

## BANANA FARMER



### **AISECT**

Scope campus, NH-12, Near Misrod, Hoshangabad Road, Bhopal – 462047

Ph : 91-755-2499657, 3293214 -15-16-72, 3207080

Fax : 91-755-2429096, E-mail: [aisect@aisect.org](mailto:aisect@aisect.org) www. **aisect.org**

## **BANANA FARMER**

Developed By : Dr P. M. Nimje

Retired Principal Scientist ,  
Central Institute of Agricultural Engineering ,Bhopal and  
Agriculture Consultant, NSDC, AISECT, Bhopal

© **AISECT**

Publisher : **AISECT**  
SCOPE Campus, NH-12, Near Misrod,  
Hoshangabad Road, Bhopal-462047  
Ph. : 91-755-2499657, 3293214-15-16-72  
Fax: +91-755-2429096  
E-mail : [aisect@aisect.org](mailto:aisect@aisect.org)  
Visit us : [www.aisect.org](http://www.aisect.org)

Edition : First  
Composed : AISECT, Bhopal  
Printed by : AISECT, Bhopal

# **BANANA FARMER**

- CHAPTER 1 PALANTING MATERIAL PREPARATION IN BANANA CULTIVATION**
- CHAPTER 2 LAND PREPARATION AND PLANTATION IN BANANA CULTIVATION**
- CHAPTER 3 INTEGRATED NUTRIENT MANAGEMENT AND WEED CONTROL IN BANANA**
- CHAPTER 4 INTEGRATED PEST AND DISEASE MANAGEMENT IN BANANA CULTIVATION**
- CHAPTER 5 IRRIGATION MANAGEMENT AND OTHER OPERATIONS IN BANANA CULTIVATION**
- CHAPTER 6 HARVESTING AND POST HARVEST MANAGEMENT**

**ECT**

# **BANANA FARMER**



# **PLANTING MATERIAL PREPARATION IN BANANA CULTIVATION**

**1.1. Importance of Banana**

**1.2 Agro-Climatic Requirements**

**1.3. Varieties Cultivated in Different Zones**

**1.4. Types of Planting Material**

**1.5 Treatment of Planting Material**

**1.6 Health and Safety Precautions**

# PALANTING MATERIAL PREPARATION IN BANANA CULTIVATION

## OBJECTIVE-

The pupil will be able to know and understand:

- Importance of Banana crop
- Identification of different Agro- climatic zones of India in which cultivation of Banana is taken up and list of varieties suitable for the zone
- Identification of Varieties of Banana for different Agro- climatic zones and their characteristic features
- Types of planting material and its Treatment with appropriate pesticides as per the doses recommended
- Health and Safety Precautions during use of pesticides

## 1.1. IMPORTANCE OF BANANA

Banana is a very popular fruit due to its low price and high nutritive value. It is consumed in fresh or cooked form both as ripe and raw fruit.

Banana is a rich source of carbohydrate and is rich in vitamins particularly vitamin B. It is also a good source of potassium, phosphorus, calcium and magnesium. The fruit is easy to digest, free from fat and cholesterol. Banana powder is used as the first baby food. It helps in reducing risk of heart diseases when used regularly and is recommended for patients suffering from high blood pressure, arthritis, ulcer, gastroenteritis and kidney disorders.

Processed products, such as chips, banana puree, jam, jelly, juice, wine and halwa can be made from the fruit. The tender stem, which bears the inflorescence is extracted by removing the leaf sheaths of the harvested pseudo stem and used as vegetable. Plantains or cooking bananas are rich in starch and have a chemical composition similar to that of potato.

Banana fibre is used to make items like bags, pots and wall hangers. Rope and good quality paper can be prepared from banana waste. Banana leaves are used as healthy and hygienic eating plates.

Depending upon cultivar and ripeness, the flesh can vary in taste from starchy to sweet and texture from firm to mushy. Unripe or green bananas and plantains are used for cooking various dishes such as banana pudding and are the staple starch of many tropical populations. Banana sap is extremely sticky and can be used as a practical adhesive. Sap can be obtained from the pseudostem, from the fruit peelings, or from the fruit flesh.

## **Nutritional value of Banana**

| <i>Energy90 Kcal (370 KJ)</i> | <i>Nutritional value per 100 g</i> |
|-------------------------------|------------------------------------|
| <i>Carbohydrates</i>          | <i>22.84 g</i>                     |
| <i>Fat</i>                    | <i>0.33 g</i>                      |
| <i>Protein</i>                | <i>1.09 g</i>                      |
| <i>Vitamin B1</i>             | <i>0.031 mg</i>                    |
| <i>Vitamin B2</i>             | <i>0.073 mg</i>                    |
| <i>Vitamin B3</i>             | <i>0.665 mg</i>                    |
| <i>Vitamin C</i>              | <i>8.7 mg</i>                      |
| <i>Potassium</i>              | <i>358 mg</i>                      |

## **Health benefits of banana**

- Bananas are rich source of energy since it contains sugars such as fructose, glucose and sucrose.
- Bananas are rich source of iron helpful in preventing anemia.
- Bananas contain an amino acid called 'tryptophan' which is converted into serotonin helping to improve the mood of the depressed persons. Eating banana helps to alleviate the depressed mood.
- Because of its fiber (pectin) content it relieves constipation and diarrhoea.
- It is found from research that bananas can prevent age related loss of sight to a certain degree.
- Bananas help absorption of calcium from the gut thereby preventing osteoporosis.
- They maintain kidney health and help in prevention of cancer of the kidney.
- Because of its high content of potassium it controls high blood pressure.
- Bananas control hyper acidity and heart burn.
- It is believed that banana milk shake controls the hang over syndrome in alcoholics.
- It maintains electrolyte balance of the body because of its content of potassium.
- The banana fruit peels relieve irritation and swelling of the mosquito bites if rubbed on the affected part.
- Eating banana reduce the risk strokes by 40%.
- Short shelf life and increased production necessitates development of non-conventional products from banana. A wide range products can be processed from banana. Among

the products highlighted are puree, juice, flour, jam, powder, vinegar, confectionery jelly, pectin, breaded banana which have wide commercialization.

## 1.2 AGRO-CLIMATIC REQUIREMENTS

### *Climate:*

Banana, basically a tropical crop, grows well in a temperature range of 15°C – 35°C with relative humidity of 75-85%. It prefers tropical humid lowlands and is grown from the sea level to an elevation of 2000m. above m.s .l.. In India this crop is being cultivated in climate ranging from humid tropical to dry mild subtropics through selection of appropriate varieties. Chilling injury occurs at temperature below 12°C. High velocity of wind which exceeds 80 km /hr. damages the crop. Four months of monsoon (June to September) with an average 650-750 mm. rainfall are most important for vigorous vegetative growth of banana. At higher altitudes, banana cultivation is restricted to a few varieties like 'Hill banana'.

Low winter temperatures serve to only emphasize the importance of adequate heat as a factor, in banana production. • The most important of these are 'choke throat' 'November dump' and frost damage. .

### *Soils:*

- Banana can grow from the poorest to the richest type of soil with varying success.
- The soil should be tested before banana cultivation
- The soil should have good drainage, adequate fertility and moisture.
- Deep, rich loamy and sandy clay loam soil with pH between 6-7.5 is most preferred for banana cultivation.
- Ill drained, poorly aerated and nutritionally deficient soils are not suitable for banana.
- Extreme clayey, Sandy soil, Saline soil and Calcareous soil is not suitable for Banana cultivation. Similarly soils of low lying areas & heavy black cotton with ill drainage are not suitable.
- A soil that is not too acidic & not too alkaline, rich in organic material with high nitrogen content, adequate phosphorus level and plenty of potash are good for banana.

### *Agro-Climatic Zones*

The state-wise growing belts are given in the following table:

| State          | Growing belts   |
|----------------|---|
| Andhra Pradesh | East Godavari, West Godavari, Kurnool, Cuddapah           |
| Assam          | Goalpara, Nagaon, Sonitpur, foothills of Garo hills       |
| Gujarat        | Surat, Vadodara, Anand, Kheda, Junagadh, Narmada, Bharuch |
| Jharkhand      | Ranchi, Sahebganj   |

|                |   |
|----------------|---|
| Karnataka      | Bangalore, Chitradurga, Shioroga, Hassan, Chikka Mangloor   |
| Kerala         | Thiruvananthapuram, Kollam, Pathanamthitta, Alappuzha, Kottayam, Idukki, Ernakulam, Thrissur, Palakkad, Malappuram, Kozhikode, Wynadu, Kannur, Kasargod               |
| Madhya Pradesh | Khandwa, Badwani, Khargaon, Dhar  |
| Maharashtra    | Jalgaon, Ahmednagar, Buldhana, Pune, Wardha, Dhule, Nanded, Parbani, Nandurbar, Satara, Sangli, Osmanabad, Buldhana, Akola, Yeothmal, Amravati, Thane, Kulara, Alibag |
| Orissa         | Ganjam, Puri, Khurda, Gajpati, Cuttack, Dhenkanal, Angul, Sundargarh, Sambalpur, Bargarh, Deogarh, Koraput, Keonjhar, Raygada, Mayurbhanj                             |
| Tamil Nadu     | Thoothukudi, Tiruchirapalli, Coimbatore, Tirunelveli, Karur, Erode, Kanniyakumari   |
| West Bengal    | Hooghly, Nadia, North 24 Parganas   |

### 1.3. VARIETIES CULTIVATED IN DIFFERENT ZONES

Commercially, bananas are classified as dessert types and culinary types. The culinary types have starchy fruits and are used in the mature unripe form as vegetables. Important cultivars include Dwarf Cavendish, Robusta, Monthan, Poovan, Nendran, and Red banana, Nyali, Safed Velchi, Basrai, Ardhapuri, Rasthali, Karpurvalli, Karthali and Grand Naine etc.

Grand Naine, an imported variety from Israel is gaining popularity and may soon become the most preferred variety due to its tolerance to abiotic stresses and good quality bunches. Fruit develops attractive uniform yellow colour with better shelf life & quality than other cultivars.

Important banana varieties cultivated in different states of India are given below:

| State          | Varieties grown   |
|----------------|---|
| Andhra Pradesh | - Dwarf Cavendish, Robusta, Rasthali, Amritpant, Thellachakrakeli, Karpoora Poovan, Chakrakeli, Monthan and Yenagu Bontha   |
| Assam          | - Jahaji (Dwarf Cavendish), Chini Champa, Malbhog, Borjahaji (Robusta), Honda, Manjahaji, Chinia (Manohar), Kanchkol, Bhimkol, Jatikol, Digjowa, Kulpait, Bharat Moni |
| Bihar          | - Dwarf Cavendish, Alpon, Chinia, Chini Champa, Malbhig, Muthia, Kothia, Gauria   |
| Gujarat        | - Dwarf Cavendish, Lacatan, Harichal (Lokhandi), Gandevi Selection, Basrai, Robusta, G-9, Harichal, Shrimati  |
| Jharkhand      | - Basrai, Singapuri   |
| Karnataka      | - Dwarf Cavendish, Robusta, Rasthali, Poovan, Monthan, Elakkibale   |
| Kerala         | - Nendran (Plantain), Palayankodan (Poovan), Rasthali, Monthan, Red Banana, Robusta   |

|                |   |   |
|----------------|---|---|
| Madhya Pradesh | - | Basrai  |
| Maharashtra    | - | Dwarf Cavendish, Basrai, Robusta, Lal Velchi, Safed Velchi, Rajeli Nendran, Grand Naine, Shreemanti, Red Banana |
| Orissa         | - | Dwarf Cavendish, Robusta, Champa, Patkapura (Rasthali)  |
| Tamil Nadu     | - | Virupakshi, Robusta, Red Banana, Poovan, Rasthali, Nendran, Monthan, Karpuravalli, Sakkai, Peyan, Matti         |
| West Bengal    | - | Champa, Mortman , Dwarf Cavendish, Giant Governor, Kanthali, Singapuri  |

***Varieties suitable for different situations***

**Suitable varieties for Wetland:** The suitable varieties grown well in wetland are Poovan, Rasthali, Monthan, Karpooravalli and Ney Poovan at the month of February - April and Nendran and Robusta are grown well at the month of April – May.

**Suitable varieties grown well in Garden lands:** The suitable varieties grown well in Garden lands are Robusta, Nendran, and D.Cavendish at the month of January to February and November to December.

**Varieties suitable for cold climate:** Tall varieties, in general, are more tolerant to cold temperature above freezing point. The variety 'Monthan' Dwarf Cavendish or ' khasadia' can tolerate low temperature.

**Varieties suitable for ratooning of banana:** Poovan

**Varieties which resistant to drought:** Monthan, Karpuravalli

**Varieties tolerant to sigatoka leaf spot:** Ney Poovan, Pachanadan, Karpuravalli

**Varieties tolerant to panama wilt disease:** Dwarf Cavendish, Robusta,.

**Varieties tolerant to bunchy top disease:** Poovan, Pachanadan

**High yielding varieties of banana:** Dwarf Cavendish, Robusta

**Promising hybrids in banana:** H1, H2, Co1, Fhia 1 (Gold finger), Fhia 3

## *Characteristics of different varieties*

### **1. Grand Naine**



- Each bunch will be having 10 to 12 hands with 175 to 225 fruits.
- The fruits of Grand Naine Banana variety are delicious to eat and keeping quality of the fruit is good.
- High yield (Avg. 30 kg per plant)
- Long cylindrical fruits with less curvature.
- Good keeping quality.
- Attractive yellowish green colour at maturity.
- Internationally acceptable both as fresh fruit and in processed form.
- Pulp to peel ratio is more and highly suitable for processing.

### **2. Monthan : Culinary Varieties**



- Exclusive culinary variety, widely cultivated for processing.
- Plant hardy, somewhat drought resistant.

- Suitable for growing as intercrop in coconut gardens.
- Suitable for cultivation for leaf production also.
- Bunch medium, 20 to 25 kg, 60 fruits.
- Fruits large, irregularly five sided, ridges prominent, slightly curved, broad at base tapering towards apex, prominent knob-like beak, long pedicel.
- Peel - thick, tough, peels with difficulty, dark green turning straw yellow.
- Pulp - firm, cream coloured, core conspicuous, medium taste.
- Fairly tolerant to nematodes and leaf spot and rhizome rot diseases.
- Crop duration 12 to 14 months.
- It is highly susceptible to Fusarium wilt disease

### **3. Dwarf Cavendish : Desert Varieties**



- Introduced variety, important for international trade and high density planting.
- Plant dwarf.
- Bunch weight 20 - 25kg, 12 hands, 150 or more fruits.
- Fruits - large, long curved, peel - thick, green, greenish colour retained to some extent even after ripening.
- Pulp - soft, sweet, juicy, delightful aroma.