

Tropical Forages

Desmodium cinereum

Scientific name



Desmodium cinereum (Kunth) DC.

Note: The commonly cultivated provenance was initially misidentified as *Desmodium rensonii* (J. H. Painter ex Renson) Choussy, which is now considered a synonym of *Desmodium nicaraguense* Oerst., a species similar to *Desmodium cinereum* (Kunth) DC.

Synonyms

Basionym: *Hedysarum cinereum* Kunth

Family/tribe

Family: *Fabaceae* (alt. *Leguminosae*) subfamily:

Faboideae tribe: *Desmodieae* subtribe: *Desmodiinae*.

Morphological description

Shrub, perennial (sometimes short-lived), 1 - 3 (- 5) m high. Stem erect to 3 cm diameter, lenticels abundant; lateral branches ascending, tending to become woody near the main stem; immature branches densely or sparsely covered with short white hairs, inconspicuous among stiff uncinuate (hooked) hairs. Leaves pinnately trifoliolate; petiole to (1 -) 1.5 - 4.5(-6) cm long; leaflets densely and softly pilose on both sides, round, ovoid or broadly elliptic, rounded or obtuse at apex, 3 - 9 cm long, 2.5 - 8 cm wide, terminal leaflet sub-mucronate, larger than laterals; lateral leaflets almost sessile, terminal petiolule to about 2 cm; stipules triangular-ovate, attenuate, to about 3 - 8 mm long, hairy on both surfaces, deciduous. Inflorescence terminal or axillary panicle 8 -25(- 50) cm long, comprising closely-packed, many-flowered racemes, 10 - 20 cm long. Flowers 6.5 to 7 mm long, purple or rose, in groups of 3 - 5 on pedicels 3- 5 mm long, calyx tube 1 mm long, adaxially hirsute. Pod (loment), 1.5 - 3 cm long, comprising 4 - 8 segments (articles), 4.5 - 7 mm long, 3.5 - 5 mm wide, finely pubescent, oblong, unequally constricted between segments (notched more deeply below); stipe 1 - 2 mm long. Seeds reniform (kidney-shaped), flattened, yellow-brown to brown, 4 - 6 mm long and 3 mm broad. About 500,000 seeds/kg.

Similar species

***D. cinereum*:** articles 4.3 to 6 mm long

***D. nicaraguense*:** articles 3 to 4 mm long

Common names

English: bush groundnut, cinereous desmodium, tick clover

French: cousin

Southeast Asia: rensoni (see Scientific name)

Latin America: hierba del angel, pegajoso, ramoncillo, trébol (Spanish)



Shrub, usually to about 2m tall (cv. Las Delicias)



Leaves pinnately trifoliolate, densely pilose on both sides of leaflets.



Inflorescence a many-flowered raceme



Prolific seed set at ends of branches



Seeds



Used as hedgerows (with *Flemingia macrophylla*), Mindanao, Philippines (CPI 46562)



Readily eaten by ruminants, N Qld, Australia (CPI 46562)

Distribution

Native:

Northern America: Mexico (Chiapas, Colima, Guerrero, Jalisco, Michoacan, Nayarit, San Luis Potosi, Sinaloa, Veracruz)

Central America: Honduras

Cultivated:

Asia: Distributed to south and southeast Asia, now common in the Philippines

Uses/applications

Forage

Foliage cut for stock feed.

Environment

Short-term shrub legume used for alley-cropping and in contour hedgerows in steeplands to reduce erosion.

Other

Used as nitrogen-rich mulch in alley-cropping systems.

Ecology

Soil requirements

Moderately fertile, acidic to neutral soils. Becomes chlorotic in alkaline soil, probably due to iron deficiency.

Moisture

Originates from a range of rainfall environments over its distribution, with annual rainfall from about 500 to 4,000 mm/yr. It has been successfully sown in the wet tropics where average annual rainfall exceeds about 1,500 mm.

Temperature

D. cinereum originates from humid and dry environments between about 16 and 24° N at altitudes 0–1,600 m asl in Central America. It has been grown successfully in the tropics and subtropics.

Light

Originates from open grassy hills, roadsides, tropical subdeciduous forest, mesophyll forest, and dry scrublands, suggesting tolerance of a range of light conditions.

Reproductive development

It flowers from October to April in the N hemisphere. Flowering is indeterminate and high yields of seed are produced in more advanced plants, but seed yields can be low in the first year, because plants usually do not flower until about 7 months after sowing.

Defoliation

Cutting about every 6 weeks at 40–50 cm stimulates multiple stems and increases yields of leaf. If seed production is required, defoliation must be timed to avoid destroying the developing seed crop. Animal effects on the plants should be monitored if it is browsed, since it is not as well adapted to browsing as are some species such as *Leucaena leucocephala*.

Fire

Not usually an issue in areas where *D. cinereum* is grown.

Agronomy

Guidelines for establishment and management of sown forages.

Establishment

Seed germinates quickly (3–4 days) without scarification. In hedgerow systems on sloping lands, *D. cinereum* is direct sown into double hedgerows with rows 50 cm apart. Plant intra-row spacing should be 2.5–10 cm. Close spacing promotes leaf production and soil erosion control. Since seedlings are slow to establish and are sensitive to competition, rows should be kept weed-free until plants are well established.

Fertilizer

Responds to phosphorus fertilizer on low P soils.

Compatibility (with other species)

Generally grown as pure stands in hedgerows, rather than with other pasture species.

Companion species

Grasses: Not normally sown with grasses.

Legumes: In the SALT 2 system used in the southern Philippines, grown as a short-term (2–3 years) component of a hedgerow system with *Flemingia macrophylla*, *Gliricidia sepium*, *Leucaena leucocephala* and *Calliandra calothyrsus*.

Pests and diseases

Insects and disease are generally of little concern even in its native habitat. However, it has been attacked by cowpea aphid (*Aphis craccivora* Homoptera: Aphididae) and mealybugs (Hemiptera: Pseudococcidae) in Guam.

Ability to spread

Prolific seed production often results in large cohorts of seedlings, which rarely become a problem because they are slow to develop and sensitive to competition.

Weed potential

Listed as a potential weed risk in the Pacific islands.

Feeding value

Nutritive value

Leaf meal of *D. cinereum* gave similar benefits to those from *Leucaena leucocephala* leaf meal when fed as a protein supplement to poultry and pigs, and also gave incremental improvements in LWG of sheep when fed as hay. Nutrient analysis results for *D. cinereum* leaf were similar to those for *Medicago sativa*.

Palatability/acceptability

Readily eaten by ruminants in southeast Asia.

Toxicity

No toxicity reported.

Production potential

Dry matter

Growth rates in humid-tropical Indonesia were higher when *D. cinereum* was cut every 2 months, rather than at longer time intervals, and averaged 1.1–1.9 kg/m row/year DM. Yields declined to 0.5 kg/m row/year DM by the end of the third year of production. Highest yielding of 8 species evaluated in an alley cropping experiment in Nepal. Yield of pure stand in S Nigeria was comparable with that of *Desmanthus pernambucanus*, both around 7 t/ha DM.

Animal production

While no animal production data specific to *D. cinereum* can be found, it is reasonable to assume that a forage that has been fed to many classes of livestock, has had beneficial effects with sheep, pigs and poultry in dried form, has had no reported adverse effects, and has nutritional analysis comparable to that of *Medicago sativa*, will produce sound livestock performance. In the SALT 2 system used in the southern Philippines, a forage mixture comprising 55% *D. cinereum*, 20% *Flemingia macrophylla*, 20% *Gliricidia sepium*, and 5% *Leucaena leucocephala*, when fed for lactating goats as 50% of the total ration (the balance of which was concentrate feed), gave excellent economic returns.

Genetics/breeding

A report from a forage evaluation project in Belize that *D. cinereum* is "a forage plant worthy of further study". Likewise, it has been noted of the similar Central American shrub, *Desmodium nicaraguense* Oerst. (syn. *Desmodium rensonii* (J.H. Painter ex Renson) Choussy), that "the leaves and branches are eaten by stock of all kinds and are said to afford excellent forage". However, little in the way of further intra- or inter-specific evaluation of the forage value of these species appears to have been undertaken. $2n = 22$.

Seed production

Indeterminate flowering. Wider plant spacings (2 × 2 m/tree) are recommended for seed production. Plants produce seed about 7 months after sowing, with full seed production in the second year. Mature seed pods are stripped from the stem by hand, dried and seed removed by pounding and winnowing. On a fertile site, a well-maintained 10 m long double hedgerow can produce 3.5 kg of seed per year.

Herbicide effects

No information available.

Strengths

- Fast-growing shrub for cutting.
- Good coppicing ability.
- Suitable for hedgerows.
- Good quality feed.

Limitations

- Short-lived (2–3 years).
- Not drought or cold tolerant.
- Must be planted from seed.

Selected references

Gutteridge, R.C. and Shelton, H.M. (eds). (1994) Forage Tree Legumes in Tropical Agriculture. CAB International, Wallingford, Oxon, UK. bit.ly/38LYfxV

Horne, P.M. and Stür, W.W. (1999) Developing forage technologies with smallholder farmers: How to select the best varieties to offer farmers in Southeast Asia. ACIAR Monograph No. 62. Australian Centre for International Agricultural Research (ACIAR), Canberra, Australia. aciar.gov.au/node/7721

Roshetko, J.M. (1995) Community-based Tree Seed Production with *Desmodium rensonii* and *Flemingia macrophylla*. Agroforestry Information Service No 13. Winrock International, Morrilton, AR, USA. bit.ly/2QQF8wq

Cultivars

'Las Delicias' (CPI 46562) Released in the Philippines. Origin Coatepeque, Quezaltenango Department, Guatemala (14°42' N, 500 m asl, rainfall 4,030 mm). Highly productive variety recommended for use in southeast Asia.

Promising accessions

None reported.

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