

Innovative natural bioprotectors for safe postharvest fruit preservation

ECUADOR, CHILE, COLOMBIA



Webstory



Technological solution

This innovation mitigates postharvest losses caused by fungal and microbial attacks that compromise the quality of fresh fruits. Through the application of natural bioprotectors, the incidence and severity of critical pathogens, such as *Botrytis* sp., are significantly reduced, minimizing dependence on synthetic fungicides. The metabolites and bioactive compounds act by inducing natural defense mechanisms in the fruit and limiting microbial proliferation, thereby extending shelf life. As a result, the technology reduces economic losses and food safety risks, offering a sustainable alternative that meets the growing international market demand for foods free of chemical residues.



Technological description

Technology based on the development of multifunctional bioprotectors formulated from secondary metabolites produced by beneficial microorganisms and bioactive compounds of natural origin. These agents possess antifungal, antibacterial, and antioxidant properties and are designed for application on fresh fruits through simple and scalable processes such as immersion or spraying. The solution is fully compatible with existing agro-industrial operations, enabling the replacement or complementary use of conventional synthetic preservatives. Its design facilitates integration into horticultural value chains, ensuring food safety while preserving commercial quality without altering the sensory or nutritional properties of the product.



Impacts and results

Experimental trials conducted in Ecuador (UTN), Chile (UT), and Colombia (UdeA) demonstrate that these bioprotectors significantly reduce microbial load and infection severity under both room temperature and refrigerated storage conditions. Results show an extension of shelf life, reduced biomass loss, and maintenance of commercial attributes such as color, firmness, and soluble solids. No adverse effects were observed on nutritional parameters (e.g., vitamin C); in some cases, an increase in the fruit's antioxidant capacity was detected. These findings confirm the scientific and technical viability of the solution, reduce scaling risks, and support its strong potential for transfer to the regional productive sector.



+ 8

Multifunctional bioprotectors produced



~ 50 %

BM increased microbiological safety



+ 4

Workshops



700 personas

Producers trained



2 unidad

Chemical profiles



+ 20 %

Antioxidant capacity in fruit crops



+ 1

persona

Graduated students



+ 2

Scientific publications generated.

