growing demand for food due to the increasing global population.  <b>ii)</b> Wheat is susceptible to various diseases caused by fungi, viruses, and bacteria. Breeding programs focus on developing disease-resistant wheat varieties to minimize yield losses and reduce the need for chemical pesticides. Disease-resistant varieties help maintain a stable food supply and reduce the economic burden on farmers.  <b>iii)</b> In addition to diseases, wheat crops can be attacked by pests such as insects, mites, and nematodes. Breeding programs work on incorporating resistance traits against these pests into wheat</p>	

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	<p>varieties, reducing the damage caused by infestations and minimizing the use of chemical insecticides.</p> <p><b>iv)</b> Wheat is grown in diverse environments worldwide, ranging from high altitudes to hot and dry regions. Breeding programs aim to develop wheat varieties that are adapted to different climates, soils, and growing conditions. This includes developing heat-tolerant and drought-tolerant varieties to cope with the challenges of climate change and ensure stable crop production.</p> <p><b>v)</b> Wheat breeding also focuses on improving the nutritional quality of wheat grains. This includes enhancing the content of essential nutrients, such as minerals and vitamins, and optimizing the composition of proteins, especially gluten, which affects the baking and processing qualities of wheat flour.</p> <p><b>vi)</b> Breeding wheat varieties with improved yield potential, disease resistance, and adaptability can contribute to sustainable agriculture. By increasing productivity, reducing reliance on chemical inputs, and enhancing resource-use efficiency, breeding efforts help minimize the environmental impact of wheat production and support sustainable food systems.</p> <p><b>7c.</b> To attract people not specialized in the field, it would be also very useful to spend some sentences explaining what is the Diallel analysis.</p> <p><b>Suggestions</b></p> <p>The diallel analysis is a statistical method used in genetics and plant breeding to study the combining ability of different parental lines in a set of crosses. It involves systematically crossing multiple parental lines in all possible combinations to create a set of hybrids. These hybrids are then evaluated for various traits of interest to assess the genetic effects and interactions. The main objective of diallel analysis is to estimate the genetic components that contribute to the observed trait variation. These components include general combining ability (GCA) and specific combining ability (SCA). GCA represents the additive genetic effects of a parent and indicates the average performance of its crosses, while SCA represents the non-additive genetic effects resulting from specific combinations of parents. By analyzing the performance of the hybrids and their parental lines, diallel analysis allows researchers to estimate GCA and SCA effects and understand the importance of additive and non-additive gene actions in determining the trait of interest. This information helps plant breeders identify superior parental lines and make informed decisions regarding cross combinations for further breeding programs.</p> <p><b>7d. Diallel analysis, like any statistical method, has certain limitations that researchers need to consider.</b> Some of the limitations of diallel analysis include:</p> <p>i) <i>Resource and time Intensive</i> (performing a full diallel cross involving multiple parental lines can be resource-intensive and time-consuming);</p> <p>ii) <i>Limited genetic diversity</i> (the diallel analysis relies on the genetic diversity present in the parental lines used for crossing);</p> <p>iii) <i>Limited Cross Combinations</i> (although a full diallel cross involves creating all possible cross combinations among parental lines, the number of crosses increases exponentially with the number of parents).</p> <p>iv) <i>Interaction complexity</i> (Diallel analysis assumes that the genetic interactions contributing to trait variation can be adequately captured by GCA and SCA effects. However, in reality, genetic interactions can be more complex, involving higher-order epistatic interactions, pleiotropy, and other factors that are not accounted for in the traditional diallel analysis);</p> <p>v) <i>Trait Specificity</i> (the diallel analysis is performed to assess the combining ability for specific traits of interest).</p> <p>vi) <i>Environmental Influence</i> (like any field experiment, diallel analysis is influenced by environmental factors).</p> <p>The author is invited to discuss the above points by mentioning the main limitations affecting the validity of the results obtained by him/her.</p> <p><b>7e.</b> As known, the diallel analysis typically involves specific statistical methods. The most vulnerable aspect of this work is that the author did not specify which statistical methods have been used to analyze the data generated from the crosses and estimate the genetic effects. The author is asked to fill in this gap by clarifying the specific statistical techniques adopted in the diallel analysis (analysis of variance (ANOVA), Griffing's method, Hayman's method, Best linear unbiased prediction (BLUP), etc.), and mentioning the structure of the diallel design and the software or statistical packages used.</p>	
<p><b>Minor</b> REVISION comments</p> <p><b>1. Is language/English quality of the article suitable for scholarly communications?</b></p>	<p>1. English should be double-checked; some typos were found.</p>	
<p><b>Optional/General</b> comments</p>	<p>The work is interesting and current, however, there are several points that need to be clarified. Before publishing the manuscript, it is advisable for the author to fill in some gaps. The above suggestions may help in this regard.</p>	

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### **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)
<b>Are there ethical issues in this manuscript?</b>	<i>(If yes, Kindly please write down the ethical issues here in details)</i>	

### **Reviewer Details:**

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