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

BREEDING OF GREEN GRAM & BLACK GRAM



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GREEN GRAM

Scientific name :Vigna radiata

Chromosome no. :2n = 22

Also known as **mung bean**

Origin: India 2014 2016 2017

Distribution : India, Pakistan, Bangladesh, Sri Lanka, Philippines, Taiwan, Thailand, Nepal and Southern Asian countries. In India, Maharashtra, UP, MP, Karnataka, Gujarat A.P, Tamil Nadu and Rajasthan.



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Breeding objective:

1. High yield, medium duration dry land varieties

2. High yielding, short duration irrigated varieties :

Lines having rapid growth rate or dry matter increase associated with high harvest index.

3. Breeding for rice fallows

4. Breeding for disease resistance , YMV, Leaf crinkle virus, Tarai local Lm 214 - resistant



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5. Breeding for quality

- a) Mung bean has highest digestibility among grain legumes from 83 to 90%. Varieties having bold seeds to use as sprouts is the aim.
- b) Transfer of high methionine content from black gram to green gram.
- c) High dal recovery - 80% and more
- d) Less hard seed.



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Breeding Methods:

1. Introduction - Pusa baisaki
2. Pure line selection - Co1
3. Hybridisation and selection

Inter Varietal :

Inter specific - To transfer high methionine content from black gram to green gram.

V. radiata x **V.umbellata** rice bean to transfer resistance to bean fly crossing with V.radiata var. sublobata resistance to bruchids



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5. Mutation breeding

Co4 - mutant of Co1

6. Embryo culture :

Green gram x Black gram

Ideal plant type

1. 60 - 65 days duration with determinate habit for irrigated conditions

2. 80 days duration with indeterminate type for dry land condition

Plants with more pods and seeds, increased branches podding from base of main stem with synchronised maturity non - shattering habit.

Varieties:

Jawahar – 45, WGG-2, LGG-127



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Black gram

Scientific name: *Vigna mungo*

Chromosome no. : $2n = 22$

Origin: India

Distribution: India, Pakistan, Sirlanka, and South Asian countries. In India, Maharashtra, UP, MP, Karnataka, Gujarat A.P, Tamil Nadu and Rajasthan.



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Breeding objectives

1. Evolving medium duration high yielding varieties for dry land cultivation.

2. Evolving short duration high yielding varieties suitable for irrigated conditions.

This can be used as mixed crop in cotton, turmeric Short duration varieties are Co2, Vamban 1, 2 and 3.

3. Evolving short duration varieties suitable for rice fallow conditions

4. Breeding varieties resistant to diseases

YMV is a serious disease. Leaf crinkle virus, powdery mildew



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5. Pest : White fly vector for YMV and leaf crinkle, leaf eating caterpillar

6. Breeding for better quality

24% protein. There are lines having 27% protein . These can be utilized.

Quality of black gram is determined by

- a) Protein content
- b) Methionine content 1.17%
- c) cooking quality - Time
- d) % of hard seeds.
- e) Dal recovery 70%



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Breeding methods

1. Introduction :

2. Pure line selection :

3. Hybridization and selection

a) Intervarital

b) Inter specific :

Vigna mungo x V.mungo var.sylvestris - Pantnagar.
YMV resistant lines obtained. but pod shatters. More number of back crosses suggested.
Vigna mungo x V.radiata for increasing pod length, digestibility. Sterility is the main problem. Few plants obtained revert back to parental form.

4) Mutation breeding

5) Embryo rescue - Attempted in inter specific crosses.



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Ideal plant type

For irrigated and Rice fallows

Determinate type, short duration, high dry matter producing with 30cm plant ht.

Photo insensitive.

For rainfed condition.

Semi determinate with pod setting from base of the main stem; higher pod length and more number of seeds / pod.



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Breeding centers:

ICRISAT, - Hyderabad

ICARDA, - (International Crops for Agricultural Research in Dryland Areas) – Syria

AVRDC - (Asian Vegetable Research and Development Centre)

IIPR - (Indian Institute of Pulse Research),
Kanpur

Varieties:

Black gram : T9, T27, LBG-17, LBG-402



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THANK YOU

