Hemarthria altissima

**Scientific name**

*Hemarthria altissima* (Poir.) Stapf & C.E. Hubb.

**Synonyms**

*Hemarthria fasciculata* (Lam.) Kunth

*Hemarthria compressa* (L.f.) R.Br. subsp. *altissima* (Poir.) Maire

*Manisuris altissima* (Poir.) Hitchc.

*Rottboellia altissima* Poir.

**Family/tribe**


**Common names**

batavian quick grass, halt grass, limpo grass, red quick, red swamp grass, snake grass, swamp couch, Red vlei grass, rooikweek, perdegras (southern Africa); limpo grass (Florida); halt grass (Panama); capim gamalote (Brazil); pasto clavel, gramilla canita (Argentina); baksha, panisharu (India).

**Morphological description**

Perennial with short rhizomes and long spreading stolons, decumbent at first, but ascending to 30-80 (-150) cm. Leaves green, developing red colouration mostly on tips and sheaths, largely glabrous except for fringe on sheath of some genotypes; blades linear or linear lanceolate, 5-15 (-20) cm long and 6 mm wide, usually folded. Inflorescence comprising single spike, or a panicle of several spikes arising inconspicuously from axils of upper leaves; spikes 5-12 cm long, ovate-keeled in section (1.5 x 3 mm), tapering toward the apex; spikelets 5-8 mm long, in pairs, one sessile and hermaphrodite, the other pedicellate and male.

**Distribution**

Native to:

- **Southern Europe**: Greece (incl. Crete), Italy (incl. Sicily), Spain (incl. Balearic Islands).
- **Africa**: Algeria, Botswana, Canary Islands, Chad, Egypt, Ethiopia, Lesotho, Malawi, Mali, Mozambique, Nigeria, Senegal, South Africa, Swaziland, Tanzania, Tunisia, Zambia, Zimbabwe.
- **Indian Ocean**: Madagascar, Mauritius, Reunion.
- **Western Asia**: Georgia, Lebanon, Saudi Arabia, Turkey.
- **Southern Asia**: India (Tamil Nadu).

**South-east Asia**: Indonesia (Kalimantan), southern Myanmar, northern Thailand, southern Vietnam.

Occurs in wet situations along river banks, seasonally flooded areas and seasonal swamps.

**Uses/applications**

Primarily used for grazing but has been used successfully for hay and silage. "Stockpiled" or used as winter standover in southern Florida. Not well suited to cut-and-carry.

**Ecology**

**Soil requirements**

Grows in soils of any texture, providing moisture is adequate. It tolerates acid soils down to pH 4.5, but is best between 5.5 and 6.5.

**Moisture**

Found in flooded areas, swamps and lakes, vleis. It can withstand short, seasonal dry periods, but does not tolerate long droughts.

**Temperature**

Occurs over a wide latitudinal range from about 40ºN to 34ºS, and from near sea level to 2,000 m asl. This equates to a range in average annual temperature from 16-27ºC. For the types assessed, the optimum temperature for growth is 31-35ºC, with growth declining rapidly above 38ºC. Tops are killed by moderate frost (temperatures down to -10ºC), but plants regrow with the onset of warm, moist conditions. Heavy frosts (-13ºC) can kill some plants, with some differences among cultivars in winter-hardiness. Some genotypes can survive temperatures as low as -18ºC. 'Floralta' is slightly less winter-hardy than 'Redalta', but equal to or more winter hardy than 'Greenalta' and 'Bigalta'.

**Light**

No information available.

**Reproductive development**

Flowers October to June in the southern hemisphere, but sets very little seed.
Defoliation

The main advantage of this species over many other tropical grasses is superior early and late season growth. To capitalise on this advantage, it is usually mowed off and fertilised with up to 100 kg/ha N. The pasture is then destocked and allowed to accumulate for 3-4 weeks, giving a good yield of moderate quality feed. For best results, the grass is normally maintained between a 15 cm stubble and 30-45 cm regrowth (never above 60 cm). During the dormant period, all tops can be grazed or cut off. Excessive growth leads to not only quality loss, but also trampling losses and insect build-up. *H. altissima*, by virtue of its stoloniferous and rhizomatous growth habit, is tolerant of heavy grazing although persistence under such management varies among cultivars, e.g. *Floralta* is more grazing-tolerant than *Bigalta*.

Fire

It does not tolerate burning.

Agronomy

Guidelines for the establishment and management of sown pastures.

Establishment

Seed is not commercially available due to generally poor seed-set. It is therefore propagated by cuttings planted into wet soil, early in the season if unfrosted planting material is available, or in late summer having allowed a build-up of planting material during the peak season. It appears more successful establishment results if the cutting nursery is fertilised with nitrogen 2-3 weeks before harvest. Freshly mowed stems and stolons of two- to three-month old grass are spread over a well-prepared seedbed, partially covered with a disk harrow and rolled to compact the soil around the cuttings. Planting rates of 1 t/ha vegetative material are recommended on "clean" ground or 1.5-2 t/ha if weeds or other grass are likely to compete. Livestock should be withheld until the grass is established, even cutting and conserving the initial growth flush to ensure establishing plants are not pulled out. When the grass reaches 10 cm or more high, susceptible weeds can be controlled with dicamba. Broadleaf herbicides should not be used for weed control if legumes are planted with the grass.

Fertiliser

Establishment fertilizer should be low in nitrogen to encourage root development without promoting excess weed growth. If cuttings have been harvested from fertilised ground, it is best to apply nitrogen and any other nutrients, particularly phosphorus and potassium, once the cuttings have started to grow. In Florida, an establishment dressing of 35 kg N, 10 kg P and 20 kg/ha K is recommended, with a follow-up dressing of about 75 kg/ha N 7 weeks later. Once the grass becomes well rooted, nitrogen should be applied to stimulate forage growth.

For grazed established stands, maintenance dressings of 50-100 kg/ha N (and 40-60 kg/ha each of P and K if required) can be applied at the beginning of the season, with a similar N dressing later in the season. For conserved stands, where nutrient is removed from paddocks, similar N rates are used, but higher rates of P and K may be necessary.

Compatibility (with other species)

Companion species

Grasses: Normally not planted with other grasses. Grows in similar environment to *Acroceras macrum*.
Legumes: *Aeschynomene americana*, *Lotus uliginosus* (*pedunculatus*), *Vigna parkeri*, *Trifolium repens*.

Pests and diseases

No major foliar diseases have been identified. Although tolerant genotypes exist, ‘Floralta’, ‘Bigalta’ and ‘Redalta’ are susceptible to attack by sting nematodes (*Belonolaimus longicaudatus*).

No major insect problems have been observed. The yellow sugar-cane aphid (*Sipha flava*) attacks some accessions, but other accessions exhibit a degree of resistance. ‘Floralta’ and ‘Greenalta’, although susceptible, are less so than *Digitaria eriantha* cv. *Pangola*. The armyworm complex (*Laphigma* spp., *Spodoptera* spp. and *Mosis* spp.) can cause severe damage in isolated circumstances, but no more so than on most other tropical grasses. Isolated cases of damage from spittlebugs (*Prosapia bicincta*) and chinchbugs (*Blissus* spp.) have been reported. Spittlebugs may be more of a problem if the grass is not grazed and is allowed to accumulate throughout the summer.

Ability to spread

*H. altissima* spreads rapidly by creeping rhizomes and culms cum stolons. ‘Bigalta’ spreads more rapidly than ‘Floralta’ or ‘Redalta’, but ‘Floralta’ provides better ground cover than the other two.

Weed potential

Due to poor seed set and limited adaptational range, *H. altissima* poses little or no weed threat. However, as a precaution, it should be kept isolated from wetlands.

Feeding value
Nutritive value

Organic matter digestibility of young grass may be as high as 70% but drops to as low as 40% in mature grass. Some data suggest that digestibility of tetraploids may be higher than that of diploids. CP levels in grass less than 6 weeks old is usually >7%, but in 3-4 month regrowth, levels may be as low as 3%. Although crude protein levels are relatively low, OM digestibility and intake tend to remain higher than many other warm season grasses at a similar stage of growth. Protein supplementation using concentrates or legume is usually necessary.

Palatability/acceptability

Palatability varies with genotype. It is highly palatable and is valued as a fodder grass. ‘Floralta’ and ‘Bigalta’ are both more palatable than ‘Redalta’ and ‘Greenalta’, and ‘Bigalta’ is more palatable than ‘Floralta’.

Toxicity

No record of toxicity.

Production potential

Dry matter

Dry-matter yields can be increased by increasing harvest interval and nitrogen fertilisation. Application of 125 kg/ha N can increase yields from 10.5 to 17.5 t/ha DM, and at 480 kg/ha N, to nearly 30 t/ha DM. ‘Floralta’ is higher yielding than ‘Bigalta’ or ‘Redalta’.

Animal production

Can carry 3-6 beasts (300-400 kg)/ha gaining an average of 0.55 kg/head/day during the growing season.

Genetics/breeding

The basic chromosome number of *H. altissima* is 9 or 10. Diploids (*2n* = 18 or 20) and tetraploids (*2n* = 36 or 40) have been identified.

Seed production

It is not a good seed producer.

Herbicide effects

*H. altissima* is tolerant of pre-emergence applications of atrazine. Control of broadleaf weeds is best done with dicamba since the grass is somewhat susceptible to 2,4-D. Annual grasses may be controlled by post-planting applications of atrazine, simazine, ethofumesate and metolachlor. *H. altissima* can be controlled using paraquat, glyphosate or fluazifop-butyl.

Strengths

- Adapted to wet soil.
- Productive when well fertilised.
- Good early and late season production.
- High digestibility.

Limitations

- Intolerant of very heavy grazing.
- Must be planted vegetatively.
- Crude protein levels tend to be low.
- Not well adapted to well-drained soils.
- Difficult to cure for hay at advanced stages of growth.

Other comments

Evidence of allelopathic properties.

Selected references


Internet links

http://rcrec-ona.ifas.ufl.edu/cirs-312.html
http://www.animal.ufl.edu/extension/beef/documents/SHORT93/QUSNBERY.PDF

Cultivars

<table>
<thead>
<tr>
<th>Cultivars</th>
<th>Country/date</th>
<th>Details</th>
</tr>
</thead>
</table>
Inflorescence and seedhead (does not commonly produce seed).

Promising accessions

<table>
<thead>
<tr>
<th>Promising accessions</th>
<th>Country</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>None reported.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

'Bigalta' (PI 299995)
Florida, USA (1978)
From Limpopo Province, South Africa. A tetraploid ($2n = 36$) with fewer but broader leaves, and larger stems, than 'Redalta' and 'Greenalta' - similar in appearance to 'Floralta', but with less intense purple coloration under cool temperature stress or fertility deficiency. Less cold tolerance than 'Redalta' and 'Greenalta', with poorest early season growth. Intolerant of heavy grazing.

'Floralta' (PI 364888, PI 508285)
Florida, USA (1987)
From the Luvuvhu River in Kruger NP, South Africa (22.38ºS, 270 m asl, rainfall 400 mm). A tetraploid ($2n = 36$) morphologically similar to 'Bigalta' with larger stems and wider leaves than the diploid 'Redalta' and 'Greenalta', selected for persistence under grazing. More intense purple colouration under cool temperature stress or fertility deficiency than 'Bigalta', but generally does not show the intense red pigmentation that 'Redalta' shows under similar environmental conditions. Some difference in winter hardiness from other cultivars (see Temperature). Superior dry matter yield to other cultivars, and better IVOMD than 'Redalta' or 'Greenalta'. Used for grazing and hay production on poorly drained soils.

'Greenalta' (PI 299994)
Florida, USA (1978)
From the Pienaars River, North-West Province, South Africa (estimated 25.1ºS, 1,000 m asl, rainfall 700 mm). A diploid ($2n = 18$). Retains medium dark green colour at maturity, even under stress conditions. Similar plant form to that of 'Redalta', except leaves are slightly wider.

'Redalta' (PI 299993)
Florida, USA (1978)
Probably from Limpopo Province, South Africa. A diploid ($2n = 18$). Distinguished from other cultivars by characteristic red colour in mature growth or under stress conditions, and usually finer stems and narrower leaves. The most cold tolerant of the cultivars, having survived down to -18ºC.