LOCAL NAMES
English (sesbania pea,pricky sisham,prickly sesban,dunchi fibre,danchi,canicha); French (sesbane); Hindi (dhaincha,danchi,canicha); Lao (Sino-Tibetan) (sanô); Swahili (msalia-Nyuma,mrindazia); Thai (sano-khangkhok); Vietnamese (r[us]t)

BOTANIC DESCRIPTION
Sesbania bispinosa is a herb, sometimes suffrutescent, (min. 0.6) 1-3 m tall; young stem glabrous or nearly so, sparsely to rather densely aculeate.

Leaves with axis usually aculeate, to about (min. 5.5) 9.5-29.5 (max. 35) cm long, 20-100 foliate; stipules linear lanceolate, 5-10 mm long, adaxially pubescent, pilose on margins and above, late caducous; petiole 2-20 mm long; leaflets oblong to oblong linear, 0.75-2 (max. 2.6) cm x 1.5-3 (max. 5) mm, obtuse, mucronate, glabrous on both surfaces, in (min. 10) 20-50 (55 max) pairs; base obtuse; apex obtuse, emarginate, usually apiculate, glabrescent; stipels minute, caducous; inflorescence and pedicels often aculeate; bracts and bracteoles linear, caducous.

Raceme (min. 1) 2.5-15 (max. 16.5) cm long, 1-12 (max. 14) flowered; peduncle (min. 0.5) 1.5-4 (max. 6) long, glabrous; flowers 10-12 (max. 13) mm long; pedicels 6-11 mm long; calyx about 3-5 mm long, 3-4 mm wide, glabrous except when puberulent along the margin and inside teeth; teeth triangular 0.5-1 mm long; corolla yellow with brownish markings; vexillum with wedge-shaped, truncate basal appendages within; standard rounded to obovate, 1-1.5 cm x 8-14 mm, pale yellowish, spotted brownish or purplish; wings oblong, 1-1.25 cm x 2.5-3 mm, yellow; keel straight, 1-1.3 cm x 3.5-5 mm; staminal tube up to 12 mm long, free filament parts 2-4 mm long; pistil glabrous; style 2-3 mm long; stigma capitate.

Fruit a glabrous pod, somewhat curved, about 12.5-25 cm long, 2-3 mm wide, beaked, 28-45 seeded, constricted between the seeds, with septa about 5 mm apart; seeds pale brown, olive-green or greenish-black, ellipsoid, about 3 x 1.5 x 1.1 mm.

BIOLOGY
S. bispinosa is self-pollinating and requires no isolation for pure seed production. Flowers are mainly pollinated by bees, and ripe pods shatter to release the seeds.

ECOLOGY
S. bispinosa is adapted to wet areas and heavy soils that do not require much preparation. Under waterlogged conditions, the stem produces a spongy mass of parenchyma. It thrives in low to medium elevations, along streams, in open wetlands or often as a weed in rice paddy fields. The species also grows along waterways, in marshes and often on disturbed sandy soils. It ranges from subtropical moist through tropical dry to moist forest zones. Leaves of sesbania follow the direction of sunlight and fold at night.

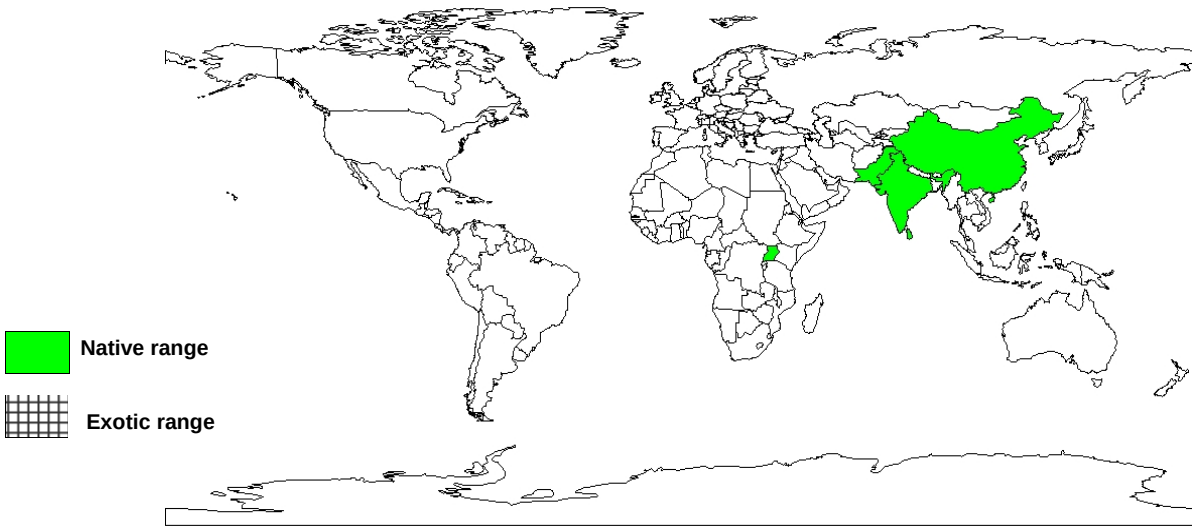
BIOPHYSICAL LIMITS
Altitude: 0-1 200 m, Mean annual rainfall: 550-1 200 mm

Soil type: S. bispinosa is tolerant of soil alkalinity even up to a pH 10, and grows well under both water-logged or non-irrigated conditions.

DOCUMENTED SPECIES DISTRIBUTION

Native: China, India, Pakistan, Sri Lanka, Uganda

Exotic: Antigua and Barbuda, Bahamas, Barbados, Cuba, Dominica, Dominican Republic, Grenada, Guadeloupe, Haiti, Italy, Jamaica, Kenya, Martinique, Montserrat, Netherlands Antilles, Puerto Rico, St Kitts and Nevis, St Lucia, St Vincent and the Grenadines, Trinidad and Tobago, Vietnam, Virgin Islands (US)



The map above shows countries where the species has been planted. It does neither suggest that the species can be planted in every ecological zone within that country, nor that the species can not be planted in other countries than those depicted. Since some tree species are invasive, you need to follow biosafety procedures that apply to your planting site.

PRODUCTS
Food: The mature seeds of S. bispinosa are cooked and eaten by Indian tribal sects: the Katkharis and the Ghonds.

Fodder: S. bispinosa is used as fodder for sheep, cattle and goats and can also be made into silage. Meat and milk production in cattle has reportedly increased when these animals have been fed with S. bispinosa. S. bispinosa gum could be a source of a sizable amount of a highly proteinous seed meal for cattle feed.

Fuel: S. bispinosa yields light, small-sized firewood. When fully grown and dried, it provides good fuel with a calorific value of 4281 kcal/kg.

Fibre: The fibre is said to be very useful and durable when used in water-related activities. In Bengal, fishing nets and ropes are made from this fibre. In durability and strength, it is reputed to be even superior to jute fibre. It can also be a good source of pulp and paper.

Gum or resin: S. bispinosa seed has been found to be a potential source of cheap galactomannan gum, as the plant can be cultivated on substandard soils without extra care or investment.

Medicine: Leaves and flowers are prepared as poultices for external application or taken as a decoction for internal ailments. Due to S. bispinosa's astringent properties, preparations made from it can be used against inflammation, bacterial infections and tumours. In traditional medicine, seed mixed with flour is used to treat ringworm and other skin diseases and worms.

SERVICES
Shade or shelter: S. bispinosa is planted as a temporary shade, windbreak or as a hedge.

Reclamation: The tree is capable of growing in soils where few or no other crops can grow, such as alkaline or saline soils of low fertility and poor texture. It therefore plays a role in the reclamation of such soils.

Nitrogen fixing: Root nodules that effectively fix atmospheric nitrogen are formed with Rhizobium.

Soil improver: S. bispinosa has remarkable sustaining quality on soils of poor fertility and texture. It improves soil permeability. The leftover stalks, roots and fallen leaves enrich the soil further by adding organic matter. It is also an important green manure crop; rice yields after a S. bispinosa green manure crop ploughed in 60-70 days after planting are equal to those obtained with the application of about 80 kg N/ha of chemical fertilizer.

Intercropping: S. bispinosa has been incorporated in agroforestry practices in farmlands as single trees, on farm boundaries or in alley-farming systems.

TREE MANAGEMENT
As S. bispinosa is usually raised as a rainfed crop, it does not need irrigation. S. bispinosa plants are normally spreading shrubs, but in dense stands they branch less. Because of its very fast growth, it competes well with weeds and may even suppress Imperata cylindrica on sites where moisture is adequate, hence it does not require weeding. Sesbania can produce a green manure crop in 2-3 months and a fuelwood crop in 5-6 months. In some areas, it is considered a weed. If used as green manure for rice, it should be ploughed in just before the rice is planted out, and delaying the rice planting may lower its response to the green manure.

GERMPLASM MANAGEMENT
Seeds are dried in the sun to maintain their viability and to protect them from fungal attack and grain pests like weevils. Seed storage behaviour is orthodox; a germination rate of 24% has been recorded following 41 years of open storage at room temperature.

PESTS AND DISEASES
S. bispinosa does not need much care during its growth. A number of insects have been observed to attack the plant, but the extent of damage is never serious. The caterpillars of Azygophleps scalaris attack and bore the stems as well as roots and eat the pith region without damaging the epidermis. The plants at this stage become weak and often tear off. The best control is to uproot such plants and destroy the insects. The larvae of the leaf webber, Striglina scitaria, damage the leaves; the young larvae twist the terminal portions of the leaflets and live inside them. A spray of 0.1% BHC or Dieldrin can control these. The caterpillars of Thyposidra successara and Amsacta moorei also cause damage to the plants but can be controlled by spraying BHC or DDT. Beetles and bugs also attack the plants. Insects may attack the pods; seeds if not properly dried are susceptible to fungal and weevil attack.

The fungus Cladosporium spp. sometimes appears on the plants but does not cause serious damage.

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SUGGESTED CITATION

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