



A collaboration between AWI, GRDC, MLA, RIRDC and Dairy Australia

## Biserrula

### Scientific name(s)

*Biserrula pelecinus*

### Strengths

- Palatable and nutritious.
- Adapted to a wide range of acid and alkaline soil types.
- Tolerant of low soil fertility.
- Deep root system capable of extracting water and nutrients from depth.
- Tolerant of heavy grazing.
- Low bloat risk.
- Suppresses herbicide resistant weeds such as annual ryegrass and radish in cropping systems.
- Seed spread by livestock.
- High hard seed levels (>99%) protect against false breaks and assist long-term persistence.
- Few insect or disease problems.
- Ideal species for ley farming systems (1:1 rotation)
- Suitable for growing under trees or vines

### Limitations

- Not suited to heavy textured soils
- Not suited to areas prone to prolonged waterlogging.
- Few suitable herbicides for broadleaf weed control.
- More susceptible to aphids than is serradella.
- May cause photosensitisation in sheep.

### Plant description

**Plant:** Leafy, low growing, herbaceous plant growing to about 40cm tall, and with a deep root system.

**Leaves:** Feathery (pinnate), up to 12 cm long, comprising 10 - 20 pairs of elliptic leaflets up to 10 mm long and 5 mm wide, covered in fine hairs.

**Flowers:** Small, blue-purple, in groups of 3 to 5.

**Pods:** 2 - 4 cm long, broad flat with deeply serrated margins. Each pod contains 15 - 20 seeds.

**Seeds:** small, yellowish, heart-shaped; about 750,000 seeds/kg.

### Pasture type and use

It can be used as a longer term pasture in mixtures with perennial or annual grasses, or as a pasture lasting 1 - 5 years as part of a phased pasture crop rotation. It will regenerate from seed after a short cropping period of 1 - 3 years.

### Where it grows

#### Rainfall

Biserrula is best suited to regions with 300 - 700 mm annual rainfall with a predominantly autumn-winter-spring distribution and relatively little summer rain. Annual rainfall requirements increase as the proportion of summer rainfall increases.

## Soils

It is adapted to well-drained fine textured soils (including sandy loams and clay loams) of acidic (as low as pH (Ca) 4.0) and alkaline reactions. It does not tolerate any waterlogging.

## Temperature

Moderately frost tolerance.

## Establishment

### Companion species

Grasses: Italian ryegrass, consol lovegrass and Premier digit grass

Legumes: sub clover and serradella, gland clover, rose clover

### Sowing/planting rates as single species

Sow at 7 kg/ha. It is very important to sow biserrula less than 2 cm to obtain an optimal establishment.

### Sowing/planting rates in mixtures

Sow at 1-5 kg/ha, depending on the mixture of pasture legume options available.

### Sowing time

Sow biserrula as close to the break of season in autumn as possible.

### Inoculation

Seed must be inoculated with its unique inoculant, 'Biserrula Special'.

### Fertiliser

Sow with 100 to 150 kg/ha superphosphate, or super/potash if on sandy soils

## Management

### Maintenance fertiliser

Phosphorus and sulphur should be applied as required, and potash (50kg/ha) in late winter if the paddock is set for seed production.

### Grazing/cutting

Under heavy winter grazing, biserrula adopts a prostrate growth habit, which protects it from overgrazing. Experience has shown biserrula to be as tolerant as subterranean clover to heavy grazing. It does not need to be managed as carefully for seed set and dispersal as annual medics during summer grazing. Cropping after the first year can help breakdown of hard seed.

### Seed production

It is a prolific seed producer. Harvesting seed with a grain harvester is possible, but major modifications to the drum are required. Biserrula is generally successfully harvested with specialist suction harvesting equipment, with seed yields ranging from 300 kg to 1, 500 kg/ha, but mostly of the order of 600 to 800 kg/ha.

### Ability to spread

Many seeds of biserrula survive digestion by sheep and can be easily spread around paddocks.

### Weed potential

There are no reported cases of biserrula spreading into native vegetation. The specific rhizobium requirement of biserrula generally confines it to sown paddocks. Biserrula is susceptible to most common broadleaf herbicides used in crops.

### Major pests

Red-legged earth mites should be controlled until plants have three true leaves. Blue-green and cowpea aphid should be controlled in seed crops if present in large numbers. Biserrula is

not affected by lucerne flea.

### Major diseases

Very few problems yet observed.

### Herbicide susceptibility

There are no registered herbicides for broad-leaf weed control in biserrula. Studies have shown particular sensitivity to Broadstrike® (Flumetsulam), Spinnaker® (Imazethapyr), Raptor® (Imazamox) and MCPA (Dimethylamine salt), so good weed control before sowing is crucial for the successful establishment of biserrula. Grass weeds can usually be controlled with a selective herbicide. Spraytopping with either glyphosate or paraquat can decrease seed production by up to 85% in biserrula and is not recommended in the first year of establishment.

## Animal production

### Feeding value

Biserrula produces high quality forage. Digestibility ranges from 76% in early spring to 62% in early summer. Metabolisable energy ranges from 10.7 to 8.8 over the same period. Crude protein levels in the vegetative stage are typically around 25% but levels as high as 35% have been recorded.

### Palatability

Moderately palatable during winter, less so in spring and highly palatable when herbage dries off. At flowering/early pod fill stage, the plant generally is less palatable and sheep avoid biserrula and preferentially graze the non-legume components of the pasture, rapidly leading to legume dominance.

### Production potential

Spring herbage yields of biserrula in Western Australia can be as high as 11 t/ha, which compares favourably with French serradella, yellow serradella and subterranean clover. It can provide green feed for an extra 2 to 4 weeks more than subterranean clover.

### Livestock disorders/toxicity

Photosensitisation in sheep has recently been observed in sheep grazing some biserrula pastures during spring in Western Australia, although the overall incidence was low.

Farmers should adopt a cautious approach to the management of sheep grazing biserrula, particularly when this plant makes up a high proportion of the pasture. Lambs and bare-shorn animals should not be grazed on biserrula for periods greater than two weeks. Provision of an alternative feed source such as hay may provide some benefit. Sheep should be observed regularly for the early signs of photosensitisation including swelling of the ears, eyelids and muzzle, and sheep seeking out shade. Suspect animals should be removed from the pasture as soon as any of these symptoms are seen. No other disorders have been reported.

## Cultivars

Group	Cultivar	Seed source/Information
Mid Season	Casbah	Australian Herbage Plant Cultivar
Mid-Late Season	Mauro 	Australian Herbage Plant Cultivar Seedmark/PlantTech

 Denotes that this variety is protected by Plant Breeder's Rights Australia

## Further information

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'Mauro'  was field tested by the National Annual Pasture Legume Improvement Program supported by GRDC and AWI.

### **Author and date**

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