

L17

Horse gram

Macrotyloma uniflorum

Synonym

- *Erroneously - D. biflorus; D. uniflorus*
- Twining annual or perennial
- Var. uniflorum is cultivated annual

Origin

- Indian, now cultivated in Asia, Africa, West Indies and S. USA as pulse and fodder

Soils

- Adapted to a wide range of soils
- From granitic sands to latosols and heavy clays.
- Its pH range is about 6.0 to 7.5.
- It is fairly tolerant of salinity.

Varieties

- CO1, Paiyur 1 & 2

Season

- Winter – November

Land preparation for establishment

- Does best in a well-prepared seed bed but will establish with little ground disturbance

Sowing methods

- Seed can be drilled or broadcast

Seed rate

- 20kg for pure crop

Spacing

- 30 x 10 cm

Nutrient

- 12.5 – 25.0 – 0 kg NPK/ha

Water

- Mostly rainfed, drought tolerant, residual soil moisture is mostly utilized

Weed management

- Weeding and hoeing once

Cropping system

- Cover crop after main crop

Harvest

- Entire plant after drying of leaves

Garden lablab -Avarai
Lablab purpureus var typicus

Season

- Jun – Jul, Sep-Nov, April

Varieties

- CO 3 to CO 13
- Seed weight – 250 – 350mg

Seed rate

- According to spacing from 4 – 25 kg/ka

Spacing

- 90 x 90, 45 x 15, 45 x 30 according varieties

Nutrient schedule (kg /ha)

- Rainfed: 12.5 – 25.0 – 0
- Irrigated: 25.0– 50.0 – 0
- As per the pits if Pandal avarai

Irrigation

- At flowering & pod formation

Weed management

- As per pulses

Special management

- Pruning and propping are essential

Harvest

- As per the plan
- May be vegetables

Garden lablab -Mochai
Lablab purpureus var lignosus

Season

- Jun-Jly

Varieties

- CO 1 & CO2

Seed weight

- 200 -240mg

Seed rate

- 20 kg CO 1, 25 kg CO 2

Spacing

- CO 1 90 x 30 cm
- CO 2 45 x 15 cm

Nutrient schedule (kg /ha)

- Rainfed: 12.5 – 25.0 – 0
- Irrigated: 25.0– 50.0 – 0

Irrigation

- At flowering & pod formation

Weed management

- As per pulses

Special management

- Pruning and propping are essential

Harvest

- Dry pods

Soybean
Glycine max

Origin

- Native of Eastern half of N China
- Then spread to Japan and USSR
- Only in 1908 to USA and also to India
 - Early works on soybean was reported from PUSA
 - Then spread to Pantnagar & Jabalpur by Edwin Bay in 63-64

Area & production - World

Country	M ha	M t	t / ha
USA	28.7	75.0	2.6
Brazil	13.3	31.4	2.3
China	8.2	13.6	1.7
India	5.8	6.5	1.1
World	70.7	158.3	2.2

Area & production - India

State	Million ha	M t	T /ha
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MP	4.26	4.92	1.15
Maharastra	0.86	0.85	0.99
Rajasthan	0.50	0.63	1.27
Karnataka	0.07	0.05	0.68
UP	0.05	0.05	0.99
India	5.80	6.53	1.13

- Remained confined to small pockets since
 - Poor acceptability of black seeded varieties
 - Low yielding & disease susceptibility
 - Long duration
 - Shattering
 - No industry to buy
 - No link between producer & buyer
 - Benefits not aware
 - Lack of product development and marketing

Importance

- Cheapest source of vegetable protein -40%+
- Oil rich 20%
- Variety of uses today
 - Soy - beverage, curd, milk, ice cream, candy
 - Soy – nuts, cheese, flour etc
 - Oil – for glycerin, explosives, varnish, paint, soap, celluloid's etc
 - Fodder

Classification

- Depending upon form, size, shape, color of seed
 - Color (Manchurian)– Yellow, Black, Green
 - Shape (Martin's)
 - Elliptical – Egg type
 - Spherical – Round
 - Compressed – Pressed seed
 - Based on maturity (USA) 10 classes

The plant

- Erect bushy annual 0.3 to 2.0 m
- Both indeterminate & determinate types
- PI within 3 weeks
- Flowering 6-8 weeks after emergence
- Pods visible 10 days after flowering
- Flowering continues for 3-4 weeks
- Many stages of pod and seed development
- Mature pods contains 1-4 seeds/pod

The seed

- Generally oval
- 120-150mg
- Cotyledons are yellow
- Germination epigeal - cotyledon comes out of soil

Root & nodulation

- Tap root but spreads laterally also
- *Bradyrhizobium japonicum* – many nodules

The climate

- Short day but cultivars differ
- Late maturing - more sensitive to photo-period than early
- Light intensity decides the floral initiation
 - 1076 lux units for 2 consecutive days for 8 hr
- Temp
 - 5°C minimum, 30°C optimum, 40°C max

The Field

- Fine seed bed

Time of sowing

- Kharif season for India

Spacing

- 45 x 4-5 cm in Kharif
- 30 x 2-3 cm in Rabi

Seed rate

- Depends upon seed wt - 75-80kg

Varieties

- CO 1, CO 2, ADT 1 in TN

Soils

- Grows well in Alfisols, Entisols, Inceptisols, Mollisols & vertisols

Nutrients

- 4 t crop removes
 - 370kg N, 40kg P, 130kg K, 90kg Ca, 40kg Mg, 28kg S
 - Application should be based on variety & soil

Nutrients ...

- 20:80:40:40 N-P-K-S kg /ha
- Zinc in high rainfall uplands & sodic soils 5kg ZnSO₄ as basal

Water

- Requires 640-750mm
- Sprouting, flowering, pod-initiation and grain filling are critical stages

Weed management

- As usual for chemical
- Sensitive to early weed infestation
- Yield may go down by 54-65% by weed alone
- IWM is very much needed

Cropping system

- Scope or intercrop in cereals & pulses

Harvest

- Leaves drop at maturity
 - Entire plant cut at 15-17% seed moisture
 - A moisture content of 13-14% is ideal for threshing
 - Storage moisture 8-10%
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