

Tropical Forages

Centrosema brasilianum

Scientific name



Centrosema brasilianum (L.) Benth.

Synonyms

Basionym: *Clitoria brasiliana* L.; *Bradburya brasiliana* (L.) Kuntze

Family/tribe

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

Morphological description

Commonly described as a prostrate-trailing to twining, perennial, herbaceous species. However, some erect and semi-erect forms have been identified. Similarly, the ability to form adventitious roots on trailing stems varies among studies. Leaves trifoliolate, leaflets elliptical-oblong to lanceolate, sometimes ovate, apex acute or obtuse, 3.3–6.6 cm long, 1.5–3.6 cm wide. Flowers usually in racemes of 2–5 flowers, sometimes solitary. Bracteoles glabrous or pubescent, 3–13 mm long, 12–17 mm long and 5–10 mm wide, ovate and flat or cupped. Peduncles in leaf axils, 4–30 mm long. Papilionate flower, usually violet, violet-blue or red-lilac, in rare cases also white or purple. Variation in colour intensity within one accession can occur, suggesting some degree of outcrossing. Time from sowing to flowering <3–7 months. Pods linear, dehiscent, 70–160 mm long and 4–5 mm wide, beak to 20mm long, containing 8–23 seeds. Seeds light to dark brown, sometimes grey, black or yellow, often with darker stripes or mottled. Seeds cylindrical, 3.4–4.4 mm long, 2.3–3.1 mm wide. 33,000–90,000 seeds/kg.

Common names

English: Brazilian centro

Latin America: brinco de princesa, cabeça de galo, cipó das feridas, coelho no prato, cunha pan do rego, espia camino, feijão bravo, feijão do campo, feijão do mato, guarumbó, jequirana, jetirana, marmelada, oró, patinha

Distribution

Native:

South America: Argentina (Misiones); Bolívia; Brazil (Alagoas, Amapá, Amazonas, Bahia, Ceará, Espírito Santo, Federal District, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Paraíba, Paraná, Pernambuco, Piauí, Rio de Janeiro, Rio Grande do Norte, Roraima, Santa Catarina, São Paulo, Sergipe); Colombia; French Guiana; Guyana; Paraguay, Peru (Loreto); Suriname; Venezuela



Leaf apex acute to obtuse (CPI 55702)



Prostrate-trailing to twining, perennial (cv. Ooloo)



Flower (cv. Ooloo)



Purple flowered form



Magenta flowered form (CPI 87946)



Mauve flowered form



Pink flowered form



Pods with prominent beak at different degrees of maturity; note twisted valve from shattering



Seeds



Twining through mature grass stems (CPI 55698/cv. Ooloo)



With *Andropogon gayanus*, Brazil

Cultivated:

Uses/applications

Forage

[C. brasilianum](#) has been evaluated extensively, mostly under cutting, in a wide range of environments in Australia, Africa and tropical America. Evaluations under cutting identified it as a promising species for the semi-arid to dry-subhumid environments of northern Australia, West Africa and tropical America, with tolerance of acid, high aluminium soils.

Ecology

Soil requirements

Native habitat: well drained, acid to very acid (pH 4.1–6.3) soils, medium to low fertility and sandy to loamy texture, tolerance of high levels of aluminium. Accession CIAT 5234 has shown some adaptation to less well-drained soils in the flooded savannas of the Pantanal of Brazil.

Moisture

A particular characteristic of [C. brasilianum](#) is its high tolerance of drought, with the ability to retain green leaves over extended (5–8 months) dry seasons. Osmotic and stomatal regulations are the main processes to control water loss. However, as the tolerance of leaf water deficits is lower than for other *Centrosema* spp. and leaf morphology does not indicate adaptation to drought, drought tolerance of [C. brasilianum](#) is attributed to its deep root system (taproot).

Temperature

[C. brasilianum](#) is a true lowland species, with most accessions collected at altitudes of 50–300 m asl and thus is a warm season plant. In northeast Argentina, the species is less affected by frost than [Centrosema macrocarpum](#).

Light

No shade tolerance known.

Reproductive development

In the Venezuelan savannas, flowering initiated 67–92 days after planting, with maximum flowering 104–138 days after planting. A wide range of time to flowering was also observed in the savannas of northern Nigeria.

Defoliation

Good tolerance of grazing and cutting.

Fire

Some tolerance to fire.

Agronomy

Guidelines for establishment and management of sown forages.

Establishment

Scarification of seeds before sowing is necessary. Positive results were obtained with mechanical scarification, hot water treatment, Osram irradiation and sulphuric acid. [C. brasilianum](#) establishes relatively slowly; hence weed control during establishment is beneficial. Can be established in oxisols and ultisols in roughly prepared seedbeds, following disc harrowing or chisel ploughing and some vegetation control. A sowing depth of 5 cm is recommended, with seeding rates of 4–5 kg/ha. Promiscuous in its *Bradyrhizobium* requirements but in experiments in Colombia, the species has responded to inoculation.

Fertilizer

As for other *Centrosema* species, phosphorus is the most limiting nutrient for establishment. Recommendations range from 10 to 40 kg P/ha, depending on soil. In contrast to commercial centro ([C. molle](#)), [C. brasilianum](#) requires only small quantities of magnesium and calcium for establishment.

Compatibility (with other species)

Successful mixtures with [Stylosanthes capitata](#) and a range of grasses are reported. Compatible with erect, tufted and stoloniferous grasses.

Companion species

Grasses: *Setaria sphacelata*, [Andropogon gayanus](#), [Megathyrsus maximus](#), *Hyparrhenia rufa*, *Urochloa* spp.

Pests and diseases

The biggest limitation for [C. brasilianum](#), particularly in humid environments, is its susceptibility to rhizoctonia foliar blight (RFB), a fungal

disease caused by a complex of *Rhizoctonia solani*, binucleate *Rhizoctonia* sp. (BNR), and *R. zeae*. In legume-only small plots, most evaluated accessions were susceptible but a certain degree of resistance has been identified in some accessions. In grazed pastures RFB affects young seedlings, reducing persistence and dry matter production, with yield reductions of up to 50%.

Ability to spread

Depending on accession, through seed and adventitious roots on trailing stems.

Weed potential

Probably low; there are no reports.

Feeding value

Nutritive value

Forage quality of *C. brasilianum* is high and compares favourably with other tropical legumes. In studies with large collections in Colombia and Nigeria (130 and 257 accessions, respectively), with sampling age of 6 and 18 weeks respectively, CP content ranged between 11.8 and 19.6%. Reports on IVDMD are variable and range from 48–56% to >70%. In contrast with many other tropical legumes, *C. brasilianum* maintains its quality and retains its leaves under drought to a large extent.

Palatability/acceptability

C. brasilianum is highly palatable. In Peru, very well accepted by cattle in the high rainfall period.

Toxicity

No information available; probably none.

Production potential

Dry matter

3–10 t DM/ha/year.

Animal production

Positive effects of *C. brasilianum* on liveweight gains in associations with *Setaria sphacelata* cv. Kazungula and other grasses, and on sward persistence are reported from Australia and Colombia. LWG of 150 kg/animal/year are reported. Biggest impact in dry season with LWG of 34–67 g/day/animal; in wet season LWG of 660–670 g/day/animal.

Genetics/breeding

$2n = 20$ and $2n = 22$. There has been no breeding work with *C. brasilianum* as yet. Occasional segregation in flower colour suggests that the species should be considered as partially outcrossing. Hybridization attempts with *C. tetragonolobum* have been successful.

Seed production

For cv. Ooloo, seed yields equivalent to 1,000 kg/ha have been harvested in trial plots in Australia. In evaluations in South America, seed yields of up to 1,200–1,400 kg/ha are reported, with common yields 200–500 kg/ha (hand-harvested). Seed yields benefit from support systems as trellises or grass stakes.

Herbicide effects

No information available.

Strengths

- Outstanding drought tolerance retaining green leaf through extended dry periods, contributing to good animal production.
- Excellent adaptation to acid soils and low mineral nutrient requirements.
- High nutritive value.
- High seed yields.

Limitations

- Susceptibility to RFB and other diseases.
- Optimum management requirements unknown.

Internet links

<https://research.csiro.au/cultivars/wp-content/uploads/sites/162/2017/03/ooloo.pdf>

Selected references

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Cultivars

'Oolloo' Released in Australia (1997). (AusTRCF 55698, CPI 55698, BRA 001945, CIAT 5370, CIAT 5468, CPAC 1802, CPAC 232). Origin Petrolina, Pernambuco, Brazil (9°23' S; 380 m asl; 400 mm/yr).

Promising accessions

ILRI 155 (= CIAT 5234) Nigeria, savannas.

CIAT 5234 Has shown some adaptation to less well-drained soils in the flooded savannas of the Pantanal of Brazil.

CIAT 5178, CIAT 5234 Colombia, savannas.

CIAT 5055, CIAT 5234, CIAT 5247 Venezuela, savannas.

CIAT 5468, CIAT 5553, CIAT 5689, CIAT 5823, CIAT 25112, CIAT 25132 Nigeria, savannas. 'Group A material': rapid establishment, short term use.

CIAT 5512, CIAT 5667, CIAT 15192, CIAT 15270, CIAT 15401, CIAT 25113, CIAT 25210 Nigeria, savannas. 'Group B material': higher persistence, longer term use.

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