

# New annual legume cultivars -where do they fit?

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**Abstract.** Four new sub clover cultivars (Izmir, Urana, Coolamon, and Napier) become commercially available in 2005 and 2006 that are major improvements over the older cultivars they replace. The new cultivars have been developed by the National Annual Pasture Legume Improvement Program (NAPLIP). Other important recent releases by NAPLIP include the annual legumes Mauro biserrula and Erica and Margurita French serradella which are aerial seeding legumes that can be harvested on-farm using conventional headers to reduce seed costs.

## Izmir

This new very early maturing cultivar was selected primarily for the West Australian low rainfall wheat belt. It flowers about 100-110 days after a mid May sowing with a maturity similar to Nungarin. It has higher levels of hard seed than Nungarin and is intended to be used in rotations with wheat. The objective is for the high hard seed levels to carry over seed between crops and allow regeneration without resowing. These short-phased farming systems are not common in eastern Australia and at this stage no obvious role has been identified for this cultivar in the eastern Australian wheat belt. Nungarin and Dalkeith continue to be preferred for most low rainfall wheat belt country although Izmir may be better suited to lower rainfall wheatbelt country where frequent false breaks require higher levels of hard seed.

## Urana

This early maturing low oestrogen cultivar was released to replace the older cultivar Daliak, which although highly persistent, was unpopular because of its compact prostrate growth habit which made it appear less productive. Urana overcomes these limitations being a more erect cultivar with higher levels of hard seed to withstand false breaks. It has excellent seedling vigour in autumn with larger leaves than other cultivars in autumn. The hard seed level in autumn is about 31% which is higher than Seaton Park at 20%. Although susceptible to clover scorch disease and root rot these should not be a serious problem in areas where it is recommended for growing. It has slightly better resistance to RLEM than existing cultivars.

It is more productive than other early cultivars with herbage production averaging 14% higher

than Dalkeith. It has very good seedling vigour and grows strongly in autumn. It has no leaf markings which make it easily distinguishable from most other cultivars.

Urana is suitable for regions with a shorter growing season in the lower rainfall areas of the wheat belt or lower rainfall tableland areas that receive an average annual rainfall of between 400 and 480 mm.

There is some anecdotal evidence that Urana may be more sensitive to some broadleaf herbicides but this is yet to be confirmed experimentally.

### Coolamon

This mid season cultivar was bred as more erect and productive replacement for Junee. It produced on average 12% more autumn-winter feed and 16% more spring feed than Junee. In some environments it was up to 30% more productive than Junee. It has lower oestrogen levels than Woogenellup and Seaton Park.

It has a more erect growth habit than Junee and shows less dark pigmentation than Junee in winter.

Another advantage is an increase in resistance to race 2 clover scorch disease.

Seed production was on average 6% greater than Junee with similar levels of hard seed (24%) in autumn. Seedling density was up to 12% greater than Junee. The higher levels of hard seed are considered optimum for good regeneration while still providing adequate protection against false breaks.

Coolamon's maturity makes it suitable for the medium rainfall (450-550 mm) southern wheat-belt and for pastures on the slopes and tablelands where rainfall is insufficient for later maturing cultivars such as Goulburn or Leura.

### Napier

Napier is a very late maturing yanninicum cultivar developed to replace Larisa and Meteora which lack winter vigour. Napier produces about 5% more autumn feed and 7% more spring feed than Larisa. In late spring Napier produced 15% more feed than Larisa and 46% more than Trikkala.

It produces significantly higher seed yields than Larisa with sufficient rainfall and seedling

Table 1. Characteristics of newly released subterranean clover cultivars compared to exiting cultivars (NB: only cultivars compared in regional NAPLIP trials are included)

Cultivar	Days to flower (Wagga)	Maturity	Hard seed	Rainfall Southern NSW
Izmir	110	Very early	Very High	>360
Nungarin	110	Very early	High	>360
Dalkeith	120	Early	High	>375
Urana	125	Early	High	>400
Seaton Park LF	130	Early-mid	Moderate	>425
York	130	Early-mid	High	>425
Junee	138	Mid season	Moderate	>475
<b>Coolamon</b>	138	Mid season	Moderate	>475
Goulburn	145	Mid-Late	Low-moderate	>550
Denmark	149	Late	Low	>650
Leura	155	Late	Low	>700
<i>Yanninicum cultivars</i>				
Trikkala	122	Mid season	Low	>500
Riverina	128	Mid season	Moderate	>525
Gosse	136	Mid-late	Moderate	>600
Larisa	150	Late	Moderate	>750
<b>Napier</b>	150	Very late	High	>800 (irrig)
Meteora	158	Very late	High	>800 (irrig)

regeneration is on average 35% greater than Larisa in the 3<sup>rd</sup> year. It produces cream coloured seed and seed size is large at about 11 mg/seed. Hard seed levels are very high with about 62% hard in autumn compared to 36% in Gosse.

Napier is a low oestrogen cultivar with formononetin levels similar to Trikkala, Gosse and Riverina, but much lower than Meteora.

It is very late maturing being similar to Larisa and 2-4 weeks later than Trikkala and 10 days later than Gosse. Due to its very late maturity it is unlikely to be suited to most dryland pastures in NSW. It would require good soil moisture until late November –early December for good seed set with an annual rainfall >750-800 mm. These conditions do not occur reliably in many southern regions of NSW unless paddocks are irrigated.

### Mauro biserrula

Biserulla (*Biserrula pelecinus*) appears very similar to serradella in leaf shape but can be distinguished by its small blue flowers. Mauro biserulla produces a large seed yield which is very hard seeded (70%) at the following autumn. The high levels of hard seed ensure a good carry over of seed which is very resistant to false breaks. However unless managed properly the hardseed may inhibit good regeneration in the following year. The key to managing biserrula is to ensure residues are grazed hard over summer and to crop the paddock after the first seed set to ensure the hard seed is incorporated into the ground which aids hard seed breakdown.

Biserrula has two distinct advantages. The first is that being aerially seeding it can be readily harvested on farm using conventional headers. By harvesting their own seed farmers have a low cost source of seed for resowing. The other major advantage is that the palatability of biserrula is lower than most pasture weeds including ryegrass. Sheep will graze out most weeds before grazing the biserrula. It is therefore a valuable tool in controlling herbicide resistant weeds or in organic farming systems where herbicides cannot be used. Biserrula is more sensitive to herbicides than most other annual legumes but this is not a problem if well grazed as stock preferentially graze the weeds before the biserrula.

Some of phytosensitisation has been reported in sheep grazing pure stands of biserrula in Western

Australia but the incidence has been very low (less than 2% of pastures) and appears to be occur in paddocks with nutrient deficiencies. Biserrula is more sensitive to herbicides than most other annual legumes but this is not a problem if well grazed as stock preferentially graze the weeds in preference to the biserrula.

Biserrula sets large amounts of pod in spring and stocking rates should be set at a level that allows sufficient flowering and seed set to occur. Given its excellent spring growth stocking rates can usually be kept at moderate levels and still allow good seed set. Herbage yields of up to 9 t/ha have been reported in NSW trials.

### Erica and Margurita French serradella

French serradella (*Ornithopus sativus*) is distinguished from yellow serradella by its pink flowers. Previously Cadiz was the most widely grown French serradella cultivar but it was very soft seeded, and germinated following false breaks in late summer resulting in poor persistence. These new cultivars have higher levels of hard seed (about 50%) which protect them from out of season rainfall and have shown good persistence in low to medium rainfall (375-500 mm) areas of NSW wheat belt. Like biserulla they can be harvested on-farm using conventional headers providing a low cost source of seed for further sowing.

Erica is more prostrate in growth habit than Margurita and hence Erica is more suited to heavy grazing. Being aerial seeding the stocking rate on French serradella in spiring needs to set at a level that allows good flowering and seed set to occur. Usually the strong surge in growth in spring allows stock numbers to be maintained at reasonable levels during flowering. Areas destined to be harvested for seed should be locked up at the commencement of flowering.

The most serious pest of French serradella is native bud worm which can prevent seed set. This pest can occur periodically and swards need to be monitored during flowering and pod fill and sprayed if necessary.

### Additional notes

Minimum rainfall requirement refers to total average annual rainfall in southern NSW. Minimum rainfall requirements increase in northern NSW where there is a greater proportion of summer

rainfall and in some situations with poor water holding capacity or greater runoff.

Days to flower are averages based on a mid May sowing at Wagga. Cultivars take less days to flower when germination is delayed after mid May.

### **Plant breeders Rights**

All of the new cultivars are protected under PBR.

### **Acknowledgements**

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### **Further reading**

Dear, B.S. and Sandral, G.A (2004) Urana subterranean clover Agnote DPI 486. <http://www.agric.nsw.gov.au/reader/past-varieties>

Dear, B.S. and Hackney B. (2004). Napier subterranean clover Agnote DPI 488. <http://www.agric.nsw.gov.au/reader/past-varieties>

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