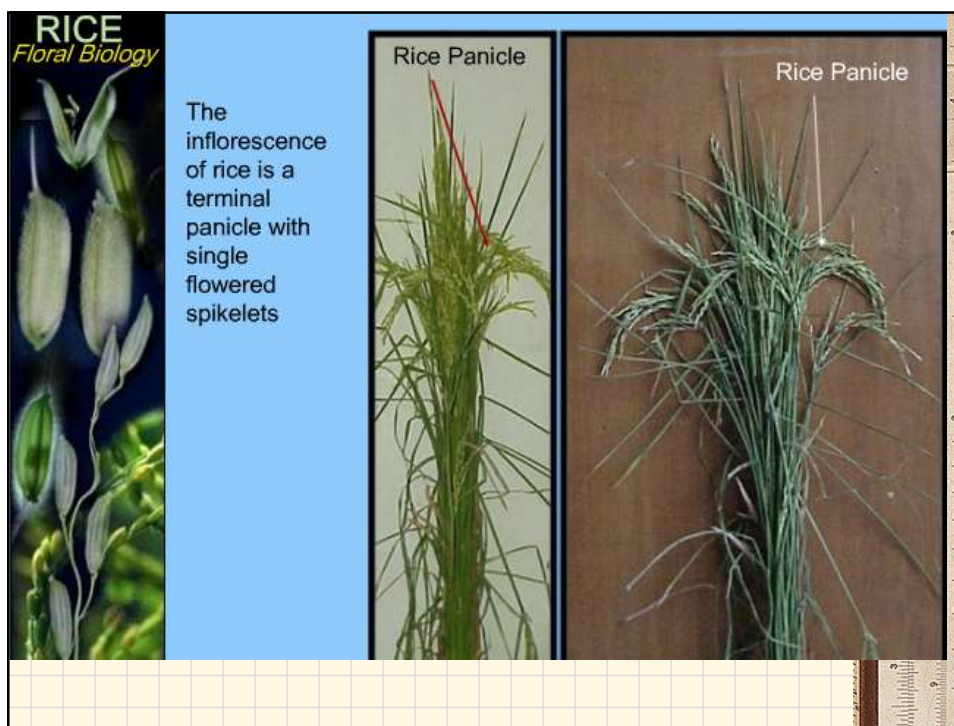


# Demonstration of Selfing and Crossing Techniques in RICE (*Oryza sativa* L.)

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**RICE**  
*Floral Biology*

# The Panicle

## Panicle Initiation Stage

The panicle initiation starts several days before panicle emergence. Swelling of flag leaf sheath indicates start of reproductive phase. In these pictures upper covering of flag leaf is unfolded to show the panicle initiation.

Rice Panicle

Rice Panicle

Rice Panicle

Spikelets

Tertiary branch

Main axis

Secondary branch

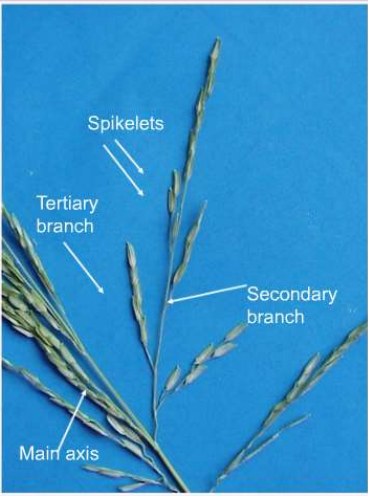
Spikelets

Main axis

Secondary branch

**The Panicle**  
(Close View)

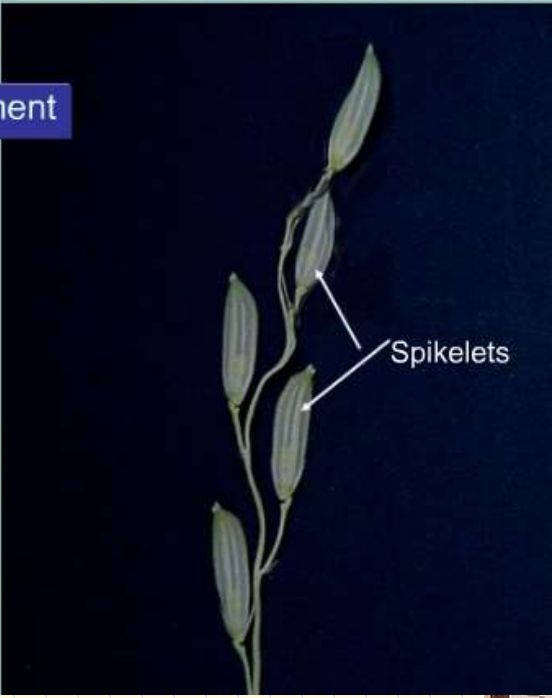
The panicle has a main axis, on which primary branches are borne. Secondary branches are borne towards the basal region of the primary branches. Tertiary branches, if any, are seen at the base of the secondary branches



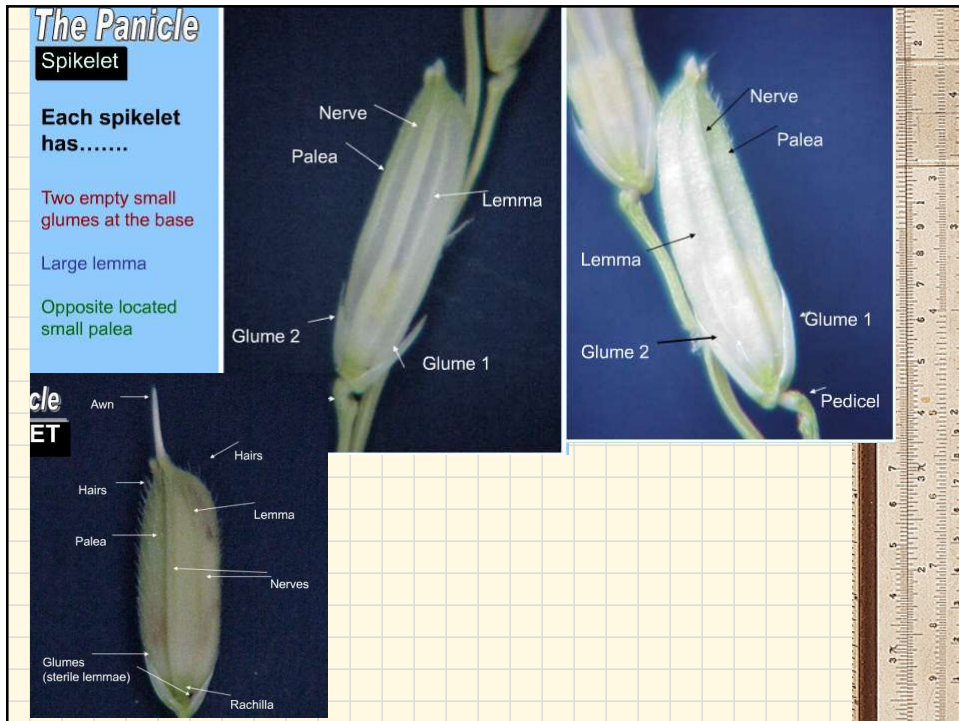
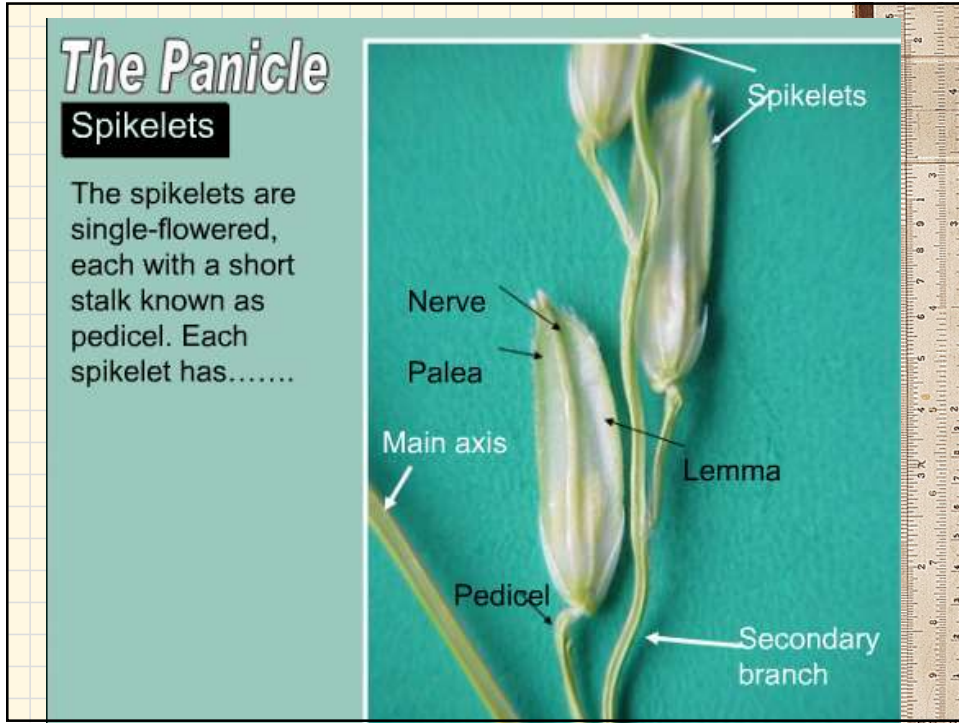
A close-up photograph of a grass panicle against a blue background. The panicle consists of a central main axis with several primary branches extending from it. Secondary branches are shown at the base of the primary branches, and tertiary branches are visible at the base of the secondary branches. Small spikelets are attached to the branches. Labels with arrows point to the 'Main axis', 'Tertiary branch', 'Secondary branch', and 'Spikelets'. A ruler is visible on the right side of the image for scale.

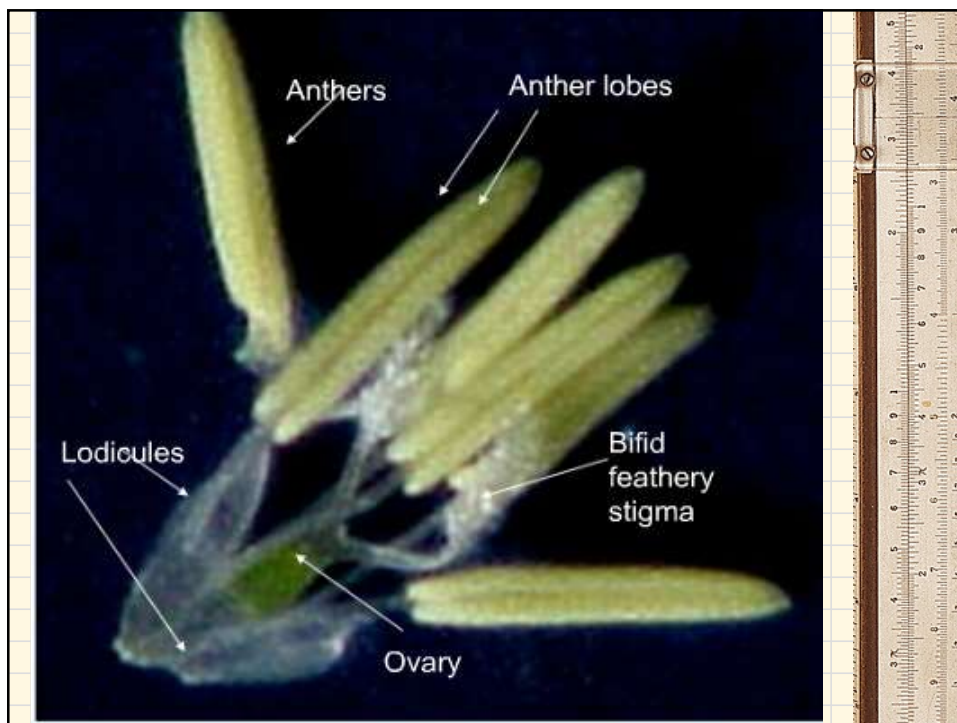
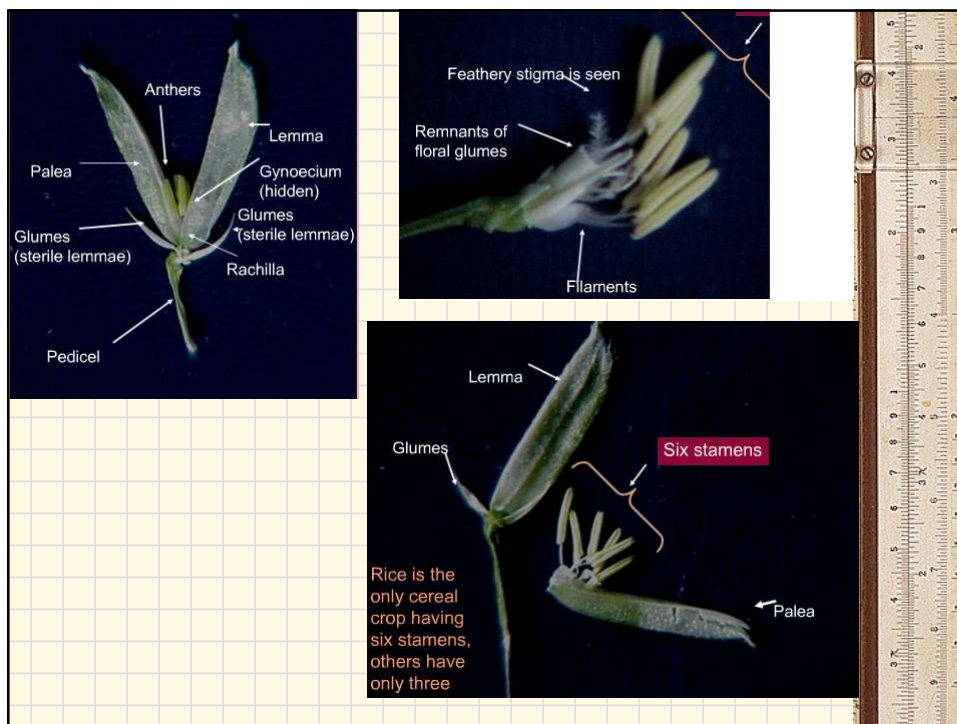
**The Panicle**  
Spikelet Arrangement  
Secondary branch

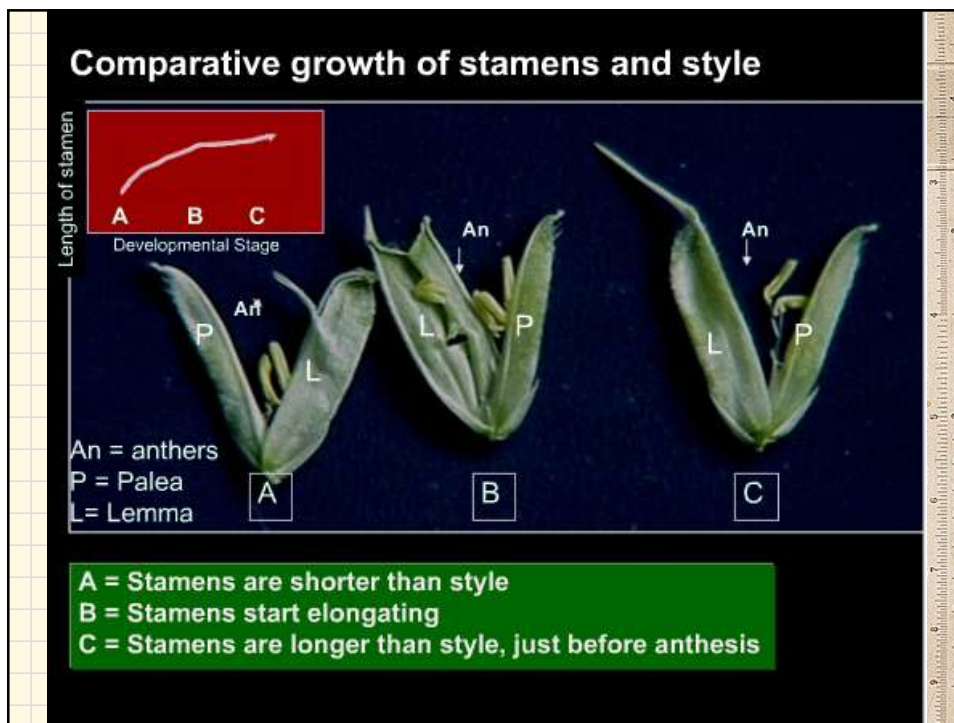
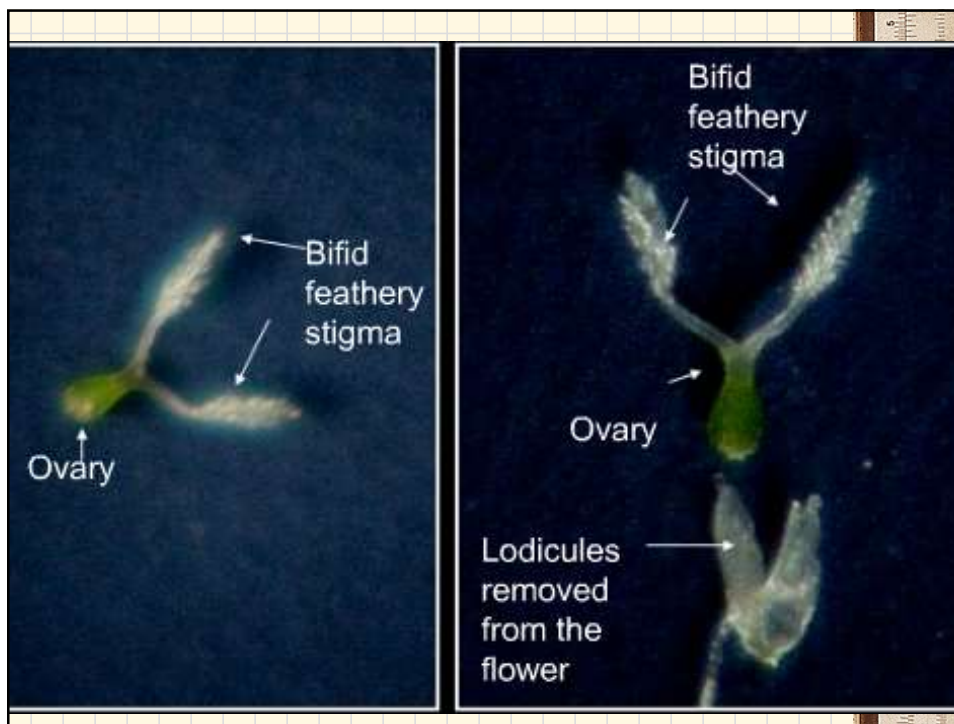
Spikelets are arranged alternately on the secondary or tertiary branches of the panicle.

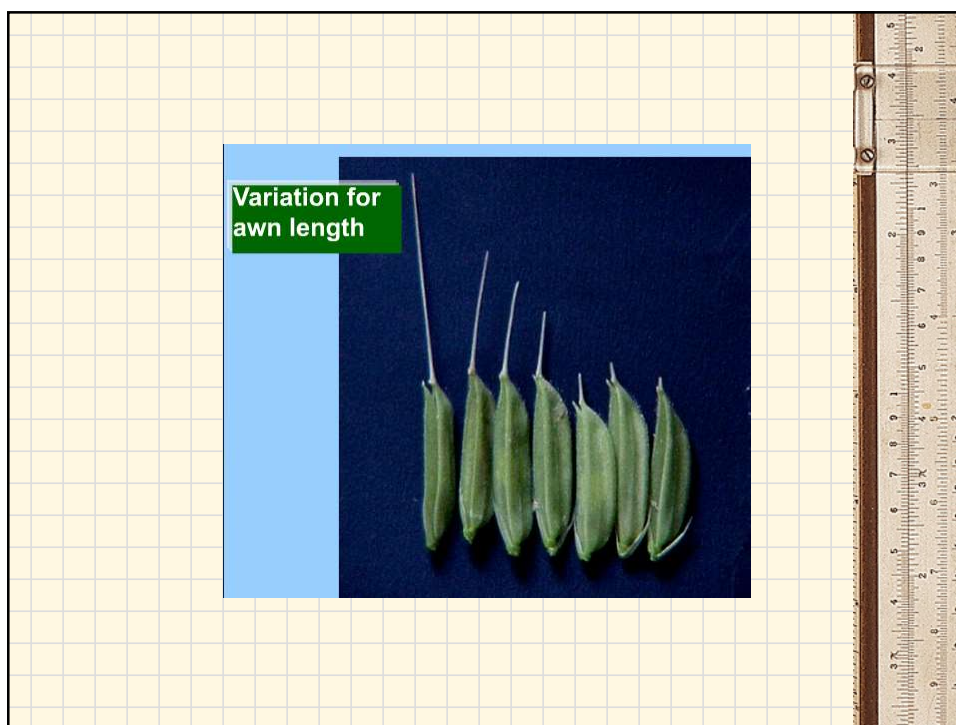
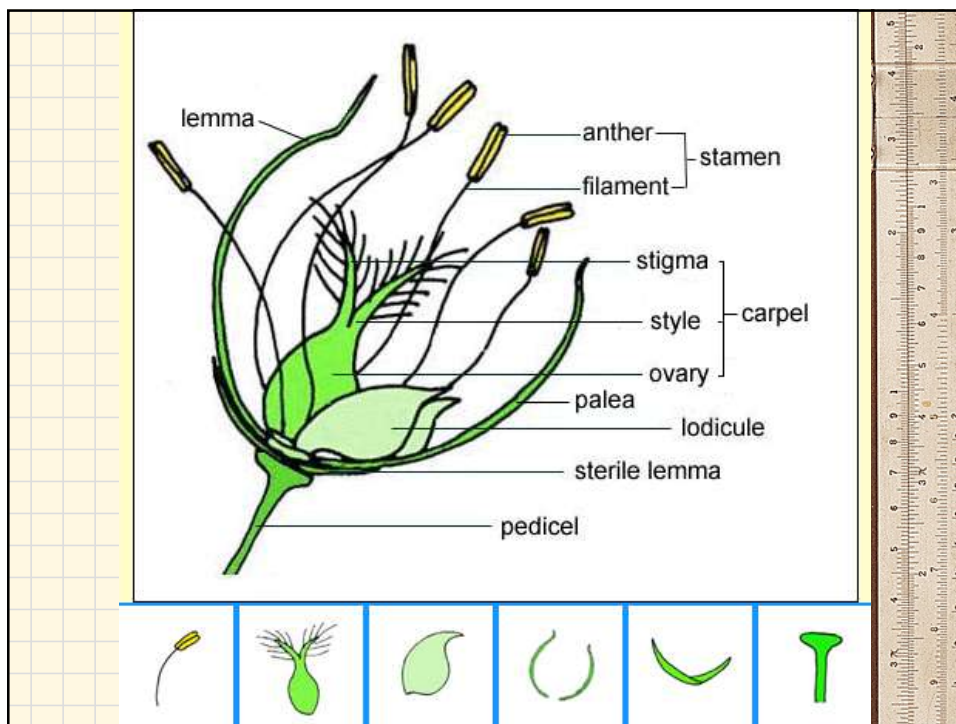


A photograph of a grass panicle against a dark background, focusing on the arrangement of spikelets on a secondary branch. The spikelets are arranged alternately along the branch. Labels with arrows point to the 'Spikelets'. A ruler is visible on the right side of the image for scale.











## Quick Facts

- It is naturally self pollinated
- Blooming sometimes occurs the same day when panicle emerges from leaf sheath.
- Panicle completes anthesis in 4-7 days.
- Middle florets mature first and blooming progresses downward and then upward.
- Most active period of blooming is between 9 to 11 in Sept and 11 to 12 in Oct.

## Equipment:

A pair of scissors,      Forceps,  
A pointed needle,      Magnifying lens,  
Camel hair brush,      Petri dish,  
Butter paper bag (4 $\frac{1}{2}$ "  $\times$  2 $\frac{1}{2}$ "),  
Black paper bag,      Thermos bottle,  
Thermometer,      Stove,  
Hot water container,      Tag and Pencil.

## Selfing

Bag the panicle to avoid whatever little chances there are of cross pollination.



## Crossing

### 1. Hand Emasculation

- i) Select a desirable plant whose panicle is just emerging from the leaf sheath.
- ii) Retain 10-20 florets on the panicle.
- iii) Clip off the top 1/3<sup>rd</sup> of the floret with a pair of scissors.
- iv) Remove the six anthers with a forceps carefully so that pistil is not injured.
- v) Bag the emasculated panicle with butter paper bag.









## Other methods of Emasculation

### 2. Hot water treatment:

- i) Dip the panicle in hot water at 40 to 44 C in the thermos bottle for about 10 mins.
- ii) After 10 mins. remove the panicle and cover it with a butter paper bag.
- iii) The hot water kills the immature anthers without harming the ovary.

### 3. Black paper bag method

- i) Select a desirable panicle which is just emerging from the leaf sheath.
- ii) Cover the panicle with black paper bag
- iii) After 24hrs remove the bag from the panicle and pick up the protruding stamens.
- iv) If in some florets the stamens have not protruded remove them from the panicle.
- v) Cover the panicle with butter paper bag
- vi) This protrusion of stamens is brought about by the heat produced within the black bag.

## Pollination

1. In the evening select a desirable plant who's panicle has been emerged for the past 2 to 3 days or observe the panicle in which the mature yellowish stamens are appearing out from the florets.

Observe the following pictures:







2. Collect the pollen grains in the petri dish
3. Remove the bag of hand emasculated panicle and dust the pollen grains with camel hair brush
4. Again cover the panicle with the respective bag.
5. For hot water and black paper bag treated panicles you will have to cut the florets to expose the stigma for pollination.
6. Sterilize your hands and equipment with methylated spirit.

## Tagging

After completion of pollination Tag the panicle indicating :

The name of the cross

Date of emasculation

Date of pollination

Signature