"Influence of Mulches on Ericoid Mycorrhizal Colonization in Blueberry Roots: Field Trials in Fataca, Portugal (2024–2025)"

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ABSTRACT

Background: Berries have gained popularity over the last decade among consumers, especially the blueberry. Blueberries belongs to the Ericaceae family, prized for their sweet edible fruits, rich in vitamin C, minerals, and a number of antioxidants. Ericoid mycorrhizal fungi (ErMF) play a crucial role in the nutrition and growth of blueberry (*Vaccinium virgatum* Aston cv. Centra Blue.), particularly under field conditions. Understanding how mulches influence ErMF colonization can help optimize sustainable blueberry cultivation in Mediterranean environments.

Methods: This study investigated how five different mulches affected ErMF colonization in blueberry roots in a field experiment conducted in Fataca, Odemira (Southern Portugal), over two consecutive years (2024–2025). The treatments included: **A:** pine bark (control); **B:** Kraft® cellulose biofilm (0.80 m width, beige, COTESI); **C:** geotextile fabric, a polypropylene (PP) derived material (1.60 m width, black, 50×70,97 g m^{-2}); **D:** polyethylene (PE) plastic film (1.50 m width, black, 40 µm thick); **E:** KRITIFIL® biofilm (PBAT- Poly(butylene adipate-co-terephthalate)-based material, 0.80 m width, black, 14 µm thick). Root samples were collected annually and analyzed to quantify ericoid mycorrhizal colonization.

Results: Overall, ErMF percentual colonization increased in 2025 compared to 2024 in all treatments, reflecting a progressive establishment over time. Among treatments, B and E exhibited the most pronounced increases in colonization, with +4.91% and +8.38%, respectively, compared to the control (A).

Conclusions: Soil cover type influences ericoid mycorrhizal colonization in blueberry roots. Specific mulching materials, such as Kraft® cellulose and KRITIFIL® biofilms can enhance symbiotic interactions and support sustainable cultivation practices in Mediterranean environments, while also offering the advantage of being biodegradable in soil.

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