28th Workshop on the Developments in the Italian Ph.D research on Food Science, Technology and Biotechnology
Catania, 18-20 September 2024

Evaluation of Biostimulants on Vegetative and Productive Performances of Strawberry (Malga and Annabelle) Plants Under Hydroponic Conditions

Samreen Nazeer-samreen.nazeer@unipr.it
Department of Food and Drug, University of Parma, Italy
Tutor: Prof. Benedetta Chiancone

Introduction

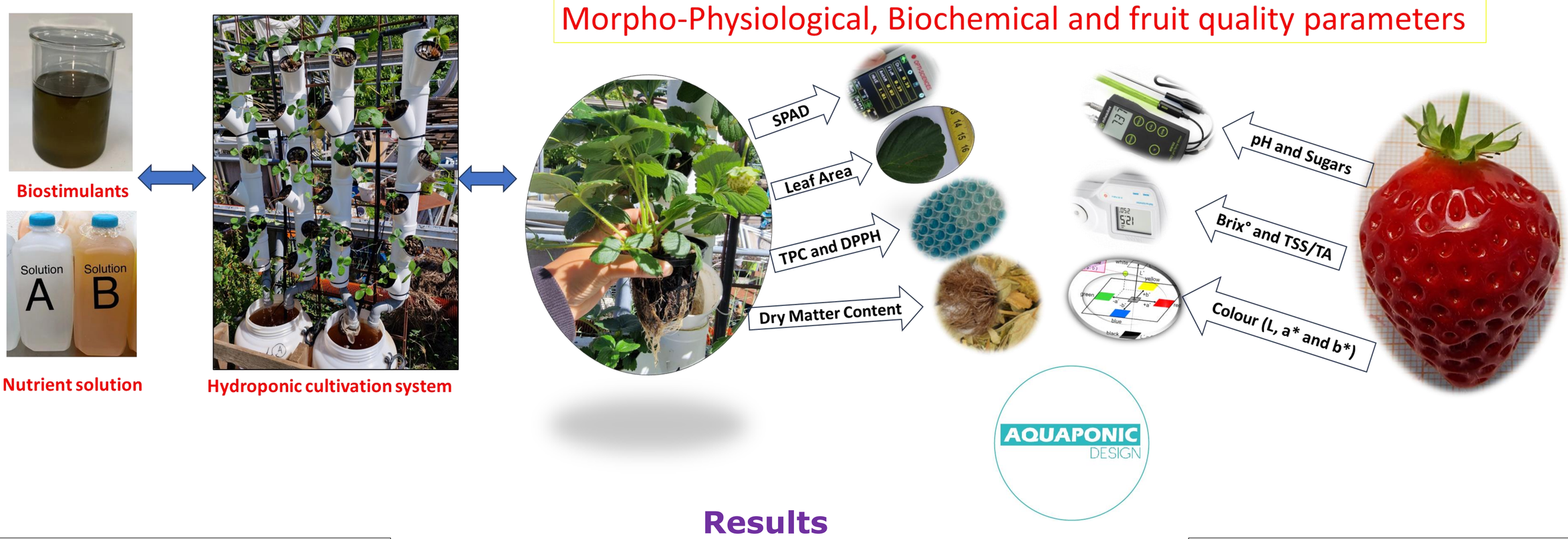
Climate change poses significant threats to traditional agriculture, including strawberry cultivation. Hydroponics, a water-based cultivation method, offers a sustainable alternative by reducing water consumption and optimizing resource use. Biostimulants can enhance plant growth and resilience under changing climatic conditions, making them valuable tools for strawberry production in hydroponic systems (Ranasingha et al., 2024).

Objective

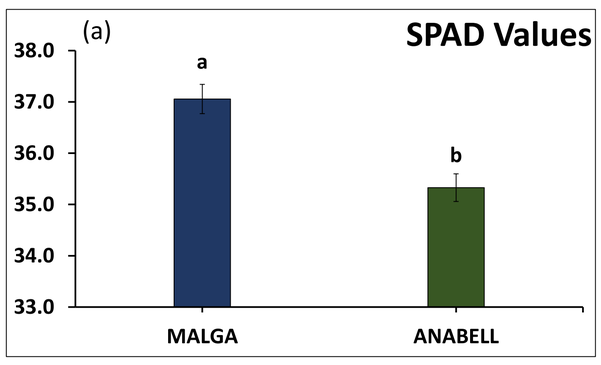
Investigating the role of biostimulants on the vegetative-productive, physio-chemical and fruit quality response of strawberry plants, grown in hydroponic condition.

Materials and Methods

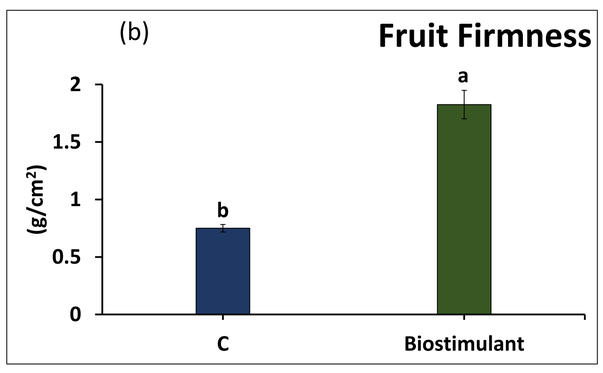
- Two cultivars of strawberry spp., 'Malga' (CV1) and 'Annabelle' (CV2) were studied
- Six plants of each cultivar placed in a Column Hydroponic System (CHS).
- Tank filled with Hoagland solution as control (T1), and combination of Hoagland solution with 100ml of a biostimulants (T2).
- Biostimulants obtained after the fermentation with Lactic bacteria of the kiwifruit waste (FKW).
- Various morpho-physiological, biochemical and quality parameters monitored.
- Two-way ANOVA evaluating the influence of two factors, "Cultivars" and "Treatment".



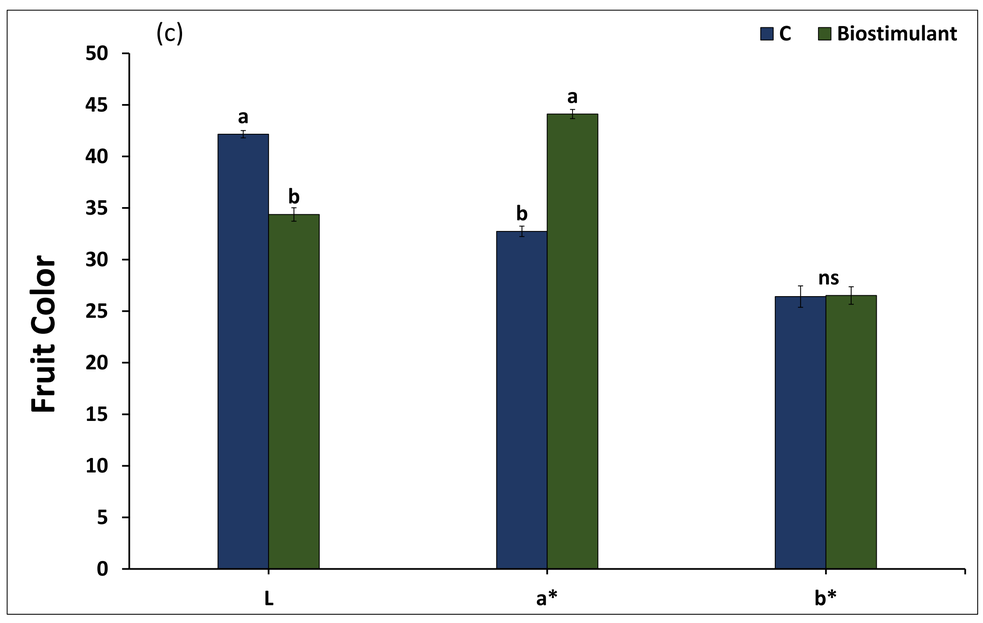
Results



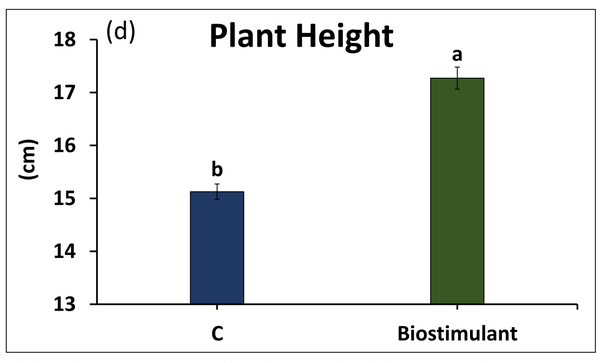
Regardless of growing conditions, cultivars exhibited different SPAD values (Fig. a)



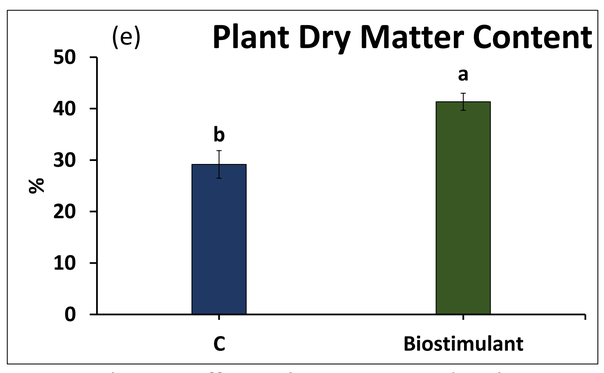
Firmness of fruits was positively influenced by the biostimulant application (Fig. b) reflecting enhanced structural integrity and quality.



Biostimulant application significantly enhanced fruit color intensity (L, a*, b*) compared to the control (Fig. c) by lowering L values indicating more intense color, while higher a* value highlighting more reddish color.



Biostimulant application significantly increased plant height compared to the control (Fig. d)



Biostimulant effectively promoted biomass accumulation (Fig. e), potentially leading to increased yield and improved plant vigor.

Conclusion

In conclusion, plant growth, chlorophyll content and fruit quality of both cultivars (Malga and Annabelle) were positively influenced by biostimulants application. Further investigation is required to deepen the knowledge on biostimulants potential to improve vegeto-productive performances of strawberry plants, grown in hydroponic conditions.

References

Ranasingha, R., Perera, A., Baghalian, K., & Gerofotis, C. (2024). Amino acid-based biostimulants and microbial biostimulants promote the growth, yield and resilience of strawberries in soilless glasshouse cultivation. Journal of Sustainable Agriculture and Environment, 3(3), e12113.