Response to Reviewer 2 Comments
Manuscript ID: **Agronomy- 4252825**

Title: **The effect of cultivation techniques on the antioxidant properties and phenolic acid content in the tubers of five sweet potato (*Ipomoea batatas* L.) cultivars grown under the climatic and soil conditions of southeastern Poland**

Dear Reviewer 2,

We are very grateful for the insightful review of our manuscript. The comments and suggestions of reviewer 2, which have been incorporated into the text, will greatly enhance its scientific value. The text has been corrected in accordance with the reviewer's comments. The corrections have been marked in blue in the 'track changes' mode, and comments on the corrected version are provided below. We hope that the manuscript in its current form meets the requirements of the journal 'Agronomy'.

Response to the comments that were marked in the manuscript text

Point 1. I miss numerical values. Achieved results in values are the best way to description and for future citation value.

Response 1. We thank Reviewer 2 for this important comment. We have revised the abstract in accordance with the reviewer's suggestion. The corrected abstract is provided below.

,,The study confirmed that cultivation technologies, cultivar, and meteorological conditions significantly influenced the contents of ascorbic acid, total polyphenols, and phenolic acids in sweet potato tubers. Ascorbic acid content ranged from 27.22 to 111.9 mg·100 g^{-1} DW, with the highest values recorded in the traditional cultivation system (TC), reaching 111.9 mg·100 g^{-1} DW in 'Carmen Rubin' and 111.4 mg·100 g^{-1} DW in 'Beauregard'. In contrast, in the 'Satsumo Imo' cultivar grown under nonwoven fabric, ascorbic acid content decreased to 49–58% of the values obtained in TC. Genetic factors strongly differentiated the contents of bioactive compounds. The 'Purple' cultivar showed the highest contents of total polyphenols (up to 963.5 mg·100 g^{-1} DW) and phenolic acids (17067.42 mg·100 g^{-1} DW), whereas the lowest values were recorded in 'Satsumo Imo' (858.82–1225.89 mg·100 g^{-1} DW). Cultivation under polyethylene film increased and stabilized phenolic compounds. The 'Carmen Rubin' cultivar also exhibited high phenolic acid content (5332.04–5447.60 mg·100 g^{-1} DW), while 'Beauregard' was characterized by high stability of this trait (1535.93–1581.46 mg·100 g^{-1} DW). From a practical perspective, the results highlight the importance of appropriate cultivar selection and cultivation technology for obtaining raw material with high functional value. These findings may serve as a basis for developing agrotechnical recommendations aimed at producing sweet potatoes with enhanced nutritional and health-promoting quality under the climatic and soil conditions of Poland.''

Point 2. On what basis or according to what were the fertilizer doses determined? Calculation of nutrients in terms of crop nutrient requirements or another method? It is enough to explain or define in one or two sentences.

Response 2. Thank you for this comment. We have supplemented the text.

,,Fertilizer doses were calculated based on the results of soil analyses carried out by the District Chemical-Agricultural Station in Rzeszów, (Poland) and adjusted to the nutrient requirements of sweet potato, in accordance with standard agronomic recommendations for this crop under temperate climate conditions (Table 3)''.

Point 3. The same recommendation about numerical values of results.

Response 3. We thank Reviewer 2 for this important comment. We have revised the conclusions in accordance with the reviewer's suggestion. The corrected text is provided below:

,,The study confirmed that cultivation technologies, cultivar, and meteorological conditions significantly influenced the contents of ascorbic acid, total polyphenols, and phenolic acids in sweet potato tubers. Ascorbic acid content ranged from 27.22 to 111.9 mg·100 g^{-1} DW, with the highest values recorded under the traditional cultivation system (TC) in 'Carmen Rubin' (111.9 mg·100 g^{-1} DW) and 'Beauregard' (111.4 mg·100 g^{-1} DW). In contrast, in 'Satsumo Imo' grown under nonwoven fabric (FW), ascorbic acid decreased to 49–58% of TC values. Genotypic effects strongly differentiated bioactive compound accumulation. 'Purple' exhibited the highest contents of total polyphenols (up to 963.5 mg·100 g^{-1} DW) and phenolic acids (17067.42 mg·100 g^{-1} DW), whereas the lowest values were recorded in 'Satsumo Imo' (858.82–1225.89 mg·100 g^{-1} DW). Cultivation under polyethylene film (FC) increased and stabilized phenolic compound levels in comparison with TC and FW systems. The highest phenolic responses to FC were observed in 'Purple' and 'Carmen Rubin', while 'Beauregard' showed high stability across all cultivation systems. In contrast, 'Satsumo Imo' exhibited strong sensitivity to environmental variation. Additionally, 'White Triumph' achieved the highest phenolic compound levels under FC, whereas FW increased interannual variability of secondary metabolites. Overall, the results highlight that appropriate cultivar selection combined with FC cultivation is an effective strategy for enhancing the functional quality of sweet potato tubers under temperate climate conditions. These findings may serve as a basis for developing agrotechnical recommendations for producing sweet potatoes with improved nutritional and health-promoting value in Poland.''