

Tropical Forages

Stylosanthes guianensis var. *intermedia*

Scientific name



Stylosanthes guianensis (Aubl.) Sw. var. *intermedia* (Vogel) Hassl.

Conspecific taxa:

Stylosanthes guianensis (Aubl.) Sw.

Stylosanthes guianensis (Aubl.) Sw. var. *dissitiflora* (B.L. Rob. & Seaton) 't Mannetje

Stylosanthes guianensis (Aubl.) Sw. var. *guianensis*

Stylosanthes guianensis (Aubl.) Sw. var. *longiseta* (Micheli) Hassl.

Stylosanthes guianensis (Aubl.) Sw. var. *marginata* Hassl.

Stylosanthes guianensis (Aubl.) Sw. var. *robusta* 't Mannetje

Synonyms

Basionym: *Stylosanthes montevidensis* Vogel var. *intermedia* Vogel; *Stylosanthes campestris* M.B. Ferreira & Sousa Costa; *Stylosanthes hippocampoides* Mohlenbr.

Family/tribe

Family: *Fabaceae* (alt. *Leguminosae*) subfamily: *Faboideae* tribe: *Dalbergieae* subtribe: *Stylosanthinae*.

Morphological description

A prostrate to ascendant (rarely erect), much branched perennial to 30 cm, with stems mostly 1–2 mm diameter, covered with sparse radiating bristles about 1.5 mm long; well-developed crown with buds both below and above ground level, nodal rooting rare, strong taproot. Leaves trifoliolate, leaflets bright to deep green, 15–35 mm long, 3–5 mm wide, few hairs. Flowers yellow, borne in compact spikes, with 4–20 flowers/spike. Pods light brown, flattened, single-seeded, 3 mm long and 2 mm wide with a minute coiled beak; conspicuously reticulately fine-veined without hairs. Pods shed as they ripen. Seeds yellowish brown. About 380,000 seeds-in-pod and 770,000 dehulled seeds per kg.

Common names

English: fine stem stylo

Distribution

Native:

South America: Argentina (Córdoba, Corrientes, Misiones); Bolivia (e.); Brazil (Bahia, Goiás, Mato Grosso, Mato Grosso do Sul, Paraná, Rio de Janeiro, Santa Catarina, São Paulo); Paraguay; Uruguay



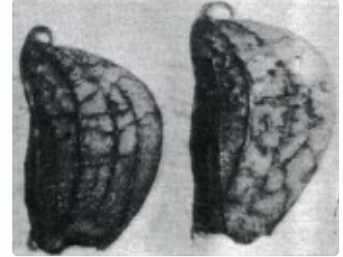
Prostrate to ascendant, much branched perennial. Image: seed increase area of cv. Oxley



Foliage and commencement of flowering (ATF 3071)



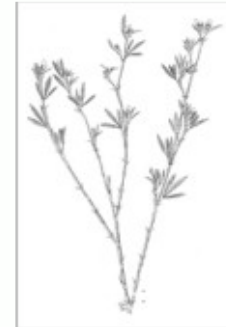
Flowers borne in compact spikes, with few to many flowers/spike



Pods showing minute coiled beak and reticulated fine-veins.

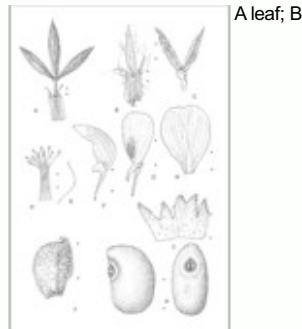


Seeds



Habit.

Scale: between points = 1 cm. (Drawn from Hassler 7030.)



A leaf; B

bract; C bracteoles; D androecium; E gynoecium; F keel; G wing; H standard; I unfolded calyx; J pod; K seed. Scale: between points = 2 mm. (A and C–J: drawn from Hassler 7030; B, C and K: drawn from N. Sousa Costa 3084.) J modified to show more common single article.



Prostrate growth habit and flowering under heavy grazing (CPI 11493)



Dense cover of 'Oxley' in *Heteropogon contortus*-*Digitaria didactyla* under heavy grazing



Plant recovery from crowns after fire

Cultivated:

Africa: South Africa; Zimbabwe

Australasia: Australia (New South Wales (n.e.), Queensland (s.e.))



Seedling recruitment after fire

Uses/applications

Forage

Mainly used as a source of leguminous protein in sub-humid, subtropical native pastures dominated by early-maturing grasses such as *Heteropogon contortus* and *Hyparrhenia* spp.

Ecology

Soil requirements

Occurs naturally on sands to light clays of pH 6.5–7.0, rarely 5.5. Adapted to well-drained, friable-surfaced, low to moderate fertility, sandy to well-structured clay soils in subtropical environments. Best on sands and sandy loams. Not adapted to heavy clays, and generally poor on surface-sealed soils. Grows best in soils of near neutral pH, although has grown well on sandy soils of pH 5.0. Responds to application of phosphorus in infertile soils. No record of salinity tolerance.

Moisture

Occurs in areas with annual rainfall from 600 to 1,800 mm. Mostly sown in areas with rainfall of 700–900 mm. Very drought tolerant, but very intolerant of flooding and waterlogging. Suggested that presence of sedges (Cyperaceae) may indicate unsuitability for *S. guianensis* var. *intermedia*.

Temperature

Mostly found between 18 and 33° S (with possible outliers at 12°45' S in Bahia, Brazil and 36° S in Buenos Aires Province, Argentina). This largely equates to an average annual temperature range of about 16–24 °C. In cultivation, *S. guianensis* var. *intermedia* has proven successful between latitudes 23–29° near sea level, and 17–19° at >1,200 m asl. Commences growth early in the growing season and in the absence of frosts, continues to grow into the cool season. Optimum temperature for growth is approximately 27–29 °C. Tops remain unaffected by light frosts, but are killed by heavy frost. Crowns of established plants survive temperatures of -10 °C.

Light

Requires full sun or very open shade. Not well-suited to agroforestry.

Reproductive development

A long day plant, *S. guianensis* var. *intermedia* flowers and sets seed through much of the growing season, with a peak towards the middle of the warm season.

Defoliation

Benefits from regular defoliation, and dies out in association with taller grasses if fairly intensive management not maintained. Crowns develop a profusion of short leafy shoots in a prostrate rosette under heavy grazing, giving the plant a higher leaf to stem ratio. Can be grazed throughout the year.

Fire

Survives fire well because of its buried crown. There is usually dense seedling development following fire due to heat-softening of hard seed and reduced competition.

Agronomy

Guidelines for establishment and management of sown forages.

Establishment

High levels of hard seed in the absence of scarification. Can break dormancy by: (a) mechanical scarification; (b) immersion in water at 80 °C for 10–15 minutes, and cooling for 40 minutes; (c) treating with concentrated sulphuric acid for 10 minutes, wash and dry; (d) pass seed over hot surface at 120 °C for 15 seconds. It is fairly specific in its rhizobial requirements, and seed should be inoculated with CB 82, CB 1650, CB 1552, or similar strains prior to planting in areas not growing other *Stylosanthes* spp. Seed can be broadcast after light cultivation or drilled at 2–5 kg/ha, sowing no deeper than 1–1.5 cm. Seed can also be broadcast onto ash following fire, providing the area is continuously stocked after seeding to reduce grass competition. Generally slow to establish.

Fertilizer

Efficient in extracting phosphorus from the soil and grows quite well without fertilizer, but may require 20 kg/ha P in P deficient soils.

Compatibility (with other species)

In its adapted low rainfall environment, it competes successfully with weeds. Combines well with grasses in more open stands.

Companion species

Grasses: *Bothriochloa pertusa*, *Digitaria eriantha*, *Heteropogon contortus*.

Legumes: *Aeschynomene falcata*, *Chamaecrista rotundifolia*, *Listia bainesii*, *Stylosanthes scabra*.

Pests and diseases

Although infected by anthracnose caused by *Colletotrichum gloeosporioides* late in the season, the disease is of little consequence.

Legume little-leaf disease caused by phytoplasma can reduce production in some seasons and head blight caused by *Botrytis cinerea* can be a problem in seed crops under humid conditions. Seed-harvesting ants can affect establishment of new stands and reduce the opportunity to build soil seed reserves.

Ability to spread

High levels of seed production. Spread through ingestion by livestock and through surface water movement. Has become naturalized at significant distances from sown area.

Weed potential

No record of weediness.

Feeding value

Nutritive value

CP levels in DM at mid-full bloom stage average 16%, and P levels 0.23%, while end of season values have been measured at 9% and 0.15%, respectively.

Palatability/acceptability

It is well grazed, the proportion in the diet increasing through the season as the associated grass becomes more fibrous.

Toxicity

No problems recorded.

Feedipedia link

<https://www.feedipedia.org/node/251>

Production potential

Dry matter

Generally low production, with yields of the order of 2–5 t/ha DM growing in association with grass producing about 2 t/ha DM. Yields can be doubled with the use of phosphatic fertilizer.

Animal production

Can improve animal performance by 30–80 kg/hd/yr over those on declining quality grass pastures, at a stocking rate of c. 1 beast/2.5 ha. May also increase the carrying capacity of the pasture, although such a step should be approached with caution. The legume can often tolerate higher grazing pressure than the associated grass. Relatively low amounts can have a significant effect on animal production.

Genetics/breeding

Self-pollinated; chromosome number $2n = 20$. The original fine stem stylo released in Australia was a mixture of 2 accessions, giving a variety with asynchronous flowering, which led to difficulties in assessing seed harvest time. Cv. Oxley resulted from selection within the mixture to obtain a more synchronized seed crop.

Seed production

Ripe seed is readily dislodged from the flower head, making mechanical harvesting difficult. Commercial seed is usually produced under irrigation, and harvested with a combine harvester, usually in February/March in the southern hemisphere. This may be followed by suction harvesting to recover fallen seed, which can double the total yield. Where labour is plentiful and cheap, hand harvesting of seed can provide a valuable source of income to smallholder farmers. Seed yields range from 300 to 500 kg/ha, but up to 1,000 kg/ha has been obtained by manual sweeping and winnowing of fallen seed.

Herbicide effects

Tolerant of 2,4-D, 2,4-DB, acifluorfen, bentazone, and fluzafop-butyl, but moderately susceptible to sethoxydim.

Strengths

- Buried crown protects plant from fire, frost and heavy grazing.
- More cold tolerant than most warm season legumes.
- Responds well to heavy grazing pressure.
- Largely resistant to anthracnose.
- Efficient in extracting calcium and phosphorus from the soil.
- Naturalizes on suitable country.

Limitations

- Intolerant of even marginally impeded drainage.
- Difficulty of seed harvest.
- Specific rhizobium.
- Low dry matter yields.

Selected references

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Cultivars

'Oxley' (composite of CPI 11491 and CPI 11493) Released in Australia (1969). Origin Mercedes (Corrientes), Argentina (29° S, 80 m asl, rainfall 1,200 mm) and Asunción, Paraguay (25° S, 90 m asl, rainfall 1,350 mm), respectively. Uniform line selected from the variable composite based on morphology and flowering time. Although largely evaluated on sandy soils in the subtropics, it has proven useful in other well-drained soils, primarily for sowing into native pasture .

Promising accessions

None reported.

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