



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

## Glycine

### Scientific name(s)

*Neonotonia wightii*

### Strengths

- Productive
- Moderately drought tolerant
- Good seed production
- Palatable
- Persistent under suitable management

### Limitations

- Restricted to near neutral, fertile soils
- Slow nodulation and establishment
- Frost-tender
- Susceptible to amnemus weevil attack

### Plant description

**Plant:** Vigorous trailing and twining, strongly taprooted perennial legume climbing to 10 m on associated species.

**Stems:** The woody main stem can reach a diameter of 25 mm at the base in older plants, while the much-branched herbaceous stems are mostly only 2-3 mm in diameter and covered with grey to reddish-brown hairs. Cultivars vary in their ability to root down along trailing stems.

**Leaves:** Comprise three leaflets mostly 5 - 10 cm long and 4.0 - 6.5 cm wide, covered in fine grey to reddish-brown hairs.

**Flowers:** Individual flowers about 5 mm long, whitish with pink-violet streaks, borne in large numbers along a central stem usually 10 - 15 cm long.

**Pods:** Brown, covered with flattened, fine brown hairs; each pod 2.5 - 4.0 cm long and 3 mm wide, containing 4 - 5 seeds.

**Seeds:** Seeds rectangular with rounded corners, 3mm long and 2mm wide, light to dark brown, about 150,000-160,000/kg.

### Pasture type and use

Grown in association with tussock grasses in permanent, semi-intensively managed pastures. It can be used to grow over and smother shrubby weeds in a pasture, and also as a high protein standover feed in frost-free areas.

### Where it grows

#### Rainfall

Glycine is mostly grown in areas with an annual rainfall above 1000 mm, and usually below 2000 mm. Although it will grow outside these zones, there are usually better adapted legumes that can be used. 'Cooper' is considered to be more drought-hardy than 'Tinaroo'.

#### Soils

It grows best on deep, fertile, freely drained, near neutral clays and clay loams, usually of

alluvial or volcanic origin i.e. largely well-structured red and black soils. It is very susceptible to molybdenum deficiency, and aluminium and manganese toxicity, all of which are more common at pH(water) less than 5.5.

### **Temperature**

Glycine is best adapted to the subtropics and upland tropics. Although plants recover after being "burnt" by frost, it is usually grown on slopes and other frost-free areas.

## **Establishment**

### **Companion species**

Grasses: Green and Gatton panics, rhodes grass, setaria and signal grass.

Legumes: Leucaena, siratro, white clover

### **Sowing/planting rates as single species**

Rarely sown as single species.

### **Sowing/planting rates in mixtures**

2 - 4kg/ha

### **Sowing time**

Seedlings are slow to establish, so sowing is best carried out when there is a high probability of follow-up moisture. In frosted areas, glycine should be sown in spring, once the probability of frost is low, to give as long a period as possible for establishment prior to onset of next frosts.

### **Inoculation**

Although seedlings may nodulate with native rhizobia, it is best to inoculate seed with Group M inoculant to ensure the most effective nitrogen fixation.

### **Fertiliser**

Glycine requires fertile soil, and deficiencies or toxicities must be corrected to achieve a productive stand. Main nutrients to consider are calcium, phosphorus, sulphur and molybdenum (Mo). On very fertile soils, no fertiliser may be required, but as a guide, a suitable establishment dressing is 400kg superphosphate/ha (which supplies the first three nutrients). If in doubt about the molybdenum status of the soil, it is advisable to apply 300 g molybdenum trioxide at sowing or 600g of sodium molybdate/ha in solution after establishment. Liming may also be necessary on acid soils to bring then pH up to about 6.

## **Management**

### **Maintenance fertiliser**

Follow-up dressings of 200 kg/ha superphosphate every 1 or 2 years, and 300 g/ha Mo every 3 years may be necessary

### **Grazing/cutting**

Glycine is relatively slow to establish, and should not be grazed too early. Under normal conditions, mixed grass/legume pastures can be grazed 7 - 8 weeks after sowing, but then only with sufficient grazing pressure to reduce the grass competition for the young legume plants. In the following season once the legume is fully established, the pasture can be rotationally grazed, leaving at least a 20 cm stubble after each grazing. It is intolerant of continuous intensive grazing. It is advisable to exclude stock towards the end of the growing season every few years to allow the legume to flower and set seed to improve the stand and assist legume persistence. Longer periods of de-stocking may be necessary for shrubby weed suppression.

### **Seed production**

Seed crops are ready to harvest when pods become dark and hard and commence shattering. They can be direct headed, or mowed and windrowed prior to threshing. Peg drum threshers are favoured to minimise the difficulties encountered with tangling vines. Commercial seed yields of about 300 kg/ha are normal.

### **Ability to spread**

Glycine spreads vegetatively by climbing over fences and associated vegetation, and by

rooting down along trailing stems. Spread by seed is common in areas where grazing during the flowering period is controlled.

### **Weed potential**

It can grow to considerable heights, and if left unchecked, will smother smaller shrubs and trees along rainforest margins.

### **Major pests**

Amnemus and rough brown weevils attack the roots of young plants, causing loss of stand, and during moist and mild conditions, webworms can severely damage foliage. Bruchid beetles can reduce yields in seed crops.

### **Major diseases**

Plants may be affected by various leaf spot fungi during wet periods, but these rarely cause any real problem.

### **Herbicide susceptibility**

Seedlings are susceptible to acifluorfen, bentazone, 2,4-D and 2,4-DB. Tolerance to 2,4-D and 2,4-DB increases with age of the plant. Older plants are susceptible to a 2% solution of triclopy amine in water with surfactant, as well as to dicamba.

## **Animal production**

### **Feeding value**

Crude protein values range to about 26% in the leaf, and 15 - 20% of the dry matter in the whole plant. Dry matter digestibility varies from about 55 - 62%, which is marginally lower than levels in lucerne.

### **Palatability**

As with many warm season legumes, glycine is not always well grazed early in the season, but if not properly managed, may be selectively grazed towards the end of the season when grasses are more mature.

### **Production potential**

Dry matter yields vary according to soil and environmental conditions, and with variety and grazing/cutting management. They generally range from about 3 - 8 t/ha DM, and rarely to 12 t/ha. Commercial dairy and beef producers continue to sow glycine, mostly in "scrub" soils above the frost, to help maintain animal production into the cooler season.

### **Livestock disorders/toxicity**

None reported.

## **Cultivars**

<b>Cultivar</b>	<b>Seed source/Information</b>
Cooper	Australian Herbage Plant Cultivars
Tinaroo	Australian Herbage Plant Cultivars

## **Further information**

Tropical Forages database (SoFT) - Glycine

## **Acknowledgements**

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## **Author and date**

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