

# **Establishment of Tissue Culture Based Mass Propagation Facility of Banana and Plantains**

## **Background and Objectives**

Plantains and bananas are the major members of the *Musa* spp. being cultivated in many parts of the tropical and subtropical parts of the world as food crops and considered to be important source of carbohydrate for millions of people. These are also an important source of rural income, particularly in some locations where small holders produce them in compound or home gardens. India is the major producer of banana followed by China, Philippines and Ecuador. Again in India the southern states are the major producers. Currently, more than thousands varieties are available for different purposes around the world. Among these are the culinary types, the plantains used for vegetable purpose, whereas, the table types are being used directly as fruits. Among the table types, Grand Naine is the major variety cultivated in many parts of the world.. In Odisha, the Patakapura variety is highly prized for its size and pleasant flavor, taste and quality. However, the Champa variety is preferred for its wider range of adaptability and is suitable for handling and transport. Other local varieties are Rasthali, Amrit Sagar and Giant Governor etc. However, currently Grand Naine and Gaja Bantal are being cultivated in large scale in the state.

For the cultivation of banana and plantains, supply of quality planting material is highly essential. Since last 23 years, Regional Plant Resource Centre has developed the protocols for the mass propagation using tissue culture techniques of number of banana and plantains and supplying quality planting materials to support the farmers of the state. The production system has changed the economic condition of many of the farmers of the state. In the production of the planting material system the following three criteria need to be taken in to consideration.

1. The planting materials need to be produced using tissue from a healthy mother plants.
2. All the tissue culture raised plants need to be genetically identical to the mother.
3. All of them need to be free of any diseases.

In this direction, the project has been designed with an objective of developing facilities for producing 5 lakhs of quality plantlets of banana and plantains using tissue culture techniques.

## **Intervention**

Keeping in mind of the above objective, the following facilities have been developed for the production of quality planting materials. This is according to the guidelines of the National Certification System for Tissue Culture Raised Plants.

### **List of facilities developed**

- a) Tissue culture production centre
- b) Insect proof mother block
- c) Secondary hardening chamber
- d) Bottle washing station

## Outcome

- One insect proof **Mother Block** has been developed in which 200 different varieties of banana and plantains will be grown. All the plants will be grown providing recommended fertilisers and will be free of diseases. With an expectation that each will produce 5 no of suckers, in a year 1000 suckers will be produced. These will be used for tissue culture purpose.
- The production centre is known as the **Modern Tissue Culture Lab** equipped with all modern equipments and designed according to the National Tissue Culture Certification System. The facility do have defined sterile and non-sterile zone and equipped with highly efficient growth rooms, media preparations room, media storage room, inoculation room etc.
- The **Secondary Hardening Chamber** is constructed to store about 1 lakh plants. These facilities do have double door entry, raised beds etc. The plantlets coming from the primary hardening chamber will be grown here for three months for proper growth and development before supplying to the farmer.
- The **Bottle Washing Station** is constructed out-side of the production centre. Adequate sinks, water facility and storage space are available in the facility. In the facility 2000 bottles could be washed each day.



Fig. 1 Different sections of the banana plantlet production facility.

- a) Tissue culture production centre
- b) Bottle washing station
- c) Insect proof mother block
- d) Secondary hardening chamber
- e) Bottle washing station