

Agronomy – Kharif Crops

SUNNHEMP

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SUNNHEMP
Botanical name: *Crotolaria juncea*
Family: Fabaceae (Leguminosae)
Chromosome number: 2n=16

The crop is grown for its stem (bast) fibre, green manuring and fodder. Of the 3 uses, green manuring is most important followed by fibre and fodder. The sunnhemp fibre is used in making cordage, fishing net and paper. The fibre pulp is especially used in currency note paper and cigarette paper manufacturing. Sunnhemp raised for green manuring purpose, is turned into soil when the plants are about 6-8 weeks old. It adds about 40-60 kg N/ha in the soil after decomposition.

Origin

Genus *Crotolaria* comprises over 200 species distributed mainly in tropical and sub-tropical regions. To a lesser extent, it is also found in temperate areas. It is believed to be native to Indian sub-continent. It was introduced to other countries from India. According to some investigators, Myanmar is the place of origin of the crop, because it is found there in its wild state.

Geographic distribution

The important sunnhemp raising countries of the world are: Russia, Romania, India, China, Hungary, Poland, Turkey, Brazil, Chile and Bangladesh. The crop is grown in almost all parts of India. But the state of Uttar Pradesh has the largest area under sunnhemp cultivation followed by Madhya Pradesh.

Botanical description

Sunnhemp is an erect (1.2-3.0 m) annual with a few lateral branches. The stems are thin and straight. The stem has a very thin skin which contains the long bast fibres. The plant is deep rooted with well developed lateral roots numerous nodules. The leaves are almost sessile, small and narrow, shining and covered with short silky hair. The arrangement of leaves is alternate and rather far apart on the stem.

The inflorescence is a raceme usually of 12-20 bright yellow flower typically papilionaceous in structure. Flowers are self-sterile and cross-fertilized. The pods are small and cylindrical and about 5 cm in length. The ripen seeds rattle within the pods when shaken. The seeds are kidney shaped.

Climate

Sunnhemp is a crop of tropical and sub-tropical climates. The crop can not withstand low temperatures and frost. It can also be grown in *rabi* season, where winters are mild i.e. in southern region. It is cultivated in areas with a well distributed rainfall of 400-1000 mm throughout the crop growth, with high relative humidity (60-85%) and a temperature ranging from 20-35°C.





Photo - Graeme Wilson ©

Source: www.tropicalforages.info/

Soils

Well drained fertile soils (sandy loam or loamy texture) with neutral pH are most suited for sunnhemp cultivation. Under acidic soils or soils with low calcium and phosphorus, biological N-fixation is hampered. Liming is essential for its successful cultivation in such soils.

Land preparation

The soil should be well pulverized and free from weeds before sowing the crop. This can be achieved by one ploughing followed by 2-3 harrowings. After harrowing, the field should be levelled so as to give a gentle slope to facilitate quick and easy drainage.

Seeds and Sowing

Seed rate and spacing

For green manuring, the seed is broadcast in late May to early June using a seed rate of 70-80 kg/ha. For fibre, sowing in lines is preferable. Line sowing requires a seed rate of 40 kg/ha, while broadcast crop needs 60 kg/ha of seed. The optimum spacing for fibre crop is 30

cm x 5-10 cm. For seed production, a seed rate of 20-25 kg/ha is sufficient. The seed crop is sown in lines, maintaining a spacing of 30 cm x 15 cm. The depth of sowing should not be more than 3-4 cm.

Time of sowing

The crop is generally sown with onset of monsoon or in May-June with pre-sowing irrigation in north India. The seed crop is raised in *kharif* season i.e., in early August in the sunnhemp-growing districts of the northern states. But it is ideal to grow a seed crop in *rabi* season in a zone where winter is not severe and temperature seldom falls below 10°C.

Manures and Fertilizers

Being a legume, it meets most of its N requirement through biological N fixation. However, in sandy-loam soils, 15 kg N/ha should be applied at the time of sowing. The crop needs liberal P fertilization (20-50 kg P₂O₅/ha) depending on soil fertility for better root growth and nodulation. Besides phosphorus, calcium is also needed in some of the soils. No response to application of potash has been observed. All the fertilizers are applied at the time of sowing.

Application of *Rhizobium* alone or in association with phosphorus-solubilizing bacteria proves effective in substituting fertilizers in sunnhemp.

Water management

It is predominantly a rainfed monsoon crop and requires no irrigation. However, the crop sown in the month of May requires 2-3 irrigations before the onset of monsoon. The fibre crop may need one irrigation during prolonged drought spells in monsoon season. Irrigation at 50% depletion of available soil moisture is sufficient for the crop.

Weed management

Sunnhemp owing to its quick growth smother the weeds and requires no weeding. Crops grown for fibre and seed require some initial weeding. The weeds like *Cyperus rotundus*, *Celosia argentic*, *Ludwigia parviflora*, *Convolvulus arvensis* and *Ipomea* sp. pose serious threat to seed production.

Harvesting

The harvesting of sunnhemp is best done at the pod formation stage for good quality fibre. Such fibres have good luster and colour. Sometimes plants are allowed to remain in the field until they are dead ripe. The fibre obtained from such plants is of very poor quality. Too early as well as too late harvesting spoils the fibre quality.

Harvesting of fibre crop is done by cutting the plants close to the ground with sickle. The leafy top portions of the plants may be chopped off and used either as fodder or may be ploughed down to add organic matter to the soil. After 2-3 days when most of the leaves get dried up, these plants are shaken to shed the leaves. The plants are then tied into bundles of convenient sizes having 50-100 plants in each bundle.

A crop of sunnhemp for the purpose of green manure becomes ready for incorporation in the soil within 2 months of sowing.

Steeping

The bundles are brought to the nearest ponds, pools, ditches or streams and arranged side by side to form a platform in water for steeping. Care should also be taken to see that while weighing down the jack, the bundles do not touch the bottom of the retting tank.

Retting of Sunnhemp

Retting in slow running water is better than retting in stagnant water. This process is complete when the fibre is loose enough for extraction and is easily separated from the sticks. The period of retting may vary from 3 to 15 days depending upon the temperature of retting water and month of harvesting. In September, retting takes place generally within 3-7 days, while in December; this period may range from 12 to 15 days. The optimum temperature for retting is 21-27°C.

Extraction of Fibre

The extraction of the fibre of sunnhemp is more difficult than jute. The beat and jerk method is unsuitable in case of sunnhemp as tendency of fibre to stick to the wood is more, and the fibre gets entangled with broken twigs. Therefore, fibre is extracted single plantwise by breaking the lower ends of the plants and then stripping upwards from the bottom. After extraction, the peeled fibre should be washed thoroughly in clean water to remove dirt and other adhering materials. The fibre needs to be squeezed to remove excess water and spread on bamboo rafts to dry in mild sun for 2 to 3 days. After drying the fibre is graded and bundled into small '*moras*' for marketing.

Yield

Sunnhemp has a fibre content of 2-4% on the basis of weight of green stem to 8-12% in terms of dry weight. With improved package of practices under irrigated conditions, it is possible to get about 0.8-1.0 tonnes of fibre/ha.

Additional Reading:

<http://www.hort.purdue.edu/newcrop/proceedings1996/v3-389.html>

<http://agroecology.ifas.ufl.edu/sunn%20hemp.htm>