

Lesson 7
Castor
Ricinus communis

Importance

- It was poor man's crop
- Globalization changed the scenario
- Now it is one of the most commercial non-edible oil seed
- Its stem, leaves, seeds, oil and cake are useful
- Oil - variety of uses
 - Industrial
 - Lubrication- including 'aero-engines'
 - Medicine- both human and veterinary
- Oil cake - manure
- Stalk - fuel or thatching
- Leaves - used for rearing silk worms
- Castor oil
 - Purgative as medicinally as cathartic & obstetrics
 - Skin ointment
 - Soothing agent to eye applied after removal of foreign bodies
 - As resins
 - Surface coating to household articles, furniture, refrigerators
 - Base materials for several paints, enamels & varnishes of super quality
 - Manufacture of leathers, adhesives, synthetic perfumes & flavors
 - Variety of rubber goods, hair oils
 - Clear bright colors in dyeing fabrics
 - For soaking raw skins in fur trade

Origin

- Indigenous to Eastern Africa
 - Most probably in Ethiopia
 - There are four large centres based on wild varieties
 - Irano-Afghanistan-USSR region
 - Palestine-SW Asia
 - India China
 - Arabian peninsular

World scenario of castor – (million ha & million T)

Country	Area	Production	Productivity
India	1.05	1.00	0.95
China	0.24	0.28	1.17
Brazil	0.12	0.05	0.37
Thailand	0.02	0.02	0.79
World	1.58	1.42	0.90

Indian scenario of castor – (million ha & million T)

State	Area	Production	Productivity
Gujarat	0.37	0.74	1.99
AP	0.24	0.06	0.25
TN	0.04	0.01	0.32
Orissa	0.02	0.01	0.31
Rajasthan	0.04	0.05	1.36
Karnataka	0.02	0.02	1.00
India	1.58	1.42	0.90

The Plant

- Can be divided into 2 groups
 - Tall – Giant - like tree, tap roots
 - Short - Dwarf – tap root less apparent
- Stem
 - Round glabrous & covered with waxy bloom
- Leaves
 - Dark glossy green
 - Palmate with 5 -11 lobes
- Inflorescence
 - The capsule contains three seeds
 - Seeds may vary greatly in size
 - 1000 seed may vary from 100 to 1000 g but most dwarf weighs around 300g
 - Inflorescence
 - Pyramidal raceme – ‘spike’ or candle
 - Male flowers in lower raceme
 - Number influenced by climate
 - High temp causes maleness
 - Female flowers in upper
 - May reach 100cm
 - Flowering may continue
 - Fruit is globular capsule, spiny to some degree, becomes hard & brittle when ripe
 - Shattering at maturity in giants but not in dwarf

Climate

- Hardy perennial
- Adapted to tropics to sub-tropics
- Now grows under warm temperate
- Temp ranging from 20-26°C with low humidity, long, clear, summer days throughout the growth favors high yield
- Frost free for dwarf is must
- It is long day crop
 - Short day (<9hrs /day) increases male flowers ratio
- Drought tolerant since deep rooted crop

Soil

- All soils
 - except clay and poorly drained
- Grows well in light sandy soils
- Deep moderately fertile with acidic (pH 5.0 to 6.5) are more ideal
- It can tolerate up to pH 8.0
- Soil with high fertility un desirable
 - since excessive vegetative growth & poor yield
- It can be in soils where other commercial crops are not possible

Filed preparation

- Deep ploughing is beneficial for rainfed crop for moisture conservation
- Chiseling in sandy soils
- Beds and channels in rainfed crops
- May be ridges and furrows in irrigated

Season

- Onset on SW monsoon
- Depends upon the date of receipt in different states
- During winter when the soil temp is
 - <10-12°C

Method of sowing

- Sowing behind the furrows –in AP
- Dibbling in lines
 - May be placed between 5-6cm
 - Germination is epigeal, can break surface crust also

Varieties

- During 70's
 - SA 2, V 19 & RC 6
- Hybrids
 - GCH 3, GAUCH 1, GCH 2
- In TN
 - SA1, 2, TMV 4, 5, 6, TMVCH 1, CO 1

Spacing (cm)

- 90 x 90
- 90 x 60
- 60 x 45
- 60 x 30

Seed rate

- 10kg
 - depending upon seed weight and spacing

Manuring

- In TN
 - 30:15:15 kg NPK
- In Gujarat
 - For rainfed - 40:40:0
 - N in two equal splits
 - Basal + 30-35 DAS

- Irrigated - 40:40:40 as basal
 - + 10 kg N after each picking
 - from 90DAS at 30 days interval
- There is N usage up to 150 kg in Gujarat

Irrigation

- Mostly as rainfed
- During prolonged drought
 - 2-3 supplemental irrigations
- Rabi & Summer crops require
 - 6-8 irrigations
 - Less number of irrigations in heavy soils
 - High moisture during maturity leads to
 - New leaves and delaying maturity

Weed management

- Weed free situation is 45-50days
- Early suppression by weeds
 - Intercropping is a solution
 - Summer ploughing, deep ploughing are to reduce the weed
- Herbicides
 - Fluchloralin 1.0 kg PPI
 - Pendimethalin – 1.5 kg PE (1-2 DAS)

Maturity and harvest

- Harvesting in stages
 - 2-6 stages depending upon duration and spike opening
 - Capsules are picked when the spike turn yellow to black
- Drying
 - Sun drying the capsules and threshing

Yield

- Yield
 - 0.8 to 1.0 t in rainfed and
 - 1.5 to 2.0 t in irrigated
- Oil yield 50%
 - Oil extraction
 - Kernel pressing followed by solvent extraction

Cropping systems

- Crop rotation is very useful to control wilt
- Castor after pulse
- Castor followed by winter wheat
- Intercrops
 - Castor + peanut 1:3
 - Castor: blackgram 1:3
 - Castor : Pigeonpea 1:1