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Climate Change and Olive Culture: The Potential of Biostimulants

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Introduction

Droughts, heatwaves, and floods are becoming more common, posing a threat to agriculture by reducing plant growth and productivity. The Mediterranean region is a hotspot for climate change, and traditional agricultural systems such as olive groves are particularly vulnerable. In the Mediterranean, both traditional and intensive olive cultivation systems coexist. Both systems have different water and agrochemical demands, but global agrochemical and irrigation inputs have increased to achieve high productivity and profitability. Finding sustainable alternatives to maintain high productivity in the face of ongoing climate change is critical if the EU-Farm to Fork strategy and climate neutrality are to be met. Biostimulants are one example of eco-friendly alternatives [1].

Description

These are substances or microorganisms that activate signalling cascades and metabolic processes in plants, increasing yield, quality, and stress tolerance. These advantages include improved growth, nutritional status, and water availability, which reduces the need for irrigation and agrochemicals. The goal of this review is to present various types of biostimulants (e.g., seaweed, protein hydrolysates, humic substances, microorganisms, and nanomaterials), their mode of action, and agricultural benefits. We also investigate the current state of the art in the use of biostimulants in olive culture, as well as their potential benefits in increasing tolerance to biotic challenges [2].

Agriculture is facing unprecedented challenges as a result of rising food demand for the world's growing population, fierce competition for scarce natural resources, and climate change threats. The growing global population puts a strain on arable land, increasing productivity at the expense of increased agrochemical use (e.g., fertilisers and pesticides). Furthermore, climate change, particularly drought and heat waves, are threats to global food security and production, and are expected to become more frequent and intense, resulting in massive socioeconomic and biodiversity losses. Several changes must be implemented in this scenario, beginning with developing more sustainable agricultural practises while minimising resource deterioration. Several targets to adapt to climate change and increase crop yields are included in the European Union's Farm to Fork strategy [3].

Biostimulants are distinct from the synthetic substances commonly used in agriculture to boost crop productivity, such as inorganic nitrogen and phosphorous fertilisers, pesticides, and other agrochemicals. Biostimulants improve plant performance by acting on several molecular and physiological processes. Fertilizers provide plants with nutrients needed for cell growth and metabolism, and pesticides aid in pest and weed control (extermination), but their unbalanced use has a negative impact on various components of the water, air, and soil ecosystems, as well as human health. Biostimulants have a lower environmental impact because the majority of their components are of natural origin. Biostimulants have been reported to be biodegradable, non-polluting, and non-hazardous/non-toxic to a variety of organisms, especially when used at the recommended application rates.

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Conclusion

Agriculture production must change to meet the EU's Farm to Fork agricultural strategy, adapt to climate change, and promote agroecosystem biodiversity. As a result, the search for innovative and sustainable agricultural strategies has increased in recent decades. Under the actual context of climate change, the use of biostimulants, which are natural products, microorganisms, or even nanomaterials, emerges as a sustainable strategy to achieve the goal of developing a more sustainable agricultural production, reducing irrigation water requirements, and agrochemical needs. In comparison to other crops such as grape, the use of biostimulants in olive culture remains very limited. However, the promising results obtained, particularly in the control of some important olive diseases, provide promising prospects for their application to other diseases as well as improving olive performance and productivity under abiotic stress conditions (like drought and heat). These findings also highlight the need for additional research to better exploit the benefits of biostimulants in olive groves as a supplement to other sustainable practises and the valorization of more tolerant cultivars. Finally, the information gained here may be useful in expanding the use of biostimulants to other economically significant crops.

References

1. Obied, Hassan K., Paul D. Prenzler, Danielle Ryan and Maurizio Servili, et al. "Biosynthesis and biotransformations of phenol-conjugated oleosidic secoiridoids from Olea europaea L." *Nat Prod Rep* 25 (2008): 1167-1179.

2. Valente, Simão, Beatriz Machado, Diana CGA Pinto and Conceição Santos, et al. "Modulation of phenolic and lipophilic compounds of olive fruits in response to combined drought and heat." *Food Chem* 329 (2020): 127191.

3. Guerrero-Casado, José, Antonio J. Carpio, Francisco S. Tortosa and Anastasio J. Villanueva et al. "Environmental challenges of intensive woody crops: The case of super high-density olive groves." *Sci Total Environ* 798 (2021): 149212.

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4. Petridis, Antonios, Ioannis Therios, Georgios Samouris and Stefanos Koundouras, et al. "Effect of water deficit on leaf phenolic composition, gas exchange, oxidative damage and antioxidant activity of four Greek olive cultivars." *Plant Physiol Biochem* 60 (2012): 1-11.

5. Fernández-Lobato, L., R. García-Ruiz, F. Jurado and D. Vera. "Life cycle assessment, C footprint and carbon balance of virgin olive oils production from traditional and intensive olive groves in southern Spain." *J Environ Manage* 293 (2021): 112951.

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