FrontAg Nexus

Practice Abstract

Sustainable Pitaya Cultivation: Water-Smart Practices for Arid Regions

Problem/Challenge

Cultivating high-value fruits like pitaya in water-scarce Mediterranean regions demands innovative, resource-efficient methods for sustainability and profitability. Traditional farming often leads to high water consumption and soil degradation, hindering sustainable food production within the water-energy-food-ecosystem (WEFE) Nexus.

Our Solution/Key Finding

The FrontAg Nexus project showcases ElBosten Phytagri's adapted pitaya cultivation under greenhouse cover, highlighting customized, low-input irrigation and fertilization practices. This approach optimizes water and nutrient delivery, efficiently utilizing the plant's shallow root system for quality production.

Benefits & Impact

Localized micro-irrigation and minimal, targeted fertilization significantly improve water efficiency, prevent flower/fruit drop, and ensure high-quality fruit with reduced inputs. This enhances resilience, lowers environmental footprint, and directly contributes to water and food security within the WEFE Nexus.

Applicability Box

Theme: Water-Efficient Horticulture, Sustainable Fruit Production, Greenhouse Cultivation

Keywords: Pitaya, Micro-irrigation, Low-Input Farming, Greenhouse, Water Efficiency, Arid

Context: Arid and semi-arid regions, commercial fruit farms, protected cultivation, small to medium-scale operations.

Required Resources: Greenhouse, micro-irrigation, manual labour for weeding/pruning, and plant-specific technical knowledge.

Scalability: Highly applicable from small-scale pilot projects to larger commercial greenhouse facilities.

Risk Management/Considerations: Requires careful monitoring of irrigation to match plant phenology; potential for initial investment in greenhouse infrastructure.

Practical Recommendations

- Implement micro-irrigation, especially during summer, to support flowering and fruit development while avoiding foliage wetting.
- Apply minimal, targeted fertilization to align with pitaya's shallow root system, preventing nutrient overload.
- Prioritize manual weeding, mulching with crop residues, and cover cropping to avoid chemical herbicides.

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About this practice abstract

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FrontAg Nexus: The project was launched in May 2023 to promote sustainable agri-food practices by applying the Water-Energy-Food-Ecosystems (WEFE) Nexus approach. Focusing on six Mediterranean countries—Israel, Italy, Morocco, Tunisia, Turkey, and Jordan—the project addresses climate change, resource scarcity, and food insecurity through collaborative research and innovation.

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