Samanea saman

Scientific name

Samanea saman (Jacq.) Merr.

Synonyms

Basionym: *Mimosa saman* Jacq.; *Albizia saman* (Jacq.) F. Muell.; *Inga saman* (Jacq.) Willd.; *Pithecellobium saman* (Jacq.) Benth.

Family/tribe

Family: *Fabaceae* (alt. *Leguminosae*) subfamily: *Caesalpinioideae* (mimosoid clade*) tribe: *Ingeae.*

* Azani, N. et al. [97 authors from 54 institutions] 2017. A new subfamily classification of the Leguminosae based on a taxonomically comprehensive phylogeny. *Taxon* **66**: 44–77.

Morphological description

Deciduous to evergreen tree up to 25 (–40) m high with an umbrella-shaped spreading crown whose diameter surpasses the tree´s height; leaves bipinnate with 3–9 pairs of pinnae each with 2–10 pairs of leaflets, oblique-ovate to elliptical or subrhomboid, 1.5–6 cm long, 0.7–4 cm wide. Inflorescence a loose umbelliform head with 20–25 flowers in groups of 2–5 heads in the axils of leaves on actively growing shoots, with exposed conspicuous stamen filaments, white in their lower half and reddish above. Fruit is a broadly linear, compressed, indehiscent pod, 10–22 cm long × 1.5–2.2 cm wide × 0.5–1 cm thick; the mesocarp is pulpy, sweetish; there are 5–20 seeds/pod; seeds are ellipsoid, strongly biconvex, 8–11.5 mm long × 5–7.5 mm wide, with a characteristic U-shaped pleurogram. 4,500–8,000 seeds per kg.

Similar genus

In the past the rain tree has been classified as *Albizia saman.*

***Samanea* Merrill:** central flower with 7–8 perianth segments; fruits fleshy and internally segmented.

***Albizia* Durazz.:** central flower with 5 perianth segments; fruits not fleshy and usually not segmented inside.

Common names

Asia: □□ yu shu (Chinese); meh (Indonesian); America-nemu (Japan); trembesi (Javanese); âmpül barang, ampil barang (Khmer); hujan-hujan, pukul lima, pokok hujan (Malay); ကုက္ကို kok ko, သဘော်ကုက္ကို thin:bau kok ko (Myanmar); acacia, palo de China (Philippines); ki hujan (Sundanese); กำมปู kampu, ฉำฉา chamcha, จามจุรีแดง chamchuri daeng, จามจุรี chamchuri (Thai); còng, muồng tím, cây mưa, me tây (Vietnamese)

Caribbean: guannegoul(e) (Haitian Creole); goango, guango (Jamaica); samaan tree (Trinidad); marsave (Caribbean region)

Deciduous to evergreen tree up to 25 (–40) m high with an umbrella-shaped spreading crown , Colombia

Leaves bipinnate with 3–9 pairs of pinnae each with 2–10 pairs of leaflets

Inflorescence a loose umbelliform head

Broadly linear, compressed, indehiscent pods

Pod comparison with *Enterolobium cyclocarpum* (left)

Seeds

In fodder sorghum field, Cauca valley, Colombia

Providing shade, Zulia, Venezuela

Dry season pod-fall eaten by livestock

With *Enterolobium cyclocarpum*, silvopastoral system with *Megathyrsus maximus*, dry season, Zulia, Venezuela

English: coco tamarind, cow-tamarind, East Indian Walnut, French-tamarind, giant thibet, inga saman, monkeypod, raintree, soar, suar, suwar,

Europe: arbre à (la) pluie, arbre de pluie (French); Regenbaum, Soar, Suar (German); cenízaro, acacia preta, árbol de lluvia, genízaro (Spanish); regnträd (Swedish)

Indian subcontinent: ■■■■■ shirish (Bengali); shirish (Gujarati); ■■■■ vilaiti siris (Hindi); bhagaya mara (Kannada) : ■■■■■■■■■■■ ■■■ chakkarakkay maram (Malayalam); ■■■■■■■ ■■■■■ (exotic shirish) (Marathi); shiriisha (Sanskrit); mara (Sinhalese); :■■■■■■■■■■■ ■■■■ thoongu moonji maram (Tamil); ■■■■■■ nidra ganneru (Telugu)

Indian Ocean: bonara(mbaza), kily vazaha, madiromany, mampihe, mampohehy (Madagascar)

Latin America: chorona (Brazil); carreto, cenicero, dormilón, genizaro, zarza (Central America); campano, samán (Colombia); algarrobo (Cuba); algarobillo, algarrobo del país, árbol de lluvia, campano, carreto negro, delmonte samán (Spanish); carabeli, couji, lara, urero, samán (Venezuela)

Pacific: filinganga (Northern Marianas); gumor ni spanis (Yap); kasiakula, mohemohe (Tonga); marmar (New Guinea); 'ohai, pu 'ohai (Hawaii); tamalini, tamaligi (Samoa); trongkon-mames (Guam); vaivaini vavalangi, sirsa (Fiji)

Distribution

Native:

Central America: Costa Rica, El Salvador, Nicaragua, Panama (Bocas del Toro, Coclé, Panama)

South America: Colombia, Venezuela

Cultivated/naturalized:

Elsewhere in the tropics.

Uses/applications

Forage

In agroforestry, including silvopastoral systems, provision of shade. Although there are reports on *S. saman* foliage being used as forage, the main forage/livestock-related value of this tree lies in the fact that it provides (1) highly nutritious pods in the dry season, (2) shade and shelter to grazing livestock and (3) improved pasture growth under its canopy. Pods are readily eaten by grazing livestock and/or collected to be fed as sugar-rich supplement. In its area of origin, it is frequent as a spontaneous tree component in pastures, often in association with *Enterolobium cyclocarpum*.

Other

Source of lumber and craft-wood.

Ecology

Soil requirements

Adapted to a wide range of soils; pH range of 5.5–8.5; sandy to clayey texture; withstands temporary waterlogging.

Moisture

Adapted to an annual rainfall range of 1,000 (or lower if rainfall is evenly distributed) to 2,500 mm; withstands 2–4 dry months.

Temperature

Grows from sea level up to 1,500 m asl with a range of 18–22 °C mean minimum temperature in the coldest and 24–30 °C mean maximum temperature of the hottest month. No frost tolerance.

Light

Needs full sunlight.

Reproductive development

Flowering occurs in the late dry season. Low pod-set in comparison with abundant flowering. Generally slow initial growth.

Defoliation

Reported to regrow well after pruning. In Thailand trees are cut at 1 m height every 6 months for fodder production.

Fire

No information available but adult trees will probably resprout if fires are not too hot.

Agronomy

Guidelines for establishment and management of sown forages.

Establishment

Usually as transplants from seed that may require scarification to break hardseededness. Planting distances depend on eventual use of the tree. For fodder production in NE Thailand, 3 × 1 m spacing is recommended. Careful weeding is necessary since seedlings and small plants are intolerant of shade.

Fertilizer

No data available but trees are probably responsive to fertilization. Due to symbiotic nitrogen fixation, generally improved grass growth below *S. saman* trees can be observed in silvopastoral systems.

Compatibility (with other species)

Once established, most suitable as tree component in silvopastoral systems.

Companion species

Once established, combines well with any shade-tolerant grass or legume.

Pests and diseases

No widespread or serious disease or pest problems are reported, although mealy bug attack is causing die-back in parts of Myanmar.

Ability to spread

Spread by animals that ingested pods with mature seeds.

Weed potential

Considered to be moderately invasive.

Feeding value

Nutritive value

CP value ranges reported for pods are 13–24%, for foliage 18–30%; IVDMD for pods 40–74%, for foliage 41–68%.

Palatability/acceptability

Pods are highly palatable to all livestock. Information on the palatability of foliage is, however, controversial. Whereas there seem to be situations where leaves are actually consumed (cattle, sheep and goats), palatability of *S. saman* foliage is to be considered as very low.

Toxicity

Low levels of tannins, saponins and glucosides in pods of *S. saman* have been reported.

Feedipedia links

https://www.feedipedia.org/node/256

leaves https://www.feedipedia.org/node/12563

pods https://www.feedipedia.org/node/12564

seeds https://www.feedipedia.org/node/12565

Production potential

Dry matter

From a 5-year-old tree, 550 kg green fodder can be harvested.

Animal production

27% higher cattle (calves) LWG when 15% supplementation with *S. saman* pods. Also higher milk production has been reported when cows´s diet was supplemented with *S. saman* pods.

Genetics/breeding

2*n* = (14), 26. There appears to be little variability within the species. No taxonomic varieties have been recognized among wild *Samanea saman*.

Seed production

50–250 kg pod production per tree/season has been reported.

Herbicide effects

No specific information available.

Strengths

- Multipurpose use.
- Prolific seeder.
- Highly nutritious pods.
- Wide adaptability (soil, rainfall).

Limitations

- Very low palatability foliage.
- Slow establishment.

Internet links

https://www.cabi.org/isc/datasheet/4026

https://uses.plantnet-project.org/en/Samanea_saman_(PROSEA)

Selected references

Akkasaeng, R. (1997) *Samanea saman* (Jacq.) Merrill. In: Faridah Hanum, I. and van der Maesen, L.J.G. (eds) Plant Resources of South-East Asia No. 11. Auxiliary Plants. Backhuys Publishers, Leiden, the Netherlands. p. 224–227. edepot.wur.nl/411331

Hernández, I. and Sánchez, M.D. (2014) Small ruminant management and feeding with high quality forages in the Caribbean. Interamerican Institute of Cooperation in Agriculture (IICA), Santo Domingo, Dominican Republic. repositorio.iica.int/bitstream/11324/2611/1/BVE17038698i.pdf

Staples, G.W., and Elevitch, C.R. (2006) *Samanea saman* (rain tree), ver. 2.1. In: Elevitch, C.R. (ed) Species Profiles for Pacific Island Agroforestry. Permanent Agriculture Resources (PAR), Hōlualoa, HI, USA. agroforestry.org/images/pdfs/Samanea-raintree.pdf

Cultivars

None released to date.

Promising accessions

None reported.