

MESTA

Mesta is a common word used for both roselle(*Hibiscus sabdariffa* L.) & Kenaf (*Hibiscus cannabinus* L.) which produces good fibre of commerce. Sabdariffa types are best cultivated in between 10⁰ N & 30⁰ S where the temperature ranges between 10⁰C to 30⁰C. Strong winds prolonged period of cold foggy weather interrupt and check its growth. The sabdariffa types in general are not response to photoperiodism although the plant of sabdariffa types tends to be short day. The species cannabinus grows best in the warmer region between the latitude of 30⁰ N and 30⁰S. The cannabinus is capable of withstanding a considerable degree of cold.

Why Mesta can be cultivated

- Mesta plants absorb CO₂ two times more than other trees.
- Deforestation problems can be partially solved by using annual crops such as Mesta /Mesta as raw material instead of bamboo and wood for the production of pulp and paper.
- Due to high content protein, animal feed can be produced from Mesta leaves.
- The natural dyes can be produced from Mesta fruit.
- Edible oil can be extracted from Mesta seeds.
- Mesta core can be utilized as substitution for ply wood.
- Auto parts can be produced from Mesta /Mesta fibres as composite.
- Clothing can be manufactured from Mesta fibre blending with cotton or other natural fibres.
- Extracted Mesta seed oil can be used as a bio-fuel for Diesel engine which will reduce the emission of CO₂.
- These plants can help the human beings free from dangerous condition of air and water pollution, ozone, layer depletion and its consequences of global warming and sea level up-rising.

Uses of Mesta

- The best fibre plant with one year duration.
- There is much relief in using insecticides & fertilizers.
- For extracting of fibres, shorter water-dipping period is required.
- Mesta can be used with Jute in processing.
- Mesta has quick growth, *i.e.* it can compete with weeds.
- Mesta can be grown well in tropical climate regions.
- Mesta is an environment friendly plant.
- Mesta has efficiency to purify contaminated water.
- Mesta has nothing to be discarded. (Its leaves can be used as animal-feeds, its fruits for juice /dyes, its seeds for edible oil, its roots for charcoal, *etc.*)

Varieties:

S. No.	Name of the Variety	Year	Fibre Yield (q/Ha)	Significant attributes	Area Recommended
I	Roselle (<i>Hibiscus sabdariffa</i>) (Erra gogu)				
1	AMV - 1	1966	20	Stem has less bristles, highly susceptible to pests and diseases	Andhra Pradesh., Orissa, Tamilnadu., W.Bengal
2	AMV - 2	1982	20	Stem has less bristles, Highly susceptible to pests and diseases	Andhra Pradesh., Orissa, Tamilnadu., W.Bengal
3	AMV – 3 (SURY A)	1989	20	Stem has less bristles, tolerant to foot and stem rot disease	Andhra Pradesh., Orissa, Tamilnadu., W.Bengal
4	AMV – 4 (KALING A)	1991	20	Stem has less bristles, moderately resistant to jassids and foot and stem rot diseases	Andhra Pradesh., Orissa, Tamilnadu., W.Bengal
5	AMV – 5 (DURG A)	2006	23-25	Good fibre quality, higher fibre yield, tolerant to pests and diseases under field conditions	Andhra Pradesh., Orissa, Tamilnadu., W.Bengal
6	AMV – 7 (JANA RDHA N)	2011	28-30	Suitable for mid May to mid June sowing, maturity 130-135 days, tolerant to moisture stress, resistant to major pests and diseases	Mesta growing belt of the country
New Varieties : AMV-8 & AMV-9 (Aditya) - 140-150 Days), Yield 2.7 t/ha.					
II	Kenaf (<i>Hibiscus cannabinus</i>) (Tella gogu)				
1	AMC – 108 (Bheemily)	1982	12-14	Tolerant to foot and stem rot diseases, tolerant to jassids and spiral borer. Fibre quality suitable for making handicrafts	Southern India, Bihar, Orissa

Climate :

A warm humid climate is considered most suitable for growing both the species of mesta. Both grow well in drier rainfed areas. The sabdariffa being better drought resistant type and a rainfall at least 10mm during each month of growing period is sufficient for good growth. In areas where the rainfall is 50-90 mm the cannabinus mesta suits better by virtue of short duration and comparatively faster growth than the

sabdariffa. None of these can stand water logging conditions.

Soils:

Alluvial, red sandy, red loamy with clay base and lateritic soils with rich loamy content are suitable. The acidic soils are not suitable without proper amendments. The sabdariffa types develop chlorosis in high pH of the soils. These types can be grown in soils having a pH of 6.5-7.5.

Land Preparation.:

The land is ploughed and followed by working gorru and guntaka which helps in pulverizing the soil properly. The well ploughed and pulverized soil helps in the proper operation of seed drills etc. for better germination of seeds.

Sowing time: May 2nd fortnight to June 1st fortnight

Seed rate:

Seed quantity and seed rate varies in between two species of mesta. A seed rate of 5 kg/acre for sabdariffa and 6 kg/acre for cannabinus is required. Mesta is normally sown by broadcasting method, line sowing has been found to be advantageous over broadcasting.

Advantages of Line sowing :

- Plant growth is uniform, since uniform space is maintained in the field.
- Intercultural operations like weeding hoeing etc. are easier to attempt
- Application of fertilizers and pesticides etc. also become easier
- Lesser quantity of seed is required in line sowing over to broadcasting
- Higher yields can be realized

Spacing: Maintenance of optimum plant population per unit area is important for getting

maximum yields. A spacing of 30x10 cms. can be adopted for maintaining the optimum population for realizing higher yields.

Manures & Fertilizers: Balanced application of both organic & inorganic fertilizers at proper time is very important for a crop. It is therefore, advised at least application of 4-5 tons of FYM / Compost per acre as basal at the time land preparation for better crop growth. A fertilizer dose of N,P & K @ 16:8:8 kg/acre is recommended for higher fibre yields. The N & K can be applied as top dressing in two split doses one at the time of 1st weeding and another 6 weeks after sowing. If the soils are poor in available NPK, an application of 24-16-16 NPK kg/acre is advisable for realizing higher fibre yields. In adverse conditions i.e., excess moisture or prolonged drought condition foliar application of 1% Potassium nitrate or 2%N & 1%K is advisable to save the crop from stress conditions.

Intercultural operations: Weeding, thinning and hoeing are three major intercultural operations attempted in mesta crop. Weeding takes nearly 25-30% of the total cost of

production. If the weeding is not done at proper time whole crop is adversely affected. Weeding and thinning is generally done simultaneously. The first weeding is done at the age of 3 weeks of the crop and second weeding is done after 5th week age of the crop. Application of Pretilachlor 50% EC @ 900ml/ha as pre-sowing herbicide (within 48 hours of seed sowing) at sufficient soil moisture is recommended for effective in controlling the weeds.

Irrigation: No irrigation generally applied to this crop since growing in rainfed condition the water requirement of mesta crop is about 50 cms. It is therefore, advisable to irrigate the mesta field for better fibre yields whenever wilting symptoms appear.

Pests & Diseases of Mesta:

A) Insect Pests:

Jassids, Aphids and Whitefly : Spray Dimethoate 2.0ml or Monochrotophos 1.6 ml or Imidacloprid 0.25 ml or Thiomethoxam 0.2 gms or Acetamipride 0.2 gms /lt of water **Mealy bug:** Mealy bug can be effectively controlled by spraying

Neem oil 5.0 ml or Pongamia oil 5.0 ml or Propenophos 2.0ml or Methyl parathion 2.0ml per lt. of water. Add adhesive like Sandovit –triton AE or Dhanuvit or Teepol @ 1.0 ml/lt. of spray fluid for effective penetration of the skin of the insect. Known alternative host plants around the mesta crop should be destroyed. The affected mesta plants should be removed and destroyed.

Semilooper: Spray Endosulphon 2.0 ml or Chlorpyrifos 2.0ml or Acephate 1.5 gm or Propenophos 2.0ml /lt of water.

B) Diseases:

1. Foot & Stem rot:

- Deep summer ploughing
- Facility for drainage of excess water to prevent water logging
- Treat the seed with Mancozeb 3.0 gm or Metalaxyl 3.0 gm or Metalaxyl mz 2.0 gm /kg of seed. Drenching of the soil with mancozeb 3.0 gm/lt. when disease symptoms are noticed.

2. Leaf rot: Spray Mancozeb 3.0 gm or Copper oxychloride 3.0 gms /lt. of water twice with an interval of 7 days.

3. Yellow Vein Mosaic Virus : 1. Spray Neem Seed Kernal Extract 5% or Triazophos 2.0ml or Propenophos 2.0ml or Monochrotophos 1.6ml /lt. of water to check the white fly which is vector for the disease.

Harvesting:

A proper stage of harvesting gives higher fibre yield as well as better quality. If the plants are harvested pre-maturely in early stages, the quality fibre is good but the fibre yield is poor . In case the plants harvested late the fibre yield is better quality fibre goes down. The best time to harvest mesta for fibre is when the plants are left with 10

or 12 flowers. The taller plants will have some of the lower fruits matured without depending much on the reserve in the fibre, while the shorter plants may not have sufficient reserves to mature even a single fruit and therefore the harvest before the first capsule is matured.

Harvesting is done normally by cutting the plants close to the ground. In some areas the plants of mesta also uprooted. Such plants take more time to ret and quality of fibre is adversely affected. After the harvesting the plants are sorted out based on the thickness of the stems followed by bundling of plants in convenient sizes of 25 -30 cms in diameter. These bundles kept standing in the field for 2-3 days for shredding of leaves. The shredding of leaves also simultaneously helps in shrinking and rupture of the bark which helps in the entrance of retting microorganisms.

Retting:

Steep method of retting is very popular in all mesta growing areas. The steep retting consists of bundling of mesta plants after harvesting . The bundles are kept in standing position in 50-60 cms deep water for nearly 3-4 days. This helps in retting of the hard lower portion of the bark. After 3-4 days the standing bundles are laid down in the retting water and slightly drowned (nearly 10 cms) in water with the help of weights made of cement blocks or stones. Care should be taken not to put any weighed material which releases tannin and iron. For hastening the retting process spraying of 1.25 % Urea solution(12.5gm/ltr. of water) on mesta sticks is desirable before retting of the bundles.

Soon after completion of retting the fibre can be extracted from the sticks by single plant extraction method. The fibre is extracted from a single plant individually, each plant from the bundle is taken out and with the help of fingers the fibre is extracted, washed and kept. The bundles of ret fibre after washing are open and dried on bamboo frames under the sun. After 3 or 4 days the dried fibre is properly assorted and bundled in different grades for marketing of the fibre.

Micro-pond retting

Micro pond technology in rainfed Mesta cultivated areas

Dig a circular micro pond of 6.5m floor dia. and 7.5m top dia. having 1m wide earthen embankment raised up to 2 feet from the surface and lined with polyethylene sheet of size, 30ft x 27 ft plastic tarpaulin [enough to ret Mesta harvested from one acre land . The pond depth will be around 3.5 feet. In a normal season the pond dug at the lowest corner of the field will help retting the jute only with rain water.



Before keeping the Mesta bundles in tank, the sharp bases of the Mesta plants have to be blunted as far as possible by ramming the bundles on hard surface to avoid damage to the polyethylene sheet. Harvested jute bundles are to be arranged radially up to three layers keeping base of the plants towards periphery of the pond and covered with straw/aquatic weed jak (cover & weight) and ropes tied tightly with bamboo poles along the periphery to keep the bundles under water. Twenty five bags of soil filled in good cemented bags are also suitable as jak/weight material. The microbial consortia developed by CRIJAF may be applied in the retting tank for quicker retting.



Four plastic pipes (2 inches dia.) are to be placed at 1 foot below or cut 1 feet below the rim at four different places for draining out water received from rains or the applied water and will simulate the natural retting environment (slow moving water in retting spot). The pond has to be filled with ground water. It may require one or two additional irrigations depending on rainfall (for 1 hour each) upto the end of retting and to remove the black dirty water from the pond and diverted to rice field



Grow cauliflower and or vegetables on rims to recover the cost of plastic. Remove plastic after retting and store after drying for use in next 4 to 5 consecutive years.