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Breeding of Groundnut



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Groundnut

Scientific Name- *Arachis hypogaea*

Family- Leguminaceae

Chromosome no – (2n = 40)

Centre Origin- Brazil

Its also called “King of Oil seeds”



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Distribution

- It is important oil seed crops in India, grown in subtropical and warm temperate zone also called as peanut or monkey nut.
 - It contains 45-55 per cent oil and 25-30 per cent protein.
 - India, China, USA.
 - In India, Gujarath, AndhraPradesh, Karnataka and Tamil Nadu .



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Botanical Description

- Root system- Tap root system . nodules are formation due to nitrogen fixation by rhizomes.
- Leaves- leaves are arranged in alternate pairs and have leaf like attachments near the stalk.
- Inflorescence- solitary or raceme containing flowers in the asile of cataphylls.



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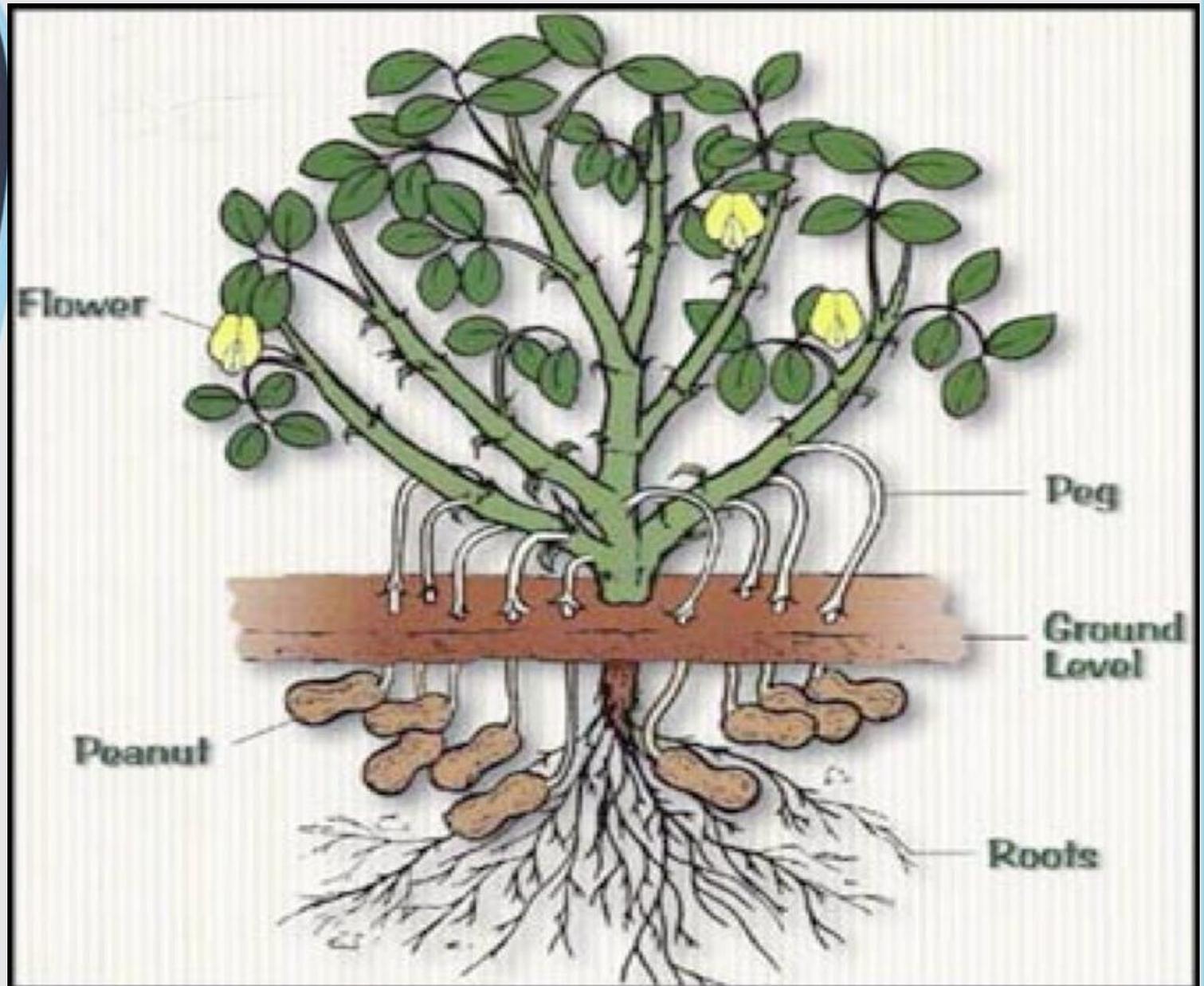
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- Flower- zygomorphic , seaside
- Pods- pods of ground nut were successfully raised in darkened, aerated ,nutrient ,solution , but not in darkened ,aerated , nutrient solution . but not in the light.
- Seed- seed length ranges from 7 to 21 mm and diameter from 5 to 13 mm seed differ in size , shape and colour of the seed coat .



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Progenitor

Arachis monticola

A. prostrata

A. silvestres

Groundnut an unpredictable Crop

Ground nut is popularly known as unpredictable legume. Since the pods are borne below ground positively geotropic we cannot predict its performance before harvest as in the case of other crops.



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Breeding objectives

1. Breeding high yielding bunch ground nut with dormancy suitable for dry land conditions

The dry land bunch type sown during June - July often caught up in early N.E. monsoon rains which results in germination of varieties. So it is necessary to breed varieties having dormancy. Semi spreading varieties are dormant TMV 7 slightly dormant varieties, BSR.1, ALR 2 dormant for 15 days.

2. Breeding varieties for quality

a) High shelling percentage > 75%

Thin shelled varieties have high shelling percentage.

b) High oil content > 50%

TMV 10 the semi spreading variety is having 52% oil. Oil content is highly influenced by environment.

ALR. 2-52% oil.

c) Table purpose varieties

Hand picked kernel for export market. Valencia types are suitable for this.



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3. Breeding disease resistance varieties.

Rust and leaf spot are causing major damage. If the onset of rust is in initial stage it results in total failure. Late leaf spot hinders harvest of crop due to foliage loss.

Tomato spotted wilt virus or Bud necrosis of late gaining importance. NCAC 17090 – resistant.

4. Breeding for pest resistant varieties

Red hairy caterpillar, leaf miner are major pests.

5. Breeding short duration (85 days) varieties suitable for irrigated conditions



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Breeding Methods

1. Introduction

All the ground nut lines are introduced ones.

2. Selection

a) Pure line selection

TMV 2 - Selection from local Gudiyatham bunch.

b) Mass selection

JL 24 from Taiwan variety.

3. Hybridization and Selection

a) Inter varietal

Bunch x Bunch - VRI 2 (Co2 x JL 24)

SSP x Bunch - VRI 3 (R 33-1 x Ah selection)

b) Inter specific

For transfer of disease resistance.



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5. Mutation breeding

TMV 10 Natural mutant from Argentina local.
GNLM - Gujarat Narrow Leaf Mutant.

6. Embryo rescue technique

A. puscilla x A. hypogaea crosses. But not much successful. Cotyledon culture is a success.

7. Transgenic plants

Transgenic plants for disease resistance. Transfer of a particular gene from wild species through use of medium of carrier (plasmid) micro projectile bombardment direct transfer. Transfer of disease resistance gene from wild species through plasmid is a success.



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Arachis sp :

A.hypogaea x A.batizocoi

$2n = 40$

$2n = 20$ (Resistant)



Triploid sterile

**doubled
Hexaploid**

Reduced to tetraploid

A. chacoense

$2n = 20$

A.monticola - for thin shelled conditions

Extranervosa sp.

A.villoulicarpa for increased number of pods.



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Breeding centres

- ICRISAT, Hyderabad
- NRCG, (National Research Centre for Ground Nut Junagarh)

Practical Achievements

Varieties: Kadiri-3, JL-24, Tirupathi 1, 2, 3, 4
TMV – 2, J11, Vemanara, Jagtial-88



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Thank You