

Tropical Forages

Digitaria didactyla & *D. swazilandensis*

Scientific name



Digitaria didactyla Willd.

Digitaria swazilandensis Stent

Note: These species are sufficiently similar for *Digitaria swazilandensis* Stent to be considered a synonym of *Digitaria didactyla* Willd. by a number of authorities.

Synonyms

None listed in GRIN for either species.

Family/tribe

Family: *Poaceae* (alt. *Gramineae*) subfamily: *Panicoideae* tribe: *Paniceae* subtribe: *Anthephorinae*.

Morphological description

Stoloniferous perennials forming dense mats 2–12 cm high (*D. didactyla*) and to 40 cm high (*D. swazilandensis*). Stems prostrate with nodal roots until mat complete, then ascendant through taller vegetation; nodes brown, glabrous or pubescent. Leaf-sheaths smooth or scaberulous, densely to sparsely pilose; ligule an eciliate membrane 0.8–2.0 mm long; leaf-blades 3–6 (–17) cm long; 2–3 (–5) mm wide; glaucous, surface smooth, glabrous; margins scaberulous. Inflorescence a terminal racemose digitate panicle with primary peduncle 10–20 cm long; racemes 2–3 (–4), slender, 3–6 (–10) cm long; occasionally branched; raceme peduncle 2–3 mm long. Spikelets (2–) 2.2–2.7 mm long; upper glume $\frac{1}{2}$ – $\frac{2}{3}$ the length of the spikelet. *D. swazilandensis* has similar habit, taller herbage, leaf blade 3–6 mm wide, and upper glume $\frac{1}{3}$ – $\frac{1}{2}$ the length of the spikelet.

Similar species

Some slender creeping specimens of *D. eriantha* may be difficult to distinguish from *D. swazilandensis*. *D. didactyla* and *D. swazilandensis* are sometimes confused with *Cynodon dactylon*, but are readily distinguished because the latter is strongly rhizomatous, has a hairy ligule, and is green in colour. *D. didactyla* has a distinctive bluish colour and *D. swazilandensis* is typically intermediate in colour between *D. didactyla* and *C. dactylon*.

Common names

***D. didactyla* :**

Asia: □□□ (China)

English: blue couch grass, blue stargrass, crabgrass, Queensland blue couch; blue serangoon grass, green serangoon grass (Malaysia); Mauritius blue

French: petit gazon (Mauritius); gazon (Rodrigues Islands)

***D. swazilandensis*:**



D. didactyla: fine leaved, stoloniferous perennial forming dense mat to 12cm high



D. swazilandensis: stoloniferous broader leaved perennial forming dense mat to 40cm high. Hay crop, E Venezuela



D. didactyla turf



D. swazilandensis turf



Inflorescence a digitate panicle mostly comprising 2-3 racemes



Seeds



Stoloniferous growth habit, Queensland Blue Couch



Blue couch with *Aeschynomene falcata*



Antonina graminis (Rhodes grass scale), a species of mealybug on *D. swazilandensis*



Stand of swazii grass damaged by *Antonina* scale

Afrikaans: skaapvingergras, swazigras, Swaziland-vingergras

Asia: หญ้าสาบซี้แลนด์ (Thailand)

English: Richmond finger grass, swazi grass, Swaziland finger grass

Europe: digitale du Swaziland (French); Swasiland-Fingerhirse (German)

Latin America: capim-suázi (Brazil); pasto swazi, suazi (Spanish)

Distribution

Digitaria didactyla

Native:

Indian Ocean: Mauritius; Réunion

Naturalized:

Asia: Malaysia

Australasia: Australia

Caribbean: Puerto Rico

Digitaria swazilandensis

Native:

Africa: Malawi; Mozambique; South Africa (KwaZulu-Natal, Mpumalanga, Gauteng, North West, Limpopo); Swaziland

Cultivated:

Caribbean: Trinidad

Central America: El Salvador; Honduras; Panama

South America: French Guiana; Suriname; Venezuela

Uses/applications

Forage

Although both provide excellent feed for livestock, only *D. swazilandensis* is sown specifically for that purpose. However, the less productive *D. didactyla* often invades heavily grazed pastures, providing useful grazing for livestock while soils are moist. Both are popular pasture grasses for horses, because they can not only withstand the often heavy grazing pressure meted out by horses, but also provide "safe" feed due to relative freedom from oxalates and nitrites found in some other grasses.

Environment

As a lawn or golf course grass, it is generally laid as turf. *D. didactyla* has been used as ground cover in better rainfall areas, but is not as resilient or stable as some other ground-cover grasses such as *Cynodon* spp. or *Paspalum notatum*. On the other hand, *D. swazilandensis* is a more aggressive species and forms a more stable cover, to the extent that it has shown promise in suppression of the tall invasive grass weed of intensively managed pastures, *Sporobolus indicus* (L.) R. Br. var. *major* (Büse) Baaijens.

Ecology

Soil requirements

Adapted to soil textures from sands to clay loams, but not to heavy clays. Tolerant of low nutrient levels but respond well to increased fertility, particularly nitrogen. Prefer pH above 5–5.5, because neither is tolerant of high Al saturation. They are also intolerant of soil salinity.

Moisture

Both species are best adapted to moist, well-drained conditions. *D. didactyla* normally grows in areas with an annual rainfall in the range (700–) 900–1,800 mm. It survives seasonal dry conditions and drought by losing all leaf, a characteristic that is criticised by farmers because this is when feed is in high demand. However, it responds almost instantly to good rainfall, particularly on light soils. It can tolerate short-term flooding, but rarely found in permanently poorly drained soils. In Central America, *D. swazilandensis* is recommended in areas with an annual rainfall of 1,000–3,000 (–4,000) mm. With such high rainfall, good drainage is of paramount importance.

Temperature

Although both species are native or naturalized over a latitudinal range from the tropics to the subtropics, *D. didactyla* tends to be more

widely found in the subtropics and higher altitude tropics, while *D. swazilandensis* has found a commercial niche as a forage in the humid tropics. Leaves of both species are burnt by frost and stolons killed by heavy frost.

Light

Grows best in full sunlight, extending into areas of only light shade.

Reproductive development

D. didactyla flowers and seeds prolifically from spring through to autumn. *D. swazilandensis* phenotypes show considerable variation in intensity of flowering and degree of seed set, some lines producing little or no seed.

Defoliation

Very resistant to mowing and heavy grazing, often invading pastures of grazing-sensitive tussock species under prolonged heavy grazing. *D. swazilandensis* can produce a sufficiently deep sward to facilitate machine harvest, whereas *D. didactyla* is not cut for feed due to low creeping growth. Both are excellent turf grasses under regular mowing.

Fire

Not generally burned due to moist conditions or light fuel loads under heavy grazing, but recovers quickly after fire.

Agronomy

Guidelines for establishment and management of sown forages.

Establishment

Seed of *D. didactyla* is available for lawns but is expensive so it is usually planted as turf. Naturally spread through cattle faeces under prolonged heavy grazing. *D. swazilandensis* is mostly a poor seeder and is normally established from cuttings on about a 40 cm grid.

Fertilizer

Both species are responsive to an improvement in soil nitrogen status, either through use of N fertilizer or to N from vigorous associated legumes. Other nutrients may also be required in low fertility soils.

Compatibility (with other species)

Under heavy grazing, combines well with creeping and other native and introduced legumes, especially if superphosphate is applied.

Companion species

Legumes: *Aeschynomene falcata*, *Arachis pintoi*, *Chamaecrista rotundifolia*, *Grona triflora*, *Glycine* spp., *Listia bainesii*, *Lotus uliginosus*, *Stylosanthes guianensis* var. *intermedia*, *Trifolium repens*, *Vigna parkeri*.

Pests and diseases

These grasses are often prone to attack by various lepidopterous larvae, particularly when well-fertilized. Patches of grey mould on leaves is often seen in spring and autumn. Can be attacked by spider mites (*Oligonychus* spp.) and infected by *Digitaria* striate mosaic monogeminivirus. *D. swazilandensis* is sometimes severely attacked by an *Antonina* species (Hemiptera, Pseudococcidae), probably *A. graminis* in E Venezuela, causing weakening and desiccation, but not death of the stand. *D. didactyla* turf plants in Australia are also weakened by infestations of the same or similar insect. Neither is infected by pangola stunt virus (unlike many other *Digitaria* spp.). Swazi grass is less affected by moulds and other diseases than Queensland blue couch.

Ability to spread

Spread rapidly by runners and seed, particularly under persistent heavy grazing or regular mowing. Seed reserves can be high in the soil; germinable seed can be spread through dung of cattle on well grazed pastures (up to 20 germinable seeds/g faecal DM).

Weed potential

D. didactyla seeds fairly freely and spreads more by seed than *D. swazilandensis*. However, both are primarily stoloniferous and easy to kill with common contact and translocated grass herbicides, unlike the strongly rhizomatous *Cynodon dactylon*.

Feeding value

Nutritive value

See Feedipedia.

Palatability/acceptability

Very palatable.

Toxicity

None reported.

Feedipedia link

<https://www.feedipedia.org/node/454> (*D. swazilandensis*)

Production potential

Dry matter

Up to 11 t/ha DM recorded from *D. didactyla* with fertilizer application of 225 kg/ha N, but very low yields without N. Yields of 9–20 t/ha DM have been obtained in Central America from *D. swazilandensis*.

Animal production

Liveweight gains of no more than about 90 kg/head/year are achievable on heavily grazed, unfertilized stands of *D. didactyla*. Liveweight gains averaging 0.5 kg/hd over long periods at quite high stocking rates have been achieved from cattle grazing *D. swazilandensis* pasture without supplement.

Genetics/breeding

Commercial varieties have largely been derived from selections from wild populations or seedlings therefrom. In the absence of definitive data, observations of the variation in the progeny of selected plants suggest at least a proportion of outcrossing in both species.

D. didactyla $2n = 18, 36$.

D. swazilandensis $2n = 18, 54$

Seed production

Seed harvest is difficult due to low growth. In south-east Queensland (Australia), yields of 100 kg/ha seed have been recorded in 2 harvests; in January and November. Seed remained viable (with germination up to 80%) over 2 years when stored at 15 °C. Dehulling seed reduced germination, probably because of damage to the caryopses.

Seed growers in Queensland, Australia, typically fertilise seed crops by the end of October (spring), though this can be up to a month earlier depending on seasonal conditions. The amount of Fertilizer N used on established paddocks varies from 55–85 kg N/ha on the fertile soil to c. 140 kg N/ha on the infertile soil. Depending on the starting date, seed crops may be harvested in late December, though January is more usual. Seed growers in Queensland typically mow the ripe seed crop, and then pick it up from the windrow with a combine harvester 1–3 days later unless drying has been delayed by wet weather. Excessive rainfall during the summer growing period can lead to crop failures. A second seed crop in late autumn is sometimes possible.

Herbicide effects

Tolerant of a range of broadleaf herbicides, including 2,4-D, MCPA, dicamba, fluroxypyr, metsulfuron, trifloxysulfuron. Susceptible to the organoarsenate herbicides, MSMA (monosodium methanearsonate) and DSMA (disodium methanearsonate). *D. swazilandensis* has some tolerance to fluazifop, which could be used for the selective control of other grasses.

Strengths

- Very palatable.
- Good quality.
- Very resistant to heavy grazing.
- Good ground cover.

Limitations

- Low production during dry periods.
- Intolerant of waterlogging.
- Intolerant of shade.
- Weed ingress in heavily grazed pastures.

Selected references

Loch, D.S., McMaugh, P. and Scattini, W.J. (2013) A review of *Digitaria didactyla* Willd., a low-input warm-season turfgrass in Australia: Biology, adaptation and management. International Turfgrass Society Journal 12:1–14. espace.library.uq.edu.au/view/UQ:325603

Strickland, R.W. (1973). A comparison of dry matter yield and mineral content of three forms of *Cynodon* with *Digitaria decumbens* and *D. didactyla*. Tropical Grasslands 7:313–317. [bit.ly/2R76E9h](https://doi.org/10.1080/00222673.1973.10664999)

Cultivars

'Aussieblue' Released in Australia (1997). Origin unknown. Derived from a line ostensibly introduced to Australia from Trinidad as *Digitaria longiflora* SR 1232-1 and catalogued as CPI 40639 (more likely SR 1233-1 *D. swazilandensis*). Both lines came to Trinidad

from USDA. Useful for lawn turf having vigorous lateral spread, wide leaf and sparse flowering. Compared with Queensland blue couch, it is more robust in appearance with broader, lighter coloured, less bluish-green leaves, and fewer but larger inflorescences. It spreads more rapidly by stolons, and forms a denser, more easily maintained sward.

'**Tropika Blue**' Derived from a seedling of unknown origin growing at the Department of Primary Industries, Mareeba (QLD); this differed from known material of the 4 accessions then being distributed experimentally. Compared with 'Aussible', 'Tropika' has slightly broader leaves that are darker blue-green in colour.

Promising accessions

CPI 40674, CPI 40676 Selected at Grafton, New South Wales, Australia. Origin unknown. Introduced to Australia from Trinidad, previously from USDA, and prior to that from South Africa. Both lines produce viable seed, CPI 40674 more than CPI 40676. Both lines produce higher yields than naturalized *D. didactyla* in the Australian subtropics, and have larger leaves.

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