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Sunnhemp

Seed Production Technology

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Non-availability of quality sunnhemp seed is one of the major constraints for expansion of sunnhemp crop both as a fibre crop as well as a green manure. Information on seed production is meagre and scattered. Observations and experimentations over the years at the Central Research Institute for Jute and Allied Fibres, Barrackpore revealed the critical points like choice of season, quantity of fertilizers to be applied, irrigation, control of pests and diseases at pod-setting-maturation stage and also field and seed certification standards for successful seed production. In the present article various innovative agronomic and other important aspects of sunnhemp seed production technology are discussed.

Key words: Production, Seed, Sunnhemp, Technology



Borer affected pod
Healthy (H) and phylloid (P) inflorescence



Microbial seed rotting
Healthy (H) and malformed (M) floral parts



Discoloured seed
Healthy (H) and phylloid (P) affected seed crop

SUNNHEMP (*Crotalaria juncea*) is an important multipurpose fabaceous crop grown all-over India for fibre, green manure and fodder purposes. Till sixties it was a premier crop in India. But with the advent of Green Revolution and cheap synthetic fibre, its area under cultivation has reduced gradually. Presently it is grown by traditional and marginal farmers.

Package of practices

Climate: Sunnhemp thrive well at a latitude below 24° N and withstand mild-winter with a minimum temperature not below 10°C, and needs good sunshine hours with no rainfall during seed setting stage.

Land requirements: Land to be used for seed production of sunnhemp shall be free of volunteer plants.

Land preparation: Land should be well pulverized with 2 to 3 ploughings with cultivator followed by laddering. For proper germination of seed the moisture content of soil at the sowing should be 25 to 30%. Application of N:P:K @20:40:40 kg/ha is essential.

Varieties: Important varieties include 'K 12 yellow', 'K 12 black', 'SH 4' (Shailesh), 'SUN 053' (Swastika), 'SUIN 037' (Ankur) and JRJ 610 (Prankur). The Breeder seeds of the above varieties are available at CRIJAF, Barrackpore.

Sowing time: The most important factor for sunnhemp seed production is sowing time. Sunnhemp is generally grown from April to August in northern and north-western part of the country. But being a short-day crop flowering starts around mid-September and continues up to November. Minimum period for sowing to flowering is 30 to 40 days. Thus when early sown crop is left for seed production purpose, the vegetative growth becomes luxuriant which is undesirable for seed production. Moreover, lodging and incidence of pests and diseases badly affect the seed production in early sown condition. In north Indian condition

Table 1. Sunnhemp seed yield in different places

Places	Seed yield (q/ha)
Pratapgarh, Uttar Pradesh	10-16
Barrackpore, West Bengal	18-25
Coimbatore, Tamil Nadu	10-20
Akola, Maharashtra	12-20
Bamra, Odisha	12-16
Pantnagar, Uttrakhand	12-16
Bengaluru, Karnataka	10-15

the best time of sowing is the end of July to the first fortnight of August. The crop sown after August results weaker growth and at the flowering, temperature falls (in northern India) that affect activity of pollinators (*Xylocop alatipies, X. fenistroides* and *Megachile lanata*), which in turn reduce seed yield. However, in areas with mild cold, seed production is possible during of *rabi* (September to March). The best time of sowing in such areas is September- October. In early sown crop topping at 50 days after sowing resulted in profuse seed setting but when the crop is sown during October or thereafter topping is not required.

Seed rate: For seed crop, sowing of 20 to 25 kg/ha seed is sufficient. Seed treatment with carbendazim 50 WP @ 0.1% is recommended for better stand and vigour.

Spacing: In sunnhemp, flowering starts only at the ultimate branches. In late sown crop, profuse branching is common. Generally the crop grown for fibre with spacing 25 to 30 cm × 5 to 10 cm is left for seed production, which does not produce sufficient seed. Wider spacing is (40 cm × 20 cm) found suitable to produce more seed.

Irrigation: Sunnhemp seed crop is generally grown as rainfed crop. Enough soil moisture is available at the sowing and no irrigation is required at the early growth stages of the crop. But two to three light irrigations are given, at seed setting and pod maturation stages that result in more seed yield. If only one irrigation is available, it should be given at pod setting/maturation stage.

Fertilizer: Being leguminous crop farmers do not apply any fertilizer but application of nitrogen (N) @20 kg/ha, phosphorus (P) @ 40 kg/ha and potash (K) @ 40 kg/ha increase seed yield considerably. Half of nitrogen and total amount of potassium (K) and phosporus (P) fertilizer to be added during final land preparation and the rest half of nitrogen to be applied at 25-30 days after sowing.

Table 2. Field standard for sunnhemp seed certification-isolation distance.

Field standard: General requirements: Isolation distance	*Foundation*	*Certified*
Fields of other varieties (m)	250	100
Fields of the same variety not conforming to varietal purity requirements for certification (m)	250	100

Table 3. Minimum seed certification standards for sunnhemp

Factor	Foundation seed	Certified seed
Pure seed (minimum)	98 %	98 %
Inert materials (maximum)	2 %	2 %
Other crop seed (maximum)	10% per kg seed	20% per kg seed
Germination including hard seed (minimum)	80 %	80 %
Moisture content (maximum)	9 %	9 %
Moisture content (for vapour proof container)	8 %	8 %

Source: *Indian Minimum Seed Certification Standards.*

Pests and diseases: Sunnhemp seed crop is affected by a number of pests and diseases among which pod borer pests viz., *Nazara* spp., *Utethaisa pulchella* and *Lasperes yatricentra*are the most important ones causing about 20% loss in seed yield. Apart from direct losses, pod borers also the facilitate infection by seed deteriorating mycoflora. To protect the crop from borers spraying of profenophos @ 0.1% at pod setting stage is recommended. Spraying should be done at the evening hours so that activities of the pollinators are not affected. Pods of leguminous crops are highly congenial for growth and development of different kinds of seed mycoflora, which cause different kinds of seed discolouration, seed rotting that in turn reduces the seed vigour and longevity. One spraying at pod setting stage with carbendazim @ 0.1% reduces incidence of seed mycoflora. Vascular wilt (*Fusarium udum* f.sp. *crotalariae*) is important disease in reducing seed yield which can be managed by seed treatment with carbendazim especially crop grown under upland conditions. Virus (sunnhemp mosaic, sunnhemp leaf curl) as well as phytoplasma (phyllody) affected plants of sunnhemphardly bear any seeds.

Harvesting: Harvesting should be done by sickle at 120 to 140 days after sowing when the seed inside the pod has started rattling. Threshing can be done by tractor or by beating pods against hard surface. After threshing and winnowing, dry the seeds under sun until the moisture content of the seed reached to the extent of 10% for better storage.

Seed yield: Seed yield varies greatly depending on climate and management practices. The range of seed productivity is given in Table 1.

Seed quality and standard

Field standards: Maintenance of isolation distance and roughing from field standards should be followed as per Table 2. For checking the field standards minimum of two inspections shall be made, the first at flowering and the second before harvest.

Seed standards: After harvesting and upon completion of all the post-harvest operations the certifying. The certifying agency collect the seed samples and arrange laboratory test. After laboratory test, if the seed lot confirms to the prescribed standards (Table 3), then it is recommended for use with certification tag and standard packaging.

SUMMARY

The importance of sunnhemp is regaining due to its biodegradable fibres as well as green manuring properties. Non-availability of quality seed is a major limiting factor for the expansion of this crop.

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