



**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*

**Course name :**

**Crop Production Technology-II  
(ASAG 2204)**

**Course credit :**

**(2-1-0)**

**Lecture 10**

**Topic: Rapeseed & mustard**



Centurion  
UNIVERSITY

Shaping Lives...  
Empowering Communities...

# 10.1 RAPESEED & MUSTARD

(*Brassica campestris*)

- Rapeseed and mustard are the major *rabi* oilseed crops of India.
- They occupy a prominent place next to **groundnut**, both in area and production.
- **India is the largest producer of rapeseed and mustard in the world.**
- Rapeseed contributes for **18 % of total oilseeds** production of the country.
- Common names are sarson, rai or raya, toria or lahi.
- While sarson and toria are generally termed as rapeseeds, rai or raya or laha is termed as mustard.
- The oil content varies from 37-49%. The seed and oil are used as condition in the preparation of pickles and for flavouring curries and vegetables.



**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*

- Rapeseed oil is used in the manufacture of **greases**.
- The oilcake is used as a **cattle feed and manure**.
- **Green stems and leaves** are a good source of **green fodder for cattle**.
- The leaves of young plants are used as green vegetables

## **10.2 ORIGIN**

**Eastern Afganistan, and adjoining parts of India and pakistan.**

## **10.3 AREA AND DISTRIBUTION**

- India, china, Canada, Pakistan, Sweden are the major producing countries.
- In India it is cultivated in UP, Rajasthan, MP, Haryana, Punjab, West Bengal, Assam and Bihar.
- India: Area=5.80 m ha, Prodn.=6.28 million t, Y= 1083kh/ha



**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*

UP ranks 1<sup>st</sup> in productivity.

Rajasthan rank 1<sup>st</sup> in area and production.

- These crops are not drought tolerant.
- They are not tolerant to waterlogging.
- Toria is more liable to suffer from frost and cold and is therefore , usually sown earlier and harvested before the onset of frost.



## 1.4 Difference

	Rapeseed	Mustard
Scientific name	<i>Brassica campestris var. sarson and toria.</i>	<i>Brassica juncea - rai or laha.</i>
Plant height	Tall 45-150 cm	Short 90-200 cm.
Stem	Covered with waxy deposit.	No waxy deposit
Leaves	sessile, glabrous and hairy.	Stalked, broad and pinnatifid
Fruits ( pods)	Thicker	slender
Seed colour	yellow or brown	brown or dark brown.
Seed coat	smooth	Rough



**Centurion**  
**UNIVERSITY**  
*Shaping Lives...  
Empowering Communities...*

## 10.5 Classification of Rapeseed-mustard

### **10.5.1 Sorson: International Common Name Indian rape**

Brassica campestris var. yellow sorson (yellow sorson)

Brassica campestris var. brown sorson (brown sorson)

Brassica napus (Gobi sorson)

### **10.5.2 Toria: International Common Name Rape/ Toria**

Brassica campestris var. yellow toria

Brassica campestris var. black toria

Eruca sativa (Taramira)

### **10.5.3 Rai: International Common Name Mustard**

Brassica juncea (Indian mustard)

Brassica carinata (African mustard/ Karan rai)

Brassica juncea var. rugosa (Pahari Rai)

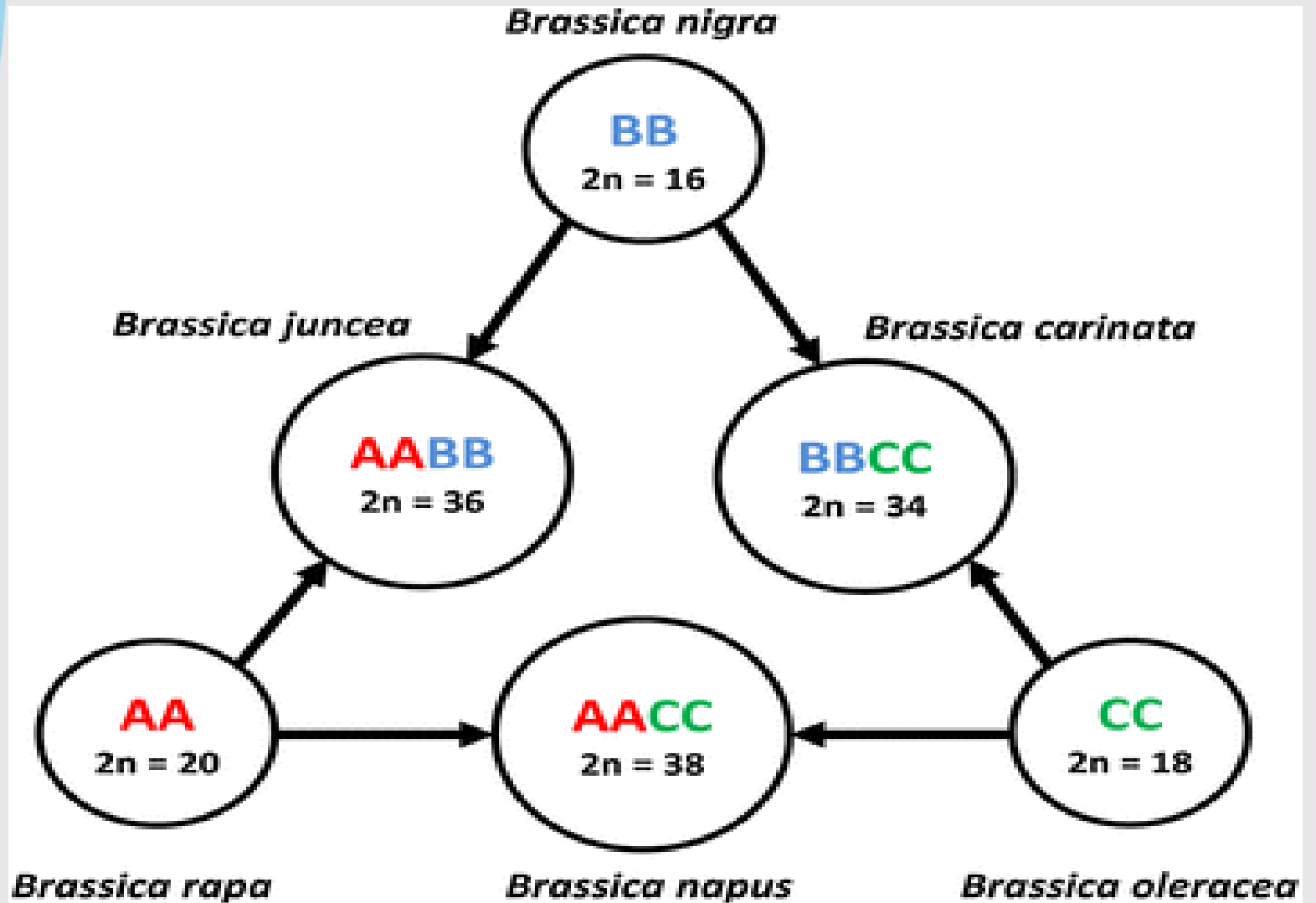
Brassica nigra (Black mustard/ Banarasi rai)



**Centurion**  
**UNIVERSITY**

Shaping Lives...  
Empowering Communities...

## 1.6 Triangle of 'U' rule







**Centurion**  
**UNIVERSITY**  
*Shaping Lives...  
Empowering Communities...*

## 1.7 CLIMATIC REQUIREMENT

- Rapeseed and mustard crops are of tropical and temperate zones and requires cool and dry weather.
- Cool temperature, clear dry weather with plentiful of bright sunshine accompanied with adequate soil moisture increase the oil yield.
- Toria is more liable to suffer from the frost and cold.
- They are not tolerant to drought and water logging.
- During sowing : daily mean temperature 26-28<sup>0</sup>C
- Moderate tolerant to soil salinity.





**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*

## 1.8 SOIL

➤ Grown under soils from sandy loam to clay loam soils but will come best under light loam soils.





Centurion  
UNIVERSITY

Shaping Lives...  
Empowering Communities...

## 1.9 VARIETIES/ HYBRIDS

**Suitable for Kashmir valley, HP**

**Mustard:** RCC4, Pusa Mustard 21

**Karan rai:** Kiran, Pusa Swarmin

**Gobhi sorson:** Neelam, Sheetal, GSL 1, GSL 2, Hyola 401(F1) **Jammu, Punjab, Haryana, Delhi and northern Rajasthan**

**Mustard:** RH 30, **Pusa Mustard 30**, Pusa Mustard 21, Laxmi, CS 52, Geeta, Kanti, Maya, Swaran Jyoti, Vasundhara, Pusa Karishma, DMH 1(F1), Coral 432 (F1)

**Karan rai:** Kiran, Pusa Swarmin, Pusa Aditya

**Gobhi sorson:** GSL 1, GSL 2, Hyola 401(F1), PGSH 51, GSC 5, GSC 6 **Toria:** TL 15, PBT 37



Centurion  
UNIVERSITY

Shaping Lives...  
Empowering Communities...

## 10.10 VARIETIES/ HYBRIDS Contd...

### 10.10.1 Suitable for West Rajasthan, Uttarakhand, UP, northern MP

**Mustard:** Jagannath, Varuna, Rohini, Urvashi,  
Basanti, Narendra Rai, Narendra Ageti Rai 4,  
Aravali, Swarn Jyoti, Ashirvad, Vasundhara

**Karan rai:** Kiran, Pusa Swarmin

**Gobhi sorson:** Teri Uttam Jawahar

**Toria:** T 9, Bhawani, PT 303, PT 507, JT 1

**Yellow sorson:** Ragini, NRCYS 1, YSH 401

**Taramira:** Narendra Tara (RTM 2002)

### 1.10.2 Suitable for South Rajasthan, Gujarat, Maharashtra

**Mustard:** Pusa Jaikisan, GM 2, PCR 7, Shatabdi,  
TPM 1

**Yellow sorson:** Ragini, NRCYS 1, YSH 401





Centurion  
UNIVERSITY

Shaping Lives...  
Empowering Communities...

## **VARIETIES/ HYBRIDS Contd...**

### **10.10.3 Suitable for West Bengal, Odisha, Jharkhand, Chattishgarh, Asom, Bihar and Manipur**

**Mustard:** Pusa Bold, Pusa Agrani, Pusa Bahar, Pusa Sivani, JD 6, Surya, Bhagirathi, Sarama, Varuna

**Toria:** M 27, Agrani, Anuradha, Parvati

**Yellow sorson:** Binoy (B 9), Jhumka, Ragini, YSH 401

### **1.10.4 Suitable for Karnataka, Tamilnadu, AP**

**Mustard:** Pusa Agrani, GM 2, JM 1, Vardan, Varuna



**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*

## **VARIETIES/ HYBRIDS Contd...**

### **10.11 VARIETIES WITH ABIOTIC STRESS TOLERANCE**

#### **1.11.1 Drought Tolerant**

**Aravali, Geeta, GM 1, PBR 97, Pusa Bahar, Pusa Bold, RH 781, RH 819, Shivani, Vaibhab**

#### **1.11.2 High temperature Tolerant**

**Ashirwad, Swarn jyoti, Vardan, Navgold, CS 56, Kanti, Urvashi, Pusa Mustard 25, Pusa Mustard 27**

#### **1.11.3 Salinity Tolerant**

**CS 52, CS 54, Narendra Rai 1**

#### **1.11.4 Frost Tolerant**

**RH 781, RH 7868, RH 819, RGN 13, RGN 48**



**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*

# **VARIETIES/ HYBRIDS**

## **Contd...**

### **10.12 VARIETIES WITH PEST-DISEASE TOLERANCE**

#### **10.12.1 Alternaria blight Tolerant**

**Aravali, Geeta, Divya, JMM 915**

#### **10.12.2 White rust Tolerant**

**Basanti, JM 1, JM 2**

#### **1.12.3 Aphids Tolerant**

**RH 7846, RH 7847, T 6342**



**Centurion**  
**UNIVERSITY**  
*Shaping Lives...  
Empowering Communities...*

## 10.13 CROPPING SYSTEMS

- Maize –Toria - Wheat
- Maize – Toria – Sugarcane
- Pearlmillet – Toria- Barley
- Maize – Toria – Cotton
- Greengram – brown or yellow sarson/rai
- Blackgram – Sarson / rai
- Maize – Sarson / rai
- Early Rice – Sarson / rai





**Centurion**  
**UNIVERSITY**  
*Shaping Lives...  
Empowering Communities...*

## **10.14 SEED AND SOWING**

### **10.14.1 Time of sowing**

Toria – mid- last week of September.

Sarson /rai – 1<sup>st</sup> fortnight of october.

- Late sowing results in attack of aphids

### **10.14.2 Seed rate and spacing**

- Toria: 30 cm
- Mustard/ Sarson : 40- 45 cm
- Seed treatment with Thiram or Captan @ 2.5 g/kg seed.
- Seed rate : 5-6 kg/ ha



Centurion  
UNIVERSITY

Shaping Lives...  
Empowering Communities...

## 10.15 NUTRIENT MANAGEMENT

- 15-20 t/ha FYM
- 60-90 kg N / ha
- 60 kg P<sub>2</sub>O<sub>5</sub> / ha
- 40 kg K<sub>2</sub>O/ ha
- Under irrigated conditions **half of nitrogen** and full dose of P and K should be applied as basal dose at the time of sowing
- Remaining **half N** should be applied at the time of 1<sup>st</sup> irrigation
- Rapeseed and mustard have higher requirement for sulphur, therefore nitrogen should preferably be applied through Ammonium Sulphate and phosphorous from SSP.
- Rapeseed & mustard responds well to Zn and B. Foliar application of micronutrients is beneficial.1



**Centurion**  
**UNIVERSITY**  
*Shaping Lives...  
Empowering Communities...*

## **10.16 WATER MANAGEMENT**

- Usually raised as rainfed on conserved moisture.
- Rapeseed and mustard responds well to irrigation.
- Water requirement: 30-40cm. CU: 20-30 cm
- Two irrigations at branching (30DAS) and siliqua formation (65DAS) stages are beneficial.

## **10.17 WEED MANAGEMENT**

- Weeds cause 20-30 % yield reduction.
- Most common weeds are *Chenopodium album* , *Lathyrus spp.* , *Melilotus indica*, *Argemone mexicana*, *Cirsium arvense* .
- 1 intercultural operation is beneficial.
- This besides creating a soil mulch and thus reducing moisture losses through evaporation helps in better growth and development of crop plants.
- Apply Nitrofen @ 1-1.5 kg/ha or isoproturon 1 kg/ha in 800-1000 litres of water as pre emergenc herbicide application.



**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*

## **10.18 DISEASES:**

Alternaria blight

Downy mildew

## **10.19 PESTS :**

Mustard saw fly

Mustard aphid

Cabbage butterfly

Bihar hairy caterpillar

**Control :** Spray the crop with one of the following insecticides in the aphid appearance; Imidacloprid 17.8% @ 0.25 ml/l, Thiamethoxam 25 WG @ 0.2g/l, Dimethoate 30EC @ 1 ml/l of water.



**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*

## **10.20 HARVESTING AND THRESHING**

- Harvest the crop when the pod turns to yellowish- brown
- The crop is liable to shattering so harvesting should be done before the pods open in order to avoid losses.
- Sarson is less liable to shattering as compared to toria and mustard.
- Moisture content at storage should be 8 %.

## **10.21 YIELD**

- 14-20 q/ha – rapeseed
- 20-25 q/ha - mustard