

Lentil variety development

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The aim of these trials was to investigate the effects of soil type and climate on the yield of commercial varieties and advanced breeding lines in Victoria and thereby assist in the selection of superior varieties for farmers in this state.

Summary

Lentil yields were poor in 2004 due to dry conditions, mainly through October, combined with high temperatures and frost during the reproductive period. Trial data was unreliable for many sites and variety selection should be based on long term data. Disease was not a major issue in 2004 but seed from the Horsham trial site had high levels of infection by ascochyta blight and diligence must be maintained in disease management.

Background

The Coordinated Lentil Improvement Program (CIPAL) aims to improve lentil profitability in Australia by developing red and green varieties that are resistant to major diseases (ascochyta blight and botrytis grey mould) and soil constraints (boron and salt), and have improved harvestability. CIPAL also aims to develop varieties that have new sources of resistance to current diseases and resistance to exotic diseases to ensure a sustainable lentil industry into the future.

Methods

All sites were managed in a way to reflect the best local practice for site selection, sowing time, fertiliser and herbicide types and rates, cultural practice (e.g. cultivation and rolling) and the timing of harvest. The Birchip, Tarranyurk and Gooroc trials were not harvested due to low yields as a result of drought and Kaniva due to residual herbicide damage. Although harvested, the yield results from Ultima, Quambatook, Warne, Rosebery and Rainbow were not presented because of low yields (site mean less than 0.3t/ha) and large trial variability.

Results

Note: CIPAL203 was resistant to botrytis grey mould and ascochyta blight and is suited to medium rainfall areas such as the Wimmera. CIPAL411 and CIPAL415 have improved salt tolerance. CIPAL402 is moderately resistant to botrytis grey mould and ascochyta blight and is a larger seed size than Matilda.

Table 1. Victorian yield results (2004 and long term) for commercial varieties and breeding lines likely to be commercialised in 2005/06 (%Digger). * Only includes 2003 data.

Region Site/region Years	Wimmera				Longterm		
	Horsham	Minyip/Laen 2004	Rupanyup	Mean 2004	Mallee (1996-03)	Wimmera (1996-03)	Southern Aust (2001-03)
Red lentils							
<i>Digger (t/ha)</i>	0.51	0.88	0.93				
Aldinga	101	111		106	91	96	
Cassab	119	95		107	101	100	
CIPAL203	84	84	96	88	93*	110*	
CIPAL411	123	101	114	113			128
CIPAL415	123	137	103	121			123
Digger	100	100	100	100	100	100	100
Northfield	88	78	78	81	90	95	102
Nugget	120	113	100	111	104	112	111
LSD (%)	21	15	16				
CV (%)	12.0	9.2	9.8				
Green lentils							
<i>Digger (t/ha)</i>	0.54	0.87	0.93				
Digger	100	100	100	100	100	100	100
Matilda	73	89	90	84	89	90	107
CIPAL402	89	75	95	86			104
LSD (%)	17	18	16				
CV (%)	12.9		9.8				

Interpretation

No reliable yield data is available from the Mallee in 2004 and only limited data from the Wimmera. Also, the Wimmera sites presented include Minyip that was frosted and Horsham that was severely drought stressed. Nugget was the highest yielding variety in the Wimmera in 2004 but decisions should not be based on this data but rather the long term data (Table 1). Disease was generally low in 2003 but seed from the Horsham site had high levels of infection by ascochyta blight.

CIPAL203 is resistant to ascochyta blight and botrytis grey mould, has round seed similar to Northfield and is best suited to medium to high rainfall zones where ascochyta blight and botrytis grey mould are most prevalent. In the trials presented CIPAL203, like Northfield, had a lower yields in 2004 than in previous years. CIPAL402 is a green lentil with larger seed size, better vigour and improved resistance to botrytis grey mould and ascochyta blight compared to Matilda. CIPAL203 and CIPAL402 will be commercialised in 2005 and widely available for farmers in 2007. Lines with improved tolerance to salt (NaCl) were evaluated in stage 4 trials in 2004 and were consistently among the highest yielding entries across sites (e.g. CIPAL411 and CIPAL415).

Variety selection

The best lentil variety for an area should be selected on the basis of yield potential, disease resistance and marketing arrangements.

- Nugget has a high yield potential in the Wimmera and has moderate resistance to ascochyta blight and botrytis grey mould. Seed can be sold to most buyers.

- Nugget, Cassab, Digger and Cobber have the highest long-term yields in the Mallee.
- For areas at high risk from botrytis grey mould, Cassab and Digger have the best resistance.
- Northfield is resistant to ascochyta blight and the best variety where ascochyta blight is severe and botrytis grey mould is not a significant problem.
- Northfield grain can attract a premium price in some cases.

Crop Production Issues

- Yields in 2004 seemed to be better where stubbles were not burnt and tillage was minimal.
- Paddock selection remains very important, especially where soils can be high in salt or boron and prone to waterlogging. When planning to use new herbicides in other crops check plant back periods for lentils.
- Although disease was not a major issue in 2004, botrytis grey mould control is important in the Wimmera, especially for the variety Northfield. Control of seed infection by ascochyta blight is important for all varieties except Northfield.
- Weed, insect (Heliothis and Etiella sprays need to be timely) and seed quality need to be managed.

Acknowledgments

Grains Research and Development Corporation (GRDC), Alan Bedggood and DPI crop evaluation staff.