Chhatrapati Shahu Ji Maharaj University, Kanpur

Answer Script Details
Barcode 10687918

Roll No. 25088000033
Total Mark 36/50.00

Exam M.SC IN AGRICULTURE HORTICULTURE MSCAG_ODI
Subject HORT5003 - TROPICAL AND DRY LAND FRUIT PRODU

Question wise Mark Summary

Q.No	Mark	Q.No	Mark	Q.No	Mark	Q.No	Mark
1A	4/5						
1B	3/5						
1C	4/5						
1D	3/5						
1E	4/5						
1F	4/5						
2	7/10						
3	NA/10						
4	NA/10						
5	NA/10						
6	NA/10						
7	NA/10						
8	7/10						
9	NA/10						

Chhatrapati Shahu Ji Maharaj University
Kanpur, Uttar Pradesh

PART-I

Date of Exam: 01/02/25 Shift: 1st Room No.: CT-4
Paper Code: HORTS003 Subject: T&DFP Year/Sem.: 1st/sem
Name of Candidate: MOH ASIF
Roll No.: 2 5 0 8 8 0 0 0 0 3 3

COE Facsimile

Signature of Invigilator

Signature of Candidate

PART-II

MARKS OBTAINED										
Q.	1	2	3	4	5	6	7	8	9	10
(a)										
(b)										
(c)										
(d)										
(e)										
(f)										
(g)										
(h)										
(i)										
(j)										
Total										

Total Marks in Figures	Max. Marks
Total Marks in Words	

Paper Code

Signature of Evaluator

PART-III

Course: M.Sc [Ag] [Horticulture]
Session: 2024-25 Year/Semester: 1st sem.
Subject: Topical & Dryland Fruit Production

Paper Code: H O R T S 0 0 3

Exam Date: 0 1 0 2 2 0 2 5

Name of Candidate: M O H A S I F

Father's Name: M D R A S H I D

महाविद्यालय का कोड College Code: E W 0 2

परीक्षा केन्द्र का कोड Exam Centre Code: E W 0 2

परीक्षा का प्रकार Type of Exam: Regular ● Ex Student ○ Private ○ Back paper Exam ○

ANSWER BOOKLET NO.: 10687918

H O R T S 0 0 3
Paper Code

PART-IV

नामांकन संख्या Enrollment Number: C S J M A 2 0 0 1 3 2 5 5 4 9

परीक्षार्थी अनुक्रमांक संख्या Candidate's Roll Number: 2 5 0 8 8 0 0 0 0 3 3

पेपर कोड Paper Code: H O R T S 0 0 3

Signature of Candidate

Signature of Invigilator

परीक्षा केन्द्र-EW-02

C S Facsimile

COE Facsimile

नोट : 1. परीक्षार्थी को निर्देशित किया जाता है कि आवरण पत्रों के पृष्ठ भाग पर अंकित सभी निर्देशों को सावधानी पूर्वक पढ़ें।
2. बॉक्स में सही भरने वाली प्रविष्टियों काली स्याही से भरें। 3. गोलों को काले या नीले बॉलपेन से भर दें।

INSTRUCTIONS TO THE CANDIDATE FOR FILLING PART-I

1. Read the instructions carefully given on the answer script and admit card.
2. Write Date of Exam, Shift, Paper Code & Name of Subject Correctly.
3. Write Name & Roll No. Correctly.
4. Write Semester & Branch Correctly.

INSTRUCTIONS TO THE CANDIDATE FOR FILLING PART-III

1. Use blue or black ball point pen for writing alphabets & numerals in ☐ Boxes.
2. Carefully study the example before you start marking.
3. As shown in the example below blacken the circles completely.

4. Make no Stray marks on this sheet.
5. **DO NOT WRITE OR MARK ON THE BAR CODE.**

परीक्षार्थी के लिए निर्देश

1. प्रवेश पत्र एवं उत्तर पुस्तिका पर दिये गये निर्देशों को ध्यान से पढ़ें।
2. कवर पृष्ठ के दूसरी तरफ कुछ न लिखें।
3. उत्तर पुस्तिका के पृष्ठों पर दोनों तरफ लिखें।
4. प्रश्न पत्र पर अपने अनुक्रमांक के अतिरिक्त कुछ न लिखें।
5. प्रश्न पत्र कोड एवं प्रश्न पत्र कोड सावधानी पूर्वक लिखें।
6. अपनी स्थिति स्पष्ट लिखें।
7. उत्तर पुस्तिका के पृष्ठों की संख्या देखें। अगर उत्तर पुस्तिका में पृष्ठ (1–24) से कम है या फटे हुए है, तो परीक्षा शुरू होने के पूर्व दूसरी उत्तर पुस्तिका ले लें।
8. प्रश्नपत्र को देख, यदि प्रश्नपत्र के विषय कोड, विषय का नाम तथा प्रश्न में कोई त्रुटि है तो उसके परीक्षा शुरू होने के 30 मिनट के अन्दर कक्ष निरीक्षक को तत्काल सूचित करें, उसके बाद विश्वविद्यालय द्वारा कोई कार्यवाही नहीं की जायेगी।
9. प्रश्नों के उत्तर लिखने के लिये पेंसिल का प्रयोग न करें।
10. B कोपी या अतिरिक्त ग्राफ नहीं दिया जायेगा।

IN ORDER TO AVOID UFM (UNFAIR MEANS) :

1. The Roll No. and Answer Book no. found elsewhere or any other symbol found in the answer book will be treated as unfair means.
2. Any tempering of Bar Code and Booklet no shall be treated as Unfair Means.
3. Do Not bring the materials like slip of paper/mobile/digital diaries/ study material/ revision notes in examination hall. Possession of the mobiles/ digital diaries/ electronic watch and any other electronic gadget except memory less scientific calculator shall be considered as UFM case.
4. Do not keep or paste currency note in answer script it shall be consider as UFM.

INSTRUCTIONS TO THE CANDIDATE

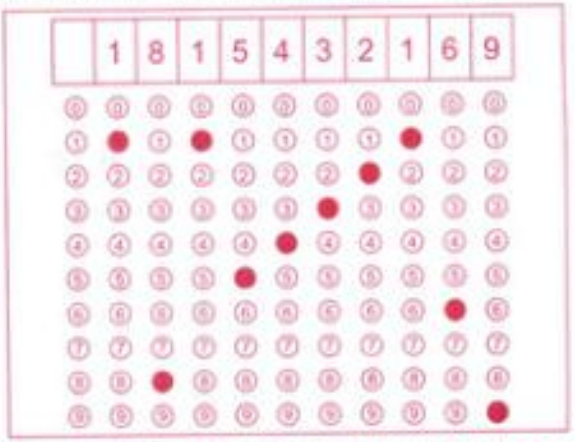
1. Read the instructions carefully given on the Question Paper, Admit Card & Answer Script.
2. Do not write anything on back side of the cover page.
3. Write on both sides of pages of answer book.
4. Do not write anything on question paper except Roll Number.
5. Write Paper Code & Question Paper Id carefully.
6. CHECK the number of pages (1-32) or any other kind of damage in your answer script, if found than change the answer script immediately before the commencement of examination.
7. CHECK the Question Paper for any kind of discrepancy e.g. Subject Code, Subject Name and Question of the Question Paper during first THIRTY MINUTES of the commencement of the exam, so that it can be corrected in TIME. After that no corrections shall be entertained by the university.
8. Do not use pencil for answering the question.
9. Write status correctly e.g. those appearing in carry over papers should fill in status as Carry Over. Those appearing as Ex-Students should fill in status as ex.
10. No supplementary answer book & graph paper will be provided.

अनुचित साधन से बचने हेतु:

1. उत्तर पुस्तिका के निर्देशित स्थान को छोड़कर अनुक्रमांक एवं उत्तरपुस्तिका का क्रमांक कही और न लिखे तथा कोई भी चिन्ह न बनायें क्योंकि यह अनुचित साधन प्रयोग की परिधि में आता है।
2. उत्तर पुस्तिका के बारकोड अथवा उत्तर पुस्तिका संख्या पर छेड़ करने पर अनुचित साधन प्रयोग माना जायेगा।
3. परीक्षा कक्ष में निम्न वस्तुएं साथ न लायें, जैसे लिखे हुए कागज के टुकड़े, मोबाईल, डिजिटल डायरी, कोपी, पुस्तक यह सभी वस्तुएं जो अनुचित साधन के अन्तर्गत आती है। केवल संबंधित प्रश्नपत्र में ही मेमोरी लैस साइंटफिक कैल्कुलेटर ले जाने की अनुमन्यता होगी।
4. उत्तर पुस्तिकाओं में रूपये न रखें न ही उत्तर पुस्तिका में चित्रकारी। ऐसा करना अनुचित साधन प्रयोग की परिधि में आता है।

INSTRUCTIONS TO THE CANDIDATE FOR FILLING PART-IV

1. Use blue or black ball point pen for writing alphabets & numberals in ☐ Boxes.
2. Use blue or black ball point pen for filling the circles.



Note - If your Roll No. is of 10 digits. Please leave first three columns

Paper Code

01

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Section - A

Ans of Qus. 1(A)

Polyembryony — Formation of multiple embryos within a single seed is called Polyembryony.

The term 'Polyembryony' was coined by Brau (1859) & it was first discovered by Leeuwenhoek in 1719 in Citrus aurantium.

Types of Polyembryony: There are two types of Polyembryony.

1. True Polyembryony
2. False Polyembryony

1. True Polyembryony - Development of multiple embryos within or by fragmenting into single embryosac. It is further divided into two groups.

a. Cleavage Polyembryony — When embryos arises within embryosac either from cleavage of egg or from synergids antipodals or from endosperm. Eg. Coconut

b. Nucellar Polyembryony — When embryos arises from tissues living outside the embryosac. Eg. Citrus mukia (10 seedlings) & mango Coleus, Begonia, Gaur, Mulgoa etc.

2. False Polyembryony - Development of multiple embryos due to developed zygotic embryosac.

Paper Code

02

Advantages of Polyembryony:

1. Nucellar embryo supposed to be diseased free.
2. Propagation of Mango & Citrus.
3. Development of homozygous diploides.
4. Artificial development of embryos.
5. Genetically identically seedlings.

Do Not Write anything in this Portion

Ans of Qus- 1(B)

Alternate bearing — It is a severe disorder of Mango. Mango tree bears a fruit crop in one years and no crop or few crop in the next year is called alternate bearing. It is also called Biennial bearing or Biennial bearing. It is genetic or inherent in mango varities.

Causes of Alternate bearing —

1. Climatological factor: High humidity, Heavy rain & low temp making on the off years.
2. Age & Size of shoots: 8 to 10 months mature shoots will be more productive than new or older branches.
3. Hormonal Imbalance: High conc of low GA in plants are vital for flowering.
4. Improper C:N ratio: High Carbon & moderate Nitrogen encourage flower bud formation.
5. Alternate bearing variety: Dashehari, Langra etc.
6. Improper Pollination & sex ratio.

Control of Alternate bearing —

1. Grow regular bearing varieties eg. Neelam, Gulabkhas, Himsagar.

Paper Code

2. Proper pruning of fruit bearing branches.

3. App. of Rhizobium @ 10g/plant for legumes flowering

4. Pollination by NAA atleast once in a year.

5. Maintain C:N of Soil ratio

Paper Code

05

Ans of Qus- 1(c)

Parthenocarpy — Natural or induced production of fruits without fertilization of ovules which making fruit seedless called parthenocarpy.

Parthenocarpy word discovered by Noll (1902).
Term 'Parthenocarpy' is derived from greek words:
Parthenos + Carpos
Virgin Fruit.

Types of Parthenocarpy — 3 types.

1. Vegetative Parthenocarpy: It generally takes place without pollination. Due to absence of pollination no seed form in fruits. eg. Seedless cucumber, Pear, Fig, Banana.

2. Stimulative Parthenocarpy: If fruit develops by stimulus of pollination but without fertilization is called stimulative parthenocarpy. eg. Seedless watermelon, Papaya, Litchi.

3. Stenospermo parthenocarpy: When pollination & fertilization both takes place but embryo gets aborted accidently result in seedlessness of fruit.
eg. Grapes, Guava, Citrus.

Advantages of Parthenocarpy —

1. Improve fruit quality
2. Provide seedless fruit
3. Reduce cost of production.
4. Pollination is not essential.

Disadvantages —

1. Parthenocarpic fruit can not used for asexual propagation
2. Parthenocarpy is undesired in those fruits where seed is edible part.
3. Short life span.

Paper Code

07

Ans of Que - 1 (D)

Bahar regulation — Bahar regulation is practised in guava in order to get high quality fruit with high commercial value.

In North India guava comes flowering twice in a year:

Region	Season	Bahar	Flowering	Fruiting
N. India	Rainy	Ambe	Feb-March	July-Sep
N. India	Winter	Mrig	June-July	Nov-Jan
S. India	Summer	Hast	Oct	Feb-April

The winter season crop is considered superior in quality than rainy season crop which is affected by fruit fly in order to get only winter season crop following practices may adopted.

1. Withhold irrigation — Withhold irrigation for 2 months in advance to normal flowering season - mostly in April-May.

2. Root pruning & Basing — Exposing the roots of tree of 1.5 ft radius around the trunk by removing the soil on soil. Prune the terminal portion of shoot about 25-30 cm.

3. Inorganic fertilizers — Apply inorganic fertilizers in June-July to encourage growth in July-Aug for getting maximum flowering in Aug-Sep for winter crop.

4. Chemical regulation — Apply Urea @ 1% or NAA @ 200 PPM in Pea months when new flowers are open.

5. Deblossoming — Deblossoming manually is very effective.

Paper Code

09

Ans of Q6 - 1 (E)

Citrus canker

CO — Xanthomonas axonopodis pv. citrii

Importance - It occurs in all citrus growing areas of India, Acid lime is highly susceptible to canker.

Symptoms —

1. It appears on leaves, twigs, branches, petioles & fruits. when it is in severe it can affect yield & shape.

2. The lesion appears as minute water soaked & yellow spots which enlarge slightly & turn brown.

3. The canker lesion on fruit do not possess a yellow halo as on leaves but several lesions may form patches on fruit

4. There may be defoliation in severe infection.

5. Stunted growth & reduce crop yield.

Seasonal & spread —

1 Survive in infected twigs for 6 months.
2 Spread by Citrus leaf miner [Phyllocnistis citrella] & rain splash.

Paper Code

Control —

1. Remove & burn all infected twigs before rain.
2. Grow resistant varieties Balaji & Jyoti selection.
3. Periodic spray of Streptocycline (4g) + Copper oxychloride
4. Control leaf miner by spraying Pyrethroids.

Ans of Que - 1(F)

Air layering — यह layering की वह विधि है जिसके द्वारा की जड़ों वाली शाखा ले जड़ निकलने हेतु प्रोत्साहित किया जाता है। यह विधि उस पौधे में अपनाई जाती है जो सीधी वृद्धि वाले तथा शाखाएँ अधिक बड़ी वाली होती है। जिसे शाखाएँ को झुकाकर भूमि के सम्पर्क में नहीं लाया जा सकता।

इस विधि में कर्तितांग 1 की पुरानी परिपक्व, स्वस्थ व लचीली शाखा का चयन करते है। पुष्पित Pkg में चुनी हुई शाखा में ऊपर से 20-25 cm भाग छोड़कर तेज धार वाले चाकू की सहायता से 2.5 cm दूरी के वलय (ring) आकार में निकाल लेते है। इन हटाये गये भाग को ध्यान रखें कि [illegible] किसी प्रकार की क्षति न हो तथा [illegible] उसी तरह से हट जाए।

अब इस छोड़े गये भाग के ऊपर तना मूल के निशान से कुछ दूरी से तथा इसके अंदर पानी में भीगी हुई कोई के टुकड़े को लपेट देते है। इस विधि में अतिरिक्त पानी देने की आवश्यकता नहीं होती है।

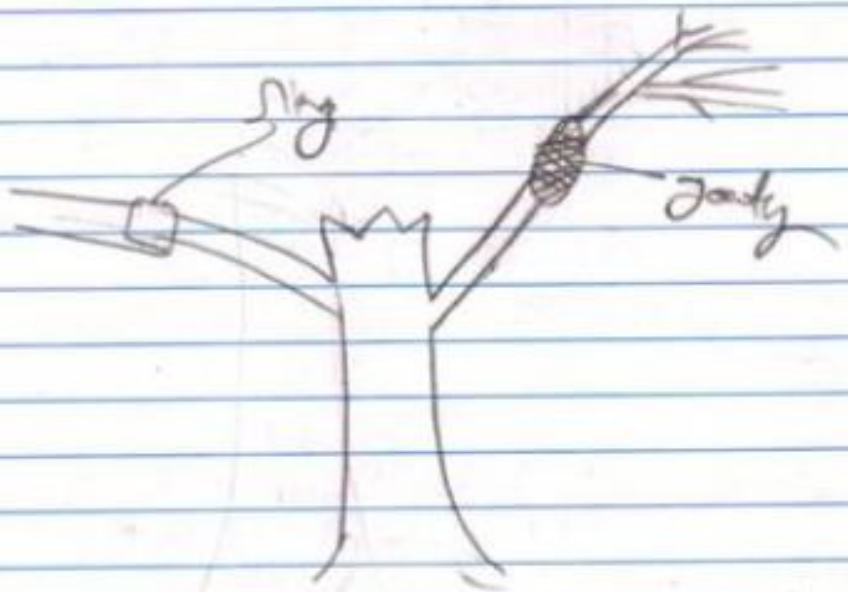
इसकी आधुनिक विधि सहारनपुर फल विज्ञान केन्द्र से निकाली गई है जिसमें अतिरिक्त पानी की आवश्यकता नहीं पड़ती है। इसके गोबर तथा मृदा के मिश्रण के स्थान पर जल में भीगी नम moss घास को लपेट देते है तथा दोनों के ऊपर polythene bags (22.5×22.5 cm) का जोड़ लेते है।

लगभग 3-4 सप्ताह बाद जड़े निकलने लगती है तथा पौधे को नर्सरी अथवा खेत में लगाया जाता है।

उदा- अमरूद, लीची, कुमट आदि।

Que - Gooty / Marcottage called

Paper Code



Section — B

Ans of Q6 — 2

:- Papaya Cultivation -:

Botanical name — Carica papaya
Family — Caricaceae
Chromosome no — 2n = 18
Origin — Tropical America
Type of fruit — Berry
Edible part — Mesocarp
Ploidy — Diploid
Pollination — Cross.

- Climate — Tropical & Sub tropical

1. Temperature : 20-25°C.
2. Rainfall : 50-100 cm / annum
3. Hight from sea level : 1000 mtr.

- Soil — Well drained, fertile sandy loam with 6-7.5 pH. is best suitable for papaya.

- Varieties —

A Gynodioecious Varieties :
Pusa delicious, Pusa majesty, CO3, Coorg Honey dew (Madhu Bindu), Sinoise solo (Pink flesh), Taiwan (Bloodred)

B. Dioicious varieties —
Washington, Pusa giant (Best canning & tasty fruits), Pusa dwarf, Pusa nanha (Pot cultivation 1.25 x 1.25 m²), Sunny bank, Hadden gold, CO-5 (800–1000 kg/plant)

- Propagation — It is commercially propagated by seeds. Seeds are sown in nursery for sprouting.

  Seed rate: 250–300 gm for 1 hac seedlings
  Seed treatment: Treat with Apron GM @ 3gm/kg seeds
  Time of sowing: IInd week of July & IInd week of Sep-
  Size of bed: 2 x 1 x
  spacing & depth of sowing: 10 x 5 cm & 1.5 cm depth
  Seed germination: within 3–5 weeks.

- Method of planting — 50 x 50 x 50 cm size pits are dug before one month of planting generally in May-June. Pits are filled with Top soil + 20–25 kg F.Y.M + 50 g N_2, 25 g P_2O_5, 40 g K_2O mixture. Planting is done in July-Aug at 1.5 x 1.5 m^2 & Pusa nanha at 1.25 x 1.25 m^2. Male: Female seed should be kept 1:10.

- Manures & Fertilizers — 20–25 kg F.Y.M & 200 : 200 : 200 gm N:P:K per plant per year. In two split doses Feb. March & sowing in Aug–Sep.

- Irrigation — In Summer at 7-8 day interval & In winters at 15-20 day interval.
- Weed mgt — Two manually weedings per year in Jan-Feb & Aug-Sep.
  Pre emergence spray of Fluchloralin or Alachlor @ 3lt/Hac
- Flowering — Flowering occurs after 4-5 months of transplanting. Female flowers in 18th - 20th leaf axil & Male flowers in 24th leaf axil. Female & male flowers developed in 32 & 42 days respectively.
- Fruiting — After 10-15 months of planting & continue till 3 years.
- Yield — Yield obtained 5-5.5 kg fruits per tree or 400-500 q./Hac.
- Storage — At 10-13°C, 85-90% relative humidity for 3-4 weeks.
- Plant protection ——

A. Insects :

1. Aphid — It is vector of Mosaic disease in papaya. Control by spray Dimethoate insecticide.
2. White fly — Bemisia tabaci is the vector of leaf curl disease & control by spray Monocrotophos insecticides.

B. Disease ——

1. Collar rot : Pythium spp. fungus is causal organism.

2. Damping off : Rhizoctonia solani is causal organism.

3. Leaf curl : Spread by white fly. It is a viral disease which caused by T.L.C.V. virus.

4. Mosaic : Spread by Aphid insect.

Control — For the control of viral disease spray Insecticide for vector control of collar rot, damping off disease are controlled by Dithane M-45 fungicide.

Paper Code

17

Section — C

Ans of Que — 8

-:- Banana Cultivation -:-

- Botanical description —

Botanical name: Musa paradisiaca
Family: Musaceae
Chromosome no: 2n = 22, 33, 44
origin: South East Asia or India
Type of fruit: Berry
edible part: Mesocarp & Endocarp
Ploidy: Triploid
Pollination: Cross

- Climate — Warm & humid climate

1. Temperature: 10-40°C but 25°C is optimum.
2. Rainfall: 100 - 150 cm/annum.
3. Height from sea level: 1000 - 1500 mtr

- Soil — Loamy soil which is rich in organic matter, fertility of 6.5 pH is best suitable for Banana.

- Varieties —

1. Poovan : Also called 'Champa' in W Bengal, 'Lal bale' in Maharashtra & 'Karpura Chakrakeli' in Andhra. it is resistant to Bunchy top & Panama wilt.

2. Dwarf Kavendish: Also called 'Basrai dwarf'. It is resistant to Panama wilt but susceptible to Bunchy top.

3. Rasthali (Malbhog): Susceptible to Panama wilt & fruit drop.

4. Nendran (Regali) — Suitable for baby fruit, chips.

Varieties for desert banana: Rasthali, Robusta, Malbhog, Pom...

Culinary banana (Vegetable) — Monthal, Hari chall, Pink, Harora

Banana chips or Baby fruit: Nendran, Kunnan, Virupakshi

Others — Safed bale, Lal bale, Gross michel, Ladyfinger.

- Propagation — It is commercially propagated by Sword suckers.

Sword sucker: Sword suckers have a well developed base with narrow leaf blade at early stage. When suckers attain a height of 80-120 cm & 2 kg weight they are transplanted to field.

Planting material: Either cuttings or in pieces of 1.5–2 kg suckers are also used for propagation.

- Planting — 60×60×60 cm pits are dug before one months of planting. Pits are filled by top soil & FYM mixture.

Planting time:

Heavy rain — Sep–Oct
Average rain — Aug

Planting distance:

Tall — 3×3 mtrs
Dwarf — 1.5×1.5 mtrs

- Manures — 20–25 kg FYM with 200:60:300 gm N:P:K applied after 6 months of planting per plant.

- Irrigation — Banana is a moisture loving plant. It requires regular irrigation. Atleast 40–50 irrigation should applied in banana from planting to harvesting. Drip irrigation saves 40–50% water.

- Intercultural operation —

1. Desuckering: Removal of unwanted suckers.
2. Propping: Support given to fruit bearing bunches plant.
3. Mattocking: Sequential cutting of pseudostem after harvesting.
4. Trashing: Remove unwanted materials like dead & dry

branches etc.

5. Wrapping — Covering of fruit bunches with Polythene to protect them from hot winds & improve colour of banana.

- Flowering — After one month of planting mainly in Sep – April season.
- Cutting –

  Tall: 14-16 months after planting
  Dwarf: 11-12 months after planting.

- Yield —

  Tall – 150 - 200 q/ha
  Dwarf – 300 - 400 q/ha

- Plant protection —

A. Insects :

1. Banana aphid — Pentalonia nigronervosa
   Vector of bunchy top. Spray monocrotophos for control.
2. Banana beetle — Nodostoma spp.
   Bore the stem & fruits of banana.
   Spray Malathion 50 EC

B. Disease —

1. Pencong wilt — Caused by Fusarium oxysporum f. sp. vasinfectum. In this leaves die & drying of with affected react & stem turns black — brown.

Control by soil treat with bayleton @ 1.5 kg / three spray Brassical @ 2g / plant

2. Bunchy top — Viral disease & spread by Banana aphid.

Control the banana aphid.

3. Sigatoka leaf spot — Cercospora musicola

Control by spray Dg M-45 @ 2-2.5 kg / ha.

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