

Tropical Forages

Crotalaria juncea

Scientific name

Crotalaria juncea L.



Synonyms

GRIN: None listed

ILDIS: *Crotalaria benghalensis* Lam.; *Crotalaria fenestrata* Sims; *Crotalaria ferestrata* Sims; *Crotalaria porrecta* Wall.; *Crotalaria sericea* Willd.; *Crotalaria tenuifolia* Roxb.; *Crotalaria viminea* Wall.

Family/tribe

Family: *Fabaceae* (alt. *Leguminosae*) subfamily: *Faboideae* tribe: *Crotalariaeae*.

Morphological description

An erect annual, up to 3.5 m tall. Laxly branched, depending on plant density (there may be a single stem in dense stands). Vigorous lateral roots and long taproot that can exploit deeply stored soil moisture. Stem ridged and pubescent, up to 2 cm in diameter. Leaves are simple; oblong-elliptical, 4–13 × 0.5–3 cm; sparsely appressed-pubescent above, more densely so below; petiole 2–3(-5) mm long; stipules 2–3 mm long, caducous. Inflorescence a terminal open raceme, up to 25 cm long, with 18–20 bright yellow flowers, showy; sepals 5, hairy; standard erect, suborbicular, ca. 2.5 cm in diameter. Pod cylindrical, 3–6 × 1–2 cm, tomentose, light brown, containing ca. 6 seeds. Seeds heart- to kidney-shaped, with narrow end strongly incurved, up to 6 mm long, dark brown to black; loose when mature and rattling in the pod. About 33,000 seeds/kg.

Common names

Asia: kâk'tung (Cambodia); □□ shu ma (China); san, sunn (India); orok-orok lembut (Indonesia); po:th'üang, thwax chu:b (Laos); putok-putukan (Tagalog), karay-kagay (Bikol) (Philippines); po-thuang (Thailand); suc sat, lue lac (Vietnam)

English: sunn hemp, sunn crotalaria, sann-hemp brown hemp, Indian hemp, Madras hemp

Europe: chanvre du Bengale, chanvre indien, crotolaire jonciforme (French); Sanhanf (German); sunnhampa (Swedish)

Latin America: cânhamo-da-Índia, crotalária (Brazil); cáñamo san, matraca, sonajuelas (Spanish)

Distribution

Native:

Asia: Bangladesh; Bhutan; India

Cultivated/naturalized:

Throughout the subtropics and tropics

Uses/applications



Flowers bright yellow, standard erect, suborbicular; pods tomentose (P1441)



Erect annual to 3.5 m tall; crop in E Paraguay



Inflorescence a terminal open raceme to 25 cm long



Leaves simple, oblong-elliptical



Mature crop with pods, Malawi



Crotalaria juncea L. – 1, flowering branch; 2, part of stem; 3, fruit; 4, opened fruit; 5, seeds

Line illustration



Seeds



Harvesting sunhemp, US Virgin Islands

Forage

Leaves stripped to feed to livestock (e.g. as supplement to low-quality feedstuff).

Environment

Soil improvement when used as green manure (including to suppress nematodes).

Other

Mainly used as a source of fibre (extracted from the bark).

Ecology

Soil requirements

Adapted to poor soils but responds to fertilization; pH 5–7.5; intolerant of salt and prolonged water-logging. On light, well-drained soils production is higher than on clay soils.

Moisture

Drought tolerant, adapted to hot, semi-arid and arid areas.

Temperature

Being a short-lived warm-season plant, suitable for a wide range of climates as long as there is a hot summer; can tolerate light frosts.

Light

No shade tolerance reported.

Reproductive development

Sunn hemp is a short-day plant; long day-lengths favour vegetative growth, although daylength neutral selections exist. Fast growing; under favourable conditions reaching a plant height of 1.2 m in 60 days, 1.8 m in 90 days.

Defoliation

For green manure or forage, should be used at vegetative growth stage or at the beginning of flowering. Optimum cutting height to enable high yields and subsequent cuts should be about 30 cm.

Fire

No information available.

Agronomy

Guidelines for establishment and management of sown forages.

Establishment

High seed germination; 40–50 kg seed/ha when used for green manure or forage; 100–240 kg/ha when intended use is fibre production; 1–2 cm sowing depth. Nodulates readily with native cowpea type rhizobia. 150–165 kg/ha nitrogen contribution have been measured in 60 days.

Fertilizer

Responsive to P, K and Ca.

Compatibility (with other species)

Smother weeds because of fast initial growth.

Companion species

Except for intercropping (with e.g. rice, wheat, *Cenchrus americanus*), *C. juncea* is generally not grown with other species.

Pests and diseases

Many pests and diseases are reported with varying degree of economic damage. To avoid build-up of disease and insect pressure, rotations are recommended.

Ability to spread

Although the pods are dehiscent, there is no indication of *C. juncea* being dispersed, to a major extent, by seed.

Weed potential

No information available.

Feeding value

Nutritive value

18–22% CP content in hay has been reported. 0.29% P; 1.40% Ca; 60% digestibility.

Palatability/acceptability

Animals are reported not to eat *C. juncea* when it is green; forage should be dried. Restriction recommendations in terms of hay to be offered to cattle vary between 10 and 45% of the animals' diet.

Toxicity

As other species of the genus *Crotalaria*, it contains poisonous glucosides (pyrrolizidine alkaloids).

Feedipedia link

<https://www.feedipedia.org/node/313>

Production potential

Dry matter

Establishment yields 2 t DM/ha after 6–8 weeks; thereafter, 3 further cuts at 4-week intervals may be possible.

Animal production

No data available.

Genetics/breeding

2n = 16. Self-incompatible; extensive cross-pollination.

Seed production

Up to 1.8 t/ha have been reported.

Herbicide effects

Fluchloralin and pendimethalin have shown to be effective for controlling early weed growth.

Strengths

- Fast growth.
- Tolerance of low soil fertility.
- Tolerance of drought.
- Fairly high protein content.

Limitations

- Forage potential restricted by concentrations of toxic glucosides.

Internet links

https://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/njpmcpg11706.pdf

Selected references

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Rotar, P.P. and Joy, R.J. (1983) 'Tropic Sun' sun hemp; *Crotalaria juncea* L. Research Extension Series 36. University of Hawaii, Honolulu, USA. hdl.handle.net/10125/15089

Sarkar, S.K., Hazra, S.K., Sen, H.S., Karmakar, P.G. and Tripathi, M.K. 2015. Sunnhemp in India. Central Research Institute for Jute and Allied Fibres (ICAR), Barrackpore, West Bengal, India.

Wang, Q., Li, Y., Klassen, W. and Hanlon, E.A. Jr. (2018) Sunn Hemp – A Promising Cover Crop in Florida. UF-IFAS Extension SL-306. University of Florida, Gainesville, FL, USA. edis.ifas.ufl.edu/tr003

Cultivars

A wide range of cultivars and elite lines are available, particularly in India with most being developed for their fibre quality and production. But some varieties have been developed for forage or green manure use (see Sarkar et al., 2015).

'K-14' (Cawnpore 14) Developed at Kanpur, Uttar Pradesh, India for use as a green manure.

'T6' Released in India (~1974). Day-neutral variety which flowers at about 30 days after sowing – suitable for green manure and fibre.

'Tropic Sun' Released in Hawaii, USA (2002). Selected for green manure and forage, not toxic to animals and is resistant to *Meloidogyne* spp. (root-knot nematodes).

Promising accessions

None reported.

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