FONTAGROTECH

Advanced lines of subtropical Cavendish banana and an agroecological management package based on biologicals

ARGENTINA, BOLIVIA, COLOMBIA, ECUADOR, HONDURAS, PARAGUAY, PERU



Webstory

Technological solution

The constraint has three faces. Subtropical production lacks uniformity and volume, so its fruit sells below imported produce despite an advantage in flavor and in proximity to consumption centers. Continuous agrochemical use has degraded soil microbiology, with consequences for root growth, nutrient uptake, and rainfall infiltration. Above all there is disease risk: no Cavendish-type material is resistant to Fusarium wilt tropical race 4, whose only available control today is exclusion and eradication. The advanced lines address the first face: uniform material, multiplied in vitro, selected for yield and commercial quality. The management package addresses the second, restoring microbial activity in the soil and cutting applications. Screening in high disease pressure environments addresses the third, measuring how those same clones behave against the highest-risk pathogens before those pathogens reach subtropical growing areas.

Technological description

The technology combines two elements. The first is twelve advanced lines of Cavendish banana adapted to the subtropics, selected over more than two decades on criteria of resilience, yield, hand shape, and disease resistance, and already entered in Argentina's national cultivar register. Their identity is fixed through genomic and transcriptomic sequencing and through sequence-specific primers that allow rapid, low-cost detection of spontaneous variants arising in the field or in in vitro culture. The second element is a management package for the agroecological transition: root growth promoting microorganisms (Pseudomonas spp., Azospirillum spp., and Trichoderma spp.), preventive control of yellow Sigatoka with Bacillus amyloliquefaciens, and spraying decisions guided by biological forewarning systems. The reference sector is banana production for export and domestic markets in subtropical environments.

Impacts and results

The project expects to identify the best performing clones for each environment and establish genotype by environment interactions from thirteen comparative yield trials run under a common protocol in Argentina, Bolivia, and Paraguay, complemented by growth-room resistance screening in Colombia against Fusarium, Ralstonia, and Sigatoka. In parallel, the twelve lines will be grown in unsprayed strips to record their behavior against yellow Sigatoka and cigar-end rot. The project also expects to validate an agroecological transition production model across environments, verified through soil sampling in year one and year four, and to assess external and internal fruit quality between months 24 and 36, with tasting panels. The team's ex ante estimate places the benefit at a yield increase from 800 to 1,100 boxes per hectare per year and a price improvement from 16 to 23 dollars per box.

+ 300
Expected commercial yield increase (boxes)

+ 7 US$
Expected price improvement per box

13
Comparative yield trials expected

18
Expected technical-scientific personnel trained

3700
Expected direct beneficiaries

12
Advanced lines to be sequenced, identified, and field-evaluated

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