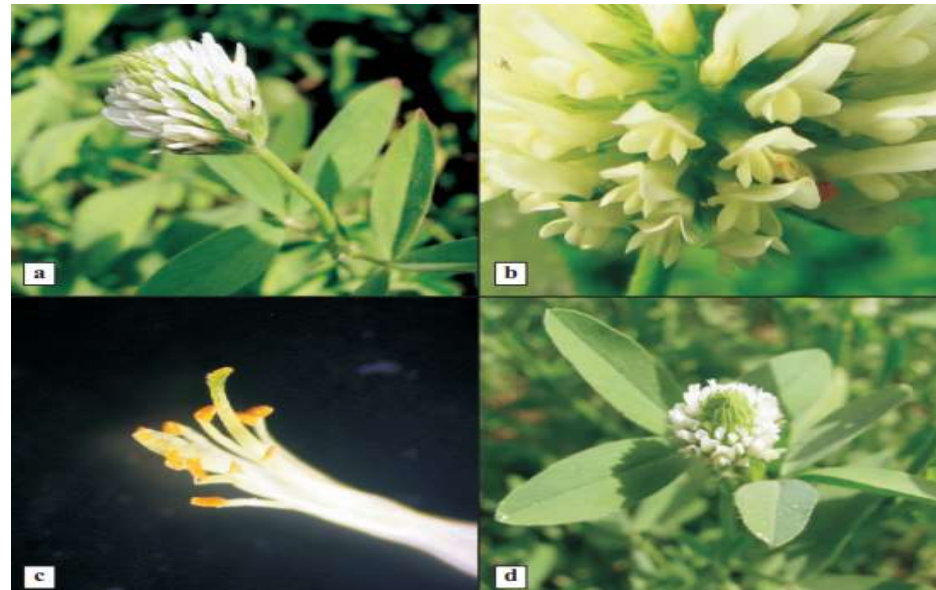




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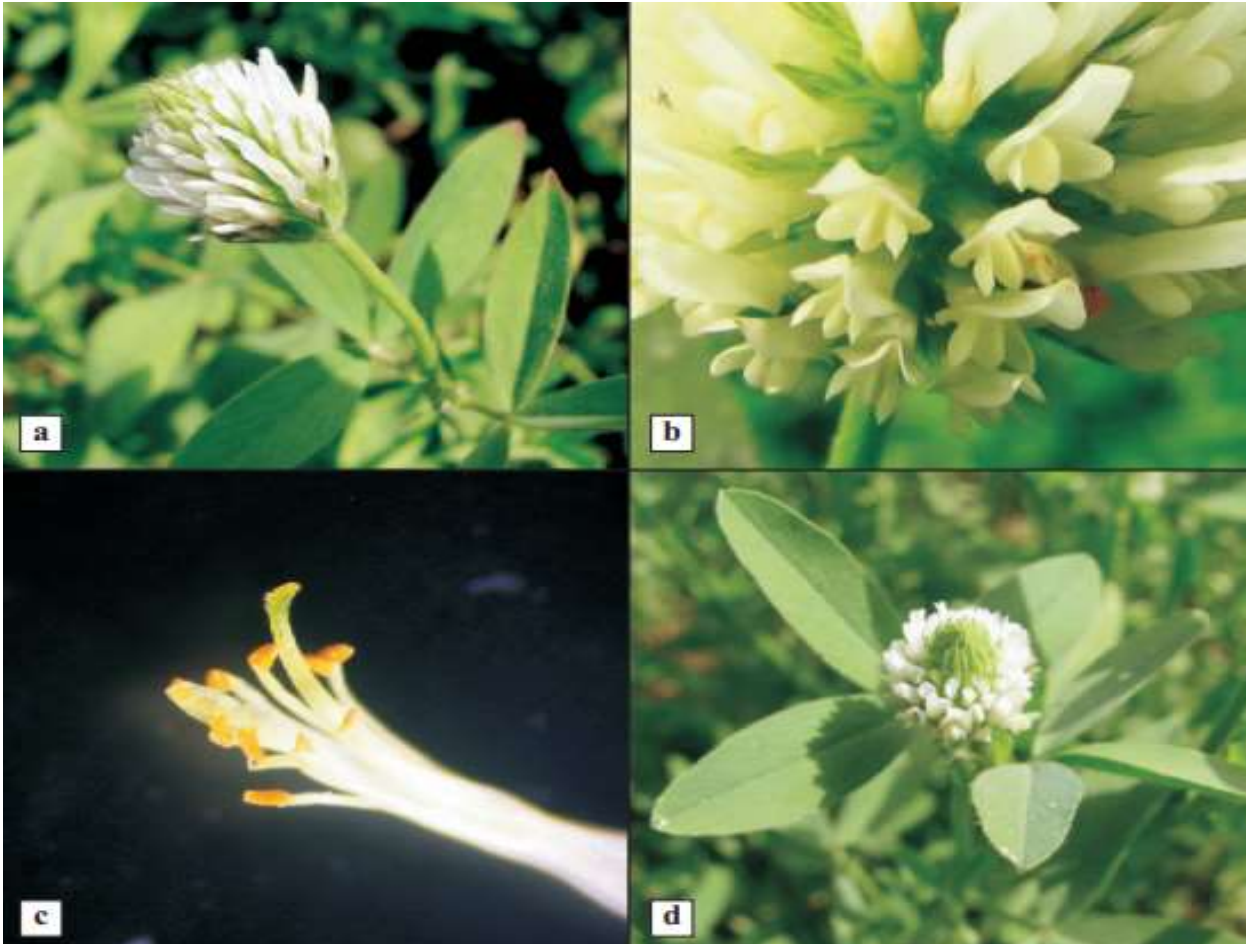
## Session 119: Berseem/Egyptian clover Seed Production



# Introduction

- ✓ Berseem (*Trifolium alexandrinum*,  $2n = 16$ ) is one of the most suitable annual fodder crop belonging to the family, fabaceae
- ✓ It is one of the oldest cultivated clovers, domesticated in Egypt and later introduced into many other parts of the world
- ✓ The **high digestibility** (up to 65%) along with **high palatability**, good forage quality (20% crude protein), long duration of green fodder availability (November-May) have made it best kind of fodder
- ✓ Berseem being a legume is having a high nitrogen fixing ability resulting in improvement of soil fertility
- ✓ Recent studies show that berseem can be used for **phytoremediation** of heavy metals viz., Cd, Pb, Cu and Zn due to its multi-cut nature, short life cycle and production of considerable biomass (Ali et al., 2012)
- ✓ The success of any crop production depends mainly on the availability of the quality seed, which is the basic input of agriculture
- ✓ Enhancement of biomass production to the tune of 30-40 per cent was observed by using quality seed material (Singh, 1995)
- ✓ **Egypt** is the major exporter of berseem seed in the world meeting the stringent quality standards of Europe

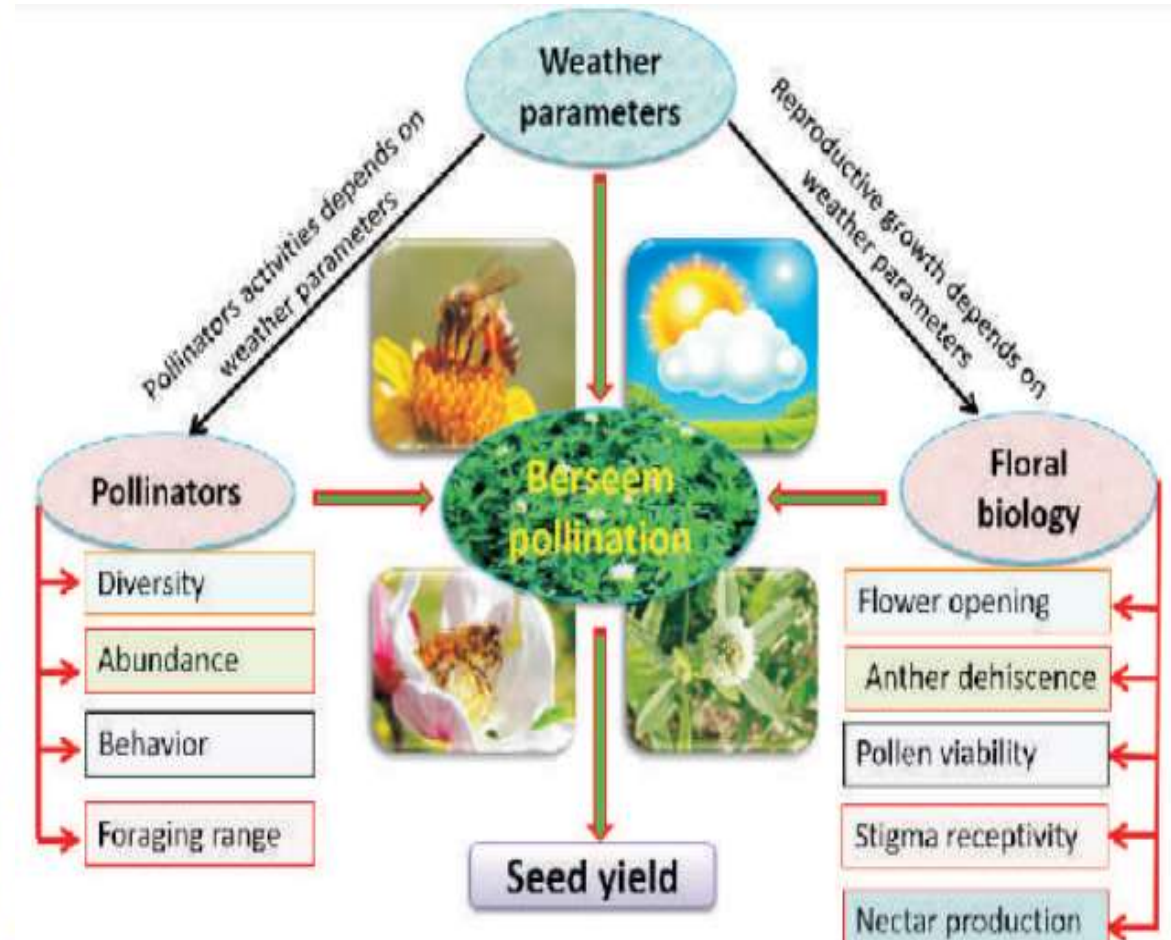
# Flowers and Pollination Dynamics



(a) Inflorescence  
petals

(b) Arrangement of

(c) Gynoecium and androecium (d) Opening bud



Berseem is an entomophilous cross pollinated crop  
**Tripping** by honey bees is the most common method in nature for the pollination

# Land requirements and field inspection

## Land Requirements:

- Most preferable soil type is loamy soil, should be free from volunteer plants and FYM or other contaminating materials
- Land should also be well drained
- Acidic soil are not suitable for berseem seed production

## Isolation distance:

- The extend of natural cross pollination depends upon insect activity
- The minimum isolation distance should be maintained for **foundation and certified** seed is **400m and 100m**, respectively from field of other varieties and fields of the same variety to conform the varietal purity

## Field Inspection

- A minimum of **two inspections** shall be made from the time the crop approaches flowering until it is ready for harvesting

# Brief cultural practices

## Land preparation:

➤ Field should be prepared well by ploughing and two to three harrowings followed by leveling for uniform germination

## Time of sowing:

➤ Berseem seeds should be sown in the month of October. Sowing around the 15<sup>th</sup> October has been found more beneficial

➤ Berseem crop meant only for seed production (no cutting for fodder) may be sown in February also

## Sources of seed:

➤ Obtained nucleus/breeder/foundation seed from **source approved by a certification agency** for raising the seed crop

## Seed inoculation:

➤ Berseem may not grow well in soils where it is being sown for the first time, because it requires association with ***Rhizobium trifoli***, a soil bacterium for its proper growth

# Brief cultural practices

## Methods of sowing:

- The prepared field should be irrigated before sowing
- After irrigation there should be 5-7 cm deep standing water in the field
- Later, the field must be mudded either by ploughing or levelling
- The seeds are usually sown by broadcasting



**Seed rate:** 25-30kg/ha

**Varieties:** Pusa Giant, Berseem Ludhiana-1, Jawahar Berseem-1, Bundel Berseem-2, Hisar Berseem-1 etc.

## Fertilizer:

- N:P::25-30:50-60kg/ha (all fertilizer applied as basal dose)
- Foliar spray of planofix (30ppm) or sulphur at 5kg/ha in 700-800lt. of water after bud stage at 15 days interval is done to boost the seed setting

# Brief cultural practices

## Irrigation:

- For good germination and early growth one or two irrigations at one week intervals may be done
- Subsequent irrigation is provided approximately every twenty days
- Withhold irrigation three weeks before harvesting

## Interculture:

- ✓ To get pure quality seed, field should be completely free from weeds after last cutting
- ✓ Most commonly weeds found in berseem field are chicory and wild palak
- ✓ Pre emergence application of Butachlore @ 3kg/ha or post emergence spray of Dinoseb @4kg/ha in 600lt of water has been effective to control chicory

# Brief cultural practices

## Plant Protection

Diseases/insect pests	Managements
Root rot complex	<p>Seed treatment with Carbendazim @ 2.5g/kg or Thiophenate-M @ 2 g/kg of seed reduces the initial infection from the seed and soil borne fungi</p> <p>Application of Neem cake @ 0.5 t/ha before sowing of crop or spraying of Carbendazim @ 250 g/ha or Thiophenate-M @ 500 g/ha or Propineb 1250 g/ha after appearance of disease in field subsides it to a great extent</p>
Stem rot	<p>Seed treatment with Carbendazim @ 2.5 g/ kg and line sowing for maintaining optimum plant population in the field prevents the disease occurrence.</p> <p>Spraying of Carbendazim @ 1 g/litre or Chlorothalonil @ 2g/litre after disease appearance helps in minimizing the loss (Bhaskar et al., 2003)</p>
Pod borer	Cypermethrin @ 200 ml/ha or Spinosad @ 150 ml/ ha after last cut, if larval population is more than economic threshold level (ETL) controls the infestation
Thrips	Spray 0.05% diazinon or 0.02% metasystox solution at the rate of 800lt of water per ha
Aphids	Spray 0.05% melathion solution @ 900lt/ha

# Brief cultural practices

## Cuttings:

- Stop the cuttings for fodder by the last week of February, or first week of March
- Any delay in the last cutting may leads to poor seed setting due to poor pollination in the ensuring dry and hot weather
- Similarly, a long gap by taking the last cut earlier , may leads to lodging due to excessive vegetative growth resulting in poor seed setting
- A period of ten weeks between the last cut and seed maturity is essential

## Roguing:

- ✓ The seed crop must be rogued carefully at pre-flowering, flowering and maturity stage
- ✓ All the off types, other crop plants and chicory plants must be removed from time to time
- ✓ The roguing must be complete before harvest

# Brief cultural practices

## Harvesting:

- The seed crop can be harvested when two third of the pods have turned brown
- The crop after harvesting should be left in the field for three to four days
- Harvesting and collection of crop should be done early in the morning when the dew drops are still on the plants to prevent shedding of seed heads

## Threshing:

- ✓ Threshing of seed should be done when the seeds are fully matured and dry
- ✓ After threshing and cleaning, the seed should be further dried to 8-10% moisture content before storage

## Seed yield:

- Average seed yield is **5-7qtl/ha**

# Seed Standard

Factor	Standards for each class	
	Foundation	Certified
Pure seed (minimum)	98.0%	98.0%
Inert matter (maximum)	2.0%	2.0%
Other crop seeds (maximum)	10/kg	20/kg
Total weed seeds (maximum) 10/kg 20/kg	10/kg	20/kg
*Objectionable weed seeds (maximum)	5/kg	10/kg
Germination including hard seeds (minimum)	80%	80%
Moisture (maximum)	10.0%	10.0%
For vapour-proof containers (maximum)	7.0%	7.0%
<i>Special requirements</i>		
Off-types	0.20%	1.0%
**Objectionable weed plants	None	0.050%
<b>*Maximum permitted at and after flowering, **Objectionable weed shall be: Chicory(Kasni)</b>		



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*Thank  
you*

