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RECENT ADVANCES IN BANANA CULTIVATION

Popular Article

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ABSTRACT

India is the largest producer of banana however; the export of banana is meager. To increase the export potential, quality fruit production with better postharvest management are essential criteria. We have to consider all production technologies including the selection of variety, tissue cultured plant, HDP, mulching, integrated nutrient, pest and disease management, fertigation, intercropping, sleeving of bunch and bunch feeding, use of PGRs, and cold chain management.

Introduction

Banana which is also known as Apple of Paradise is the fourth most important global feed commodity after rice, wheat and milk. All social, religious festivals and functions that are adorned with banana plants are considered auspicious and providing beauty to the occasion. It is referred as "Kalpatharu" (Plant of Virtue) due to its multifaceted uses. In terms of nutritional value, the fruit is rich in carbohydrates, minerals and vitamins. Banana is a food-fruit with medicinal values. It is the quickest source of energy. Banana occupies 776.0 thousand ha area, 26509.1 thousand metric tonnes of production with34.02 Productivity(t/ha) in India. Tamilnadu is the leading banana producing state of India.

Objective

For getting maximum yield and to improve quality of fruit for the export purpose, various advance techniques used in banana:

- Variety selection
- Tissue Culture
- High density Planting
- Mulching
- INM
- Drip Irrigation
- Fertigation
- Inter cropping
- Sleeving of bunch / Bunch covering
- Bunch feeding / Pouch feeding
- Plant Growth Regulators
- Integrated Pest and disease management

1. Variety selection:

Dessertpurpose: Robusta, Dwarf Cavendish, Grand Naine, Rasthali, Vayalvazhai, Poovan, Nendran, Red Banana, Karpooravalli, Co.1, Matti, Sannachenkadali, Udayam and Neypoovan are popular varieties in banana.

Culinarypurpose: Monthan, Vayalvazhai, Ash Monthan and Chakkia are cultivated for culinary purpose. Nendran is a dual purpose variety used for dessert and culinary.

Hill banana: The popular varieties of bananas suitable for hilly areas are Virupakshi, Sirumalai and Namarai. Red Banana, Manoranjitham (Santhanavazhai) and Ladan are also cultivated in hills.

2. Tissue culture:

The propagation of a plant by using a plant part or single cell or group of cell in a test tube under very controlled and hygienic conditions is called "Tissue

Culture".The tissue culture propagation of banana for the first time in India, was pioneered by Dr. R. Dore Swamy at the Indian Institute of Horticultural Research, Bangalore.

Why Tissue Culture?

- Sword suckers weighing approximately 500 - 750 g are commonly used as propagating material.
- Suckers generally may be infected with some pathogens and nematodes.
- Similarly due to the variation in age and size of sucker the crop is not uniform, harvesting is prolonged and management becomes difficult.
- Therefore, tissue culture plants are recommended for planting.
- They are healthy, disease free, uniform and authentic.
- So, properly hardened secondary seedlings are only recommended for planting.

Advantages of Tissue Culture

- True to the type of mother plant under good management.
- Pest and disease free seedlings.
- Uniform growth, increases yield.
- Early maturity of crop.
- Round the year planting possible as seedlings are made available throughout the year.
- Two successive ratoons are possible in a short duration which minimizes cost of cultivation.
- 95% - 98% plants bear bunches.
- New varieties can be introduced and multiplied in a short duration.

3. High Density Planting.

Accommodation of the maximum possible number of the plants per unit area to get the maximum possible profit per unit without impairing the soil fertility status is called high density planting.

Advantages of High Density Planting

- It increases yield and reduces labours cost resulting in low cost of production.
- It also enables the mechanization of fruit crop production.
- It facilitates more efficient use of fertilizers, water, solar radiation, fungicides, weedicides and pesticides.

4. Mulching

- Mulching is the practice of covering the soil around the plants to make more favorable condition for growth and conserve the available soil moisture.
- In banana, polythene, straw mulch, banana trash, sugarcane trash is use as a mulch material.

Advantages of Mulching

- Conserves moisture by suppressing weed growth, regulate soil temperature and protect from sun and wind.
- Improves soil structure.
- Reduces soil temperature fluctuations.
- Increases soil organic matter level.
- Control erosion.
- Improves water infiltration rate.
- Controls weed growth.

5. "Integrated Nutrient Management"

- Application of nutrient to the crop including more than two components like, FYM, Bio fertilizers, Green manuring and chemical fertilizers in adequate amounts for the efficient use of fertilizers.
- Banana being an exhausting crop requires large quantity of fertilizers.
- Research findings have indicated optimum quantity of fertilizers and time of application is important for efficient utilization of nutrients.
- Due to the advantages of drip irrigation, it has become an integral part in the commercial cultivation of Grand Naine and Robusta varieties in many parts of the banana growing areas.

6. Drip irrigation

- Drip irrigation system delivers water to the crop using a network of mainlines, sub-mains and lateral lines with emission points spaced along their lengths.
- Each dripper/emitter orifice supplies a measured, precisely controlled uniform application of water, nutrients, and other required growth substances directly into the root zone of the plant.

Advantages of Drip Irrigation

- Water saving.

- Labour saving.
- Use in hilly terrain also.
- Suppressed weed growth.
- Increased growth, vigour and yield.
- Ease in orchard operation.
- Ease in fertilizer application.
- Use of low quality water.
- Suitability for light soil.
- Fewer incidences of diseases.

7. Fertigation

- Fertilizer application efficiency increment.
- Control and dosing.
- Depth control and application timing.
- Work saving and convenience.
- Possibility of using liquid fertilizers.
- Avoids the need for fertilizer spreading.
- Additional applications.

8. Inter - cropping in banana

- When two or more crops are grown together, each must have adequate space to maximize cooperation and minimize competition between the crops.
- Intercropping can be profitable when short durational crops (45 - 60 days) can be planted between rows of plants.
- However, intercropping is only possible during early stage of the plantation.
- Vegetable and flower crops like radish, cauliflower, cabbage, spinach, chili, brinjal, lady's finger, gourds, marigold, and tuberose can be successfully grown as intercrop.
- Mixed cropping with arecanut, coconut and cassava is a common and widely adopted practice in south India.

9. Sleeving of banana/Bunch covering of banana

- Sleeving of bunch is done to protect fruits against dust, spray residue, insect and birds.
- For this blue plastic sleeves are preferred.
- This also increases temperature around developing bunch and helps in early maturity.
- Covering bunch using dried leaves of the plant is economical and prevents the bunch from direct exposure to sunlight.
- Bunch cover enhances quality of fruit.
- But in rainy season this practice should be avoided.

10. Bunch feeding in banana

- The technology is for enhancing the size of fingers in the bunch to suit the market demands by de-navelling and post-shooting feeding of N, K and S through the distal stalk-end of rachis.
- De-navelling saves mobilization of nutrients into the unwanted sink of banana plant and earns additional income when the excised male bud is used as a vegetable.
- The technique involves blending of urea with sulphate of potash dissolved in 100 ml water in 500 g of fresh cow dung and applying the slurry to the de-navelled stalk-end of bunch soon after fruit set.
- About 10-15 cm long rachis should be available after the last hand to tie the plastic bag (used and milk bag is convenient) with a strong string.
- Experimentally it was found that by this treatment, the bunch weight increased over 'control'.
- The technology is gaining popularity fast.

11. Plant Growth Regulators

Growth regulators may be defined as chemical substances, other than nutrients and vitamins regulate the growth of plants when applied in small quantities.

Types of Plant Growth Regulators

- Auxins
- Gibberellins
- Cytokinin
- Ethylene
- Abscisic Acid

12. Integrated pest and disease management

- Integrated pest and disease management technology have been developed for the effective, eco-friendly management of major pests and diseases, which affect productivity.
- Banana is severely affected by various fungal and bacterial diseases and wilt disease caused by *Fusarium* is of great concern.
- Also viral diseases are of great concern which affects the productivity greatly. Since there is no control measures available, screening of the planting materials *viz.*, sucker and cultured plants has assumes significant.India is the largest

producer of banana; however, the export of banana is meager.

Conclusion

To increase the export potential, quality fruit production with better postharvest management are essential criteria. We have to consider all production technologies and the development of rapid *in vitro* culture soon spread and the commercial opportunities for supplying the producers of export bananas with uniform planting material free of pests and diseases were grasped by emergent tissue culture laboratories throughout the world.

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