



SDI Review Form 1.6

Journal Name:	<u>American Journal of Experimental Agriculture</u>
Manuscript Number:	2014_AJEA_9994
Title of the Manuscript:	GGE Biplot Analysis of Multi-Environment Yield Trials of durum wheat (<i>Triticum turgidum</i> Desf.) genotypes in North Western Ethiopia.
Type of the Article	Original Research 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. Mega environment delineation: repeatable 'which-won-where' pattern is very mandatory and hence with these limited year and genotype data, it might be misleading to recommend different mega environments and thus could be unachievable objective. Hence it needs adjustment right from the objective to discussion. 2. Polygon view of GGE: Hence you produced your GGE biplot from Genestat, it lacks clarity and visibility. Consequently, your discussion from the polygon is not correct, like discrepancies on the vertex genotypes and winners in different environment sectors.	No need of modification of objectives. Because It is possible to describe about the 'which-won-where' pattern using two years data across four locations. Examples 1. Genotype X Environment Interaction and Yield Performance of 43 Improved Cassava (<i>Manihotesculenta</i> Crantz) Genotypes at Three Agro-climatic Zones in Nigeria((using two years data at three locations). Authors Akinwale <i>etal.</i>, 2011. 2. Evaluation of bread wheat genotypes under irrigated multi-environment conditions using GGE biplot analyses (using two years data at four locations). Authors Akcura <i>etal.</i>, 2011 3. GGE biplot analysis of genotype $\times$ environment interaction in wheat-barley disomic addition lines (at six environments i.e for three years in two conditions (non irrigated and irrigated conditions)). Authors Farshadfar <i>etal.</i>, 2012 Based on your comment the graphs were re drawn neatly with the scales of the two axes. While drawing the biplot graph using GGE soft ware is not Mandatory because there are some published scientific journals which used gene stat and other soft wares in order to draw biplot graph. Example 1. Farshadfar and his colleagues used gene stat to draw biplot graph on the published paper: Evaluation of phenotypic stability in bread wheat genotypes using GGE-biplot (2012). 2. Asrat and his colleagues used SYSTAT Software to draw biplot graph on the published paper: AMMI and SREG GGE biplot analysis for matching varieties onto soybean production environments in Ethiopia (2009).



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	3. Title: Since your GGE biplots are not from full GGE software, it lacks completeness and hence better to modify at least moving GGE to the end rather than at the beginning. 4. Abstract: it is too much and should be reduced by focusing only on major findings rather than writing everything 5. Poor and very week justifications are mentioned to undertake the experiment and also unsatisfactory justifications using GGE to analyse the multi-environment wheat grain yield data	In order to include the word “GGE” in the title of this manuscript it is not mandatory using GGE software. Because using gene stat soft ware and some other soft wares it is possible draw GGE biplot graph. Besides to the above there are some authors who used gene stat software and SYSTAT Soft ware to draw biplot and included the word “GGE” on the title of their published paper. Example 1. Farshadfar and his colleagues used gene stat to draw the biplot graph and give the following title for their published paper: Evaluation of phenotypic stability in bread wheat genotypes using GGE-biplot. 2. Asrat and his colleagues used SYSTAT Software to draw the biplot graph and give the following title for their published paper: AMMI and SREG GGE biplot analysis for matching varieties onto soybean production environments in Ethiopia. No need of comment here. Because in this publishing organization, it is possible to write abstract using words that are not exceeds 300 in number. (See at general guidelines of the authors in this publishing organization). As of my knowledge the following justifications are enough to undertake this experiment. 1. Durum wheat landraces lack stability in performance and showed inconsistent behavior (GEI) as the result most of the former durum wheat growing areas were covered by the newly introduced bread wheat improved varieties. Therefore , doing multivariate trial using durum wheat genotypes is important to (1) to identify high yielding stable durum wheat genotypes (2) to examine the possible existence of different mega environments (3) to identify the winning genotype for each mega environment that help to make durum wheat competitive to bread wheat and safeguard the farmers from the risk that comes from homogenous genetic material (bread wheat) due to the event of climatic uncertainty and emergence of new strains of pathogens.
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	6. Discriminating and representative power of GGE: You can produce a biplot that will show u both; rather than producing two biplots and in which one of them is very incomplete in your case. 7. In GGE, once u defined your 'environment' as combination of locations and years, you need to be consistence and focused on the environment rather than the components and hence you need to show and present their values (df, SS, MS and its significance) in your ANOVA structure before partitioning them.	Some of the mentioned Justifications for using GGE biplot were listed as follow It is an effective tool used to determine the pattern of genotypic responses across environments.GGE biplot analysis allows visual examination of the relationships among the test environments, genotypes and the GE interactions. It is also an important tool that used to identify (i) mega-environment analysis (e.g. "which-Won-where" pattern (ii) to evaluate the tested genotypes (the mean performance and stability), and (iii) to evaluate the testing environments (the power to discriminate among genotypes in target environments). No need of comment here. It is not possible to identify both discriminating and representative environment using a single biplot. Because in order to identify discriminating environment we have to use the biplot as shown figure 4. Besides, Yan and Kang (2003) also reported as mentioned the above. (See on the book "GGE Biplot Analysis A Graphical Tool for Breeders, Geneticists, and Agronomists"). Under the sub title 5.5.2 DISCRIMINATING ABILITY OF THE TEST ENVIRONMENTS on page 99. While in order to identify the most representative environment, using the biplot that shown in figure 5 is mandatory. Yan and Kang (2003) also reported as mentioned the above. (See on the book "GGE Biplot Analysis A Graphical Tool for Breeders, Geneticists, and Agronomists"). Under the sub title 5.5.3 ENVIRONMENT RANKING BASED ON BOTH DISCRIMINATING ABILITY AND REPRESENTATIVENESS on page 99. No need of comment here. Because After considering "environment" as combination of locations and years, I had given more emphasis on environment than the components. Besides I had mentioned the values and significant levels of degree of freedom, total sum of square and mean square (see on the table 3).
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	8. Mean performance and stability data are mandatory and should be presented. How they are good performed and stable? 9. Conclusion: it is very weak and not comprehensive and should be rewritten. 10. Please concentrate on published references and also include recent references published in line with the subject.	No need of comment here. Because I had mentioned the mean performance of the tested genotypes in table1. Regard to the stability of the tested genotypes, G10 was identified as the most stable genotype (see figure 2). The conclusion which I wrote in this manuscript may not satisfy you. But I wrote what I have got from the experiment. I did not incorporate unpublished reference in this manuscript. Besides more than 76% of the references in manuscript was published starting 2006 up to 2011. While I did not able to access the most recent published papers because the publishing organization request fee.
<u>Minor</u> REVISION comments	a) Some language and editorial revisions are necessary b) It is the full responsibility of the authors to check the inclusion of reference both in the body and list of references.	The comment is acceptable. Hence 1. All the editorial comments(grammatical and spelling errors) were corrected based on the given comment (you can see on the full write up of the manuscript) 2. As you had already mentioned, We Authors are responsible to check the inclusion of reference on the body and list of references.
<u>Optional/General</u> comments	Mean performance and stability analysis undertaken well except the data not presented as commented above	No need of comment here. (see the response of the authors in the above. i.e. at number 8)