

PROJECT INFORMATION

Strengthening Quality Planting Material Supply in Fruit Crops through High-Tech Tissue Culture Hub for Sustainable Livelihoods and Prosperity of Goan Farmers

PROJECT OVERVIEW

Funding Agency	PM-RKVY, Government of Goa
Total Outlay	586 Lakhs
Duration	3 years
Single / Multi-Institutional	Single
Principal Investigator	Dr. Theivanai M (Fruit Science)
Co-Investigators	Dr. Akula Chinapolaiah (Sr. Scientist), Dr. Vinod Ananda Ubarhande (ACTO)

RATIONALE

The horticulture sector in Goa has shown significant potential and is gaining momentum due to higher economic returns, lower production risks, and its suitability for part-time farming activities. Cultivation of high-value fruit crops has been increasingly adopted by farmers, driven by strong market demand and assured government procurement. Despite rising demand, the Goan banana industry is constrained by a lack of quality planting material. Conventional planting material is also associated with a higher risk of transmitting devastating fungal, bacterial, and viral diseases, in addition to problems of non-uniform flowering and variable crop maturity, leading to inconsistent yields and reduced market value. Tissue culture-based propagation offers a viable and sustainable solution to these constraints by providing disease-free, genetically uniform planting material with synchronized growth and flowering.

RESEARCH GAPS

Establishing a robust tissue culture-based planting material production system is crucial to meet the growing demand for high-quality planting material of banana and pineapple in Goa. Such an initiative will significantly reduce dependency on external sources, minimize disease risks, and support the state's horticultural development.

OBJECTIVES

- To establish a well-equipped High-Tech tissue culture lab and primary hardening facilities for the production of quality planting material in fruit crops.
- To establish and maintain a disease-free foundation mother block for fruit crops.
- To establish a decentralized network of secondary hardening units managed by Self-Help Groups (SHGs), rural youths, and women farmers for localized acclimatization, distribution, and entrepreneurship development.
- To provide training and create awareness among the farmers, rural youths, SHGs and NGOs on tissue culture-based quality planting material production in fruit crops.

ACTIVITIES

Objective 1

- Site selection
- Design, layout and construction of Tissue culture laboratory infrastructure
- Procurement and installation of specialized equipment
- Creation of primary hardening facility

Objective 2

- Selection and indexing of elite, disease-free mother plants of priority fruit crops.
- Establishment of nucleus and foundation mother blocks under protected conditions.
- Implementation of strict biosecurity and phytosanitary measures
- Nutrient management of mother plants
- Periodic disease surveillance and indexing
- Maintenance of traceability and documentation

Objective 3:

- Identification and mobilization of interested SHGs, rural youths, and women farmers.
- Selection of suitable locations for secondary hardening units based on accessibility and farmer demand.
- Development of secondary hardening structures such as shade net houses and poly tunnels, etc.
- Supply of primary hardened plantlets from the central facility to decentralized units.
- Training of beneficiaries in acclimatization practices, nursery management.
- Establishment of linkages between the central tissue culture lab and secondary hardening units for quality control and scheduling.
- Promotion of entrepreneurship models, buy-back arrangements, and market linkage support.
- Certification of quality planting material produced through the network.

Objective 4:

- Preparation of training modules and manuals on tissue culture technology, nursery

management, and quality planting material production.

- Organization of hands-on training programmes for farmers, SHGs, rural youth, NGOs, and extension personnel.
- Conduct of exposure visits to successful tissue culture labs and commercial nurseries.
- Awareness programmes on benefits of tissue-culture-derived planting material, disease-free plants, and productivity enhancement.
- Demonstrations on field performance of tissue culture plants compared to conventional planting material.
- Continuous handholding and technical backstopping to trained beneficiaries.

EXPERIMENTAL DETAILS

Treatment:	Local banana and pineapple cultivars will be tested for its in vitro propagation ability.
Fertilizer Doses	Various basal media, growth regulator combinations will be tested for its stage specific multiplication during micropropagation.
Variety	<i>Myndoli, Saldati, Velchi</i> and local pineapple types.
Replications:	3
Observations:	Parameters related to culture initiation, multiplication, proliferation, rooting and hardening will be tested.
GPS Coordinates:	Latitude: 15.49" N; Longitude : 73.92" E

EXPECTED OUTPUT

- Establishment of centralized High-Tech Tissue culture hub for the state of Goa.
- Establishment of centralized primary hardening facility and decentralized secondary hardening facility.
- Establishment of foundation mother block fruit crops.
- Assured quality planting material supply for fruit crops.
- Development of Standard Operating Procedures (SOP) for production of quality planting material.
- Capacity building and skill development, entrepreneurship in women farmers and rural youths.

EXPECTED OUTCOME

- Enhanced availability of Quality Planting Material in fruit crops.
 - Production and supply of disease-free, true-to-type banana and pineapple planting material to meet local demand.
 - Reduced dependency on external sources for planting material.
- Increased productivity and horticultural sustainability.
 - Uniform crop growth, flowering, and yield due to high-quality tissue culture plants.
 - Higher productivity and better-quality fruits leading to improved farmer income.

- Employment generation and livelihood enhancement.
 - Engagement of women farmers, rural youth, and SHGs in tissue culture and nursery operations.
 - Creation of self-employment and entrepreneurial opportunities in decentralized hardening and distribution units.
- Capacity building and skill development.
 - Enhanced technical skills of farmers, youth, and women in modern horticultural practices.
 - Increased awareness of the benefits of tissue culture technology and modern nursery management.
- Contribution to state and national objectives.
 - Support for Swayampurna Goa and Viksit Goa 2047 by strengthening horticultural self-reliance.
 - Promotion of sustainable, inclusive, and high-value horticulture in the reg.

FIELD INFORMATION

When the field was developed:	2026
What are crops being cultivated season-wise:	NA
Soil type:	NA
Soil pH, EC, OC:	NA
Soil depth:	NA
Soil NPK and Micronutrient status:	NA
Common pests and diseases:	NA