

Tropical Forages

Cratylia argentea

Scientific name

Cratylia argentea (Desv.) Kuntze



Synonyms

Basionym: *Dioclea argentea* Desv.; *Cratylia floribunda* Benth.

Family/tribe

Family: *Fabaceae* (alt. *Leguminosae*) subfamily: *Faboideae* tribe: *Phaseoleae* subtribe: *Diocleinae*.

Morphological description

Perennial, deep-rooting, erect shrub reaching between 1.5 and 3 m in height. Well established plants have an extraordinarily strong plant crown with numerous regrowth meristem points at ground level and below. When associated with taller plants, the common *C. argentea* form as known from Brazilian germplasm can show a somewhat voluble habit. However, there is also a form with prostrate, climbing habit (lianas) as known from Bolivian germplasm. Leaves trifoliolate; leaflets broadly ovate with silvery pubescence on under surface. Flowers arranged in elongated, many-noded pseudoraceme up to 30 cm long; 6–9 flowers per node. Size of flowers ranges from 1.5 to 3 cm (length and width); petals lilac, rarely white. Pods straight, flat, to 20 cm long and 1–2 cm broad, dehiscent, containing 4–8 oval to almost circular flat seeds of about 1.5 cm diameter. Seeds dark yellow to brown, when maturing under high-humidity conditions, dark brown. About 4,500 seeds per kg.

Common names

English: cratylia

Latin America: cratilia, camaratuba, copada, cipó-malumbe, cipó-prata (Brazil); cratilia (Spanish)

Distribution

Native:

Southern America: Bolivia (Beni, Pando, Santa Cruz); Brazil (Acre, Ceará, Goiás, Maranhão, Minas Gerais, Pará, Piauí, Rondônia, Federal District); Peru (Cuzco, Huanuco, Ucayali)

Uses/applications

Forage

C. argentea can be utilised both in mixed pastures with grasses and in fodder banks for in situ grazing or for cut-and-carry for feeding as a dry season supplement in the form of fresh forage or silage. Fallen leaf and pods are also eaten by cattle in this period. In addition to its value as dry season supplement, as silage or fresh, *C.*



Flowers arranged in pseudoraceme to 30cm long



Perennial, deep-rooting shrub to 3m tall, Venezuela



Twining branches



White-flowering form (rare)



Multiple flowers at each node of pseudoraceme (ILRI 15596)



Numerous axillary inflorescences can lead to prolific seeding



Prolific seed set



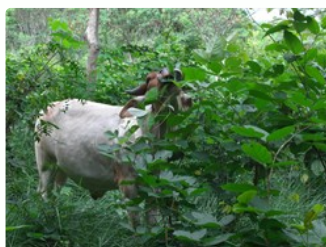
Inflorescence and immature pods



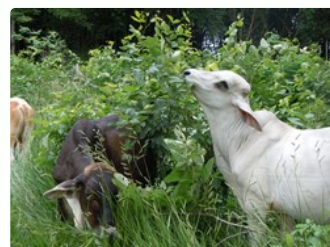
Seeds



Vigorous regrowth from basal buds



Browsing, Colombia



Browsing in *Urochloa humidicola* cv Llanero pasture, Colombia

argentea is used as a protein supplement to replace feed concentrates for dairy cows and as hay.

Environment

It can be maintained as a living hedge.

Ecology

C. argentea germplasm has been mainly collected around the sub-humid Cerrados region of Brazil. In contrast with other *Cratylia* species, *C. argentea* is found in a wider range of habitats, with altitudes between 180 and 930 m asl and main vegetation types ranging from Cerrados-Caatinga transition to Cerrados and seasonal forests.



Dry season fodder bank, Honduras



Cut and carry

Soil requirements

Adapted to acid, low-fertility soils with a pH range of 3.8–6.0. Though apparently adapted also to higher pH, initial growth of *C. argentea* in such soils is very slow.

Moisture

From wet to dry tropics, annual rainfall 1,000–4,000 mm but requires well drained soils. High drought tolerance, stays green in prolonged dry seasons (6–7 months). Particularly well adapted to sub-humid zones with a 5–6 month dry season.

Temperature

Its geographic distribution extends from 4° to 18° S. Warm season growth only, frost tolerance unknown.

Light

No information available.

Reproductive development

May require up to 14 months to initiate flowering; seeds at the onset of the dry season.

Defoliation

C. argentea can be cut for the first time 4 months after planting; it tolerates cutting at a height of 30–90 cm above ground at cutting intervals of 50–90 days even in the dry season. Plants cut at soil surface level have been observed to regrow extraordinarily well. Plants have a high regrowth potential in the dry season; 30–40% of total dry matter yield occurs during the dry season as a result of high leaf retention.

Fire

Survives bush fires very well.

Agronomy

Guidelines for establishment and management of sown forages.

Establishment

C. argentea is established by direct seeding, alternatively by transplants from nurseries. Seed does not require scarification and is superficially sown at less than 2 cm depth. The species nodulates readily with promiscuous cowpea rhizobia, though inoculation with *Bradyrhizobium* strains CIAT 2561 or 3564 is beneficial, in particular in acid soils with high aluminium saturation. *C. argentea* is established at planting distances of 1–1.5 m between rows and 0.5–1 m between plants within the row. In Veracruz, Mexico, a density of 20,000 plants/ha provided best results. Generally, initial growth is slow but can be positively influenced by fertilization and inoculation with rhizobia.

Fertilizer

Responsive to P and Ca.

Compatibility (with other species)

In view of slow establishment, weed control during the establishment phase is necessary. Once established it can be used in combination with pasture grasses such as *Urochloa* spp.

Companion species

Grasses: Bunch grasses such as *Megathyrsus maximus* and decumbent to prostrate grasses such as *Urochloa* spp.

Pests and diseases

No major diseases and pests have been reported. In some sites, larvae of a beetle (Coleoptera: Melolonthidae) were observed to attack roots of *C. argentea* during establishment; this can lead to the death of individual plants. Pod borers can be a problem in seed production.

Ability to spread

No records, probably low.

Weed potential

Considered to be nil, mainly because of short seed viability.

Feeding value

Nutritive value

The nutritive value of *C. argentea* is among the highest reported for shrub legumes adapted to acid soils. Leaf CP ranges between 18 and 30% of DM, IVDMD can reach 60–65%. In contrast with many other tropical shrub legumes, *C. argentea* contains only traces of tannins.

Palatability/acceptability

Cattle readily consume it; intake of immature *C. argentea* forage by sheep, however, is low.

Toxicity

No toxicity recorded.

Feedipedia link

<https://www.feedipedia.org/node/17365>

Production potential

Dry matter

Due to its slow initial growth, biomass production of *C. argentea* in the first year after establishment is low. Subsequent DM production is high, with 8-week regrowth yields of 2–5 t/ha DM, both in the dry and wet periods. Based on production figures of 0.6–1 kg fresh material per plant in 60–90 days, the area needed for dry season supplementation can be calculated. On station, average yields of 50–150 g/plant DM for 8-week regrowth and 110–330 g/plant DM for 12-week regrowth have been recorded. From Veracruz, Mexico, 11.3 t DM/ha/yr are reported from a planting density of 20,000 plants/ha and cuts every 120 days, with a leaf contribution of 61%.

Animal production

In trials with milking cows, a mix consisting of *Cratylia* and sugar cane for supplementation of pasture resulted in an increase of 1.2–2.2 L milk/cow/day in response to *C. argentea* increments in the supplement mix. Response to *the* legume was limited when cows of minor production potential were utilised or when the basal grass diet had CP levels above 7%. Supplementation with *Cratylia* silage led to an increase in milk production of 0.5–1 L/day.

Genetics/breeding

2n = 22. Mostly self-incompatible; pollination occurs via bumble bees. Consequently, there is little variation between accessions if seed production is not conducted in isolated fields.

Seed production

Seed can be harvested from the establishment year onwards, though seed production in the first year is low. Seed formation is affected by cutting time and height as well as phosphorus fertilisation. Positive results were found when plants were cut back to 30 cm and fertilized with P at the beginning of the wet season. Seed production extends from the start of the dry season over 2–3 months; reported yields are 500–700 kg/ha/year. Seeds show neither a marked physical (hard seedcoat) nor physiological dormancy but storage under cool and dry conditions is essential to avoid loss of viability when keeping seed for several months before planting.

Herbicide effects

No information available.

Strengths

- High drought tolerance due to a deep root system.
- Adapted to low fertility, acid soils.
- For shrub legumes adapted to acid soils, *C. argentea* is one of the few higher-quality species.
- Adapted to variable management and resists frequent cutting, even in dry periods.
- Spectacular potential to regrow from underground meristems.
- Can be grazed or cut and fed fresh or as silage.

- Persistence under frequent defoliation.
- No serious pests or diseases.

Limitations

- Not adapted to altitudes above 1,200 m asl.
- Slow initial establishment.
- Intolerant of inundation.
- Seed production not uniform.
- Rapid viability loss of seeds.

Selected references

Andersson, M.S., Peters, M., Schultze-Kraft, R., Franco, L.H. and Lascano, C.E. (2006) Phenological, agronomic and forage quality diversity among germplasm accessions of the tropical legume shrub *Cratylia argentea*. The Journal of Agricultural Science 144:237–248. doi.org/10.1017/S0021859606006034

Argel, P.J. and Lascano, C.E. (1998) *Cratylia argentea* (Desveaux) O. Kuntze: Una nueva leguminosa arbustiva para suelos ácidos en zonas subhúmedas tropicales. Pasturas Tropicales 20(1):37–43. bit.ly/2WNUvcE

Argel, P.J., Lobo di Palma, M., Romero, F., González, J., Lascano, C.E., Kerridge, P.C. and Holmann, F. (2000) Silage of *Cratylia argentea* as dry-season feeding alternative in Costa Rica. In: Manneetje, L.'t (ed). Silage making in the tropics with particular emphasis on smallholders. FAO Plant Production and Protection Paper 161. fao.org/3/x8486e/x8486e0h.htm

Pizarro, E.A. and Coradin, L. (eds). (1996) Potencial del género *Cratylia* como leguminosa forrajera. Memorias del taller de trabajo sobre *Cratylia* realizado el 19 y 20 de julio de 1995, Brasília, DF, Brasil. Documento de Trabajo No. 158. Centro Internacional de Agricultura Tropical (CIAT), Cali, Colombia. hdl.handle.net/10568/56448

Pizarro, E.A. and Coradin, L. (2016) *Cratylia argentea* (Cipó-malumbe). In: Vieira, R.F., Camillo, J. and Coradin, L. (eds) Espécies Nativas da Flora Brasileira de Valor Econômico Atual ou Potencial: Plantas para o Futuro – Região Centro-Oeste. Secretaria de Biodiversidade, Ministério do Meio Ambiente, Brasília, DF, Brazil. p. 517–530. <https://bit.ly/2UMZUzo>

Schultze-Kraft, R. (1996) Leguminous forage shrubs for acid soils in the tropics. In: Elgersma, A., Struik, P.C. and Maesen, L.J.G. van der (eds) Grassland science in perspective. Wageningen Agricultural University Papers 96-4. Wageningen Agricultural University, Wageningen, the Netherlands. p. 67–81. edepot.wur.nl/282974

Cultivars

'**Veraniega**' Released in Costa Rica (2001); '**Veranera**' Released in Colombia (2002) Mixture of CIAT 18516 and CIAT 18668.

'**BRS Ceci**' registered in Brazil 2016 for release by Embrapa Gado de Leite (Dairy Cattle), Juiz de Fora, Minas Gerais. Developed from accession CNPGL-28, origin Jaíba, Minas Gerais State, Brazil (15°20' S, 475 m asl, rainfall 830 mm/year), an area with a sub-humid to semi-arid climate, irregular rainfall, and occasional long periods of drought. Seed is not available at the time of publication.

'**Cratilia**' (mixture of unknown CIAT accessions) Informally released in Bolivia and Venezuela (~2000).

Promising accessions

CIAT 18674, CIAT 22375, CIAT 22406, CIAT 22408, CIAT 22409. Selected in Colombia on the basis of high dry matter yields on acid soils.

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