

Puccinellia

Scientific name(s)

Puccinellia ciliata

Strengths

- Excellent salinity and waterlogging tolerance.
- Tolerates saline soils better than tall wheatgrass.

Limitations

- Does not survive on non-saline soils
- Does not survive in areas where the soil surface remains wet over summer.

Plant description

Plant: A free-seeding, sprawling, tufted, perennial grass to over 50 cm high and 15 cm across the base. Grows in autumn, winter and spring, and dormant in summer.

Stems: 3-4 joints (nodes), green or reddish at maturity, 15 - 60 cm long, spreading or prostrate in open situation, erect in sward.

Leaves: Greyish green, hairless, with blades to 35 cm long, and 1 - 4 mm wide, largely arising from the base of the plant, but also scattered along the stems.

Seedhead: An open, branching pyramidal seedhead (panicle), to about 30 - 40 cm long and 20 cm wide, the branches bare for up to half their length and "raspy" to touch; green to purple to golden in colour.

Seeds: Very small, straw-coloured tinged with purple (2 - 2.5 mm long), comprising husk and grain (caryopsis) - 5 million/kg. The caryopsis is ellipsoidal, 1.25-1.50 mm in length, greenish amber; 6.6 million per kg.

Pasture type and use

A winter-active grass used solely in saline environments that are typically winter waterlogged. Grows in autumn, winter and spring.

Where it grows

Rainfall

Adapted to mediterranean and temperate climates. Requires at least 350 mm annual rainfall, but having wet, poorly drained soils over winter is more important than rainfall.

Soils

Puccinellia is the most salt tolerant of all the commercially available grasses and will grow in very high soil salinities without significant loss in production. It actually requires moderate to high levels of salinity for survival, and although precise limits have not been established, they are likely to be about 6-8 up to 40 dS/m (ECe summer levels). It is a useful species to establish on badly scalded saline land, where ECe > 20 dS/m. Also appears to require periods of winter waterlogging and possibly inundation for persistence. It survives on summer-dry salt pans with surface incrustations of crystalline salt, provided there is some subsurface moisture. While it appears to prefer neutral-alkaline soils, it has been grown successfully on soils with a pH (CaCl₂) as low as 5.5. It is suited to areas commonly colonised by sea barley grass.

Temperature

Suited to the agricultural areas of South Australia, Western Australia, Victoria, Tasmania and New South Wales.

Establishment

Companion species

Sown alone in highly saline environments, but will grow with some species in less saline soils.

Grasses: tall wheat grass

Legumes: burr medic, balansa clover

Sowing/planting rates as single species

A 4 - 10 kg/ha. Higher rates used on more saline areas. Level of seed viability should be determined prior to sowing.

Sowing/planting rates in mixtures

Normally 2-5 kg/ha. Seed viability should be determined prior to sowing.

Sowing time

Sow in autumn and early winter into moist soil when salts have been flushed from the soil surface. Good weed control is essential due to its slow early growth. Shallow sowing is required because of its small seed size.

Inoculation

Not applicable.

Fertiliser

The fertiliser requirements of puccinellia in the establishment year are uncertain.

Management

Maintenance fertiliser

Nitrogen applications (in the absence of a legume) significantly enhance growth. One recommendation is to apply 25 kg/ha nitrogen (50 kg/ha urea) soon after the seasonal break. This strategy is considered sound providing the area does not become waterlogged within 4 weeks of applying urea. If there is a high risk of flooding, spring applications of half the above rate of urea can be beneficial. The economics of applying nitrogen need to be considered carefully. Economic analysis suggests that nitrogen should be used strategically (to fill critical feed gaps) rather than routinely. Evidence indicates that pastures will benefit most from nitrogen applications if soil phosphorus levels are maintained above 12 mg/kg. (Colwell P).

Grazing/cutting

Developing stands of puccinellia are susceptible to grazing and should not be grazed at all in the establishment year, and only lightly grazed the following year. However in established stands, the growing points are embedded in the crown, allowing good recovery from grazing. Established stands in SA persisted under hard continuous grazing for three years.

Seed production

Commercial seed is often difficult to procure. However, seed can be produced on-farm. Puccinellia flowers from September to November, and the seed, which ripens by December, can be harvested during summer with little risk of shedding. Yields of 100 kg/ha or more are common from good, well fertilised stands. A closed front or comb type harvester is best. Forage harvesters and toppers can be adapted to give a rough sample. Conventional cereal harvesters can also be used.

Ability to spread

Can colonise saline areas, spreading either through crown growth or by seedling recruitment.

Weed potential

Weed risk assessments show that puccinellia poses negligible risk of invading native vegetation. However, if there is any concern regarding weediness, it is recommended that sowing should allow buffer zones near 'at risk' areas e.g.:

- 100 metres from saline areas
- 50 metres from poorly drained areas
- 50 metres from waterways
- 25 metres from other non-agricultural areas, eg. Road reserves, public land

Major pests

Susceptible to redlegged earth mite at establishment.

Major diseases

None noted.

Herbicide susceptibility

Unknown.

Animal production

Feeding value

Excellent as green feed, but crude protein (CP) and digestibility fall to levels barely adequate for maintaining liveweight as plants mature (e.g. less than 5% CP, and 50% digestibility). Supplementary feeding may be required in late summer. Puccinellia produces fine seeds which do not cause hide damage.

Palatability

Very palatable, even when mature.

Production potential

Significantly enhances the productivity of saline land. Well established stands with adequate nitrogen inputs (achieved either through the inclusion of a legume or through nitrogen application) are capable of stocking rates of up to 8 dse/ha in 465 mm rainfall environments. Carrying capacities of 5 dse/ha are typical of pastures in 465 mm rainfall environments without nitrogen.

Livestock disorders/toxicity

None noted.

Cultivars

Cultivar	Seed source/Information
Menemen	Australian Herbage Plant Cultivars
Restora	Pasture species database - University of Melbourne

Further information

Victoria Department of Primary Industries - Pastures for discharge areas AG0386
Western Australia Department of Food & Agriculture - Farmnote 1/99 Puccinellia: for productive saltland pastures
NSW Department of Primary Industries - Puccinellia Agnote DPI-288

Acknowledgements

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July 2007