From Waste to Bio-based Nanoparticles for the management of *Phytophthora* diseases of citrus

PROGRAM: Horizon Europe

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Proposal acronym: WaBioNaPhy

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ABSTRACT

In the Mediterranean areas, citrus is an important agricultural crop, with an annual production of about 10 million tons. Citrus production is seriously threatened by *Phytophthora* diseases. Chemical treatments are widely used to control these diseases. However, due to their negative impacts on the environment, human health, and the development of resistant strains, there is an urgent need for biological alternatives.

WaBioNaPhy aims to formulate new biofungicides (Bio-AlgNPs) by combining agricultural waste, nanotechnology, essential oils (EOs), and fungal metabolites to protect citrus crops from *Phytophthora* spp. In the current project, agricultural waste biomass will be used as a resource for EO extraction. Different extraction methods will be optimized to enhance EO yield and chemical composition.

WaBioNaPhy is expected to have significant scientific, economic, and social impacts. The proposal aligns with European policies aimed at reducing net greenhouse gas emissions by at least 55% by 2030. It will contribute to citizen well-being and health by supporting the production of healthy food and sustainable soil management, in line with the goals of the European Green Deal.

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