Ministry of Education
Curriculum Planning & Development Division

Level: Forms 4 & 5
CSEC Agricultural Science Syllabus
SECTION B: CROP PRODUCTION
1. Anatomy and Physiology

Specific objective(s):

1.4 Distinguish between sexual and asexual reproduction in plants;
Artificial (propagation techniques) **– layering**, root cuttings, stem cuttings, budding, grafting, tissue culture.
1.5 Demonstrate the techniques used in plant propagation;

SBA Skill # 8: Demonstrate plant propagation techniques;
8 (a) Budding (done in a separate lesson)
8 (b) Grafting (done in a separate lesson)

8 (c) Layering

- Simple Layering (done as a separate lesson)
- **Air Layering**

8 (d) Cuttings (done in a separate lesson)

Artificial Plant Propagation Techniques : Air Layering

What is Air Layering?

https://www.reddit.com/r/gardening/comments/7uoiy4/air_layering_citrus_trees_marcotting/

- Air layering or marcotting is a form of asexual plant propagation in which a new plant is created directly on the parent plant while still being attached. It is performed on the shoot system of the parent plant in which an environment is created above ground for roots to grow.

The Process of Air layering

- This process involves a system whereby new plants are formed on a stem of a plant while still being attached to the parent plant.
- It eliminates burying part of the plant in the soil.
- Part of the stem is girdled (stem is treated and wrapped around)
- It is done on plants with woody stems e.g. Croton, Hibiscus, Ficus.

Some plants that can be propagated by air layering

Ficus	
Hibiscus	
Rose	

Materials needed to perform Air Layering

Parent Plant e.g Ficus	
Damp cocoa moss	
Rooting hormone	

Materials needed to perform Air Layering

Clear polythene plastic bag	
Rubbing alcohol	
Cotton balls	

Materials needed to perform Air Layering

Rubber gloves	
Budding knife	
String	
Small brush	

Safety precautions

- Ensure budding knife is handled properly and held in the correct manner to prevent injury to self and others.
- Ensure rooting hormone is **NOT** ingested by yourself or others or comes into contact with skin and it is properly secured after use.
- Wear protective wear at **ALL** times e.g. hat, gloves, long sleeve shirt, long pants, boots
- Ensure all materials used are stored in a safe place after use.

Step 1

- Select a branch from a healthy plant.

Stems of pencil size thickness or larger are best and remove any leaves that are present.

Steps 2 and 3

- Clean the chosen stem to be girdled by sterilizing using rubbing alcohol and cotton balls
- Cut the stem using a sharp budding knife by making 2 circular cuts 3 cm apart

Step 3

A third cut is then made to join both circular cuts and the bark of the stem is removed.

Step 4

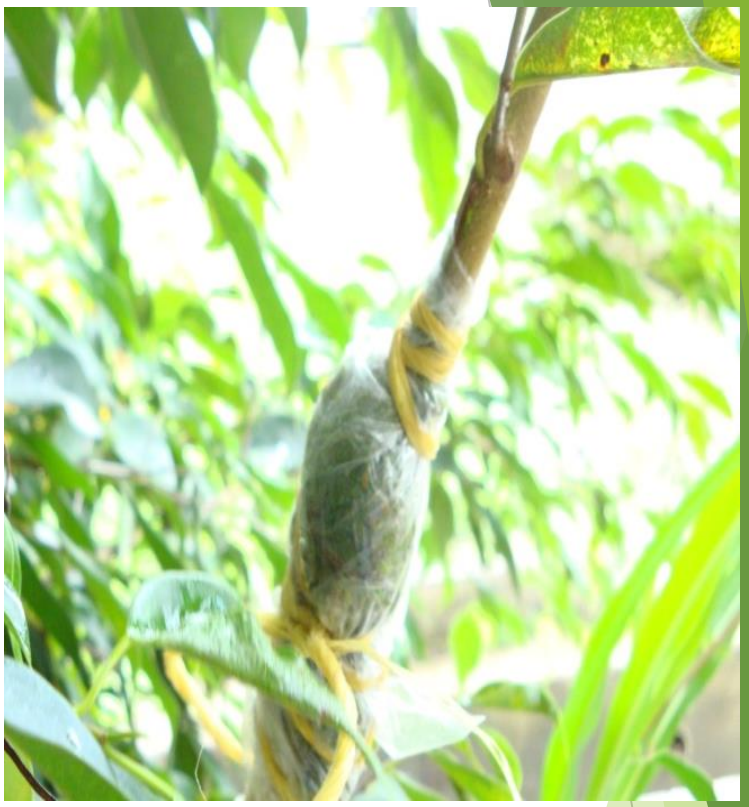
The cambium layer is gently scraped at the exposed layer.

Step 5

The exposed layer is covered with rooting hormone using a paint brush.

Step 6

Moistened cocoa moss is applied around the exposed area.



Step 7

The plastic polythene bag is then wrapped around the cocoa moss and tied at both ends with string.

Step 8

Leave to set for 3-4 weeks to allow for callus and root formation

Step 9

Sever the layered plant from parent, remove plastic and transplant new plant.

EVALUATION

1. What is Air Layering?
2. What is another term for Air Layering?
3. Explain the purpose of the following items used in Simple Layering
   - Budding knife
   - Rooting hormone
   - Cocoa Moss
4. Identify and explain ***two*** safety precautions which must be adhered to when performing Air Layering
5. Outline the steps required to produce a Ficus plant by air layering

ANSWERS

1. What is Air Layering?

Air layering or marcotting is a form of asexual plant propagation in which a new plant is created directly on the parent plant while still being attached. It is performed on the shoot system of the parent plant in which an environment is created above ground for roots to grow.

2. What is another term for Air Layering?

Marcotting

3 Explain the purpose of the following items used in Simple Layering

- Budding knife – Used to remove the bark, phloem and cambium from the shoot
- Rooting hormone –Used to stimulate root formation
- Cocoa Moss –provides a moist environment for optimum root development on the layered shoot.

ANSWERS

4. Identify and explain ***two*** safety precautions which must be adhered to when performing Air Layering

- Any TWO answers from belwo:
- Ensure budding knife is handled properly and held in the correct manner to prevent injury to self and others.
- Ensure rooting hormone is **NOT** ingested by yourself or others or comes into contact with skin and it is properly secured after use.
- Wear protective wear at **ALL** times e.g. gloves protect hands from cuts, boots protect feet from objects dropping on them, hat protects person from intense heat of the sun
- Ensure all materials used are stored in a safe place after use to prevent persons from ingesting the rooting hormone; or prevent them form using the knife to inflict injury to themselves or others

ANSWERS

5. Outline the steps required to produce a Ficus plant by air layering

1. Select a branch from a healthy plant. Stems of pencil size thickness or larger are best and remove any leaves that are present.

2. The chosen stem to be girdled i.e. using a sharp budding knife (sterilized using rubbing alcohol and cotton balls) two circular cuts are made on the stem at 3 cm apart

3. A third cut is then made to join both circular cuts and the bark of the stem is removed.

4. Cambium layer is gently scraped at the exposed layer.

5. The exposed layer is covered with rooting hormone using a paint brush.

6. Moistened cocoa moss is applied around the exposed area.

7. The plastic polythene bag is then wrapped around the cocoa moss and tied at both ends with string.

8. Leave to set for 3-4 weeks to allow for callus and root formation

9. Sever the layered plant from parent, remove plastic and transplant new plant.

End of Lesson

References

Ragooonan, S. (2003). Agriculture for CSEC New Edition Revision Course. La Romaine: Caribbean Educational Publishers.

Walsh, A. (1997). *What is air Layering?* Retrieved from Evergreen Gardenworks: http:// www.evergreengardenworks.com/airlayer.htm