



***Eragrostis curvula* (Schrad.) Nees**

Gramineae

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Home

Synonyms

E.robusta Stent

Photo

Common names

Weeping love grass (South Africa, United States), African love grass (Australia), pasto llorón (Peru).

Taxonomy

Chloridoideae; Chloridae.

Origin and geographic distribution

There are approximately 350 species worldwide. Although *Eragrostis* is cosmopolitan, most species occur in subtropical climates. *Eragrostis curvula* grows in southern Africa and northwards to east Africa, and introduced throughout the tropics mainly as a fodder.

Description(Gibbs-Russell *et al.* 1989)

A wiry perennial grass that grows to a height of 1200 mm tall. The leaf blades are up to 500 mm long and 4 mm wide, rolled or flat, appearing setaceous. Culms are unbranched and not easily compressed, with glabrous nodes; basal sheaths densely hairy with long hairs. Spikelets are 4-10mm long and 1-1.5mm wide, linear-oblong, appressed to the branches. Inflorescence 100-300mm long, much branched, variable from open and spreading (throughout most of its distribution range) to contracted with branches appressed to the main axis (in the very southernmost parts of its distribution, the Northern Cape, Western Cape and Eastern Cape of South Africa). Lowest branches whorled or not whorled. Plants are extremely variable in morphology and this may lead to further taxonomic divisions in time to come, furthermore there is sometimes little distinction between this and other species of *Eragrostis* such as *E. chloromelos*, *E. lehmanniana* and *E. rigidior* (Lyn Fish, National Herbarium, Pretoria, personal communication).

Cytology

Chromosome base number, $x = 10$.

Leaf blade anatomy

C₄ photosynthetic pathway.

Ecology

Grows in high rainfall areas on sandy or acid to loamy soils, often in disturbed, overgrazed or trampled grassland. Usually prefers open habitat and is found in a wide variety of vegetation types.

Altitude range

Sea-level to 3 500 m (originated near the equator in Tanzania at 1 000-1 600 m).

Rainfall requirements

500-1 000 mm in the tropics and subtropics generally. It will grow in rainfall as low as 300 mm if sown in basins or contour furrows and mulched (Miller & Hafenrichter, 1958).

Drought tolerance

It is quite drought tolerant.

Soil requirements

It prefers sandy loams and well drained fertile soils, but will grow in a wide range of soils. It prefers a pH of 7.0-8.5 (Miller & Hafenrichter, 1958).

Land preparation for establishment

A good seed-bed is preferred.

Sowing methods

Broadcast or drilled and easily propagated from seed.

Sowing depth and cover

Do not cover over 0.5-1 cm.

Sowing time and rate

Sow late spring to late summer at 1 kg/ha broadcast or 0.25 kg in 1-m rows.

Number of seeds per kg.

Approximately 3 850 000 or 110 000 flat spikelets.

Seedling vigour

Excellent.

Vigour of growth and growth rhythm

It starts growing early in the spring and continues until well into the autumn.

Response to defoliation

It is best subjected to rotational grazing to maintain the stand at moderate grazing pressure.

Use

A very palatable grass that is a widely cultivated pasture, and makes good hay. Because it is so easy to establish and grows rapidly, it is one of the best grasses for erosion control (especially in rehabilitation of road verges and ground cover).

Grazing management

If it is sown in rows, an inter-row cultivation during the first year will help it compete with weeds, which it will do in succeeding years. Periodic mowing will be beneficial if stock cannot keep it eaten close to the ground. Davidson (1964) developed a system of management based on a heavy initial dressing of nitrogen and then annual maintenance dressings based on nutrient removal in milk, working on 80 percent return of nitrogen by the grazing animal and 50 percent nitrogen recovery in shoots.

Response to fire

It tolerates fire.

Diseases and pests

None known.

Dry-matter and green-matter yields

At Stillwater, Oklahoma, United States, Pumphrey (1978) over four years obtained an average production of dry matter over the summer period from 1 July to 22 November of 3 178 kg/ha unfertilized, and 8 502 kg/ha fertilized with 224 kg N and 45 kg P₂O₅ per hectare. When fertilized with 450 kg N, 38 kg P and 58 kg K per hectare, the mean annual yield of *E. curvula* at Henderson Research Station, Zimbabwe over three years was 5 930 kg DM/ha (Rodel,

1970). At Samford, Queensland, dry-matter yields ranged from 13 000-27 000 kg/ha per year with eight-week cutting intervals (Strickland, 1973). Nitrogen was applied at 45 kg/ha at eight-week intervals. The grass was not irrigated. The mean yields were approximately double those for the four-week cutting interval. Under irrigation and with fertilization it yielded 28 000-32 000 kg DM/ha in south-west Australia (Roberts & Carbon, 1969).

Suitability for hay and silage

It makes good hay if cut before it becomes too tough, and combines well with lucerne in southern Africa.

Value as a standover or deferred feed

It is grown for winter pasture in Florida.

Seed yield

30-225 kg/ha under good conditions. Larger seed is obtained from rows.

Cultivars

The 'robusta' types from Argentina yielded the highest in trials at Samford, Queensland, and the 'South African Robusta Blue' (CPI30380) was the highest individual yielder (Strickland, 1973). 'Witbank', 'Ermelo', 'Kromarraai' and 'American Leafy' are cultivars; 'Morpa' has been released in Oklahoma because it has better palatability and gives better animal production (12 percent) than common weeping grass (Shoop, McIlvain & Voight, 1976). 'Renner' was released in Texas because of better palatability than 'Ermelo'. It remains green during drought and heat, autumn and winter and into maturity (Dalrymple, 1978).

Main attributes

Establishes easily, persists well under grazing. A tough grass with good cold tolerance, responds well to nitrogen, valuable in erosion control. Good palatability.

Optimum temperature for growth

It endures heat.

Minimum temperature for growth

Just above freezing.

Frost tolerance

It has survived temperatures as low as freezing in the southern Great Plains of the United States. At Samford, Queensland, *E. curvula* (CPI143218) produced dry matter at the rate of 52 kg/ha per day between March and July, during which 29 frosts were recorded (Strickland, 1973).

Palatability

The robusta types are well grazed by stock when young. Leigh (1961b) grouped *E. curvula* types into groups 'curvula', 'robusta green', 'robusta intermediate', 'robusta blue' and 'chloromelas'. The three 'robusta' types were the most palatable, 'chloromelas' varieties and *E. plana* being intermediate and the 'curvula' varieties the least palatable.

Response to photoperiod

It is indifferent to day length for flowering (Evans Wardlaw & Williams, 1964), i.e. day neutral.

Toxicity

Not toxic.

Chemical analysis and digestibility

Digestibility results at Samford showed a range from 65 percent in spring to 49 percent in midsummer and 50 percent in mid-winter, with crude protein from

17.5 percent in spring to 6.25 percent in midsummer and 9.4 percent in midwinter (Strickland, 1973).

Natural habitat

Clearings in woodlands in trampled disturbed land, moist sandy soil.

Tolerance to flooding

Not good. It will not grow on wet, seepy soils and will not tolerate standing water.

Fertilizer requirements

It will grow on poor soils, but for high production it needs extra nitrogen. With no nitrogen in Oklahoma, United States, forage yield was 2 178 kg/ha, with 112 kg N/ha it yielded 8 309 kg/ha, and with 224 kg N/ha, 11 374 kg/ha. It also has a high potassium requirement and removed 3.8, 4.0 and 4.7 kg of potassium per 454 kg of forage at low, medium and high nitrogen rates (Altom, 1978). Botha and Hamburger (1953) got significant increases in response to nitrogen with the Ermelo strain but not to phosphorus. A positive nitrogen/phosphorus interaction only occurred with applications of nitrogen in excess of about 300 kg N/ha.

Compatibility with other grasses and legumes

In the United States it is sown with Korean lespedeza.

Seed production and harvesting

This grass seeds heavily. It is harvested in early summer and again later in summer with a header-harvester or a hand sickle when one-third of the head has turned brown. Try to prevent scattering.

Economics

Eragrostis curvula has been used successfully for oversowing the broad intermontane plains or altiplanos of the arid to semi-arid Puna proper in the province of Juyjuy in northern Argentina at 3 000 m elevation. The seed is sown in listed furrows at 2 kg/ha and covered with sheep manure. It takes 20-25 days to germinate. The seed is Tanganyika-type *E. curvula* grown locally in Buenos Aires (Tothill, 1978). *E. curvula* is one of the highest producing grasses in summer rainfall areas of temperate and cool subtropical areas of South Africa (Strickland, 1973).

Animal production

At Henderson Research Station, Zimbabwe, when fertilized at 270 kg N/ha and 35 kg P/ha per year and grazed over two summers by heifers at the rate of 12.4 per hectare, the mean maximum live-weight gain from *E. curvula* was 550 kg/ha (Rodel, 1970). At Deniliquin, New South Wales, irrigated *E. curvula* yielded 4 321 kg/ha unfertilized and 12 985 kg/ha per year fertilized with 480 kg/ha N (Squires & Myers, 1970). Stocked at 53 sheep per hectare over 130 days it gave a live-weight gain of almost 3 kg/ha; but at 70 sheep per hectare a live-weight loss of almost 4 kg per animal occurred. In Oklahoma, Morpa weeping love grass showed steer gains of 1 kg per day during May and June, and 0.71 kg per day during July and August at a stocking rate of 1.5 steers per hectare during a 278-day grazing year (Pumphrey, 1978). Over a three-year period, Hereford steers showed 13 percent more live-weight gain (per animal) than those grazing the least palatable selections, and 12 percent more than those grazing common love grass, also of low palatability (Voight et al., 1970).

Value for erosion control

It is widely used in Kenya, Sri Lanka and the United States for stabilization of terraces, water discharge areas and banks of earth tanks. In Japan it has helped stabilize mountain slopes for at least three years (Endo, 1978).

Tolerance to salinity

It is very tolerant of salinity and seed germinates well under high levels of soil sodium (Ryan, Miyamoto & Stroehlein, 1975). In Western Australia, *E. curvula* (CPI14369) was moderately tolerant (Rogers & Bailey, 1963).

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