

# FORAGE FOCUS

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## Bindoon Subterranean clover

*(Trifolium subterraneum)*

A highly productive, early to midseason subterranean clover (sub clover) replacement for Seaton Park and York. Bindoon is suited to well-drained, moderately acid (pH<sub>Ca</sub> 4.5-6.5) soils in the Southern Australian rainfall zone of 425-625mm annual rainfall and a growing season of 5-7 months.

Bindoon has been developed with a break-through trait in sub clover breeding; improved red legged earth mite (RLEM) cotyledon resistance. While not an absolute resistance, RLEM feed less and produce fewer progeny on Bindoon than on other sub clover cultivars, indicating a true resistance, rather than merely a tolerance to RLEM.

This trait represents a significant progression in sub-clover breeding and the animal production systems that depend on sub-clover regeneration.

Field trial ratings suggest that the tolerances to RLEM damage flow into spring, with mature plants having less damage than other cultivars.

In addition to the improved seedling RLEM tolerance, Bindoon suffers less damage from Lucerne Flea than other cultivars.

Bindoon's strength is its high winter production, due to its high seed production and dense seedling regeneration.

In trials, Bindoon's winter production is 53% higher than York and a 22% improvement on Seaton Park. In the same trials Bindoon's seed production was 33% more than York and 40% higher than Seaton Park and seedling regeneration densities were 69% more than York and 72% more than Seaton Park.

Bindoon also has the benefit over Seaton Park and York as it is resistant to race 1 clover scorch.

Bindoon is suited to permanent pasture and phase farming systems.

### Morphology.

Bindoon has a distinctive leaf mark consisting of a pale green crescent positioned in the centre and extending to the margins.

Leaves have a weak brownish purple anthocyanin flush extending along the midrib under cold and other growth limiting conditions. Seed colour is black.



Detailed picture of plant showing markings.

### Agronomic characteristics

#### Maturity

Bindoon flowering may vary with season and region but should be similar to York and Seaton Park and 7 days later than Urana. Bindoon is 2 weeks later than Dalkeith, 3 weeks earlier than Junee and 3-4 weeks earlier than Campeda and Coolamon.

#### Oestrogenicity.

In healthy fresh leaves, formononetin levels of Bindoon are 0.1% of dry matter. This level is similar to that of Seaton Park, York, Urana and Junee. Levels for the other two less oestrogenic isoflavones are 1.9% of dry matter for genistein and 0.7% of dry matter for biochanin-A. The low level of formononetin indicates a very low potential for Bindoon to cause clover disease.

#### Seed Characteristics

Bindoon has a similar level of hardseededness to Seaton Park. This level of hard seed makes Bindoon well suited to permanent pasture, phase farming systems and to ley farming where cropping is less than once in three years.

#### Rhizobial Inoculum

Bindoon requires Group C inoculum

### Herbicide Tolerance

Bindoon is expected to have similar tolerance to herbicides as other sub clovers.

### Disease & Pest Resistance

**Clover scorch** – resistant to race 1 (*Kabatiella caulivora*) the original and most widespread race of clover scorch.

**Redlegged earth mite resistance (RLEM)** – Bindoon has improved resistance to cotyledon damage caused by RLEM. Bindoon also seems to be less affected as mature plants than other cultivars.

**Lucerne flea** – In field trials, Bindoon suffers less damage than other cultivars. Insecticide use would still be recommended to maximise Bindoon's production.

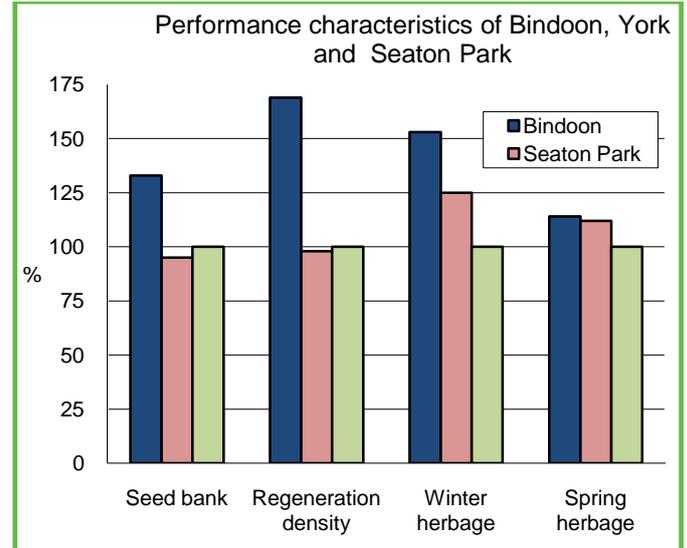
Although Bindoon has improved seedling tolerance to RLEM, in order to have an initial impact on the presence of Bindoon in the seed bank, it is suggested that seed treatment is considered when sowing seed of Bindoon in a pasture blend to improve the number of plants that establish in the first year. This will allow the rapid build-up of a seed bank of Bindoon and the subsequent generations of Bindoon to dominate the clover component of the pasture sward.

### Field Performance

**Table 1. Flowering time and hardseededness characteristics of selected mid season cultivars**

Variety	Days to first flowering		Hard Seededness <sup>4</sup>
	Perth (sown early May) <sup>1</sup>	Wagga Wagga (sown mid May)	% Hard Seed
<b>Bindoon</b>	108	125 <sup>2</sup>	24
Campeda	133	n/a	n/a
Coolamon	135	140 <sup>3</sup>	42
Junee	129	138 <sup>3</sup>	32
Seaton Park	108	125 <sup>3</sup>	25
Urana	102	123 <sup>3</sup>	54
York	110	125 <sup>3</sup>	58

<sup>1</sup>Source; P.G.H. Nichols 2010, pers. comm., 30 March. <sup>2</sup>Source B. Hackney 2010, pers. comm., 27 March. <sup>3</sup>Source; B.S. Dear and G.A. Sandral (1997). <sup>4</sup>Source; P.G.H. Nichols et al. (2007)



Mean variety performance over all trials and seasons in Western Australia, New South Wales and South Australia for winter and (expressed as a percentage of values for cv. York). Source P.G.H. Nichols et al (2007)

For more information on Bindoon please contact, Wrightson Seeds

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### References

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P.G.H. Nichols, M.J. Barbetti, G. A. Sandral, B.S. Dear, C.T. de Koning, D. L. Lloyd, P. M. Evans, A.D.Craig, and M. P. You (2007) Coolamon subterranean clover (*Trifolium subterraneum* L. Var. *Subterraneum*). *Australian Journal of Experimental Agriculture* **47** 223-225.