

PACKAGE OF PRACTICES FOR CULTIVATION OF SENNA

Recent years have seen a major spurt in the demand of medicinal plants not only within the country but also for its export. More and more number of farmers are entering into this most potential sector. The National Research Centre for Medicinal and Aromatic Plants (NRCMAP), Anand has developed package of practices for cultivation of Senna.

Senna (*Cassia angustifolia* Vahl.) leaves and pods are commonly used as natural laxatives, both in the modern as well as in traditional system of medicines. It is cultivated successfully in Tamil Nadu, Andhra Pradesh, Rajasthan, Gujarat, Maharashtra, Karnataka, West Bengal and Tripura. However, leaves of this plant are in demand internationally and preferred as ingredient of herbal tea in Europe.

It is a small 1–2 m high under-shrub, with erect stem, smooth, and pale green, with long spreading branches, bearing leaflets in four to eight pairs. The flowers are small and yellow. The pods are broadly oblong, about 5–8 cm long and 2–3 cm broad, and contain about six seeds. Presently it is cultivated in about 25, 000 ha of area. India is also the largest producer and exporter of Senna leaves, pods and total sennosides concentrate to the world market.



Senna

CLIMATE

Senna is usually cultivated as rainfed dry crop and very rarely grown as irrigated crop. It is a deep rooted hardy plant and requires warm and dry weather conditions. The plant requires bright sun shine and occasional rains during its growth period. It is highly sensitive to heavy rainfall and waterlogging conditions.

SOIL

Senna thrives well in sandy loam, red loam and even coarse gravelly soils, alluvial loam and rich clayey rice fields. It can be cultivated successfully

in black cotton soils. When grown in high saline soils, the plant growth is reduced without any symptoms of injury, but shedding of some lower leaves occurs. It can be successfully grown in soils having pH up to 8.5.

LAND PREPARATION

Senna does not require fine tilth. However, weed and pebble free land is recommended. The field should be twice ploughed, harrowed once or twice and appropriately levelled. Considering the slope the whole field should be subdivided into sub plots of suitable sizes, to facilitate drainage of excess water. It must be borne in mind that this crop can not survive waterlogged conditions even for a day.

SOWING TIME

The sowing time varies as per the onset of monsoon. However, in Western India, June–July is the optimum time of sowing. In the southern states, where crop is grown under residual moisture conditions, after harvesting of paddy, it can be sown in September–October. Delay in sowing time considerably reduces vegetative phase, especially in areas where winter sets by the end of October. As a result subsequent foliage yield is drastically reduced.

VARIETIES

ALFT–2 variety-a late flowering type, produces higher yield of foliage crop. A semi spreading type variety -Tinneyvelley senna is very popular in Tamil Nadu. Sona identified by the Central Institute on Medicinal and Aromatic Plants, Lucknow is also grown in some parts of Rajasthan.

Variety	Source of availability
ALFT–2	Head, AICRP on Medicinal and Aromatic Plants, Gujarat Agricultural University, Anand, Gujarat
Tinneyvelley senna	Director of Research, Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu
Sona	Director, Central Institute for Medicinal and Aromatic Plants, Lucknow, Uttar Pradesh

SEED RATE

Fifteen kg seed per hectare is recommended in irrigated conditions and about 25 kg in rainfed condition to be sown by broadcast. Bold,

disease free and mature seeds should be selected for sowing. Seed should be treated with Thiram at 3 g/kg seed to avoid seedling diseases. Seed rate can be reduced if crop is grown as line sowing under irrigated condition. About six kg seeds per ha is sufficient for optimum plant stand when sown by dibbling.

METHOD OF SOWING

Adopt line sowing with 45 × 30 cm spacing for optimum yield in Western India. Utmost care should be taken to place seeds at a depth of 1–2 cm in soil through dibbling for uniform germination. One light irrigation immediately after sowing enhances germination up to 90% and maintains proper plant stand.

MANURES AND FERTILIZERS

Apply 10 tonnes FYM per ha at the time of land preparation. In the international market, Senna leaves grown organically get a premium price. Therefore, the growers may get certification of organically grown Senna for getting a premium price.

IRRIGATION

Depending upon the soil moisture condition, apply 4–6 irrigations. However, two irrigations are very crucial, one immediately after sowing, and the other at 30 days after sowing if soil moisture is inadequate.

INTERCULTURAL OPERATIONS

Two weeding cum hoeing operations, at 25–30 days and 90 days after sowing (thinning) are required. The growth of this crop is very slow at initial stage and requires more care. Once the plants attain 20–25 cm height, the weed growth gets suppressed automatically.

DISEASES AND INSECT-PEST CONTROL

In the north and western parts, the crop suffers from damping-off disease, when grown in ill drained soils. It is recommended to improve drainage conditions by ensuring proper slopes. Seed treatment with Thiram at 3 g/kg seeds is also beneficial. Leaf spot caused by *Alternaria alternata*

and leaf blight caused by *Phyllostica* spp. are the two most serious diseases. Cloudy days and humid weather conditions are conducive for the spread of the diseases, which first appear on the leaves as visible minute spots and later turn dark brown to black in color. In severe infections, leaves start drying and falling. Pods are also affected in advanced stage of disease development. Two to three sprayings of Dithane M-45 at a week's interval be carried out to check the disease. In such cases harvesting of leaves must be done after 25–30 days of the last spray.

Occasionally, *Catopsilia pyranthe* causes severe damage to foliage by feeding on the leaves and remains active from July to October. In nature, these are heavily parasitized by *Trichogramma chilonis*. Therefore, release of *T. chilonis* @ 1.5 lakh/ha/week in the adult stage coinciding with the egg laying of the pest is a very effective method of this pest management.

CROP ROTATION

Senna fits well as a *kharif* crop in a crop rotation in commercially grown areas. In the southern states it is grown after paddy, and in north and western India it is followed by mustard and coriander.

HARVESTING AND YIELD

Harvesting should be done when bulk of the leaves are fully grown, thick and bluish in color. Mature leaves containing 2.0 to 2.5% and pods containing 2.5 to 3.0% of sennosides are accepted in the industry. When grown under irrigated conditions three harvestings are advised to get the maximum yield. Take first harvest after about 90 days of sowing and the second and third harvest at 150 and 210 days after sowing, respectively. Under rainfed conditions, cutting or uprooting of plants after 4–5 months of sowing can be done.

For seed production, pods need to be collected during February-March, when the plants turn "light brown". Seeds from such harvest have high germination%age. The collected pods are dried and seeds separated. By appropriate adoption of the package of practices, seed yield of 300–400 kg per ha. can be obtained. On an average, under rainfed conditions nearly 600–700 kg dry leaves per ha, and in irrigated conditions about 1500–2000 kg dry leaves per ha. is the optimum yield.

DRYING AND GRADING

Spread the harvested leaves on a clean floor in open sun for 6–10 hours to reduce the moisture. Thereafter undertake shade drying in well ventilated rooms. Undertake regular stirring to ensure uniform drying within 3–5 days (8% moisture in the final produce). Light green to greenish yellow colour is preferable. Improper and delayed drying changes the colour from brown to black, which fetches lower market price. Large leaves and bold pods in yellowish green colour are in demand and fetch a premium price.

STORAGE AND MARKETING

The leaves, after proper drying, should be stored in a cool and dry place. Pressing is done using hydraulic press to reduce the volume for transportation. The loss of sennoside contents in the stored produce is very slow and even after a year of storage, the loss is negligible. The present market price of the leaves is about Rs 8–10 per kg.

ECONOMICS

The crop can give a net profit of about Rs 5,000–10,000 per ha from otherwise marginal lands.

Caution: Cultivation of medicinal plants is undertaken by first assuring its market. The growers may like to establish buy back arrangements to minimize the risk of distress selling.

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