

Tropical Forages

Urochloa ruziziensis

Scientific name

Urochloa ruziziensis (R. Germ. and C.M. Evrard)
Crins



Synonyms

Basionym: *Brachiaria ruziziensis* R. Germ. and C.M. Evrard

Family/tribe

Family: *Poaceae* (alt. *Gramineae*) subfamily:
Panicoideae tribe: *Panicaceae* subtribe: *Melinidinae*.

Morphological description

A tufted, spreading perennial grass forming a dense leafy cover. Culms decumbent, geniculately ascending, 50–100 cm long, 3–4 mm diameter, arising from short rhizomes, sometimes rooting from lower nodes; fertile culms to 1.5 m high. Leaf sheath longer than internode, loose, covered with dense tuberculate hairs; ligule a fringe of hairs; leaf-blades lanceolate to oblong lanceolate, contracted at base, tapering to an acute apex, 10–25 cm long, (6–) 11–15 mm wide, upper and lower surfaces densely villose with erect hairs, margins cartilaginous and slightly scabrous. Inflorescence a panicle comprising (3–) 5–7 (–9) racemes, 5–10 cm long borne along one side of a central axis (rachis) 4–12 cm long; rachis, broadly winged, foliaceous, triquetrous, 2–3.5 mm wide, ciliate on margins. Spikelets elliptic, cuspidate, 4–5 mm long, falling entire; glumes dissimilar, reaching apex of florets, thinner than fertile lemma; lower glume oblate, apex obtuse or acute, clasping; 0.33–0.5 length of spikelet, membranous, without keels, 11–13-veined; upper glume oblong, length of spikelet, membranous, without keels, 7-veined, surface pilose, hairy above, apex acute. 170,000–270,000 per kg.

Similar species

U. ruziziensis: culms decumbent, stoloniferous forming a denser cover; racemes (3–) 5–7 (–9), 5–10 cm long; rachis 4–12 cm long, broadly winged, foliaceous, with rounded midrib, 2–3.5 mm wide; spikelets cuspidate, 4–5 mm long, packed in two rows along rachis; lower glume oblate, 11–13 -veined, apex obtuse; upper glume oblong, membranous, 7-veined, surface pilose, hairy above, apex acute.

U. brizantha: culms erect or geniculately ascending, more tufted habit; racemes (1–) 2–16, 4–20 cm long; rachis 3–20 cm long, crescentic in section, narrowly winged, 1 mm wide; spikelets subacute or acute, 4–6 mm long, packed in single row along rachis; lower glume ovate, 7–11-veined, apex obtuse or acute; upper glume oblong, cartilaginous, 7–9-veined, surface glabrous or pubescent, apex obtuse, or acute.



A tufted and spreading perennial with decumbent culms shown here with fruit trees.



Well fertilized young ruzi grass



Pubescence on leaves



Stolons with nodal plantlets



Inflorescence a panicle comprising mostly 5–7 racemes, Thailand



Seed units showing 7-veined upper glume with pilose surface and hairy acute apex



Line illustration



Tying seedheads prior to harvesting and threshing, Thailand



Dense stand prior to flowering, Thailand



Heavily in seed, Thailand

U. decumbens: culms decumbent, stoloniferous forming a denser cover; racemes 2–7, 1–5 cm long; rachis 1–8 cm long, flat, broadly winged, 1–1.7 mm wide; spikelets subacute or acute, 4–5 mm long, packed in 2 rows along rachis; lower glume ovate, 9-veined, apex obtuse or acute; upper glume oblong, membranous, 7-veined, surface pubescent, apex obtuse or acute.

Morphological differences are largely relative or numerically overlapping.



U. ruziziensis (foreground), *U. decumbens* (below)



Well-grazed ruzi grass with taller patches of *U. decumbens*

Common names

Africa: nyasi Congo (Swahili); itonto (Mosso region, Burundi); ndundwa (Ruzizi plains), lughutaghuta (Kinande, DRC)

Asia: rumput ruzi (Indonesia); □□□□ ruji gurasu (Japan); หญ้ารูซี่ yaa roo see (ya roo si), หญ้าซูซี่ yaa susi (Central Thailand), หญ้าคองโก yaa congo (Thailand); cỏ ruzi (Vietnam)

English: bongo grass, Chinese cabbage, Congo grass, Congo signal grass, Kennedy ruzi, Kennedy ruzigrass, palisade liverseed grass, prostrate signal grass, ruzi, ruzigrass, ruzi grass

European: herbe à Bengali, chiendent de la plaine de la rivière Ruzizi, chiendent du Zaïre (French); niederliegendes Palisadengras (German)

Latin America: braquiária-de-ruzizi, Braquiária-ruziziensis, capim Congo, capim-ruziziensis (Brazil); Congo señal, gambutera (also applied to other *Urochloa* spp.), Kenia, pasto Congo, pasto ruzi (Spanish)

Distribution

Native:

Africa: Burundi, Democratic Republic of the Congo, Rwanda

Cultivated/naturalized:

Asia: Indonesia, Thailand, Vietnam

Australasia: Australia

Caribbean: Puerto Rico

Central America: Guatemala

South America: Argentina, Brazil

Uses/applications

Forage

Permanent or semi-permanent pasture for grazing or for cutting for green feed and conservation. Sufficiently shade tolerant to be planted for grazing under coconut.

Environment

Ground cover in coffee.

Ecology

Soil requirements

U. ruziziensis can be grown on a range of soils providing they are well-drained and of moderate to high fertility. It is less tolerant of strongly acid conditions than *U. brizantha* and *U. decumbens*, and is best adapted to soils with pH between 5.0 and 7.0. There is some variation among genotypes in tolerance of high aluminum saturation on the exchange complex.

Moisture

Average annual rainfall in the Ruzizi Plain for which *U. ruziziensis* was named is around 975 mm, over 4 seasons: the long dry season (June–August), the short wet season (September–November), the short dry season (December–January), and the long wet season (February–May). It has proven well-adapted to conditions in N Thailand where the annual rainfall average is 1,000 mm, with a wet season from May to October and a distinct dry season from November to April. It has also grown well in parts of the humid tropics with annual rainfall of 3,000–3,500 mm. In general, it can perennate in areas with a dry season up to 4 months, and behave as a regenerating annual under extended dry conditions. It has poor tolerance of flooding, and does not persist on poorly-drained soils.

Temperature

The altitude of its area of origin in the Lake Edward and Lake Kivu districts of Rwanda, Burundi and the Ruzizi plains in DRC ranges from 750 to 1,500 m asl at latitude about 3° S. Average annual temperature is about 24 °C. While *U. ruziziensis* is best adapted to the warm lowland tropics, it has been grown successfully up to 2,000 m asl. Optimum growth occurs at 33/28 °C day/night, and it exhibits little growth below a night temperature of 19 °C. It is killed by heavy frost and regrowth is very slow after light frosts.

Light

Ruzi has moderate shade tolerance and is grown under coconut plantations.

Reproductive development

While *U. ruziziensis* exhibits a quantitative short day flowering response, there is considerable variation in flowering time among genotypes within the species, from late summer to mid-autumn in southern Brazil (Campo Grande, Mato Grosso do Sul, 20.5° S). Ruzi grass flowers in mid-autumn in northern Australia (South Johnstone, Queensland, 17.5° S) and October to November, with peak flowering near the end of October in N Thailand (Chiang Mai, 18.8° N). Unlike *U. decumbens*, an apomict, both diploid and tetraploid forms of *U. ruziziensis* reproduce sexually.

Defoliation

It can stand moderately heavy grazing and requires high levels of fertilizing to persist under frequent cutting.

Fire

Ruzi is sensitive to fire, and recovery after fire is slow.

Agronomy

Guidelines for establishment and management of sown forages.

Establishment

Ruzi grass seed needs to be stored for at least 6 months after harvest to overcome dormancy, but quality deteriorates if seed is kept too long at high temperatures and high humidity. Seed can be treated with concentrated sulfuric acid for 15 minutes to break dormancy, but this poses dangers to the operator and to the seed if left too long in the acid or not washed thoroughly after treatment. Seed is normally sown at 2.5–10 kg/ha (depending on seed quality) onto a well-prepared seedbed and lightly covered, no deeper than 2 cm. Seedlings grow vigorously. Ruzi grass can also be established vegetatively using stem cuttings with rooting nodes.

Fertilizer

Ruzi demands high soil fertility. Nutrient deficiencies, primarily P and K, should be corrected prior to planting, adequate maintenance fertilizer, particularly N, should be used to maintain productivity under grazing or cutting.

Compatibility (with other species)

While ruzi grass forms a dense cover and competes with weeds under light grazing, the sward opens under heavier grazing, allowing broad-leaf weeds to establish. It will combine with a range of twining, erect and shrub legumes.

Companion species

Grasses: not normally sown with other grasses.

Legumes: *Centrosema molle*, *Desmodium intortum*, *Desmodium uncinatum*, *Leucaena leucocephala*, *Stylosanthes guianensis* var. *guianensis*.

Pests and diseases

Ruzi is severely attacked by spittlebug (*Aeneolamia*, *Deois*, *Mahanarva*, *Zulia* spp.; Hemiptera: Cercopidae) in tropical America. Nymphs and adults damage the host plant by sucking its sap and injecting a toxin, that initiates yellowing and death of the forage, making it unpalatable for cattle. Leaf is attacked by foliar blight (*Rhizoctonia solani*) in tropical America. Seed heads are attacked by an ergot fungus (*Sphacelia/Claviceps*) in DRC.

Ability to spread

Ruzi spreads relatively slowly in existing vegetation by stolons and seed drop. Spread is more rapid where a clean seedbed is provided and soil fertility is sufficiently high.

Weed potential

Unlikely to become a weed of importance due to its relatively slow spread and high fertility requirements, but has potential to become a minor weed.

Feeding value

Nutritive value

Good nutritive value, better than most other *Urochloa* spp. with CP commonly 7–13%, and up to 20%, and digestibility 55–75%. For ruzi grass hay cut 45 days after seeding in northeast Thailand, the IVDMD, crude fibre, NDF and ME concentrations were 61%, 80.5%, 72.8% and 7.9 MJ/kg, respectively.

Palatability/acceptability

Very palatable. Selective, heavy grazing pressure and the need for high soil fertility can result in the loss of ruzi grass.

Toxicity

Photosensitization may occur and some references suggest that ruzi grass should not be fed to sheep, goats or young cattle.

Feedipedia link

<https://www.feedipedia.org/node/484> (Forage)

Production potential

Dry matter

Less productive than *U. decumbens* in Australia and South America although yields have exceeded 20 t/ha/year with high rates of nitrogen. In Sri Lanka, DM yields of 16.8, 22.0 and 25.6 t/ha/year were achieved with N applications of 112, 224 and 366 kg/ha, respectively. On an oxisol at Coronel Pacheco, Brazil, ruzi grass produced 6.0 t/ha DM without added fertilizer and 12.0 t/ha with 150 kg/ha N fertilizer.

Animal production

Liveweight gains have exceeded 1,000 kg/ha/year on pastures of ruzi with legumes, and over 1,500 kg/ha/yr with 200 kg/ha N fertilizer. Steers grazing *B. ruziziensis* on Brazilian savannas at 2 head/ha gained 285 kg/ha/year.

Genetics/breeding

U. ruziziensis has both diploid ($2n = 2x = 18$) and tetraploid ($2n = 4x = 36$) forms, both reproducing sexually with a high degree of cross-pollination within a ploidy level under conditions of natural open-pollination. Breeding programs have employed the ability of a tetraploid form of *U. ruziziensis* as the female parent to confer sexual reproduction ability to interspecific *Urochloa* hybrids involving the tetraploid, apomictic *U. decumbens*/*U. brizantha* complex (see fact sheet on *Urochloa* hybrids). The crossability between *U. ruziziensis* and *U. decumbens* is better than between *U. ruziziensis* and *U. brizantha*, and the hybrid seedlings obtained in crosses with *U. brizantha* are more frequently lethal.

Seed production

Seed production is excellent. Ruzi exhibits a prolonged flowering period with uneven ripening of seed on individual inflorescences and quick shedding of seed when ripe, explaining why machine harvest yields are of the order of 125–200 kg/ha pure seed, and labour-intensive hand harvesting and ground sweeping yields are much higher, 400–600 (–1,000) kg/ha seed. In Thailand, hand-harvested seed heads are stacked about 1 m deep and allowed to sweat for about 3 days, the heads being turned daily to facilitate separation of seed from the head and to prevent overheating. Alternatively, the “living sheath” method is used, where heads are tied together in groups and effectively sweated in the field for 1–2 weeks before harvest. The grouped seed heads are shaken into a large net every 2–3 days until all seed is collected. Freshly harvested seed has a high percentage of dormancy (<20% germination). Primary dormancy is physiological, whilst long-term dormancy is mechanical, caused by a restriction of the seed coat. Dormancy may be broken by 6–9 months storage or by acid scarification.

Herbicide effects

U. ruziziensis can be controlled effectively with glyphosate (720 g/ha a.i.) or nicosulfuron (60 g/ha a.i.). It is more susceptible to these and other herbicides than are *U. decumbens* and *U. brizantha*.

Strengths

- Palatable and good quality.
- High seed yields.
- Rapid establishment from seed or cuttings.

Limitations

- Needs fertile, well drained soil.
- Lower DM production compared with *U. decumbens*.
- Poor persistence on infertile and/or poorly drained soils.
- Poor dry season growth.
- Very susceptible to spittlebug.

Internet links

[https://uses.plantnet-project.org/en/Brachiaria_ruzizensis_\(PROSEA\)](https://uses.plantnet-project.org/en/Brachiaria_ruzizensis_(PROSEA))

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Cultivars

'Kennedy' Released in Australia (1966); 'Ruzi' as common name. Introduced to Thailand (1968) (CPI 30623, CIAT 605, BRA 000281, ILCA 16692). Origin unknown. Original seed obtained from la Station Agronomique du Lac Alaotra, Madagascar in 1961. Selected on the wet tropical coast of Queensland on the basis of high yields of palatable forage and ease of seed production. *U. decumbens* cv. Basilisk was released in the same year and was more widely accepted by farmers on the basis of broader adaptation, higher yields and better persistence. Seed holds better in the head of *U. ruzizensis* than *U. decumbens*. 'Ruzi' became more widely used than 'Basilisk' in northeast Thailand by virtue of the high seed yields obtainable.

Promising accessions

None reported.

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