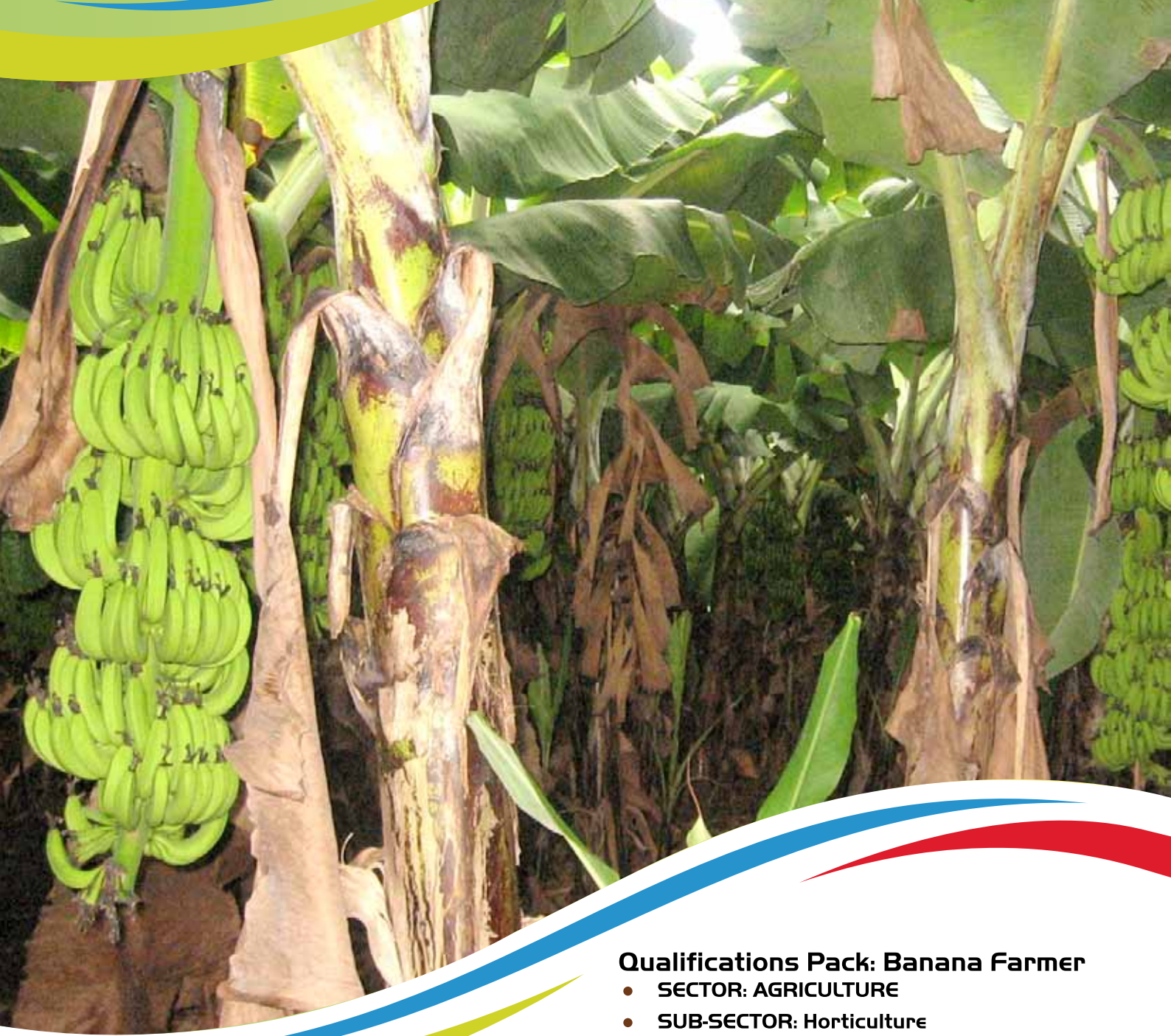


Participant Handbook

Banana Farmer



Qualifications Pack: Banana Farmer

- SECTOR: AGRICULTURE
- SUB-SECTOR: Horticulture
- OCCUPATION: Horticulture Crops Cultivation
- REFERENCE ID: AGR / Q 0201

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Module 2: Planting Material Preparation in Banana Cultivation

Session	
1	Agro-climatic Conditions
2	Characteristics of Cultivars
3	Identification of appropriate Planting material
4	Procurement of Planting Material
5	Treatment of Planting Material

Agro-climatic Conditions



After completing this session the participants will be able to:

- ◆ state the climatic and soil conditions required for banana cultivation.

Session Plan

1	Climatic Conditions
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Climatic conditions

The climatic conditions for banana cultivation are:

- ◆ Most Suitable temperature for banana is 24-28°C.
- ◆ Optimum growth at 27°C.
- ◆ Humidity : 75 – 80%.
- ◆ Average rainfall of Jalgaon: 805mm
- ◆ Grown in Maharashtra: Ahmednagar, Dhule, Nanded, Parbhani regions of the state.
- ◆ Banana hubs in Jalgaon district: Raver, Bhusaval, Jalgaon, Chalisgaon and Chopda.

The Soil conditions for banana cultivation are:

- ◆ Soil : Loamy soils with a pH range of 6.50 to 7.50 are most suited.
- ◆ Soils which are not too acidic or alkaline are desirable for banana cultivation.
- ◆ Water stagnation in the field damages the banana crop.
- ◆ Loamy soils having good drainage, adequate fertility and moisture are good for banana growing.
- ◆ Saline sodic (high concentration of sodium) and calcareous (high concentration of calcium carbonate) soils are not good.

Characteristics of Cultivars



After completing this session the participants will be able to:

- ◆ select the variety based on the characteristics of cultivars;
- ◆ list the varieties that are suitable to the zone of cultivation.

Session Plan

1

Characteristics of Cultivators



Cultural Practices to Control Diseases and Pest Incidence

The Characteristics of Cultivators is discussed in the given table:

Variety	Characteristics	Duration (months)	Yield (t/ha)	Soil Suitability	Resistance and/ Susceptibility	
					Pests and Diseases	Climatic Conditions
Grand Naine	Imported Commercial variety from Israel. Medium height. Good quality bunches having well spaced hands with straight orientation of fingers, bigger in size. Fruit develops attractive uniform yellow colour with better self life and quality than other cultivars. 8-10 hand and 200-220 fruits per bunch. The length of the fruit is 15-21 cm and girth is 12-13 cm.	11	70-75	Loamy soils having good drainage, adequate fertility and moisture	Susceptible to Sigatoka leaf spot disease when grown in humid tropics	Tolerant to biotic stress
Basrai	Very popular variety. Dwarf statured. Used for table and processing purpose. Bunch size, fruit length and size is good. Keeping quality is poor. The average bunch has 6-7 hands and with about 13 fruits per hand. The thick rind of the fruits retains to some extent the greenish colour even when the fruits are ripe.	14	45-50	Performs well drained fertile soils	No resistance to diseases and pests	Suitable for semi arid eco regions

Variety	Characteristics	Duration (months)	Yield (t/ha)	Soil Suitability	Resistance and/ Susceptibility	
					Pests and Diseases	Climatic Conditions
Sreemanthy and Mahalaxmi	These two varieties are also preferred by the local farmers. Almost having the similar characteristics like Robusta. Better self life and market potential	17 months	65-70	Loamy soils having good drainage, adequate fertility and moisture	No resistance to diseases and pests	Suitable for semi arid eco regions
Nendran	There is considerable diversity in plant stature. Bunch has 5-6 hands weighing about 6-12 kg. Fruits have a distinct neck with thick green skin turning buff yellow on ripening. Fruits remain starchy even on ripening.	16	55-60		No resistance to diseases and pests	uitable for semi arid eco regions

Identification of Appropriate Planting Material



After completing this session the participants will be able to:

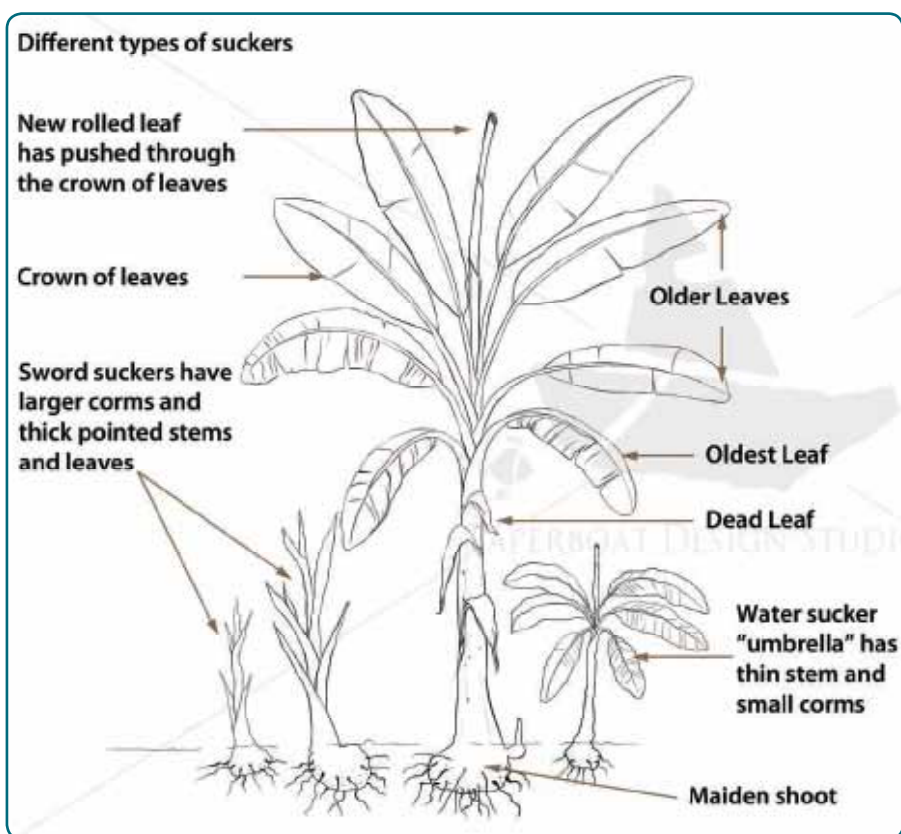
- ◆ state the types of planting materials;
- ◆ identify the appropriate planting material for various banana varieties.

Session Plan

1	Types of Planting Material
2	Varieties and their Appropriate Planting Material



Types of Planting Material



There are three types of planting material:

- i. **Suckers:** Shoots growing from the rhizome of banana plants which then grow into new plants.
 - ◆ Ideally suckers should come from a healthy, pest and disease free plantation.
- ii. **Corm pieces:** Portions of the banana plant cut from the rhizome (corm) of the plant and with a bud attached.

- ◆ More planting material from fewer suckers.
 - ◆ Easy to transport.
 - ◆ Easy to treat for pests and diseases.
 - ◆ Corm pieces should come from a healthy, pest and disease free plantation relatively clean planting material.
- iii. **Tissue culture plants:** Banana planting material grown in a clean environment in the laboratory. These planting material are small plant pieces from mother plant.



Varieties and their appropriate plant material

Variety	Appropriate Planting Material
Grand Naine (G-9)	Tissue culture raised properly hardened secondary seedlings.
Dwarf Cavendish, Robusta, Basarai	Suckers as well as tissue culture
Nedran	Suckers as well as tissue culture
Mahalaxmi and Shri Manthey	Suckers and tissue culture

Procurement of Planting Material



After completing this session the participants will be able to:

- ◆ identify various suppliers for quality planting material;
- ◆ plan and procure planting material;
- ◆ identify appropriate storage space to store planting material;
- ◆ identify the appropriate time for procuring planting material.

Session Plan

1	Selection of supplier
2	Obtaining planting material from mother plant
3	Time of procurement and storage



Selection of Supplier

The sucker/corm supplier should meet the following requirements.

- ◆ Suckers/corms from true to type mother plant.
- ◆ Mother plant should come from diseases and nematode free clean fields.
- ◆ Trust worthy, cost effective with quality planting material

Tissue culture plants can be obtained from the following suppliers:

- ◆ Regional Research Station, Mahatma Phule Krishi Vidyapeeth, Neemkheda Road, Jalgaon, Maharashtra,
- ◆ Tissue Culture & Agricultural Services, Jain Irrigation Systems Ltd., Jain Plastic Park, N.H.No.6, Bansbari, P.O. Box-72, Jalgaon-425001, Maharashtra,
- ◆ Mahabanana, Krishi Utpanna Bazar Samittee, Jalgaon-425003, Maharashtra.



Obtaining Planting Material from Mother Plant

a. Suckers

- ◆ Sword suckers (1.8–2.1 m high and ~4.5 cm in girth) are preferred, partly because
- ◆ they are less infested with nematodes and banana weevils than larger planting material.
- ◆ Sucker preparation should be done far from the new field.
- ◆ Remove all leaves, roots and all parts of the rhizome that appear diseased (tunnels indicating banana weevils, reddish lesions at base indicating nematodes).
- ◆ The oldest leaf sheaths should also be removed as they may house banana weevil eggs or adults.
- ◆ A slanting cut is made to remove the top part (slanting prevents water from collecting on top,

causing rotting).

- ◆ Plant suckers within a week after uprooting.

b. Corm:

- ◆ Separate the corm from the stem of the plant. Cut off the outer layers of the corm, about 3 cm deep, to reduce nematode populations.
- ◆ Remove damaged parts and wash the corm with clean water.
- ◆ Cut up the corm into 4–7 pieces depending on corm size and number of buds.
- ◆ Every piece should contain a visible, healthy bud.
- ◆ Treat corm pieces with recommended insecticides before planting

c. Tissue culture plants:

No major preparation is needed of tissue culture plants if they have been kept in a clean environment prior to planting. However, if the plants are seen to have pest infested leaves or leaves in a bad condition, these should be cut off prior to planting.

◆ **Primary nursery plantlets**

Tissue culture banana plantlets available in net pots to an approximate height of 12 cm. with three to four leaves. The plantlets are packed in open cartons or closed boxes and transported in pick-up-vans or trucks. These plantlets grown in Secondary Nursery for 8-12 weeks prior to planting in the main field.

◆ **Secondary nursery plantlets**

The Tissue culture Banana plantlets also available in poly bags to an height of 30 to 40 cm with 6 - 8 leaves from the Commercial Laboratories' secondary nursery. These plants are ready for field planting.



Time of Procurement and Storage

- ◆ The planting of banana is done twice in the year i.e. Kharif (June- July) and Rabi (October-November) seasons.
- ◆ Keep the field ready for planting while procuring planting material.
- ◆ Procure planting material depending on the field conditions, so that planting is done with a minimum gap between procurement and planting.
- ◆ Store the planting material in clean condition ensuring no chances of infection of pathogens and pests if there is a time lag between procurement and planting.
- ◆ Treat the planting material with fungicides/pesticides before transplanting in the field.

Labour requirement

- ◆ The actual labour cost will vary from location to location depending on minimum wage levels or prevailing wage levels for skilled and unskilled labour.
- ◆ The use of ergonomically suitable tools and equipments is desirable for efficient planting.

Treatment of Planting Material



After completing this session the participants will be able to:

- ◆ treat planting material as per dosage recommended.

Session Plan

1	Recommended treatment for Diseases and Pests of Planting Material
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Recommended treatment for Diseases and Pests of Planting Material

Diseases of Planting Material

Rotting of suckers, Weevil and nematodes are the major problems of planting material.

Treatment Recommended

- ◆ Treat suckers with Monocrotophos(0.50%) and Bavistin (0.1%) before planting to control the weevil.
- ◆ Application of 2-3gm carbofuran per plant in secondary hardening stage can protect nematode infestation.
- ◆ Neem cake would also ensure vigour and health of the plants.
- ◆ Dip suckers in a solution of aurofugine (10g/100 litres water) or Captafol (200 g/100 litres water) or Carbendazin (100 g/ 100 litres water) for 1.5 hours prior to planting, to prevent fungal diseases.

Session Plan

Program Name	Banana Farmer		
Name of Client	NSDC		
Version No.	1.0	Version Update Date	
Pre-requisites to Training	◆	One year experience in banana cultivation	
	◆	No Entry level barrier; 5th standard appear or pass preferable	
Training Outcomes	After completing this program, participants will be able to cultivate banana crop on a given piece of land which involves procurement of seed material from the market to the sale of farm produce in the market.		

Sr. No.	Module	Session	Objectives	Methodology	Tools	Duration
1	Evaluation	Pre-training Assessment	<ul style="list-style-type: none"> Assess the current knowledge of the participant on tractor and its operations 	<ul style="list-style-type: none"> Theory Test 	<ul style="list-style-type: none"> Trainer's Guide Assessment Guide 	1 hour
2	Ice Breaker	Ice Breaker	<ul style="list-style-type: none"> Get introduced to one another to build rapport with their fellow participants and the trainer. 	<ul style="list-style-type: none"> Group Participation Activity 	<ul style="list-style-type: none"> Game 	1 hour 30 minutes
3	Introduction to Banana Crop	Introduction to Banana Crop	<ul style="list-style-type: none"> State the origin and distribution of banana crop; List the nutritional value of banana. 	<ul style="list-style-type: none"> Trainer-led Discussion 	<ul style="list-style-type: none"> Trainer's Guide Participant Handbook 	2 hour
4	Planting Material Preparation in Banana Cultivation	Agro-climatic Conditions	<ul style="list-style-type: none"> State the climatic and soil conditions required for banana cultivation. 	<ul style="list-style-type: none"> Trainer-led Discussion 	<ul style="list-style-type: none"> Trainer's Guide Participant Handbook 	2 hours 30 minutes
5	Planting Material Preparation in Banana Cultivation	Characteristics of Cultivars	<ul style="list-style-type: none"> Select the variety based on the characteristics of cultivars; List the varieties that are suitable to the zone of cultivation. 	<ul style="list-style-type: none"> Trainer-led Discussion 	<ul style="list-style-type: none"> Trainer's Guide Participant Handbook 	2 hours 30 minutes

Sr. No.	Module	Session	Objectives	Methodology	Tools	Duration
48	Professional Skills	Case Study	<ul style="list-style-type: none"> ◆ Make decisions pertaining to the concerned area of work; ◆ Plan and organise banana plantation; ◆ Work with banana experts; ◆ Evaluate possible solutions for problems with cultivation and marketing. 	<ul style="list-style-type: none"> ◆ Group Discussion ◆ Presentation 	<ul style="list-style-type: none"> ◆ Trainer's Guide 	10 hours
49	Revision	Revision/ Self Learning	<ul style="list-style-type: none"> ◆ To revise the learning acquired through the training. 	<ul style="list-style-type: none"> ◆ Trainer-led Discussion ◆ Question Answer Session 	<ul style="list-style-type: none"> ◆ Trainer's Guide 	6 hours
50	Revision	Practice	<ul style="list-style-type: none"> ◆ To revise the skills acquired through the training. 	<ul style="list-style-type: none"> ◆ Practice 	<ul style="list-style-type: none"> ◆ Trainer's Guide ◆ Required Tools and Equipments 	10 hours
51	Evaluation	Assessment-2	<ul style="list-style-type: none"> ◆ Assess the knowledge and skills acquired by the participants from the training programme. 	<ul style="list-style-type: none"> ◆ Theory Test ◆ Practical Test ◆ Viva 	<ul style="list-style-type: none"> ◆ Trainer's Guide ◆ Assessment Guide ◆ Required Tools and Equipments ◆ Tractor 	6 hours
52	Evaluation	<ul style="list-style-type: none"> ◆ Post Training Assessment 	<ul style="list-style-type: none"> ◆ Assess the knowledge acquired by the participants through the training. 	<ul style="list-style-type: none"> ◆ Theory Test 	<ul style="list-style-type: none"> ◆ Trainer's Guide ◆ Assessment Guide 	1 hour



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(A Joint Initiative with National Skill Development Corporation)

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