

Summary: The paper details the design and specification of a large-scale simulator facility, its capabilities, and its potential to simulate environmental changes and pollutant impacts on plants. It outlines a promising foundation for future studies on climate change impacts on plant adaptation and pollution effects, creating opportunities for expanded experimentation in a controlled environment.

Major remarks and suggestions:

1. The introduction should explicitly state the primary goal and research gap to help understand the novelty the facility's development brings to the research domain. To help, we suggest including a comparison table to highlight how this system differs from or improves upon similar global facilities, particularly regarding key parameters such as pollutant control, temperature regulation, etc.
2. For better readability, a performance summary table with statistical data for key parameters achieved versus technical specifications (e.g., temperature control, and water exchange) could be included.
3. Could you outline a typical experimental plan (system's performance under various conditions) aimed to test this facility, including the duration of the trial, expected results, desired efficiency and regulations?
4. A discussion on the potential extended scope of testing to include extreme climatic events would be of interest. In a configuration test case like this, which measured parameters are typically used to study long-term plant adaptation under prolonged exposure to simulated climate changes or pollution?
5. Could you be precise on how the regulation system would respond to changes in the root environment, particularly in terms of adapting and handling heat management effectively?
6. Could you be precise on how the system manages pollutants and drainage water in the current large-scale testing facilities?

Minor remarks and suggestions:

1. The title could be made clearer to emphasize the novelty of the AgraSim simulator. If this is the first time AgraSim is being introduced, including terms like “innovation”, “development” or similar would highlight its significance.
2. Ensure *all* figures are properly labelled and are self-explanatory. For example, in Figure 1, labels (a-g) should be clarified in the captions, with brief names included in the figures where possible. In Figures 4 and 9, it would be helpful to explain what the axes represent. Additionally, Figure 6 is not currently referenced in the text and should be done appropriately. Figure 8 is labelled twice—once before Figure 9 and once after. It would be helpful to verify the correct order.
3. For better readability, the Plant Chamber section could be simplified by summarizing key restricted and/or applicable materials in a table format which can include the material names, their corresponding specifications and references.
4. What is the average duration of an experiment?
5. How do you manage the failure of an air conditioning channel?