

Stylosanthes guianensis var. intermedia

Scientific name

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

Synonyms

Stylosanthes campestris M.B. Ferreira & Sousa Costa

Stylosanthes hippocampoides Mohlenbr.

Stylosanthes montevidensis Vogel var. *intermedia* Vogel

Family/tribe

Family: *Fabaceae* (alt. *Leguminosae*) subfamily: *Faboideae* tribe: *Aeschynomeneae* subtribe: *Stylosanthinae*. Also placed in: *Papilionaceae*.

Common names

fine stem stylo.

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 fine-veined without hairs. Pods shed as they ripen. Seeds yellowish brown. 770,000 seeds per kg, 380,000 seed-in-pod /kg.

Distribution

Native to:

South America: Argentina (north-east), Brazil (south), Bolivia (east), Paraguay, Uruguay.

Uses/applications

Mainly used in permanent pastures in sub-humid subtropics.

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 rainfall from 600-1,800 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

Susceptible to shading.

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 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 and with dense seedling development following fire due to heat-softening of hard seed.

Agronomy

Guidelines for the establishment and management of sown pastures.

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. Seed should be inoculated with CB 82, CB 1650, CB1552, or similar strains prior to planting in areas not growing other *Stylosanthes* spp., since it is fairly specific in its rhizobial relationships. 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.

Fertiliser

Efficient in extracting phosphorus from the soil and grows quite well without fertiliser, 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*, *Lotononis bainesii*, *Stylosanthes scabra*.

Pests and diseases

Although infected by anthracnose caused by *Colletotrichum gloeosporioides* late in the season, the disease is of little consequence in pastures. 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 naturalised 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 2.3%, 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.

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 fertiliser.

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 $2n = 20$.

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 300-500 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 fluazifop-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.
- Naturalises on suitable country.

Limitations

- Intolerant of poor drainage.
- Difficulty of seed harvest.
- Specific rhizobium .
- Low dry matter yields.

Selected references

Cameron, D.G. (1987) Tropical and subtropical pasture legumes 14. Fine stem stylo (*Stylosanthes guianensis* var. *intermedia*): The subtropical stylo. *Queensland Agricultural Journal*, 113, 83-87.

Jingura, R.M., Sibanda, S. and Hamudikuwanda, H. (2001) Yield and nutritive value of tropical forage legumes grown in semi-arid parts of Zimbabwe. *Tropical Grasslands*, 35, 168-174.

*t Mannelje, L. (1977) A revision of varieties of *Stylosanthes guianensis* (Aubl.) Sw. *Australian Journal of Botany*, 25, 347-362.

Internet links

<http://www.fao.org/ag/AGP/AGPC/doc/Gbase/data/pf000071.htm>

Cultivars

Cultivars	Country/date released	Details
'Oxley' (composite of CPI 11491 and CPI 11493)	Australia (1969)	From Mercedes (Ctes), Argentina (29°S, 80 m asl, rainfall 1,200 mm) and Asuncion, Paraguay (25°S, 90 m asl, rainfall 1,350 mm) respectively. Uniform line selected from the composite based on morphology and flowering time. Largely selected on the basis of performance on sandy soils in the subtropics, but has proven useful in other well-drained soils, primarily for sowing into native pasture .

Promising accessions

Promising accessions	Country	Details
None reported.		



