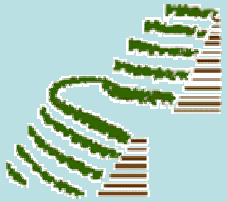
VETIVER GRASS PROPAGATION



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VETIVER PROPAGATION

IN VITRO MICRO PROPAGATION

Developed by Dr Le Van Be

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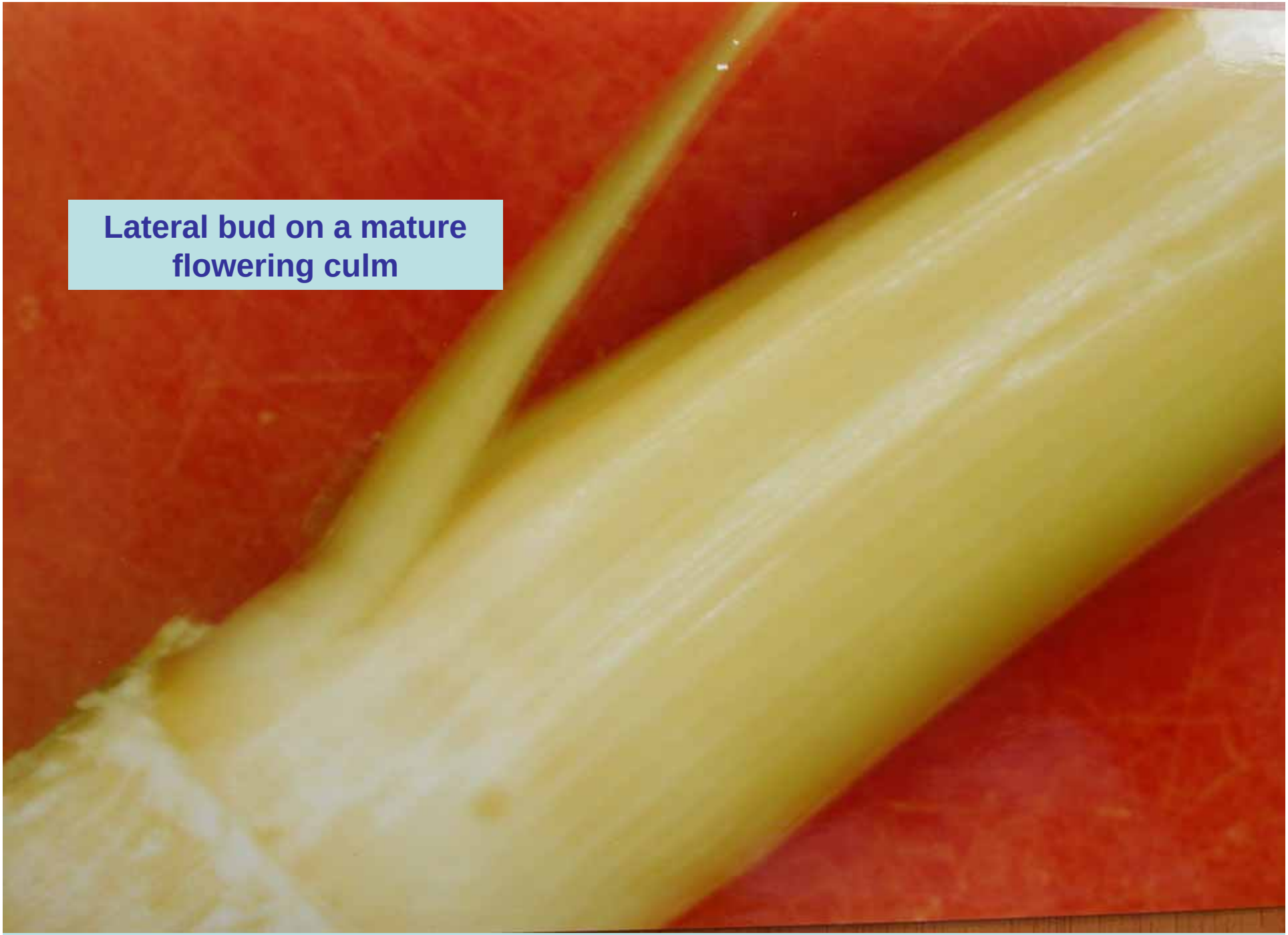
IN VITRO MICRO PROPAGATION

There are four stages in vitro micro propagation, all in liquid medium:

- **Inducement of lateral bud development**
- **Multiplication of new shoots**
- **Promoting root development on new shoots**
- **Promoting growth in shade house or glasshouse**



Lateral bud on a mature flowering culm

Stage 1: Inducement of shoot growth in MS liquid medium

Lateral shoot emerged 14 days later

Preparation of MS liquid medium for Stage 1

1- Basic medium of Murashige & Skoog (1962) (Table 1)

2- 30 g/L sucrose

3- 1 mg/L of Benzyl Adenine

4- Cooking the medium until boiling, cool down and adjust pH to 5.7

5- Pouring the medium into glass ware and sterilization at 120oC for 15 minutes

Stage 2: Multiplication of Shoots

1- After 14 days in Stage 1, the shoots are transferred into glass jars with fresh MS medium, modified with 2 mg/L of BA for shoot multiplication. Higher concentrations produce very small and ineffective plantlets

2- Glass jars of 6 cm in diameter and 12 cm high were used

3- Put 2 shoots in each jar.

4- After 4 weeks normally 7-9 shoots developed from each bud as shown in Photos 1 and 2.

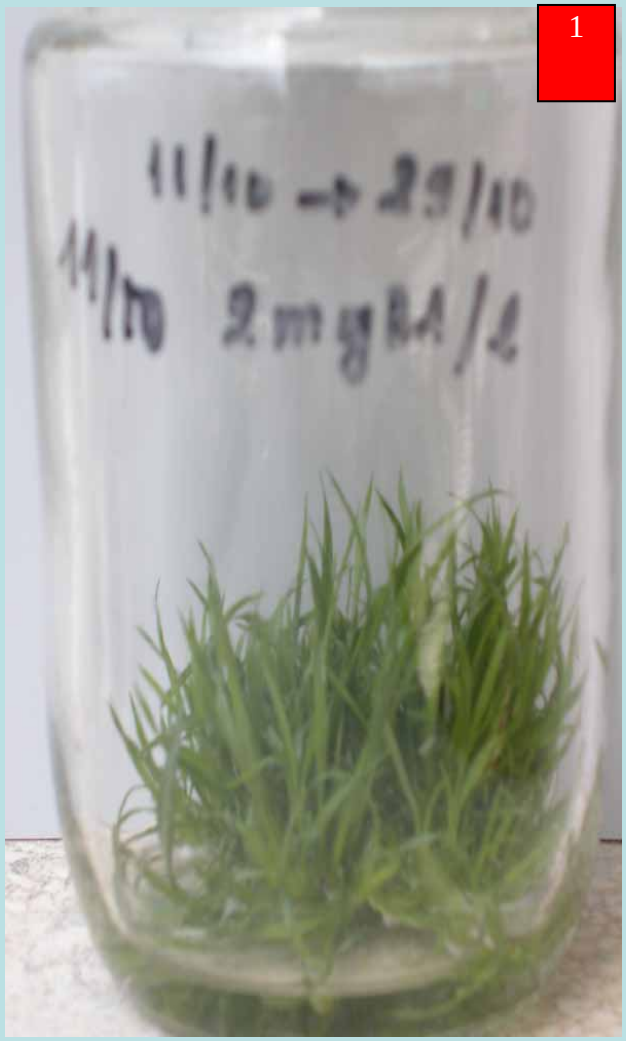


Photo 1: Vetiver was multiplied in the glass jars, 4 weeks after culture.
Photo 2: A good clump of Vetiver plantlets after 4 weeks

Stage 2: Multiplication of shoots

Effects of various Benzyl Adenine (BA) concentrations on the formation of new shoots and their mass from the initial single shoot (observed 8 weeks after planting)

(a) Shoot in medium with 1 mg BA/L; (b) Shoot in medium with 2 mg BA/L; (c) with 3 mg BA/L; (d --- j) with 4 to 10 mg BA/L.

Vetiver plantlets in MS solution with 2 mg BA/L, 8 weeks after transplanting

Stage 3: Promoting Root Development

- **After 4 weeks in stage 2, plantlets about 3cm high, were then transferred to rooting medium, a basic MS solution**

- **Plastic containers were used in this stage because they are cheap and light**

- **After 14 days plantlets were transferred to glass or shade house, stage 4.**

- **All 4 stages can be carried out in shade house or glasshouse, no need for growth chamber or cabinet**

Vetiver in the plastic containers after 2 weeks cultivation in the rooting medium

The clump of Vetiver is ready for stage 4 in the nethouse

Stage 3: Promoting Root Development

Vetiver clump and separated plantlets

Single plantlets separated from clump

Clump with 5-6 plantlets

Separated plantlets ready for rooting medium

Stage 4: Promoting growth in shade house or glasshouse

Plantlets in shade house

Photo 5: Vetiver in good potting mix in the nethouse
Photo 6: Vetiver develops well after 8 weeks in the nethouse.
Photo 7: The micro-propagated shoots is ready for planting in the field.

Stage 4: Promoting growth in shade house or glasshouse

Plantlets in shade house

(a) Plantlets after 8 weeks in shade house
(a) Plantlet ready for field planting

VETIVER PROPAGATION

VEGETATIVE METHOD

Developed by Le Van Du
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Various plant parts used for vegetative propagation

PREPARATION OF VETIVER CUTTINGS

FOR VEGETATIVE PROPAGATION

1. **Vetiver culms**
   - **Select old culms as they have more mature buds and more nodes than young culms**
   - **Cut 30-50mm lengths, with 10-20mm below the nodes**
   - **Strip off old leaf cover**
   - **In most cases, new shoots emerged one week after planting**

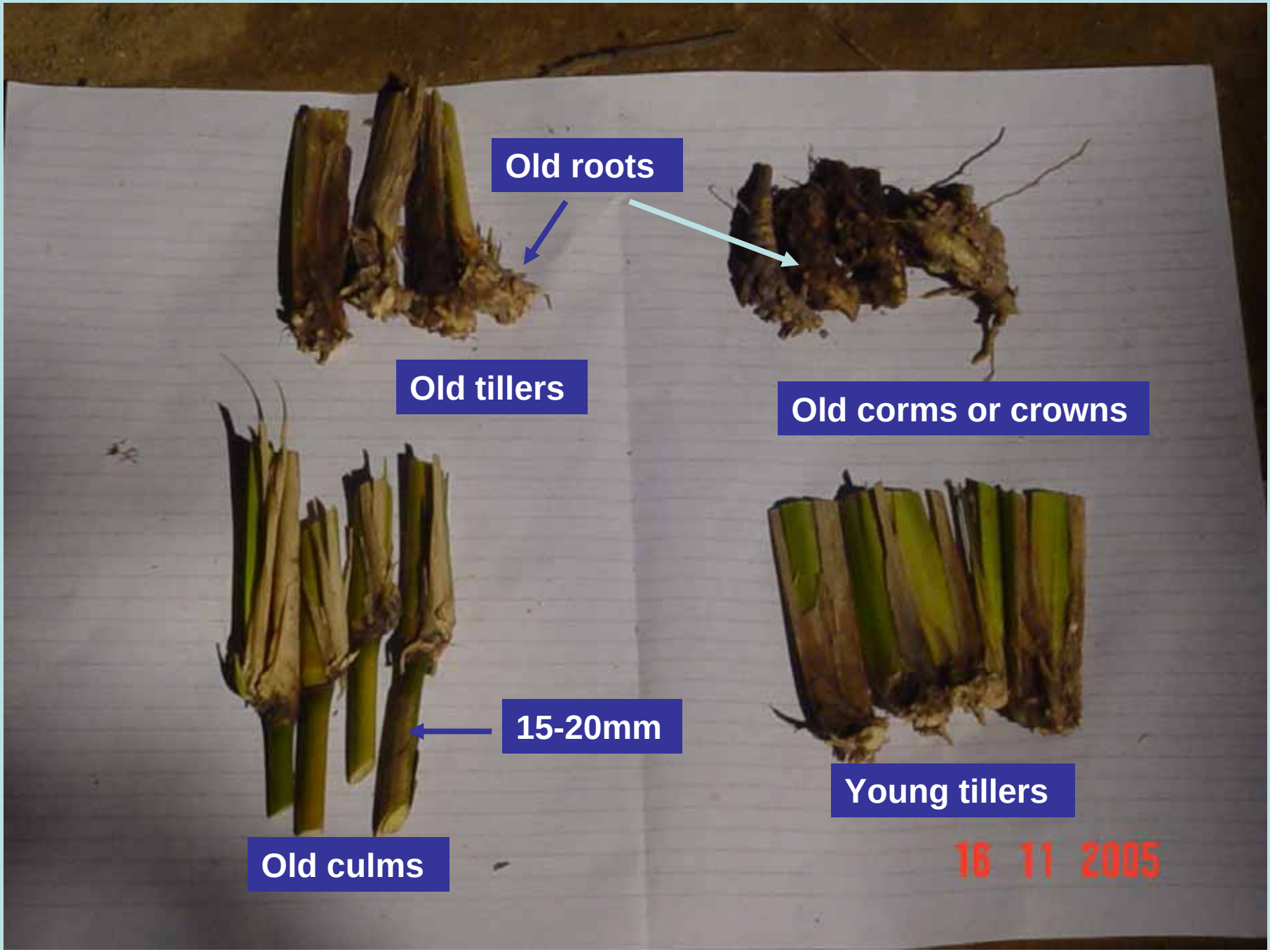
2. **Vetiver tillers**
   - **Separate tillers carefully to include the bases and some roots**

3. **Vetiver crown or corms**
   - **This is the root base of a mature vetiver plant where new shoots will start**
   - **Use only the top part of the crown**
   - **Mature crown is better.**

Three kinds of propagation material

(a) Cutting of flowering culm;
(b) Old tillers;
(c) Young tillers

Various plant parts used for vegetative propagation




Old and young culms
16 11 2005


Young tillers
16 11 2005


Old tillers
16 11 2005


Old corms or crowns
16 11 2005


Old and young culms
Old corms or crowns
Old tillers
Young tillers
16 11 2005

Spraying with water hyacinth solution

PREPARATION OF WATER HYACINTH SOLUTION

Water Hyacinth solution contains a lot of hormone and growth regulator such as Gibberellic acid, many Indol-acetic compounds: IAA

- **Remove Water Hyacinth from lakes or canals**
- **Put into 20 liter-plastic bag, tight the bag**
- **Leave it for about 1 month until Water Hyacinth decomposed completely**
- **Discard the solid parts and keep the solution only**
- **Strain the solution and keep it in a cool place until use**
- **Spray vetiver with 10% of this solution**

Cover the cutting completely with plastic bags

Cover the cutting completely with plastic bags and leave it for 24 hours

NURSERY PREPARATION

Preparation of sand bed

Water sand bed before planting

Plant firmly into the sand bed, cover with 10mm of sand, not deeper

Young shoot from crown, cover with 10mm of sand, not deeper

Young shoot from young tillers

Young shoot from old tillers, cover with 10mm of sand, not deeper


17 11 2005

10 days after planting into sand bed

One month after planting into sand bed

One month after planting into sand bed


11 12 2005

Using bare root slips for propagation

Planting in bays for easy irrigation


5 11 2005