

Tropical Forages

Macrotyloma daltonii

Scientific name

Macrotyloma daltonii (Webb) Verdc.



Synonyms

Basionym: *Dolichos daltonii* Webb

Family/tribe

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

Morphological description

An annual or sometimes perennial climbing or trailing herb to 1.5 m long. Stems slender, covered with long soft hairs. Leaves trifoliolate; leaflets elliptic, 2–6.8 cm long and 0.7–4.5 cm wide, acute or acuminate at the apex and cuneate and narrowly to broadly rounded at the base; lateral leaflets sometimes oblique; all leaflets appressed pubescent on both surfaces; dark green above, light below; petioles 1–6.5 cm long, rachis 4–10 mm long, petiolules 2–3 mm long; stipules ovate, lanceolate-triangular, 5–9 mm long and 2–3 mm wide and nerved; stipels 2–3 mm long, narrowly ovate. Flowers axillary, solitary, in pairs or 3–4-flowered fascicles, pedicels 1.5–3 mm long, bracts 2 mm long; flowers greenish-yellow to cream or white, sometimes with a mauve mark or veins on the standard; wings and keel narrow, pale greenish-yellow to cream or white. Pods linear to oblong, straight or slightly curved, 2.5–4.5 cm long, 6–8 mm wide and rather laxly covered with long white hairs, 3–6-seeded; beak 3–5 mm long. Seed reddish or pale pinkish-brown and densely mottled with grey and black. Seed size is 4.2–6.0 mm long, 3.5–5.0 mm wide and 1.5–2.0 mm thick. About 50,000 seeds per kg.



Leaflets appressed pubescent on both surfaces



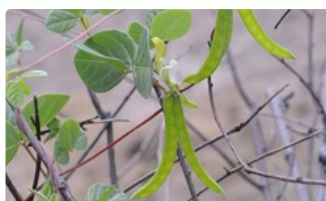
Native population on fenceline in veld, South Africa



Climbing or trailing annual (sometimes perennial) herb



Flowers greenish-yellow to cream or white, sometimes with a mauve mark or veins on the standard



Flowers, leaves and immature pods



Densely mottled seeds



Intercropped with grain sorghum

Common names

None recorded.

Distribution

Native:

Africa: Angola; Botswana; Democratic Republic of the Congo; Ethiopia; Kenya; Malawi; Namibia; Nigeria; Senegal; South Africa (Limpopo); Sudan; Tanzania; Uganda; Zambia; Zimbabwe

Macaronesia: Cape Verde

Uses/applications

Forage

M. daltonii is a productive species that requires further research. It has shown promise in early evaluation as a self-regenerating annual in permanent and ley pastures.

Environment

Its vigorous growth suggests it might also have application as a green manure.

Ecology

Soil requirements

Occurs in grassland, wooded grassland, woodland, bushland and thicket, mostly on deep sands, loams and sandy loams, but also on stony soils and clays, with pH of 6–8.

Moisture

Rainfall at collection sites ranges from 350–775 mm/yr (mostly 600–700 mm).

Temperature

Extends from about 16° N in Cape Verde, 12° N in Sudan to about 23° S (900 m asl) in South Africa, and at 1,650 m asl at 4.7° S in Tanzania.

Light

Low shade tolerance.

Reproductive development

Short day plant. Flowering characteristics vary with ecotype. Few seeds by end of March at 19° S. Seed collected early to mid April at 20° S. Pods nearly 100% shattered by mid-June at 6° S.

Defoliation

High growing points (>7 cm) on the basal stem make it intolerant of regular defoliation.

Fire

No information available.

Agronomy

Guidelines for establishment and management of sown forages.

Establishment

Easily established in cultivated seedbeds with surface and near surface sowing. Large seed size and fast germination rate enhance the success of establishment. Can also re-establish very successfully from soil seed in crop situations and also in permanent pastures but regeneration is erratic in competition with strong growing grasses.

Fertilizer

Although growing fairly well at low fertility, even on old cultivation land, it responds to applications of 10–20 kg/ha P on these poorer soils.

Compatibility (with other species)

Grows successfully with tufted grasses and other twining and shrub legumes. The twining habit enables *M. daltonii* to climb taller grasses and crop plants, and to smother weeds.

Companion species

Grasses: *Heteropogon contortus*, *Megathyrsus maximus*, *Urochloa mosambicensis*, *U. oligotricha*.

Legumes: *Macroptilium atropurpureum*, *Macrotyloma axillare*, *Neonotonia wightii*, *Stylosanthes scabra*.

Pests and diseases

Root disease can cause wilting and death in wet conditions on clay soils.

Ability to spread

Limited ability to spread. High seed production but has to regenerate each year and does not compete with strong growing perennial grasses.

Weed potential

Low potential in grasslands but could be weed of summer cropping areas.

Feeding value

Nutritive value

Leaves have high nutritive value and low acid detergent fibre (ADF) but N content in comparison with *Lablab* and *Macroptilium* is lower. Stems are lower in N and higher in ADF than *Lablab* and *Macroptilium*.

Palatability/acceptability

Less readily eaten by grazing beef cattle than *Vigna trilobata*, *Macroptilium bracteatum*, *Lablab purpureus* and *Clitoria ternatea* in grazing trials. In grasslands, *M. daltonii* is grazed most readily late in summer.

Toxicity

None reported.

Production potential

Dry matter

Depending on rainfall and the length of the growing season, yields of pure swards can range from 1 to 4 t/ha. In grasslands, yields are lower and highly variable.

Animal production

On grasslands with *M daltonii* as a legume component, animal growth rates can be improved over grass-only pastures by up to 60 kg/head/year. However, when grazed as a legume forage crop, animal growth rates of steers were lower (0.35–0.66 kg/head/day) than for those grazing lablab (*Lablab purpureus*) (0.6–0.86 kg/head/day) and cowpea (*Vigna unguiculata*) (0.55–0.79 kg/head/day), possibly because of reduced intakes of the less palatable *M daltonii*.

Genetics/breeding

Little or no breeding or selection work has been done with *M. daltonii*.

Seed production

Seed production can be high but recovery is likely to be difficult because of seed shattering. Suction harvesting as for other *Macrotyloma* spp. could be the most efficient seed harvesting strategy.

Herbicide effects

Susceptible to a range of broad-leaf herbicides including dicamba, MCPA, metsulfuron-methyl and fluroxypyr.

Strengths

- Easy establishment.
- High seed production.
- Ability to regenerate from soil seed annually.

Limitations

- Lower palatability than other legumes.
- Not tolerant of cutting.

Selected references

Blumenthal, M.J. and Staples, I.B. (1993) Origin, evaluation and use of *Macrotyloma* as forage -a review. *Tropical Grasslands* 27:16–29. [bit.ly/3awFf8j](https://doi.org/10.1071/AR9890591)

Blumenthal, M.J., O'Rourke, P.K., Hilder, T.B. and Williams, R.J. (1989) Classification of the Australian collection of the legume *Macrotyloma*. *Australian Journal of Agricultural Research* 40(3):591–604. doi.org/10.1071/AR9890591

Clem, R.L. (2004) Animal production from legume-based pastures in Southeastern Queensland. In: Whitbread, A.M. and Pengelly, B.C. (eds) *Tropical legumes for sustainable farming systems in southern Africa and Australia*. ACIAR Proceedings No. 115. Australian Centre for International Agricultural Research (ACIAR), Canberra, Australia. p. 136–144. [aciar.gov.au/node/8436](https://www.aciar.gov.au/node/8436)

Dalzell, S.A., Brandon, N.J. and Jones, R.M (1997) Response of *Lablab purpureus* cv. Highworth, *Macroptilium bracteatum* and *Macrotyloma daltonii* to different intensities and frequencies of cutting. *Tropical Grasslands* 31:107–113. [bit.ly/2UvTDYA](https://doi.org/10.1071/AR9890591)

Gillett, J.B., Polhill, R.M. and Verdcourt, B. (1971) Leguminosae (Part 3) Subfamily Papilionoideae. In: Milne-Redhead, E. and Polhill, R.M. (eds) *Flora of Tropical East Africa*. Crown Agents for Overseas Governments and Administrations, London, UK. p. 313–314.

Verdcourt, B. (1970) Studies in the Leguminosae-Papilionoideae for the 'Flora of Tropical East Africa': III. *Kew Bulletin* 24:402. doi.org/10.2307/4102845

Verdcourt, B. (1980) The classification of *Dolichos* L. emend. Verdc., *Lablab* Adans., *Phaseolus* L., *Vigna* Savi and their allies. In: Summerfield, R.J. and Bunting, A.H. (eds) *Advances in Legume Science*. Kew Royal Botanic Gardens, Kew, UK. p. 45–48.

Verdcourt, B. (1982) A revision of *Macrotyloma* (Leguminosae). *Hooker's Icones Plantarum* 38(4):1–138.

Whitbread, A.M. and Clem, R.L. (2006) Graze to grain—measuring and modelling the effects of grazed pasture leys on soil nitrogen and sorghum yield on a Vertosol soil in the Australian subtropics. *Australian Journal of Agricultural Research* 57(5):489–500.
doi.org/10.1071/AR05189

Cultivars

None released to date.

Promising accessions

CPI 60303 Selected in Queensland, Australia. Origin Huila Plateau, Namibia (20.5° S, 16.12° E, 1,270 m asl, rainfall 350 mm). A vigorous, leafy, early flowering accession.

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