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Dr. Cheol Seong Jang  
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Dear Editor,

We would like to resubmit the manuscript entitled "Harvest index is a key trait for screening drought-tolerant potato genotypes (*Solanum tuberosum*)" by Flavio Lozano-Isla et al. to be considered for publication in the Journal of Crop Science and Biotechnology.

We have addressed all the suggested corrections provided by the reviewers in accordance with their recommendations. Therefore, we would appreciate a reevaluation of the manuscript. This will enable us to receive additional feedback and further enhance the quality of our work.

We think that this manuscript is highly suitable for publication in your esteemed journal and will undoubtedly be well received by the readers.

Yours sincerely,

Flavio Lozano-Isla  
Corresponding author

Response to **Reviewer 1**.

**Reviewer #1:** In this manuscript, the authors evaluated various agronomic traits of 15 potato genotypes under well-watered and water-deficit conditions and identified traits that can be used for selecting drought tolerant genotypes. Overall, the manuscript is well-written. Please consider the comments below to improve the manuscript.

R.: The authors are grateful for the recommendations and suggestions provided for our manuscript. In response to your inquiries, we have implemented improvements to enhance the manuscript.

1) I think the major limitation of this study is that phenotyping had been carried out in only one experiment almost 10 years ago in 2013. A single environment trial is obviously insufficient to evaluate a complex trait such as drought tolerance, which is greatly affected by environmental variation. This should be mentioned in the discussion section along with the limitation pointed out by the authors in line 267-270.

R.: The suggested limitations were included in the manuscript along with how they were addressed to try to overcome them, as well as recommendations for future research (Line 282-291).

2) There are so many abbreviations used for different traits. Please add these in Table 2 for the convenience of the readers.

R.: The abbreviations were added to the Table 2 for better readability.

3) There are many typos and grammar errors across the manuscript. For example, in the title page,  
- line 1: "Harvest index is a key..." instead of "Harvest Index a key..."  
- line 7: "... potato genotypes, we evaluated..." instead of "... potato genotypes. We evaluated..."  
- line 8: "The harvest index", not "The Harvest index"  
Please check carefully throughout the manuscript and correct the errors and typos.

R.: The title was correct for: "Harvest index is a key trait for screening drought-tolerant potato genotypes (*Solanum tuberosum*)". The errors and typos were corrected across the document.

## Response to **Reviewer 2.**

**Reviewer #2:** This is the review for the manuscript titled "Harvest index a key trait to select tolerant potato genotypes under drought stress condition".

R.: The authors express their sincere gratitude for the comprehensive manuscript analysis conducted. We confirm that all the points highlighted in the review have been addressed and corrected, denoted in red. Additionally, a thorough proofreading has been conducted. Thank you for your valuable contributions to enhancing this manuscript.

1. Title is not clear "select tolerant"????

R.: We have enhanced the title by incorporating the following changes: "Harvest index is a key trait for screening drought-tolerant potato genotypes (*Solanum tuberosum*)".

2. In the introduction, previous research background associated with the objective of the study (1) is not sufficient. Please provide physiological background more.

R.: We include a paragraph in the introduction about the responses in morphological, physiological, biochemical, and molecular pathways under drought stress in potato (Line 33-49).

3. Objective of the study (2) is not clear, reword please.

R.: The objectives have been rewritten to enhance clarity and comprehension (Line 57-61).

4. "International Potato Center (CIP)" Line 54, and 57. What is the point of having abbreviation?

R.: The abbreviation is only included in the first mention. We think that the abbreviation is important as made a reference to the institution on the genotype's name (Line 66).

5. Line 53, did it mean CIP bred those varieties?

R.: Yes, the genotypes used are part of the advanced breeding population from CIP.

6. It has been ten years since the research undertaken. I do not understand why it took ten years old one year study.

R.: The present study was conducted as part of a thesis, and due to its significance, the institution has recently recommended its publication. Although the results were obtained a few years ago, the experiment was conducted in a greenhouse under controlled conditions using the lysimeter method. It should be noted that this research served as a preliminary assessment for conducting subsequent experiments under field conditions. We includes this information in the limitations section (Lines 282-291).

7. Line 63 need converted amount of fertilizer in area base /ha. In addition, this is not right way to show NPK input ratio. It should be either NPK or N, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O. So what was NPK input???? Application method also should be indicated.

R.: The information was added to the M&M (Line 75-80).

8. Line 72, RCBD?? I am not sure why they chose RCBD nor CRD in greenhouse pot experiment

R.: Since we have six tables in the greenhouse, we opted to use each table as a block in the randomized complete block design (RCBD) arrangement for the experiment.

9. Fig. 1 a,b graph type is somewhat different.

R.: The Fig. 1 was updated with the same space between x-labels and corrected the legend size.

10. Line 134, I do not understand how RCC was calculated.

R.: The sentence has been rewritten for better understanding

11. Line 160, reword "the ones"

R.: The sentence has been rewritten for better understanding.

12. In the text use abbreviation for figure (fig.)

R.: The prefix for Figure was changed across the manuscript to Fig.

13. Line 169, There was~~~ please reword for better understanding.

R.: The sentence has been rewritten for better understanding

14. Figure 2, a, b why only those show as line not bar?

R.: To emphasize the difference between SPAD measurements before and after drought stress, we increased the y-axis to focus on the range of 30 to 70 units. This allowed for easier comparison of the results. To maintain consistency across all subfigures, we decided to use line plots instead of bar plots.

15. Fundamental error of figure 2. It did not show statistical differences with current manner. Where can I read difference?? While there is explanations in Line 172 and after??? Are you comparing genotype? Before and after? Or both??

R.: The figures now include the significance of the comparison between each treatment by genotype. However, due to the high number of genotypes per treatment, visualizing this information becomes challenging. To address this, we have included a supplementary table (Table S1) specifically for the comparison of genotypes within each treatment.

16. Line 186, just curious WUE is L/g not g/L in common way?? So I can know how much water is used to produce 1 gram?

R.: Water use efficiency is typically expressed in different units depending on the context and the specific measurement being used. Grams per liter (g/L): This unit is often used for measuring water use efficiency under laboratory experiments or controlled conditions. Based in the observation, we include the following reference in the M&M for WUE description:

Liu, F., Shahnazari, A., Andersen, M. N., Jacobsen, S.-E., & Jensen, C. R. (2006). Physiological responses of potato (*Solanum tuberosum* L.) to partial root-zone drying: ABA signalling, leaf gas exchange, and water use efficiency. *Journal of Experimental Botany*, 57(14), 3727-3735. <https://doi.org/10.1093/jxb/erl131>

17. Line 234 and after, Yes HI is good indicator for water deficit associated yield loss. That is because to calculate the HI, yield is needed anyway. Index with yield represent yield does not make sense to me. I may misunderstand concept. But so should readers. Please explain how it make sense.

R.: While assessing water use efficiency under field conditions is challenging and not easily estimated, the harvest index (HI) is commonly linked to yield. Nevertheless, the findings of this study illustrate that HI can be a valuable tool for screening genotypes with drought tolerance. Additionally, HI is easily assessable in a large number of genotypes and shows a high level of heritability (Fig 5a, Table S2).