

# PLANT PROPAGATION

## ASEXUAL

**M. L. Robinson**

**ASSOCIATE PROFESSOR/Area  
Specialist**

**Environmental Horticulture/ Water Conservation**

# **ASEXUAL PROPAGATION**

- **WHAT IS ASEXUAL PROPAGATION?**

**TO PRODUCE A NEW PLANT FROM A PORTION OF THE MOTHER PLANT THAT IS IDENTICAL TO THE MOTHER PLANT.**

# **WHAT ARE THE ADVANTAGES OF ASEXUAL PROPAGATION?**

- ALL THE PLANTS HAVE THE SAME CHARACTERISTICS**
- ALL THE PLANTS ARE IDENTICAL TO THE MOTHER PLANT**
- MANY PLANTS CAN BE PRODUCED IN A LIMITED AREA**
- PLANTS MATURE FASTER**

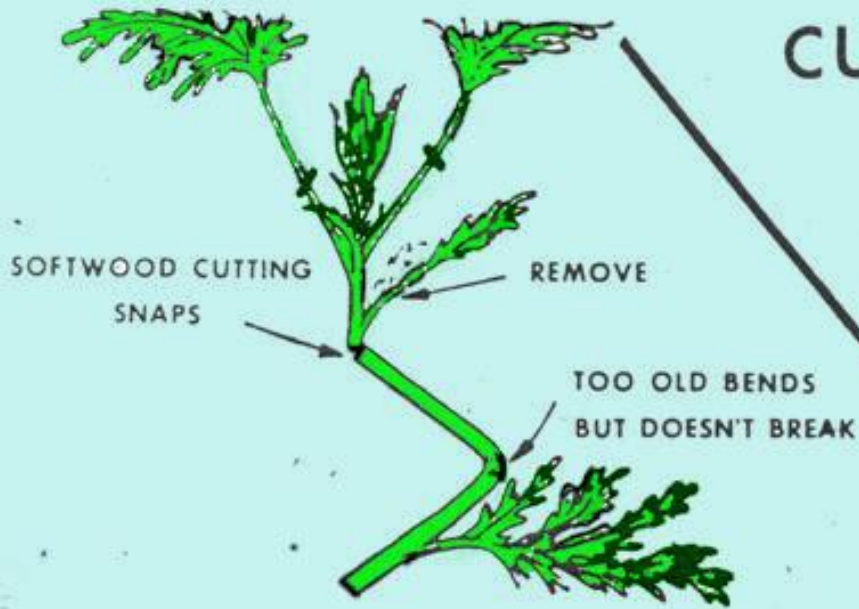
# **WHAT ARE THE DISADVANTAGES OF ASEXUAL PROPAGATION?**

- LACK OF GENETIC DIVERSITY**
- MANY PLANTS ARE HARD TO PROPAGATE BY CUTTINGS, GRAFTING, AND TISSUE CULTURE**
- COSTS ARE GREATER, TIME EQUIPMENT, BUILDINGS**

# **TYPES OF ASEYUAL PROPAGATION**

- **CUTTINGS**
- **LAYERING**
- **DIVISION**
- **GRAFTING**
- **BUDDING**
- **TISSUE CULTURE (CLONING OR  
IN VITRO)**

# HOW WE GET NEW PLANTS BY CUTTINGS



## HARDWOOD CUTTINGS

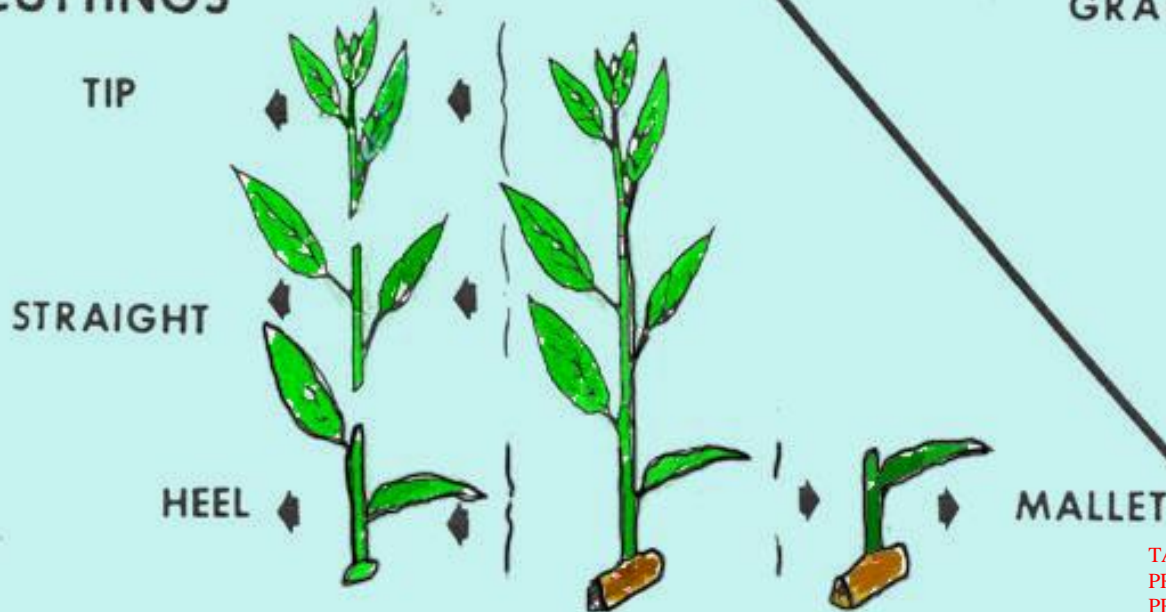


WEIGELA



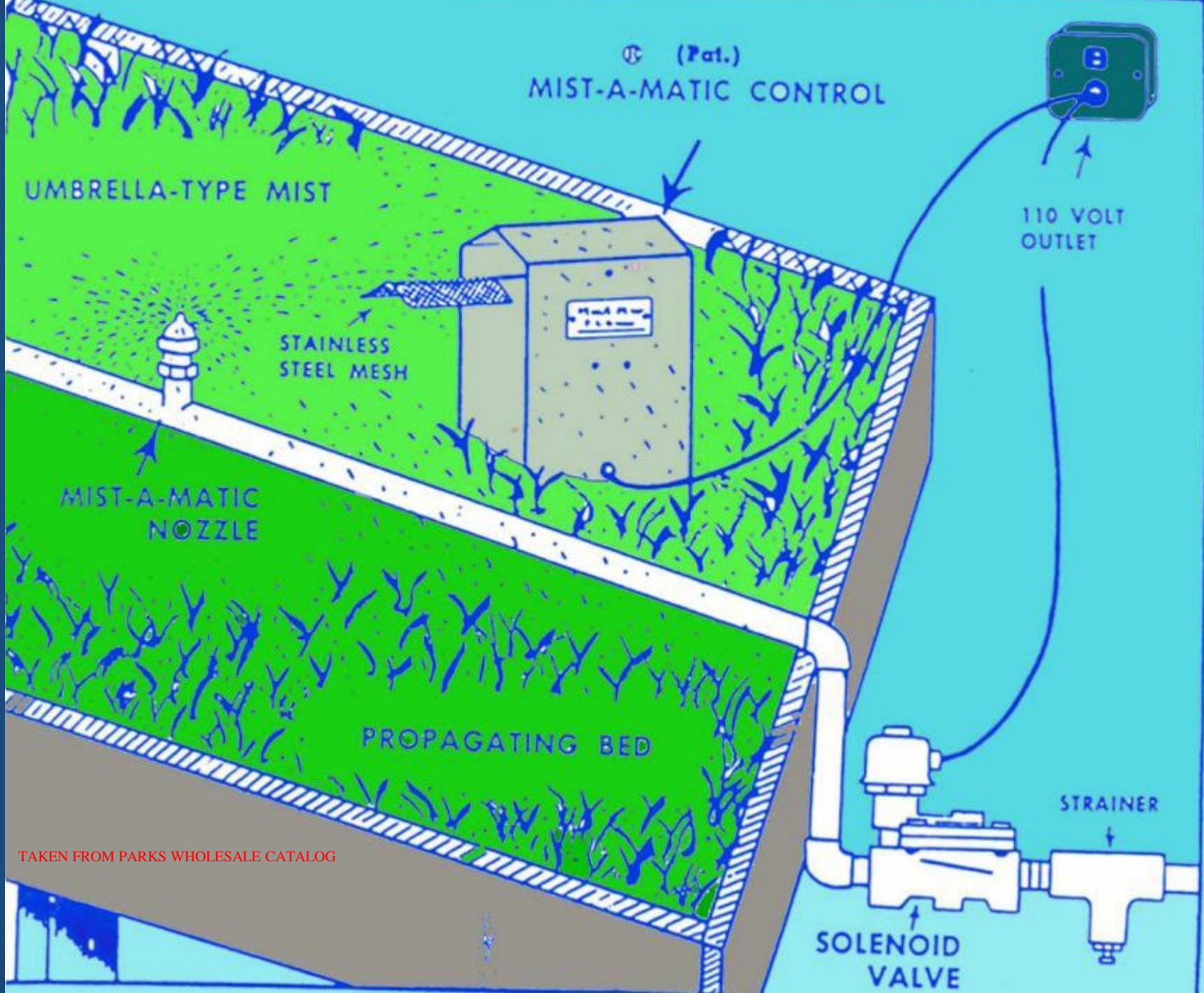
GRAPE

## SOFTWOOD CUTTINGS



# ROOTING HORMONES





TAKEN FROM PARKS WHOLESALER CATALOG





# FOGGERS







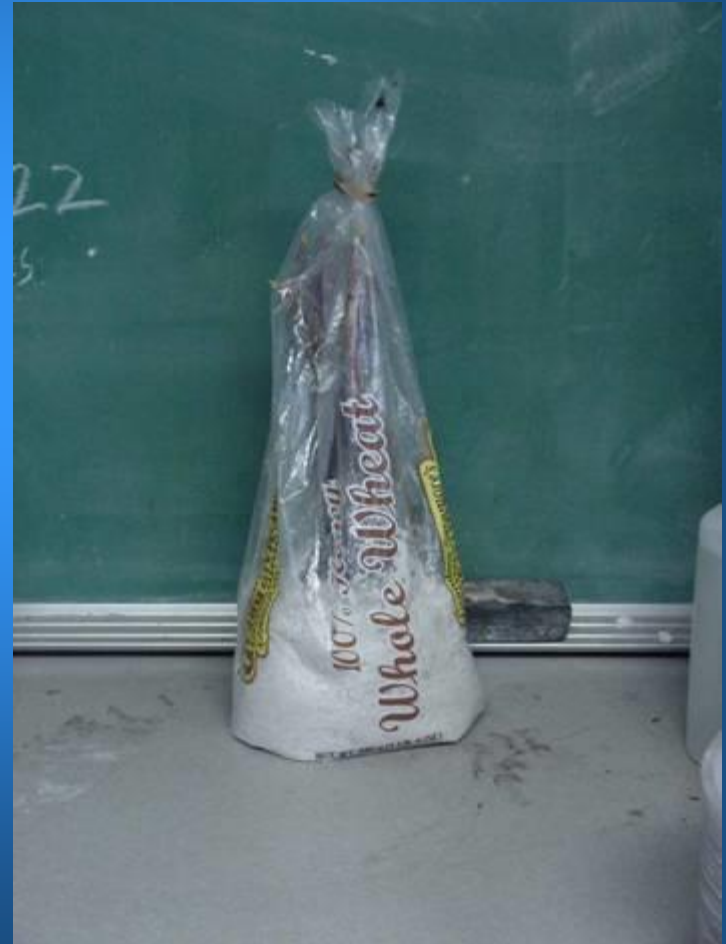
# COMMERCIAL PROPAGATION



# COMMERCIAL PROPAGATION



# PROPAGATION OF GRAPE CUTTINGS





# MINI GREEN HOUSE





# MINI GREEN HOUSES





H



JUN  
CLOSING  
2X  
SEAL  
CLOSED

# REPTILE TANK FOR MIST PROPAGATION



# OTHER MATERIALS NEEDED



FOGGER



TIMER



GROW LIGHT

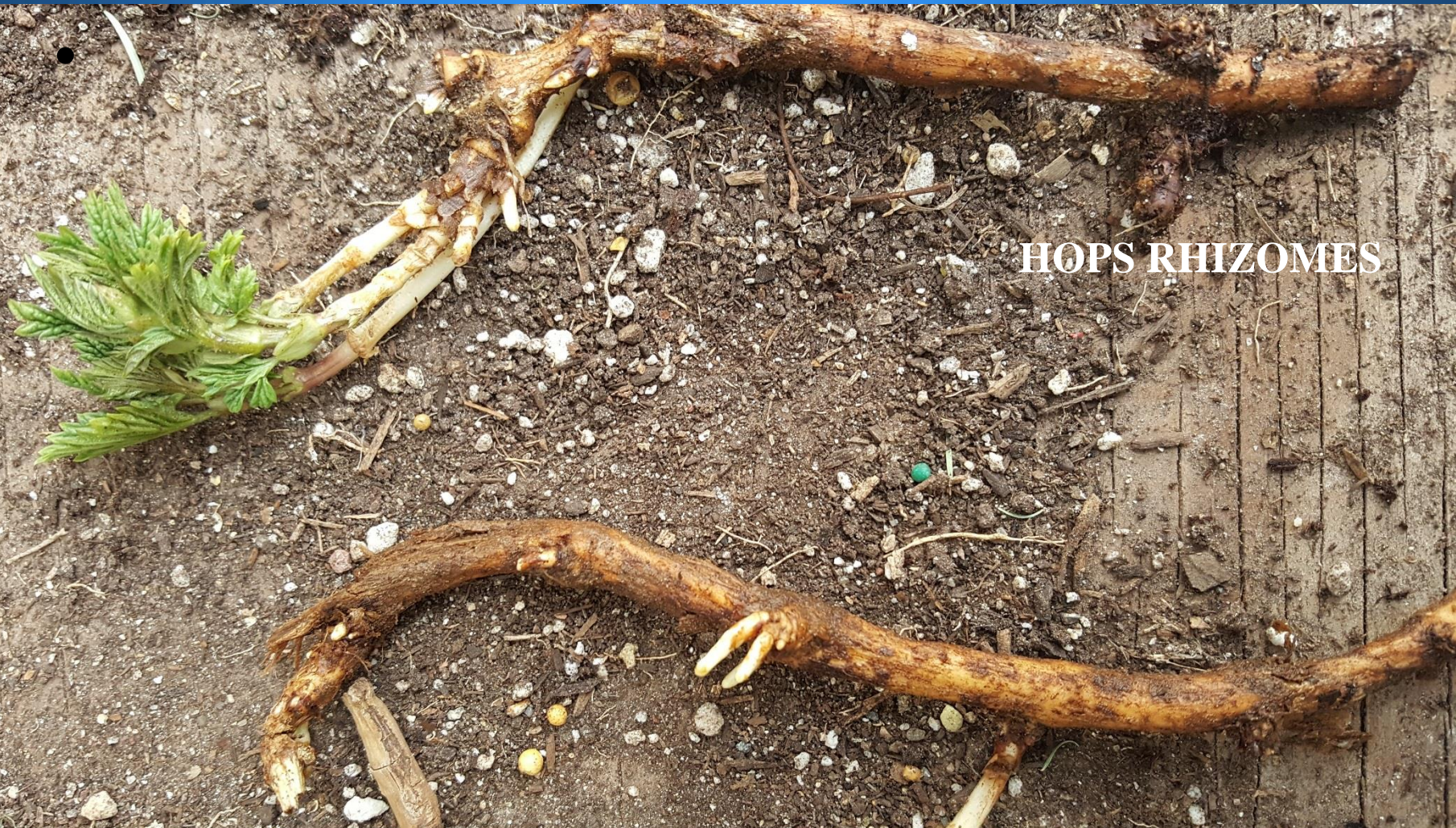
# ROOT CUTTINGS



**FIG TREE ROOT SPROUTS**



# RHIZOME CUTTINGS



HOPS RHIZOMES

# NATURAL STEM CUTTINGS



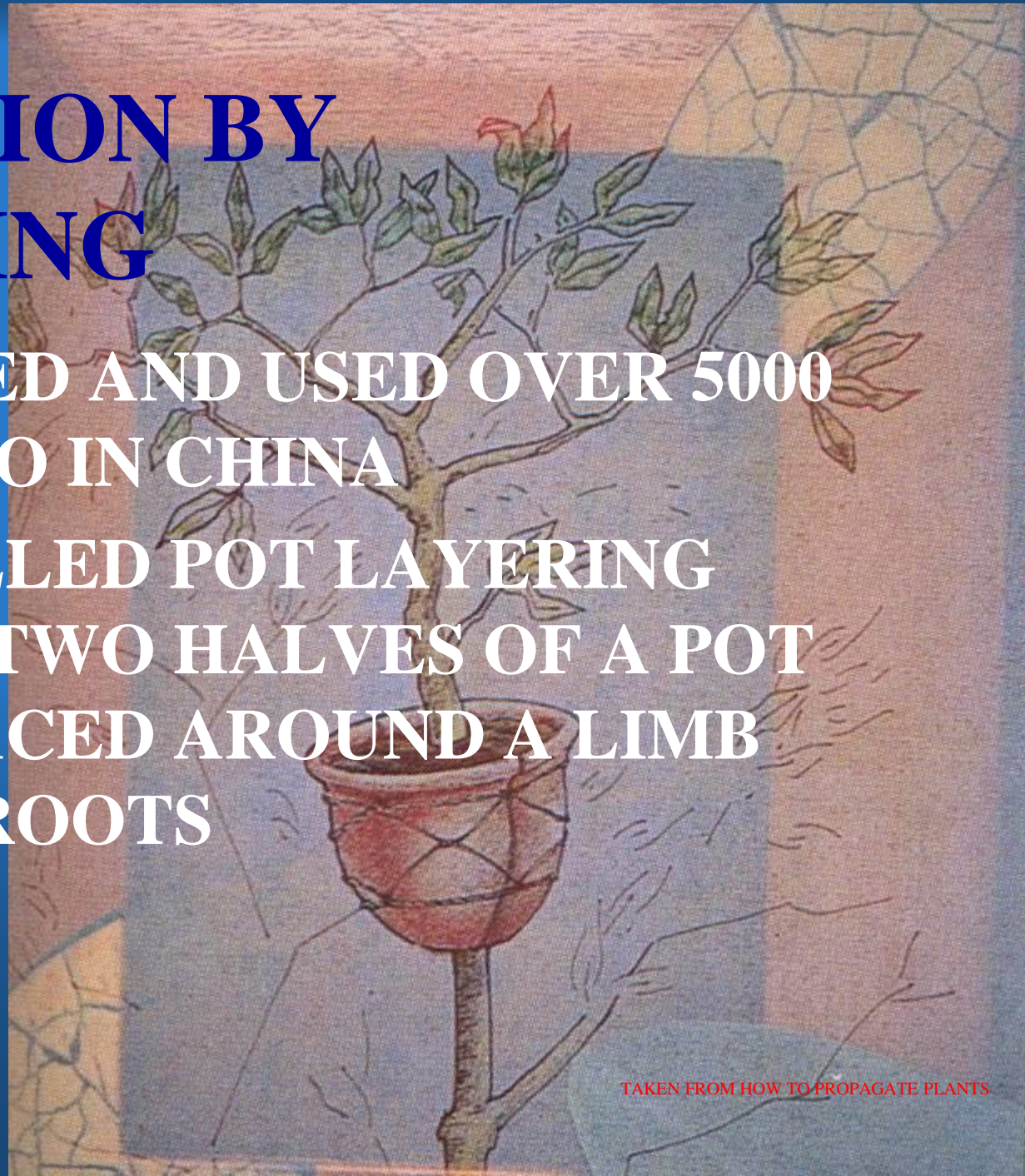
# LEAF CUTTINGS KALANCHOE AND SANSEVIERIA





# PROPAGATION BY LAYERING

- DEVELOPED AND USED OVER 5000 YEARS AGO IN CHINA
- FIRST CALLED POT LAYERING BECAUSE TWO HALVES OF A POT WERE PLACED AROUND A LIMB UNTIL IT ROOTS



# TYPES OF LAYERING

- AIR LAYERING
- TIP LAYERING
- MOUND LAYERING
- SERPENTINE LAYERING
- TRENCH LAYERING
- NATURAL LAYERING

# AIR LAYERING



**A. REMOVE 1 INCH OF BARK PAST THE CAMBIUM LAYER**

**B. APPLY ROOTING HORMONE**

**C. PLACE MOIST SPHAGNUM MOSS AROUND WOUND**

**D. SECURE PLASTIC OR FOIL COVERING**

# NEW PRODUCTS

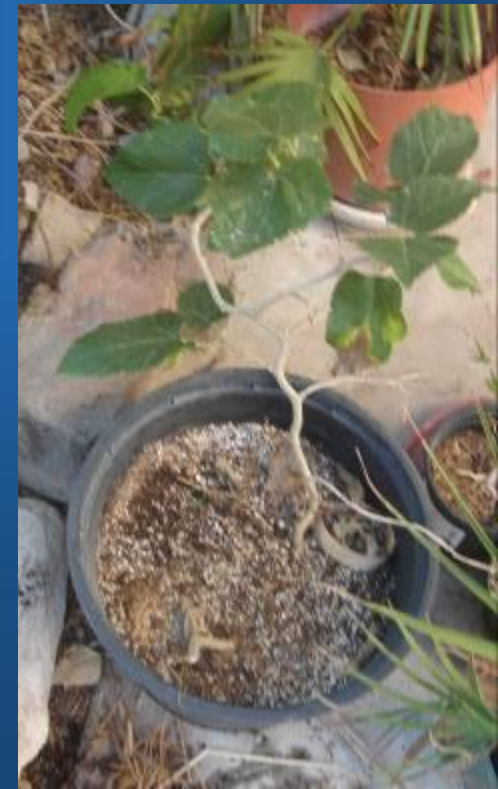


PLASTIC POT LAYERAGE

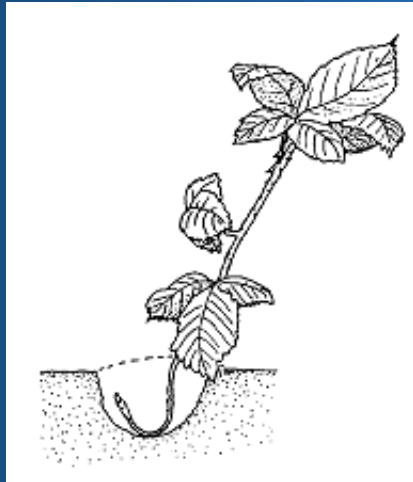
# AIR LAYERING



# TIP LAYERING



# TIP LAYERING



# VIVIPAROUS

- **PLANTS THAT PRODUCE OR GERMINATE NEW PLANTS ON THE MOTHER PLANT**





# VIVIPAROUS AGAVES



# VIVIPAROUS DASYLIRIONS



# VIVIPAROUS ALOES

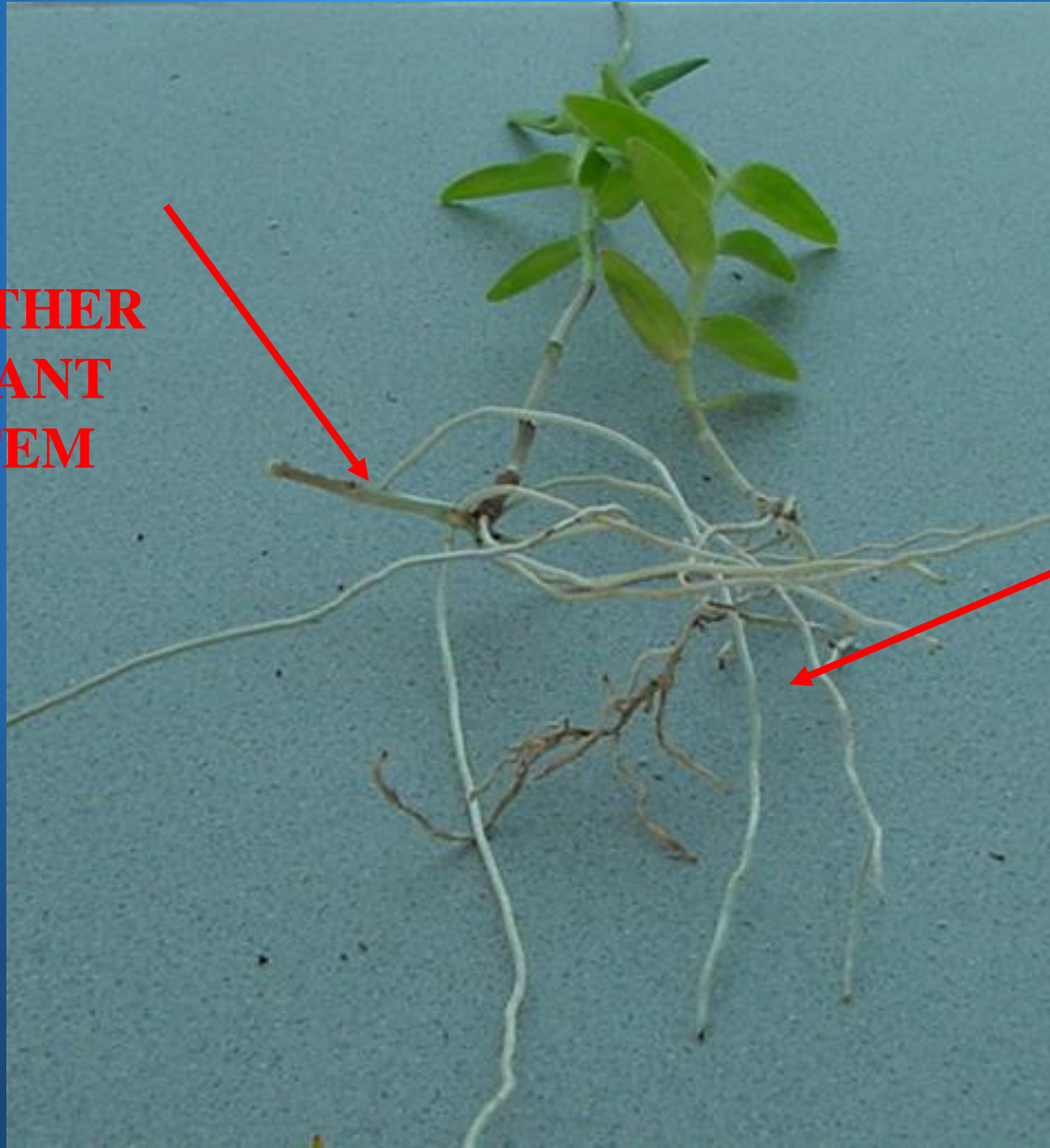


# VIVIPAROUS HESPERALOE



# VIVIPAROUS ORCHIDS

**MOTHER  
PLANT  
STEM**



**ROOTS**

# VIVIPAROUS ORCHIDS

**YOUNG  
PLANTLET S  
ON THE  
MOTHER  
PLANT**



**PLANTLETS  
REMOVED**



# VIVIPAROUS LEAVES



**BRYOPHYLLUM**



# VIVIPAROUS LEAVES

SUCCULENT





# VIVIPAROUS LEAVES

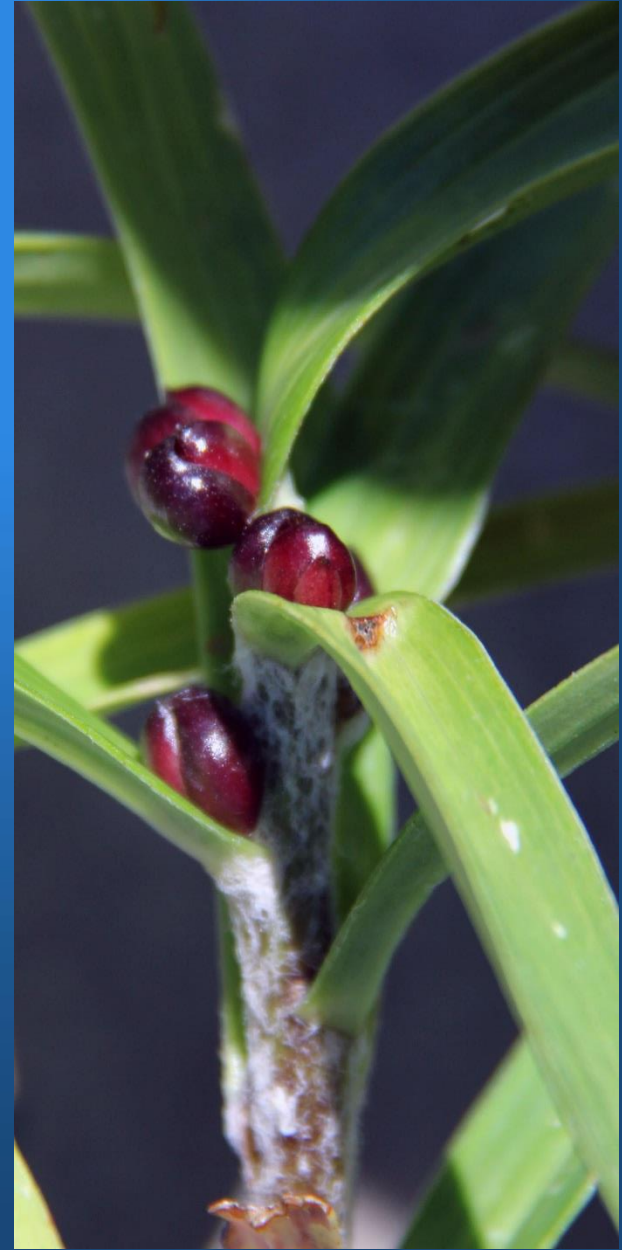


SUCCULENT

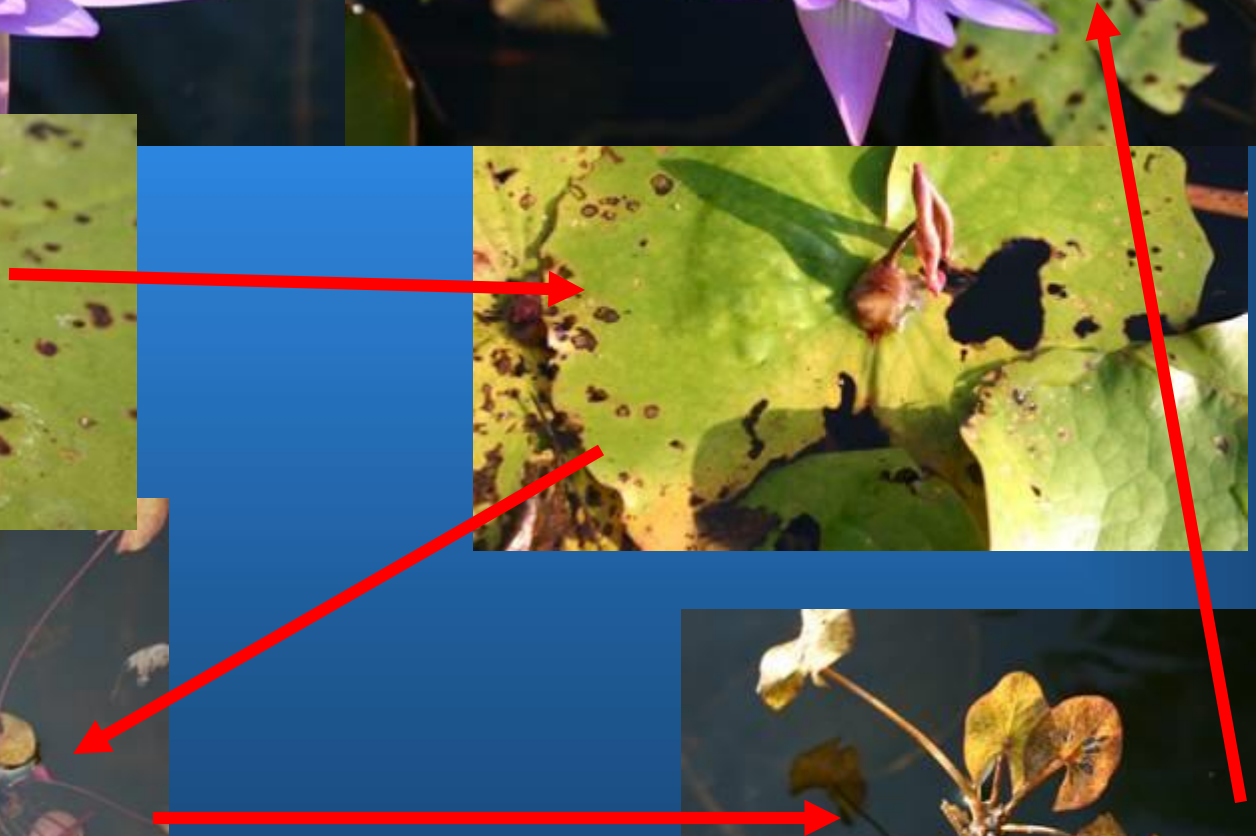
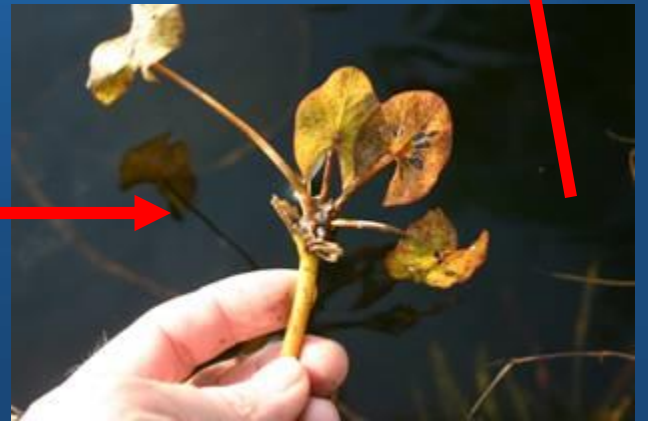
# VIVIPAROUS LEAVES



AMORPHOPHALLUS BULBIFER



# VIVIPAROUS WATER LILIES



# PROPAGATION BY DIVISION



# PROPAGATION BY DIVISION OF ZAMIAS



# PROPAGATION BY DIVISION OF CYCADS



# PROPAGATION BY DIVISION



1 TO 5  
FLATS



# PROPAGATION BY DIVISION



**6 WEEKS  
LATTER**

# PROPAGATION BY DIVISION OF DATE PALMS

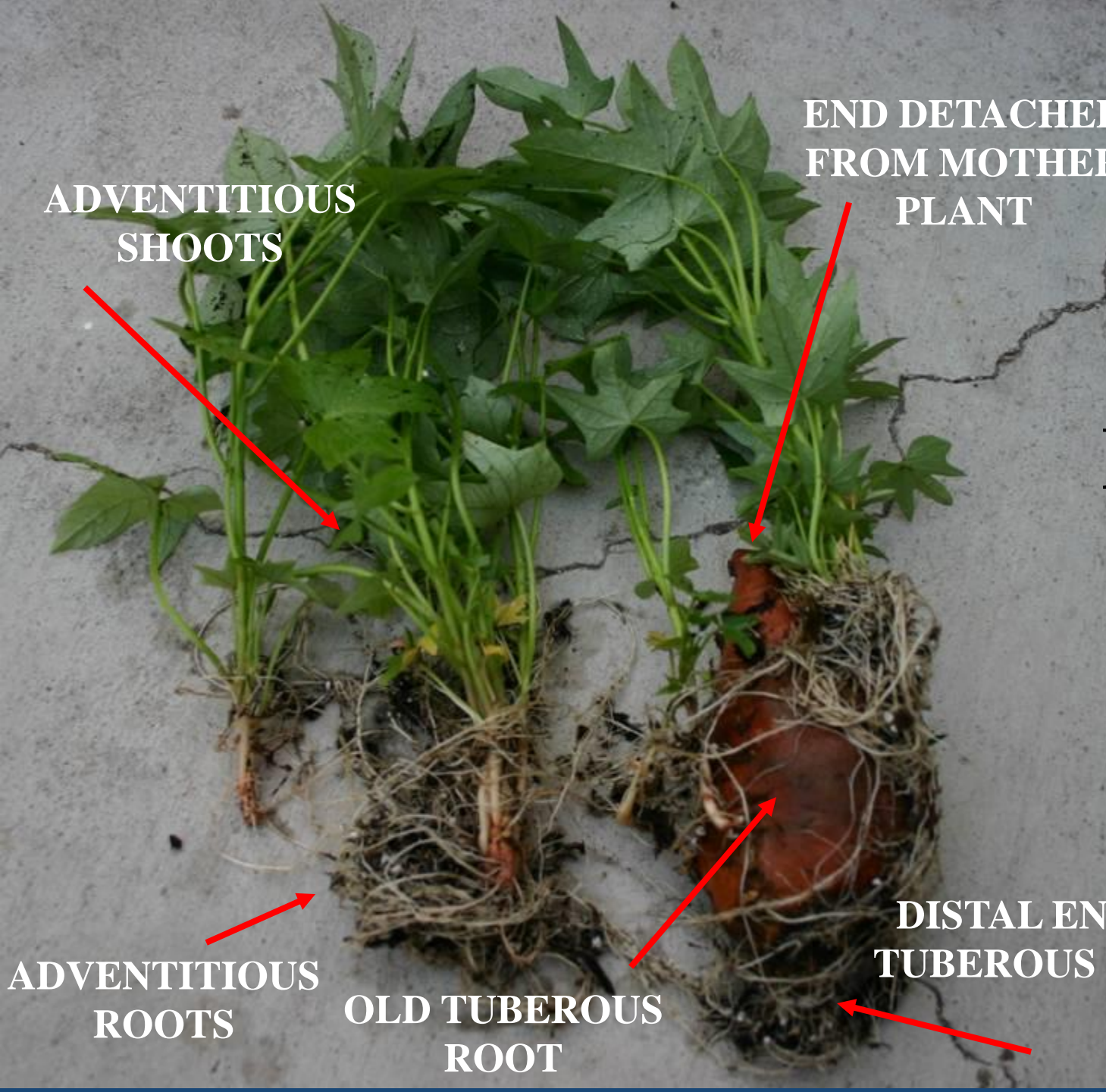


# DIVIDING CACTUS



# A BULB BY AN OTHER NAME MAY NOT BE A BULB





**ADVENTITIOUS  
SHOOTS**

**END DETACHED  
FROM MOTHER  
PLANT**

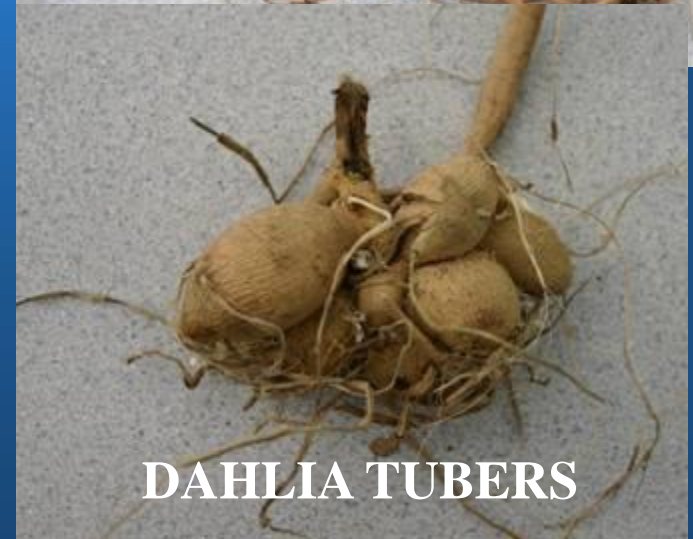
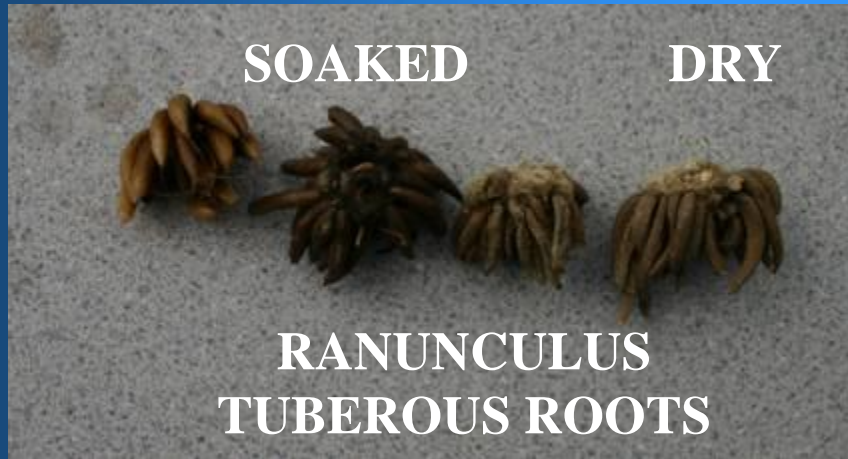
**FLESHY  
ROOTS**

**ADVENTITIOUS  
ROOTS**

**OLD TUBEROUS  
ROOT**

**DISTAL END OF  
TUBEROUS ROOT**

# FLESHY ROOTS AND TUBERS ETC.



# DIVIDING BEARDED IRIS



# BULBS



**MAKE DIVISIONS  
HERE**

**MAKE DIVISIONS  
HERE**





# BULBS, CORMS, RHIZOMES, TUBERS DISSECTED

LILY BULB



GLADIOLA CORM



CALADIUM  
TUBER



CALLA LILY RHIZOME

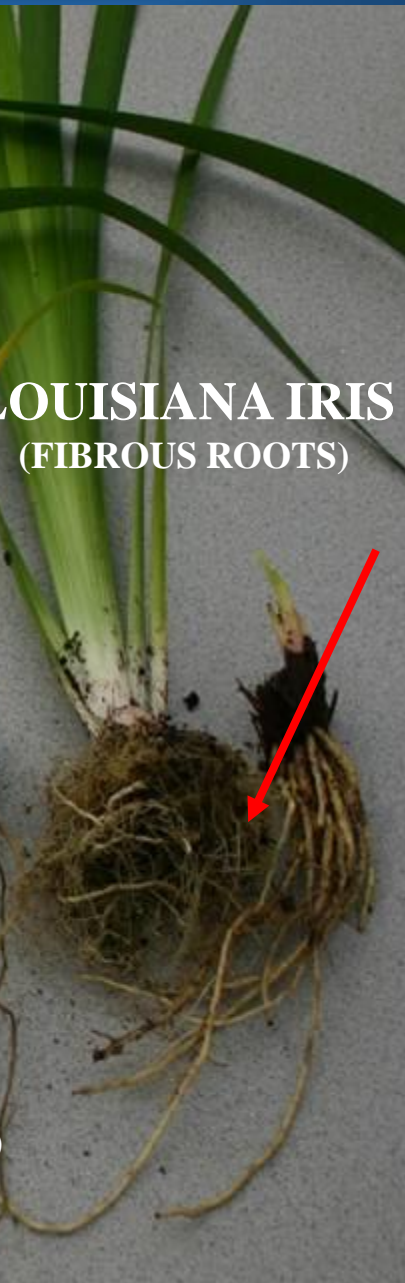


**CALADIUM (TUBER)**

**GLADIOLA (CORM),  
CALLA (RHIZOME)**

**DAHLIA (TUBER)**

**LOUISIANA IRIS  
(FIBROUS ROOTS)**

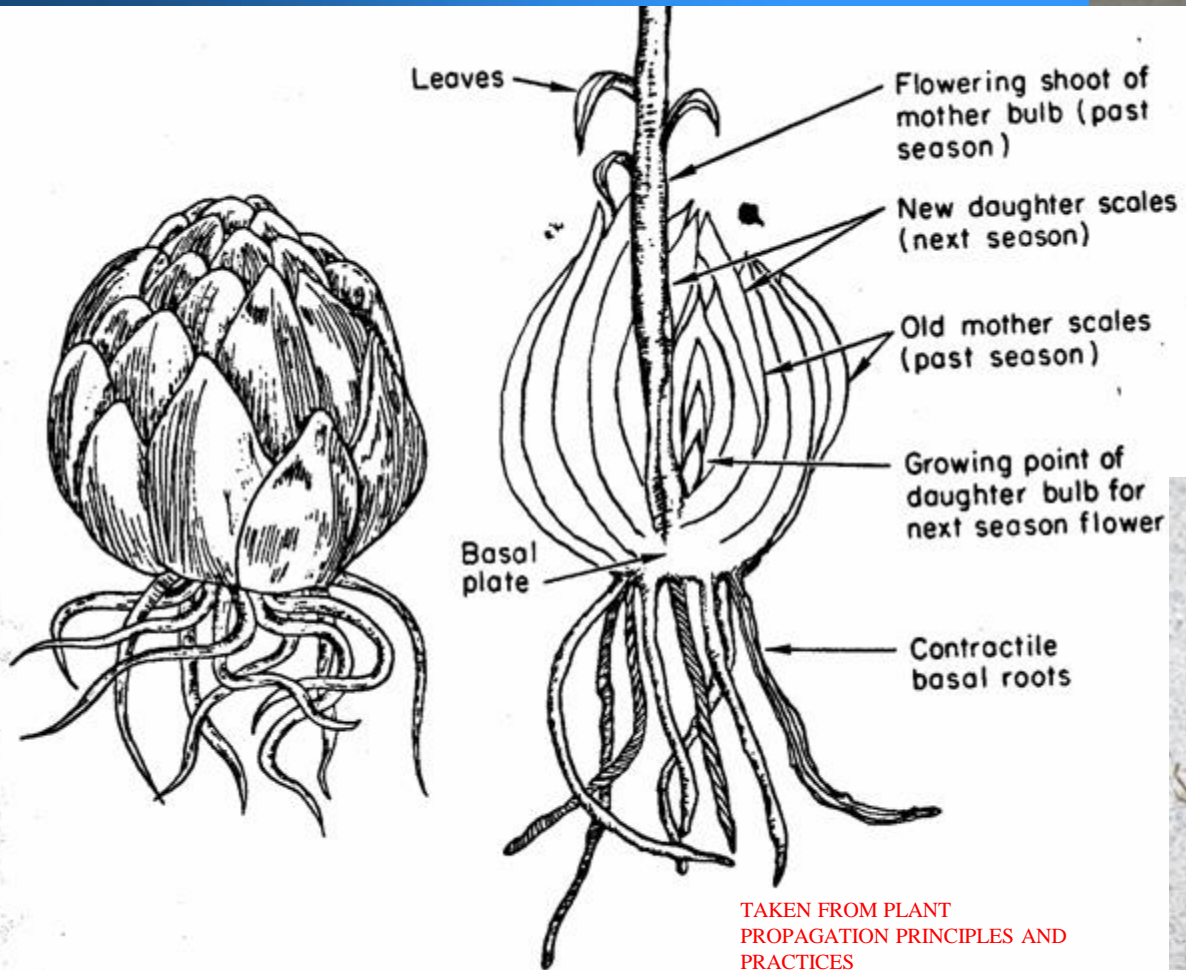


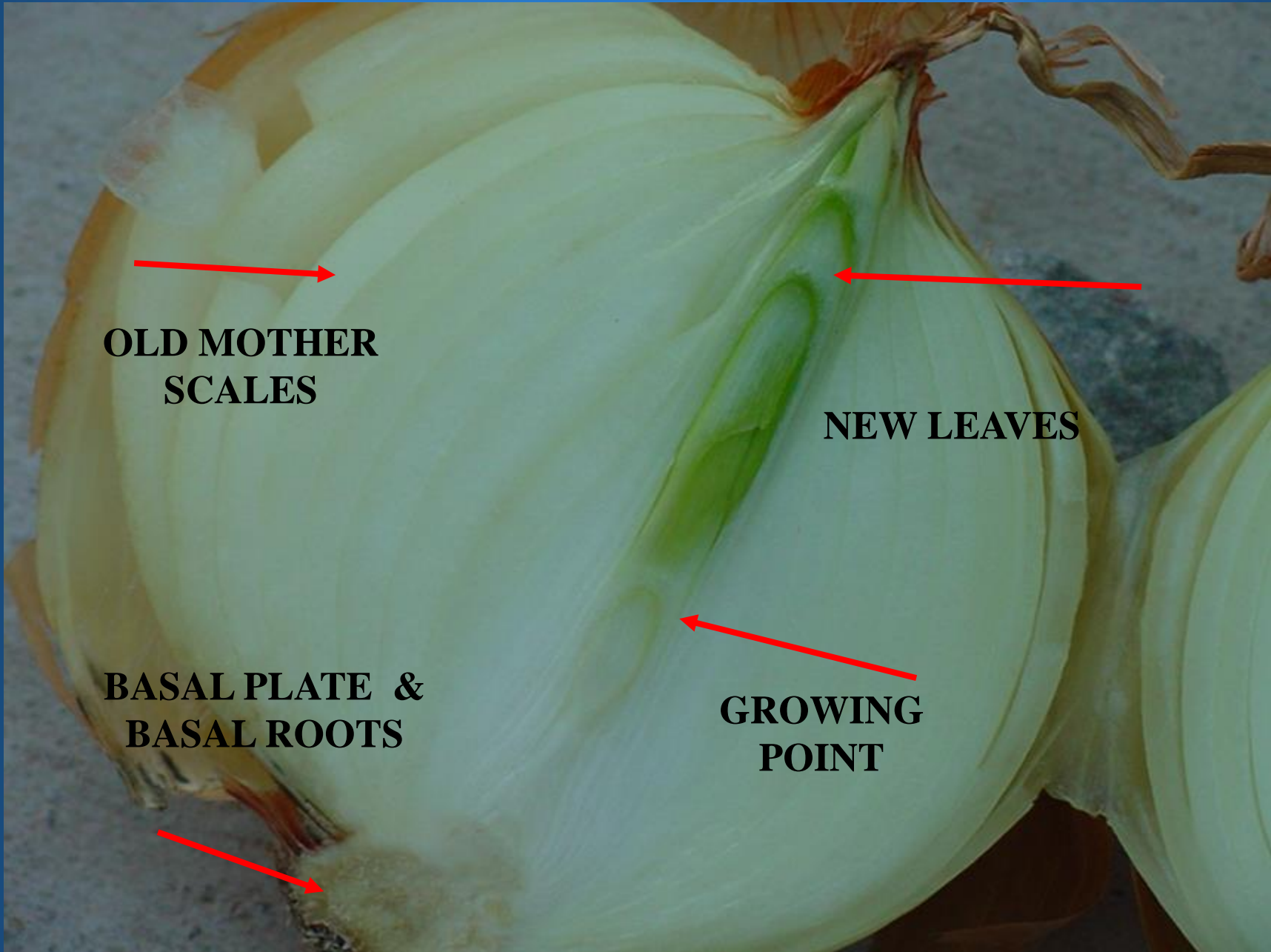
**CANNAS, WATER  
LILY (RHIZOME)**

**DAYLILY (FIBROUS/TUBEROUS  
ROOTS)**

**LILY (BULB)**

# BULBS AND CORMS





**OLD MOTHER  
SCALES**

**NEW LEAVES**

**GROWING  
POINT**

**BASAL PLATE &  
BASAL ROOTS**

# DIVIDING AMARYLLIS





# **PROPAGATION BY GRAFTING**

## **WHY GRAFT?**

- **FASTER FLOWERING AND FRUITING**
- **IMPROVEMENT OF PLANT  
BEST ROOT AND TOP**
- **PROPAGATE HARD TO ROOT  
PLANTS**

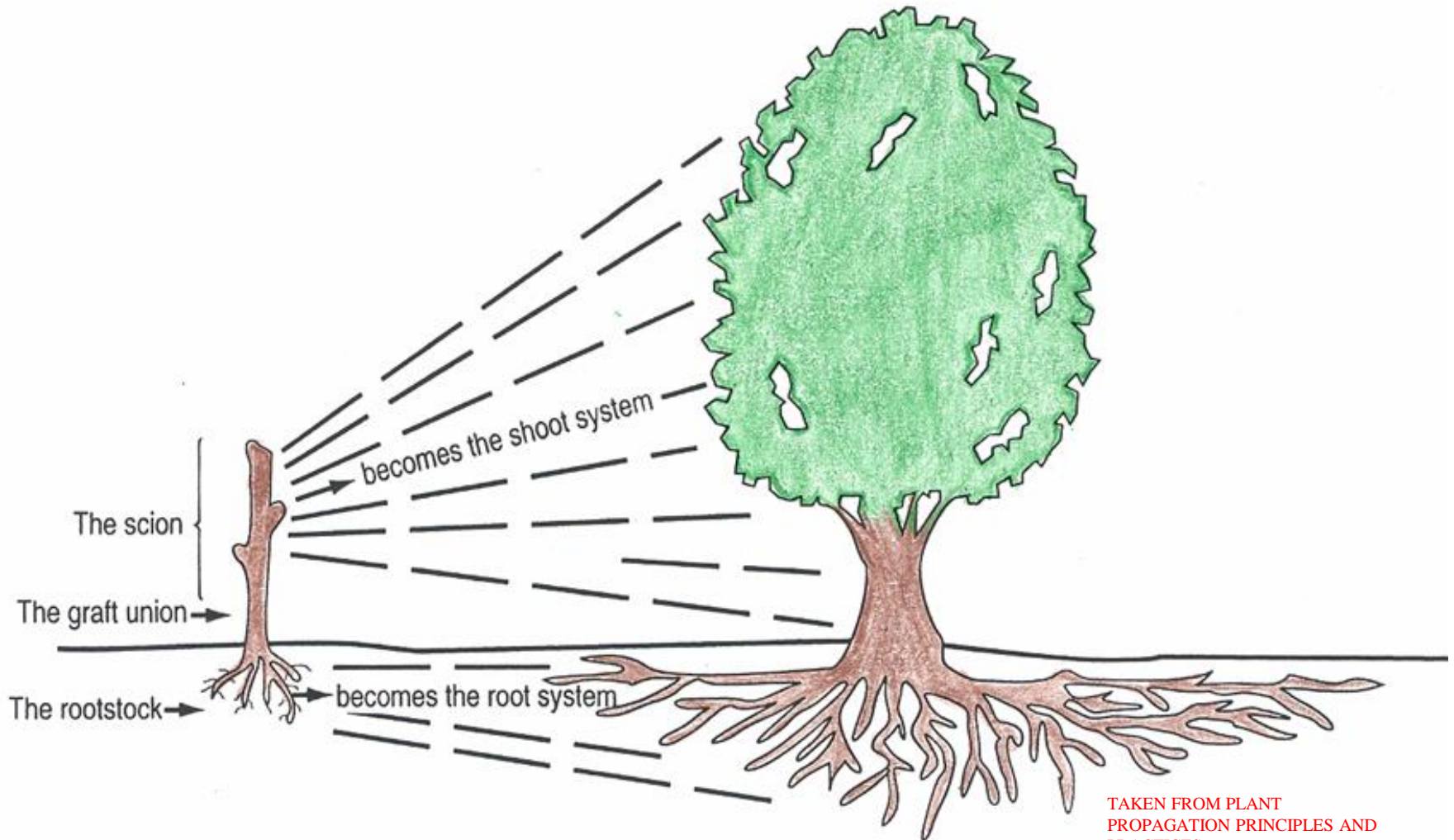
# **PROPAGATION BY GRAFTING**

## **WHY GRAFT?**

- **CHANGE A VARIETY ALREADY PLANTED**
- **HAVE DIFFERENT VARIETIES ON THE SAME PLANT**
- **CHANGE THE SIZE OF THE TREE OR PLANT**



# BASIC GRAFTING



# GRAFT ON YOUNG DWARF FRUIT TREE



**SCION**

**GRAFT UNION**

**ROOT STOCK**

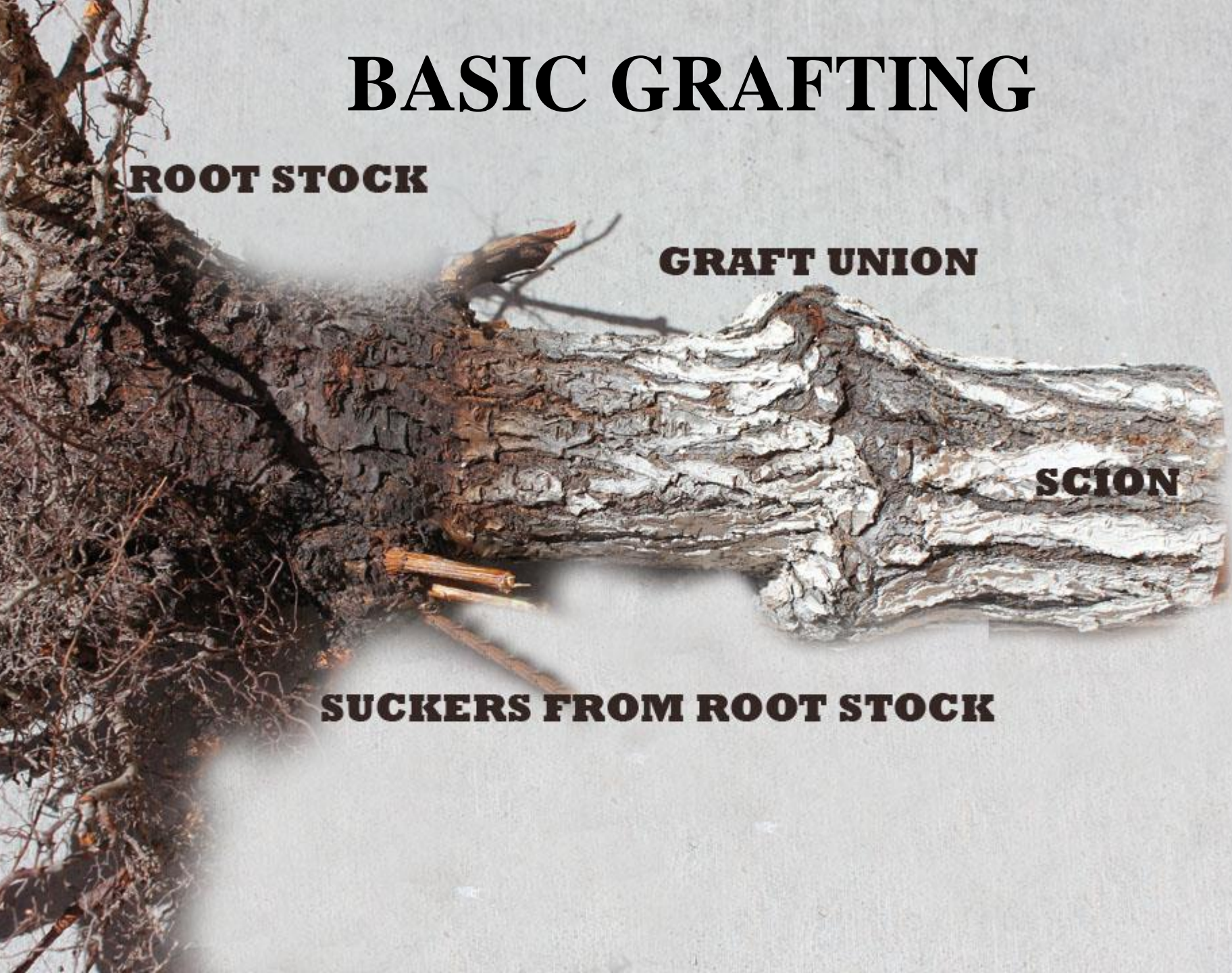
# BASIC GRAFTING

**ROOT STOCK**

**GRAFT UNION**

**SCION**

**SUCKERS FROM ROOT STOCK**



# BASIC GRAFTING





# BASIC GRAFTING



# BASIC GRAFTING



**LOCUST TREE**

**SCION**

**ROOT STOCK**

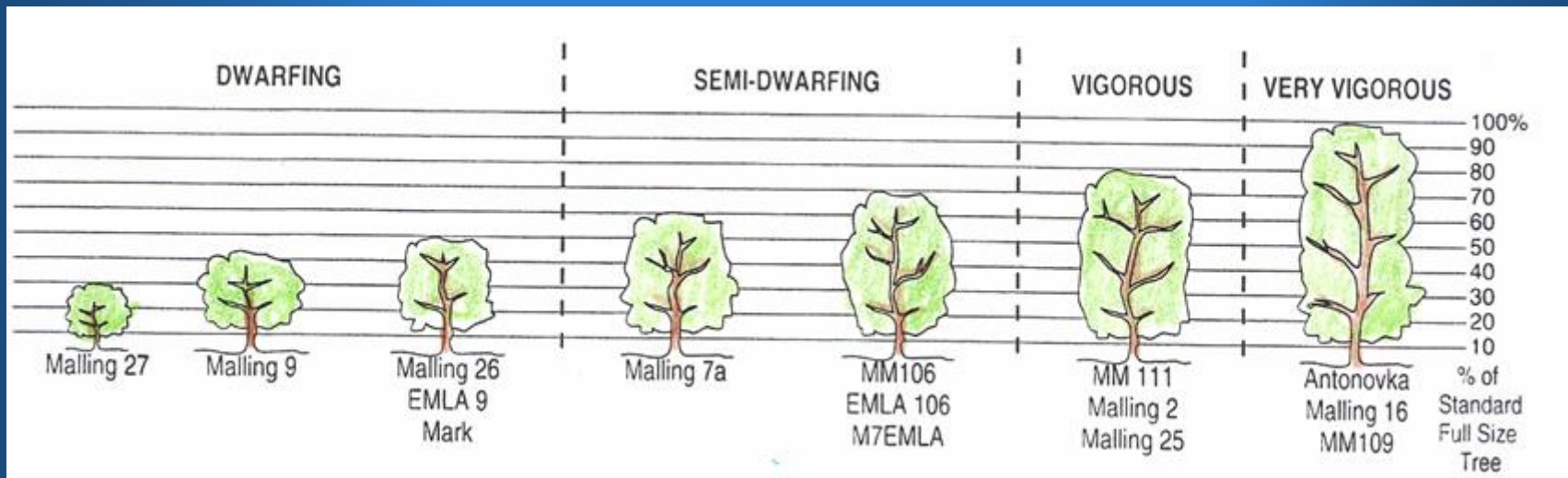


**PURPLE LEAF PLUM**





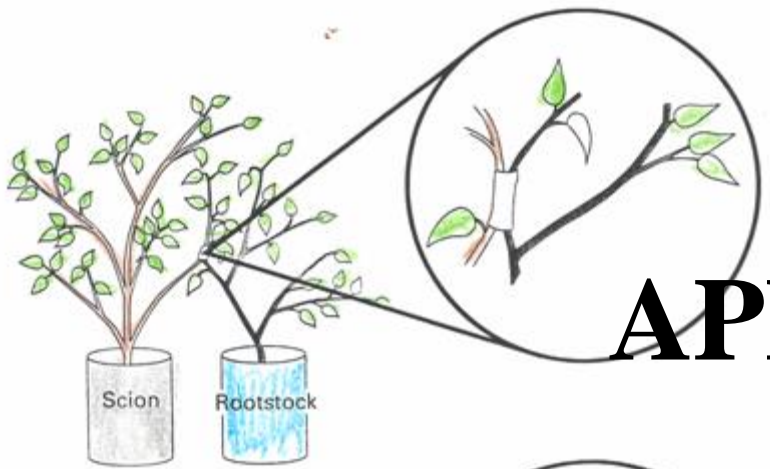
# GRAFTING CAN MAKE THE SAME VARIETY PRODUCE TREES THAT WILL GROW FROM 3 FT TO 30 FT WITH THE SAME FRUIT.



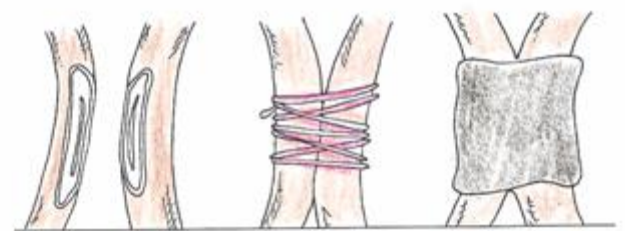
# **PROPAGATION BY GRAFTING**

## **TYPES OF GRAFTING**

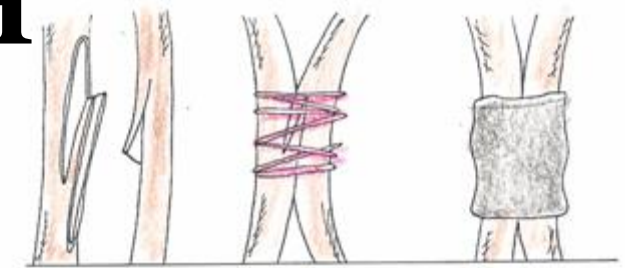
- **APPROACH**
- **BRIDGE**
- **INARCHED**
- **INVERTED**
- **ROOT**
- **SIDE TONGUE**
- **SADDLE**
- **TOP**
- **WEDGE**
- **WIPE**
- **MULTI**



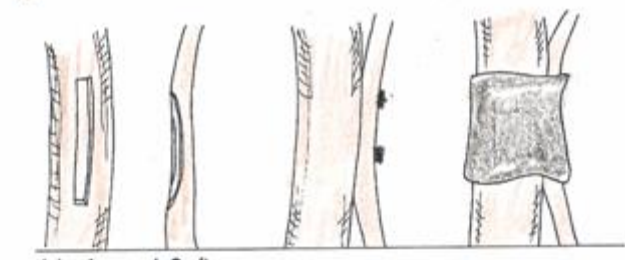
# APPROACH



Spliced Approach Graft



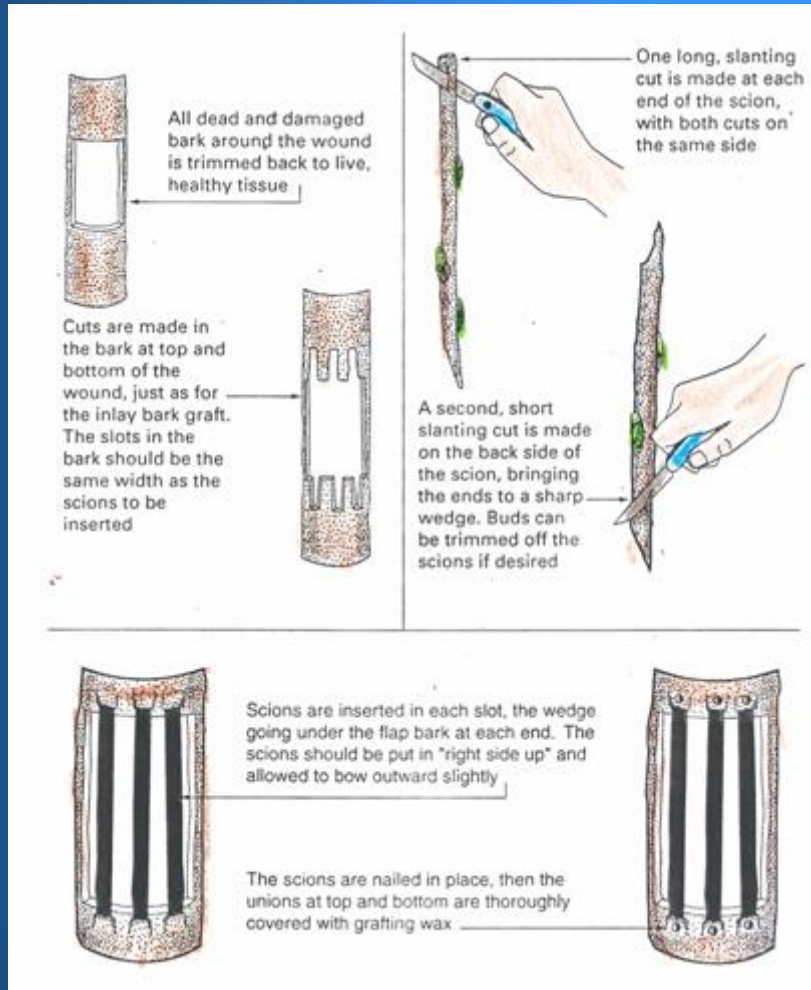
Tongued Approach Graft



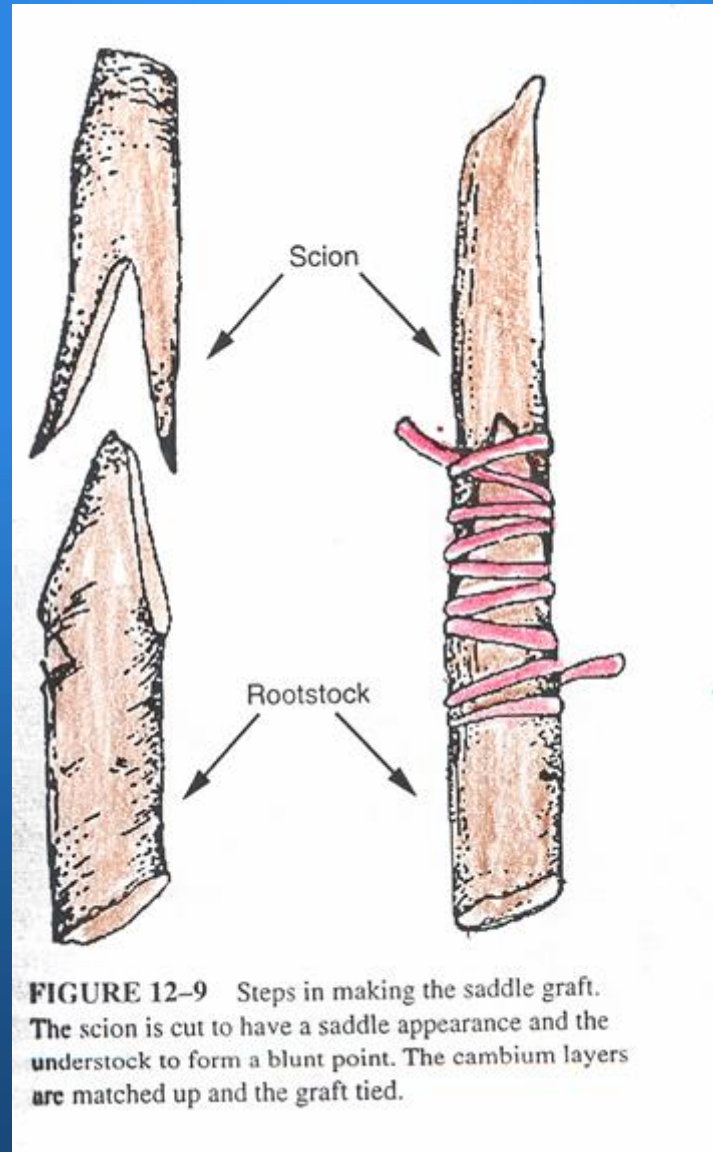
TAKEN FROM PLANT  
PROPAGATION PRINCIPLES AND  
PRACTICES



# BRIDGE



# SADDLE



**FIGURE 12-9** Steps in making the saddle graft. The scion is cut to have a saddle appearance and the understock to form a blunt point. The cambium layers are matched up and the graft tied.

# TOP



## PREPARING THE STOCK



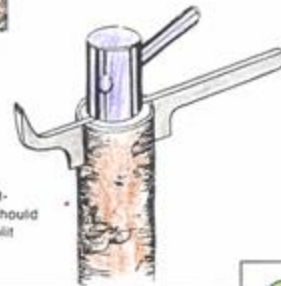
The stub is split several cm (in.)

## PREPARING THE SCION



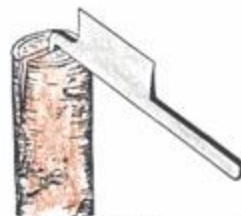
The scion is made by cutting a long, gradually tapering wedge.

A smooth straight-grained section should be used so the split will be even.

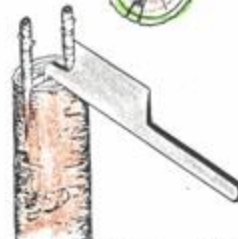


The outside edge of the wedge should be slightly thicker than the inside.

## INSERTING THE SCIONS INTO THE STOCK



The split in the stock is held open by a wedge for insertion of the scions.



Two scions are inserted in a stub, one at each end of the split. The scions must be carefully placed so the

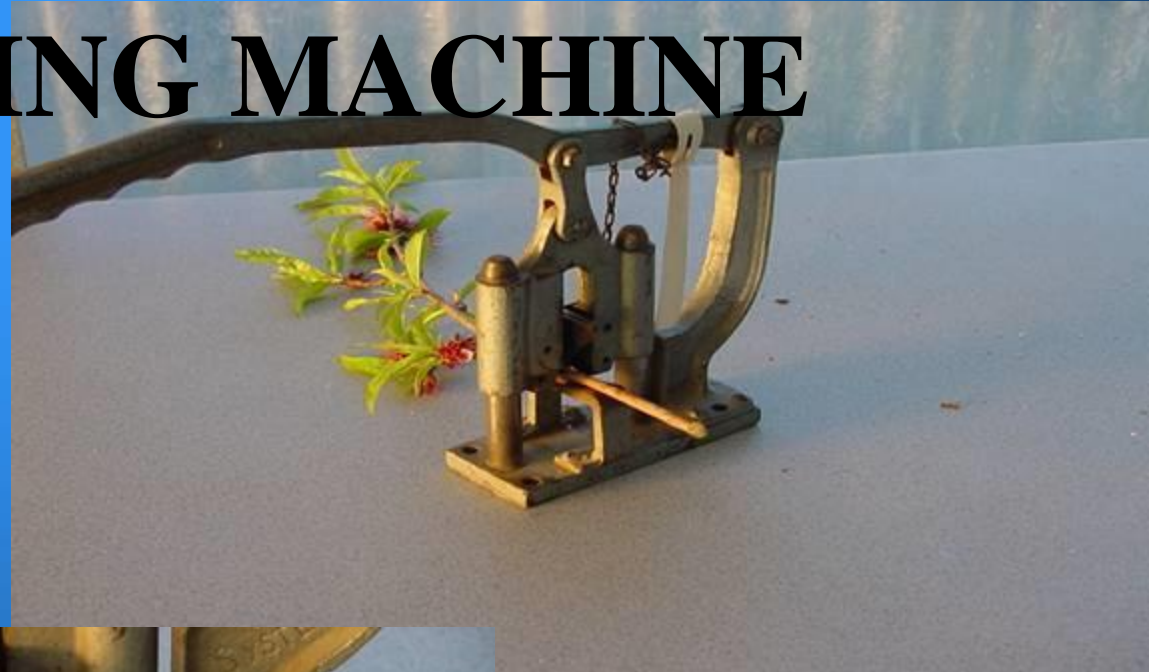


After the scions are properly placed, the wedge is withdrawn. The entire union, including the tips of the scions, is then thoroughly covered with

# CLEFT GRAFT CAN BE USED FOR TOP GRAFTING

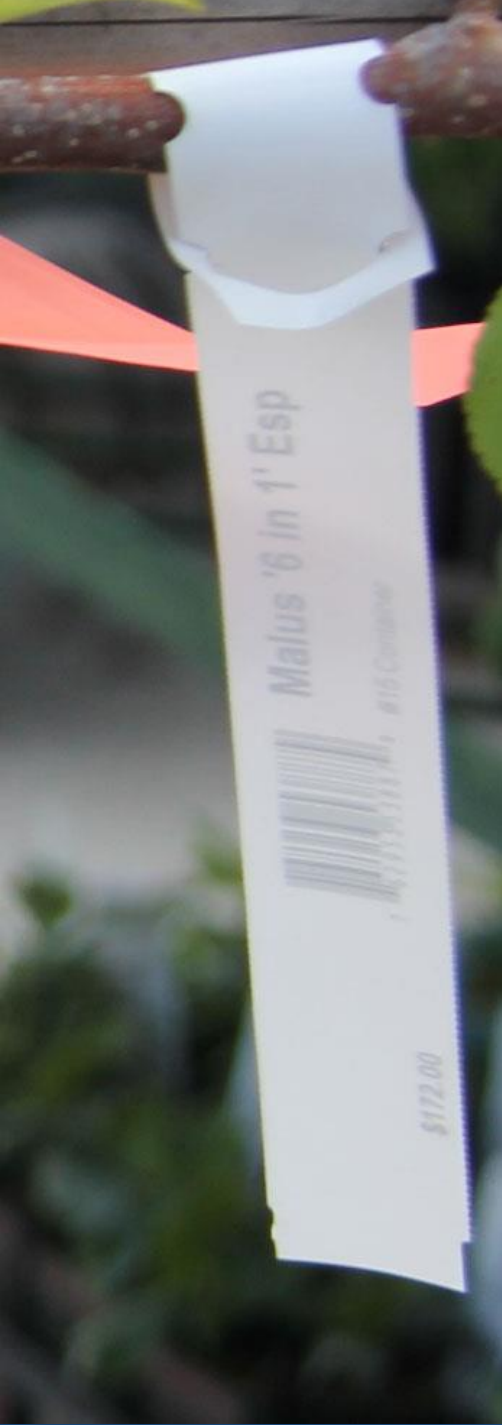
TAKEN FROM PLANT PROPAGATION PRINCIPLES AND PRACTICES

# GRAFTING MACHINE









# GRAFTING OF GRAPES



# GRAFTING OF SUCCULENTS



# GRAFTING OF SUCCULENTS

WHITE  
FLOWERING  
ROOT STOCK



# GRAFTING OF CACTUS



# GRAFTING OF CACTUS



# GRAFTING OF CACTUS



**GLUING THE SCION  
TO THE STOCK**





# ROOT STOCK CAN DETERMINES SCION GROWTH



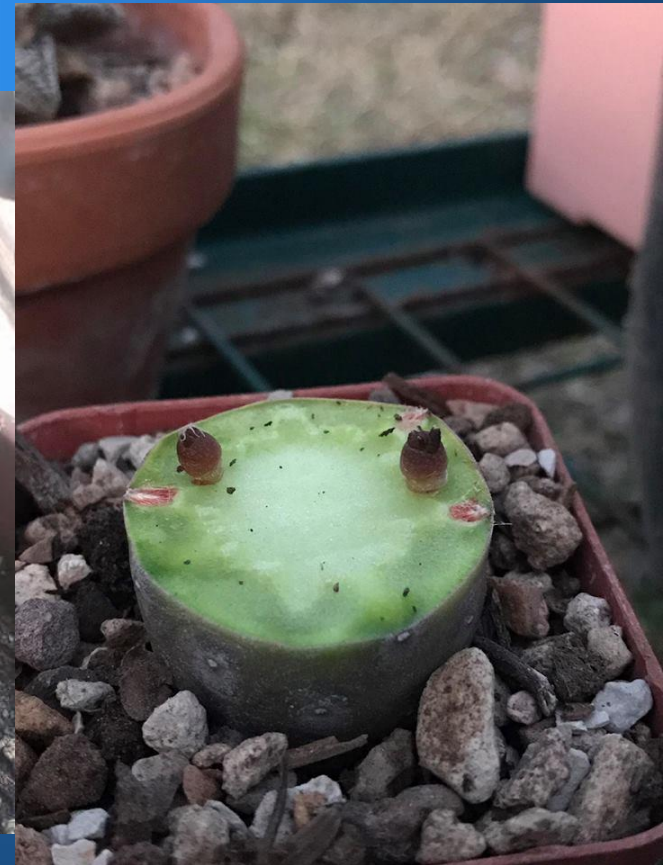
# GRAFTING OF CACTUS



Maarten VAN DER MEER

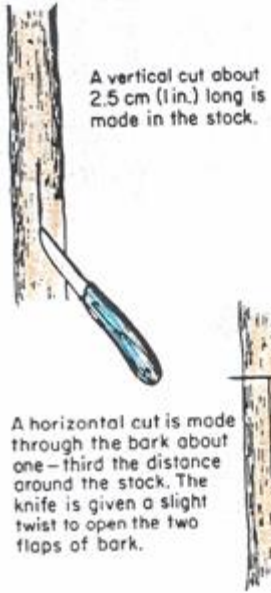


MICA MYNATT PROPAGATION

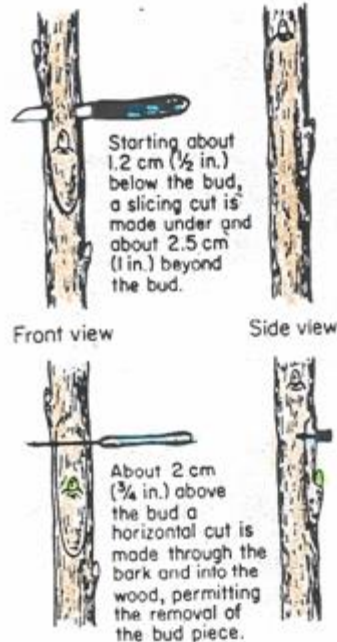


# BUDDING

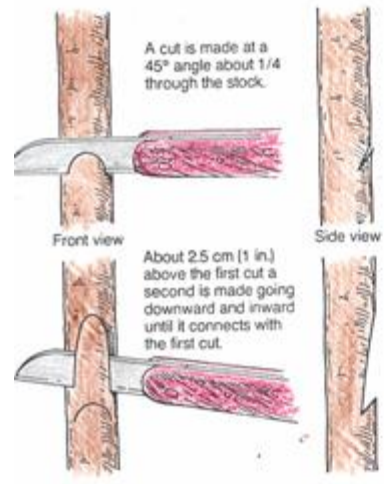
## PREPARING THE STOCK



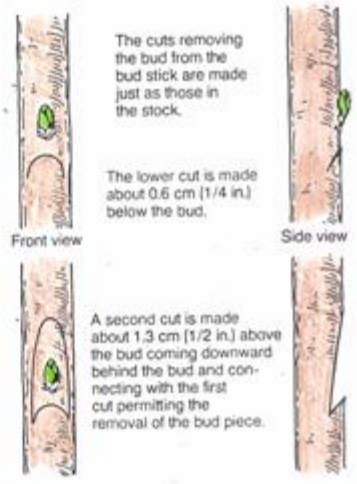
## PREPARING THE BUD



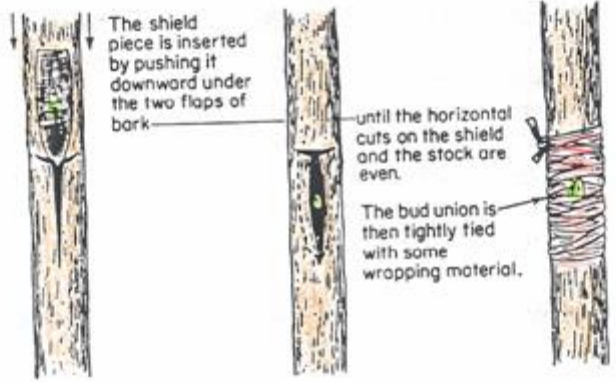
## PREPARING THE STOCK



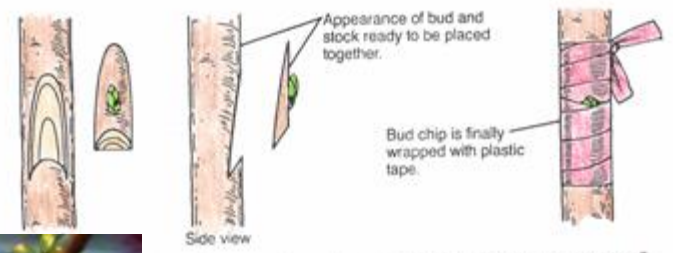
## PREPARING THE BUD



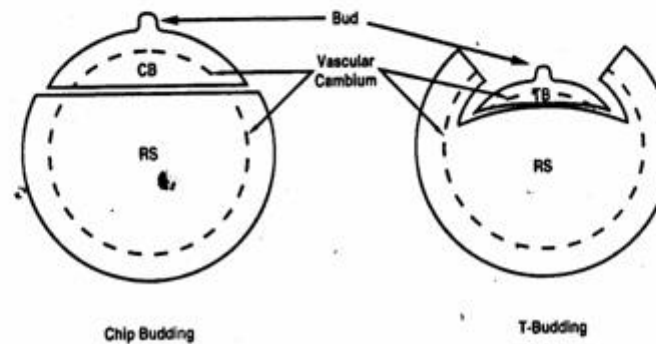
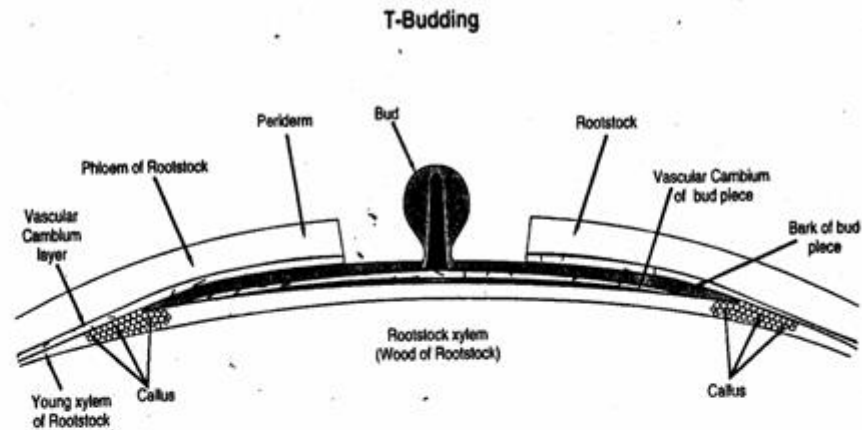
## INSERTING THE BUD INTO THE STOCK



## INSERTING THE BUD INTO THE STOCK

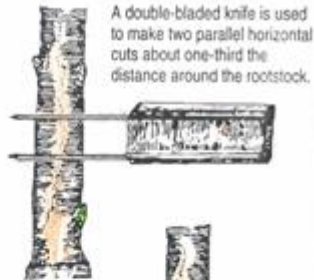


# A BUD FROM INSIDE



# PATCH BUDDING

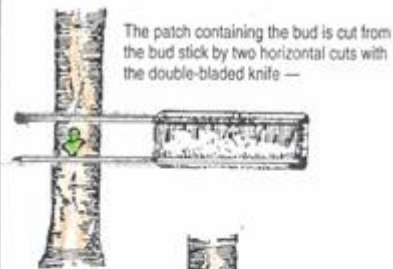
## PREPARING THE ROOTSTOCK



The two horizontal cuts are connected at each side by vertical cuts.



## PREPARING THE BUD



—followed by two vertical cuts on each side of the bud. The bud patch is removed by sliding it off to one side.



## INSERTING THE BUD INTO THE ROOTSTOCK

When the bud patch is ready the bark is removed from the rootstock and the bud inserted. It may need to be trimmed along one side for a tight fit.



Be sure edges line up.



The inserted patch ready for wrapping should look like this, fitting tightly in the opening on all four

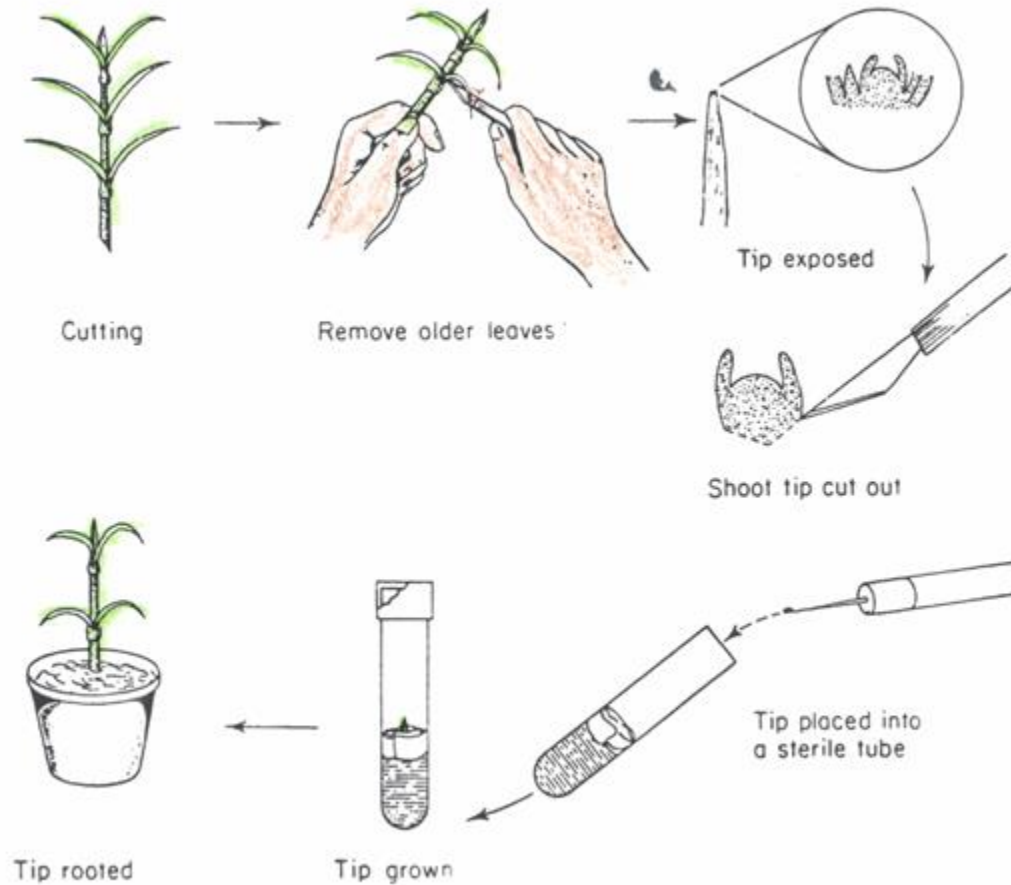
The union is then wrapped with grafting tape or poly strips, using care to cover all the cuts, but leaving the bud exposed (arrow).



# TISSUE CULTURE (CLONING OR IN VITRO)



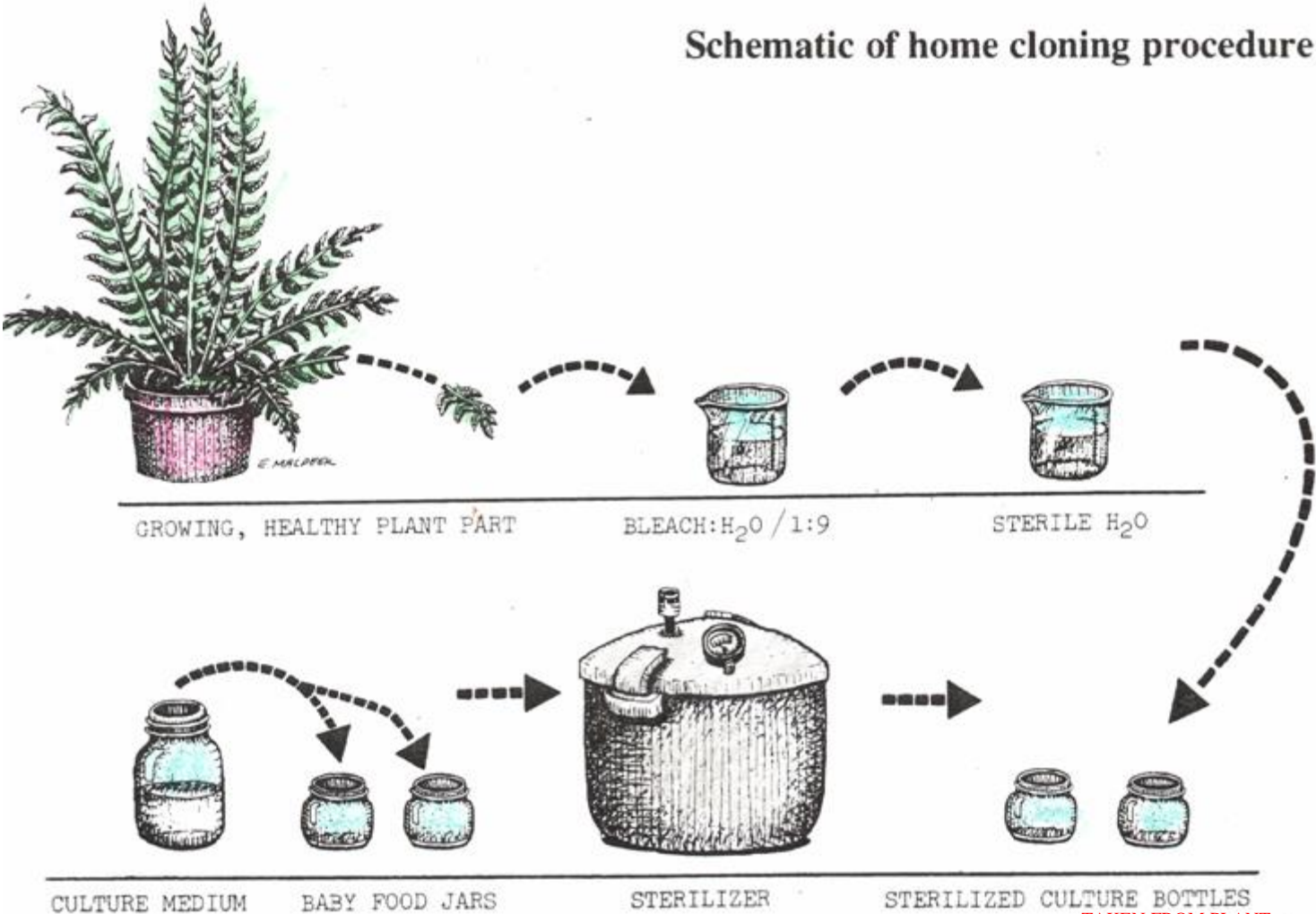
# BASIC TISSUE CULTURE





# DO IT YOURSELF AT HOME

Schematic of home cloning procedure.



# STERILIZING



# TAKING MICRO CUTTINGS





# GROWTH CHAMBER

# DIVIDING PLANTLETS



# PLANTING THE MICRO CUTTINGS



# FROM LAB TO FIELD



# SHIPPING

144 PLANTS PER  
BOX





# 5 KEY STAGES OF PALM IN VITRO PROPAGATION



**EXPLANT  
INTRODUCTION**



**BUD INITIATION**



**MULTIPLE SHOOT FORMATION**



**PLANT ELONGATION &  
ROOT**



**PALMS READY TO ESTABLISH**

# HARDING OFF OF DATE PALMS



HARDENING OFF



HARDENING OFF IN  
GREENHOUSE



MEDJOOl TISSUE CULTURED  
TREE 3 YEARS OLD



*This website was developed to help hobbyists, students, teachers, nurserymen and other brave people learn and enjoy the art and fun of plant tissue culture in their homes and classrooms without expensive equipment..... [kck@turbonet.com](mailto:kck@turbonet.com)*

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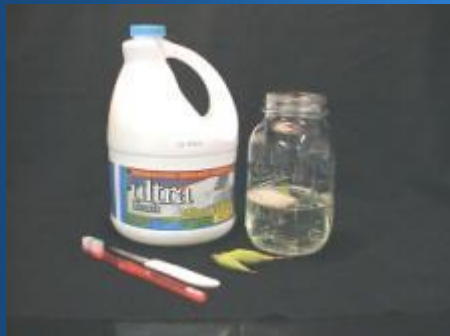
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## **FOR MORE INFORMATION**

Carol M. Stiff, PhD  
Kitchen Culture Kits, Inc.  
350 Northside Drive  
Milton, Wisconsin 53563

**A KITCHEN TISSUE CULTURE LAB**

### Resume

608-302-2750 FAX 608-868-2851

[kck@turbonet.com](mailto:kck@turbonet.com)

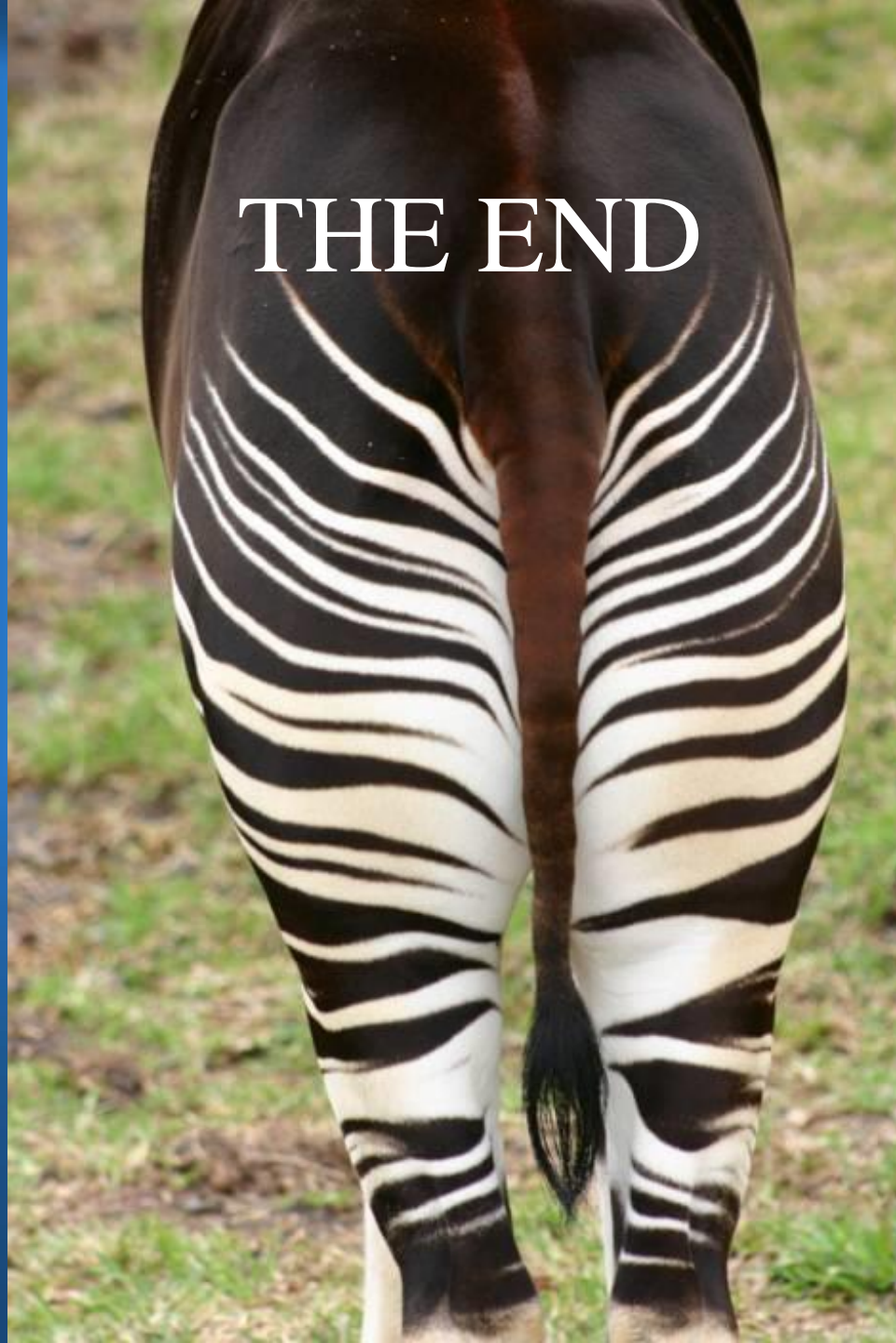
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THE END



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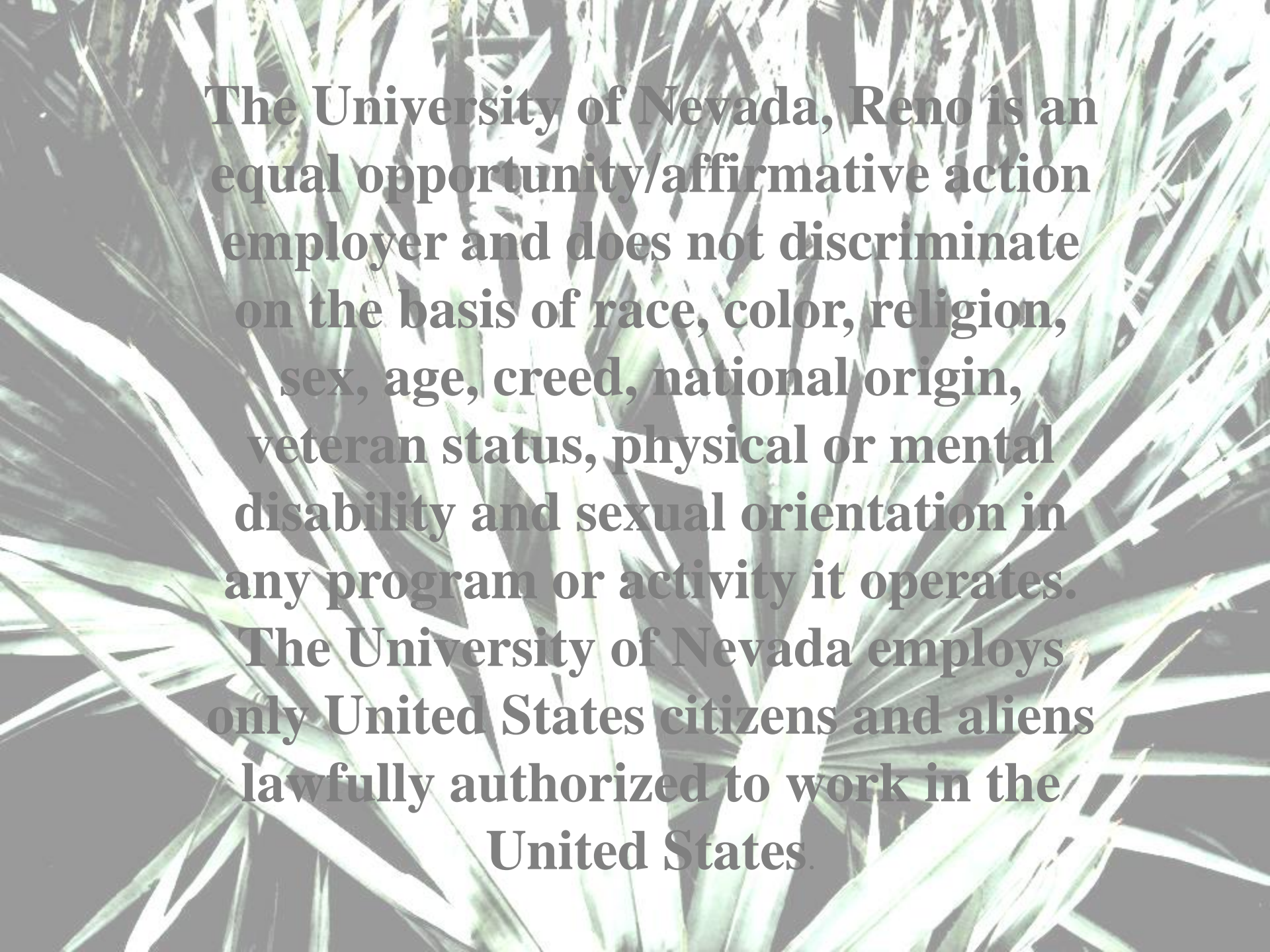


# PHOTOS

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- **PLANT PROPAGATION AND PRINCIPLES**
- **HOW TO PROPAGATE PLANTS**
- **AGRA STARTS FLORIDA**
- **<http://www.kitchenculturekit.com>**

# REFERENCES

- **PLANT PROPAGATION AND PRINCIPLES**
- Carol M. Stiff, PhD, Kitchen Culture Kits, Inc.  
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