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Poster Communication Abstract – 1.46

SELECTION OF SOLANUM TUBEROSUM CULTIVARS IN RESPONSE TO WATER DEFICIT

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Climate changes heavily affect plant growth, posing a critical threat to crop productivity and food security worldwide. Particularly, competition for reduced water resources and the effects of global warming are major constraints for potato production. *Solanum tuberosum* L. is the fourth most important crop in the World after rice, corn, and wheat. Tubers are rich in bioactive molecules, among which, polyphenols represent an important group of health-promoting compounds having antioxidative properties. The accumulation of phenolic compounds, in addition, have indirect beneficial effects on stress tolerance helping plant to cope with oxidative stresses. With the aim to select potato cultivars characterized by improved tolerance to water deficit, we firstly performed a screening based on their polyphenol content both in tuber pulp and skin, then, among them we chose those that are better suited to multiple purposes, and investigated their response to water deprivation following the “drought-rewatering-drought-rewatering” scheme to verify whether, also in potato, the application of such conditions have a priming effect, also known as “stress memory”, resulting in enhanced performances as already observed in soybean and wheat. Potato plants, subjected to the above described stress scheme, were splitted in two subsets, one subset was also treated with a microorganism-based biostimulant mixture twice by irrigation (i.e., at transplant and two days before water withholding). We determined polyphenols content both in pulp and skin of tubers produced from plants grown in all the applied conditions finding a statistically significant increase up to 1.7-fold in

pulp of one of the cultivars treated with the biostimulant mix. These preliminary data suggest that the total phenolic content of tubers is largely genotype-dependent. The assessment of transcriptional changes in all the applied conditions by RNAseq analysis will be carried out to explain the stress-related genes and regulatory cascade activated in terms of enhanced plant performance and accumulation of health-benefiting molecules, thus providing breeding targets for improving potato drought stress-response and tuber nutritional quality.

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