

Lentil variety evaluation

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SUMMARY

Lentils are a viable pulse option for the Southern Mallee, except in dry years on soils where high soil boron, sodicity and salinity are a problem. Digger has consistently been the highest yielding variety tested in the Mallee but the new variety Cassab offers a good alternative to growers.

Ascochyta and botrytis grey mould are major threats to the yield and quality of the Australian lentil crop. Northfield has been lower yielding than Digger in the Mallee but it is the only variety with seed resistance to Ascochyta and therefore is less prone to seed blemishing. However, Northfield is the most susceptible variety to botrytis grey mould. The new variety Cumra has good agronomic characteristics but it is more susceptible to Ascochyta than other varieties.

The area of lentils in Australia has increased from approximately 1,500 hectares in 1994 to over 75,000 hectares in 1999. The industry is based on the improved varieties Aldinga, Cobber, Digger, Matilda and Northfield released in 1993 and 1994. The lentil varieties Cumra, Cassab and Nugget released over the last two years will further increase lentil production in Australia. In the Northern Mallee and Southern Wimmera many farmers grew lentils for the first time in 1997 or 1998 when drought caused very poor lentil yields, especially on heavy soils. In 1999 yields looked promising after good winter rains but the dry spring limited lentil yields. The Mallee and Northern Wimmera have climatic and soil constraints such as lower rainfall, boron toxicity and salinity. A major aim of the Coordinated Improvement Program for Australian Lentils (CIPAL) is to release varieties for the drier areas of Australia. CIPAL has an emphasis on developing boron and salinity tolerant varieties.

METHOD

Lentil trials in the Mallee are sown at 150 viable seeds/m² to achieve a plant density of 120 plants/m². Seed was treated with fungicide, inoculated with rhizobia and sown 6cm deep, to avoid herbicide damage. Post-sowing pre-emergent herbicides were used for broadleaf weed control and trials were sprayed for insect pests when required. Best practice is to sow lentils in the Mallee between May 15 and 20, but unfavourable soil conditions prevented the 1999 Birchip trial from being sown before June 7.

RESULTS

Table 1.22 Yield (% Digger) of commercial lentil varieties at individual locations in the Mallee, and as averages for the Wimmera and Mallee regions and for Victoria.

Variety	Birchip	Warne	Rosebery	Quambatook	Rainbow	Wimmera	Mallee	Victoria
Digger (t/ha)	0.87	1.02	1.91	1.72	0.87	1.24	1.29	1.27
Aldinga	95	99	88	91	92	90	91	92
Ansak	115	104	88	99	121	94	98	97
Cassab	113	113	106	100	117	94	106	101
Cobber	104	88	98	92	91	95	96	95
Cumra	88	68	67	85	96	62	81	70
Digger	100	100	100	100	100	100	100	100
Nugget	97	105	105	103	120	105	107	106
(ILL7180)								
Matilda	119	95	90	89	93	95	92	95
Northfield	88	87	92	90	91	91	92	91
LSD(P<0.05)	17	17	12	5	10			
CV(%)	11.7	12.7	10.1	2.7	5.6			

INTERPRETATION

The yield of Digger in 1999 (1.29 t/ha) was higher than the long term average for the Mallee (1.04 t/ha). Good winter rainfall increased the yield potential in 1999 but a dry spring limited yield.

Nugget and Cassab were the highest yielding red lentil varieties in the Mallee in 1999 and Nugget the highest yielding red lentil across Victoria (Table 1.22). Matilda was the highest yielding green lentil in Victoria. A comparison of Mallee sites showed that Birchip was most dissimilar to the other sites in the yield ranking of the varieties. The major difference was that Nugget was lower yielding and Matilda and Cobber were higher yielding at Birchip than at other sites. This may be due to MCPA/dicamba damage at Birchip or to the heavier soil type and high levels of boron and sodicity at that site.

Long-term comparisons confirm that Nugget is the highest yielding red lentil in Victoria and that Matilda is the highest yielding green lentil (Table 1.23). The new red lentil Cassab has produced similar yields as Digger in Victoria. In 1998 and 1999 its yield was consistently equal or higher compared to Digger. The red lentil Cumra yielded less. It is more susceptible to Ascochyta compared to other varieties. Cumra is early to flower and has good lodging resistance.

Table 1.23 Long-term yield (% of Digger) of commercial lentil varieties in the Wimmera and Mallee regions and in Victoria overall.

Variety	Wimmera		Mallee		Victoria	
	1992-99	1996-99	1995-99	1996-99	1992-99	1996-99
Digger (t/ha)	1.44	1.17	1.04	0.97	1.24	0.97
Aldinga	91	92	84	89	88	91
Ansak		90		88		89
Cassab		99		100		99
Cobber	98	98	95	97	97	97
Cumra		85		82		84
Digger	100	100	100	100	100	100
Nugget(ILL7180)		105		105		105
Matilda	86	89	83	87	85	88
Northfield	90	92	85	90	88	91

COMMERCIAL PRACTICE

Among the current commercial varieties Digger has consistently been the highest yielding variety in the Mallee. Northfield yields less than Digger but has the advantage of seed resistance to Ascochyta and thus less risk of seed damage by the disease.

The new varieties Cassab and Cumra, released by Agriculture Western Australia in 1998, should be available to growers in 2000. Cassab has been similar in yield to Digger when tested in Victoria but results have varied among different Mallee locations. It is expected that Cassab may be superior to Digger in some local areas in the Mallee and growers would benefit from comparing this new release with other varieties on their own farm. Cassab is similar to Digger in agronomic, disease and quality attributes. The Lentil Company, Aust Grain/PeaCo and Agracorp market Cassab under a closed loop marketing arrangement.

The other new release, Cumra, is early to flower and has good lodging resistance. It is more susceptible to Ascochyta than other varieties and should not be grown where there is a significant risk of Ascochyta. Disease management is an important issue when growing this variety. Aust Grain/PeaCo and Agracorp market Cumra under a closed loop marketing arrangement.

The variety Nugget (IIL7180), released by Agriculture Victoria in 1999, is marketed by Seed and Grain Biotechnology Australia (SGB) and will be available to growers in 2001. Nugget

will not be under PBR or closed loop marketing arrangements but royalties will be collected on grain sales.

The fungal diseases *Stemphylium* and *Fusarium* were isolated from both sick and healthy plants in lentil crops in 1999. It is unclear if these diseases were a primary cause of plant death or occurred as a result of plant stress caused by hot, dry weather in spring. With increased lentil hectares and closer rotations the diseases of *Ascochyta*, especially because seed infection by this fungus causes poor seed quality, and *Botrytis* grey mould remain major threats to the lentil industry. Northfield is the only variety that is resistant to seed infection by *Ascochyta* but it is the variety most susceptible to *Botrytis* grey mould.