

Chickpea Variety Evaluation in Victoria, 2001

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These trials investigated the yield potential of new chickpea lines with improved ascochyta blight resistance.

Summary

Chickpeas with improved ascochyta blight resistance were tested against current varieties Tyson, Kaniva and Howzat. Under low ascochyta blight pressure the desis Howzat and ICCV96836 were slightly better than Tyson in the Mallee. In the Wimmera, Howzatb was the highest yielding desi. Two ascochyta blight resistant kabulis, FLIP94-90C and S95342 generally out yielded Kaniva while a third, FLIP94-92C, was slightly below it. Howzat and ICCV96836 should be available to growers in 2002 and 2004 respectively. The first ascochyta blight resistant kabuli will be released in 2005. Fewer fungicides are needed by the new ascochyta blight resistant varieties than for the current susceptible varieties.

Background

Desi and kabuli lines with improved ascochyta blight resistance have been identified in NSW and Victoria. Their evaluation in trials is required to determine their suitability for release as commercial varieties.

Methods

Mallee trials were sown in early June and Wimmera trials in mid-late June on cereal stubble with minimum tillage. All trials had at least three replicates. Grain legume super + zinc® was applied at 90 kg/ha. Herbicides, insecticides and fungicides (chlorothalonil) were applied. Harvesting occurred between late December and mid January. Birchip and Rupanyup individual plots were 7 m long (trimmed to 5m before harvest), with 6 drill rows (0.15m spacings) and were sown with 1.5 m between the centres of adjacent plots.

Results

Table 1. 2001 Victorian Mallee S4 chickpea yields (% Howzat)

Treatment	Mallee mean	Beulah	Birchip	Quambtk	Rainbow	Ultima	Warne
Howzat (t/ha)	1.05	0.96	0.34	0.84	1.19	1.77	1.07
Howzat	100	100	100	100	100	100	100
ICCV96836	103	108	83	110	89	100	102
Paidar-91	95	101	43	89	106	103	102
Tyson	91	120	59	77	108	98	92
FLIP94-508C	88	68	31	69	106	72	92
Level of AB at site		Low-mod	None	None	None	None	None
No. of fung sprays		1	1	0	0	0	0
CV (%)		11.6	22.0	6.6	12.9	5.9	8.6
LSD (5%)		19	26	10	23	10	14

Table 2. 2001 Victorian Wimmera S4 chickpea yields (%Howzat)

Treatment	Wimmera mean	Horsham	Laen	Kaniva	Rupanyup	Tarranyurk
Howzat (t/ha)	1.52	2.43	0.65	1.89	1.71	1.33
Howzat	100	100	100	100	100	100
ICCV96836	94	102	95	117	93	102
Paidar-91	95	94	66	113	94	109
Tyson	93	78	99	92	97	96
FLIP94-508C	86	88	60	107	88	87
Level of AB at site		Moderate	Low	Low	None	None
No. of fung sprays		3	2	2	2	2
CV (%)		7.8	12.2	2.6	5.4	5.3
LSD (5%)		11	18	5	10	9

Table 3. 2001 Victorian S4 chickpea yields (%Howzat)

Treatment Howzat (t/ha)	AB rating	Average 1.18	Horsham 2.43	Laen 0.65	Beulah 0.96	Birchip 0.34	Warne 1.07
Howzat	MS	100	100	100	100	100	100
ICCV96836	MS-MR	96	102	95	108	83	102
Paidar-91	MS-MR	80	94	66	101	43	102
Tyson	VS	89	78	99	120	59	92
FLIP94-508C	R	73	88	60	68	31	92
Kaniva (kabuli)	VS	86	45	76	82	76	96
FLIP94-90C (kabuli)	R	92	111	98	102	79	91
FLIP94-92C (kabuli)	R	78	100	55	74	62	83
S95342 (kabuli)	MR	92	99	75	106	87	102
Level of AB at site			Moderate	Low	Low-moderate	None	None
No. of fung sprays			3	2	1	1	0
CV (%)			7.8	12.2	11.6	22.0	8.6
LSD (5%)			11	18	19	26	14

Interpretation

Ascochyta blight only caused significant yield losses at Horsham. Dry conditions in the eastern Wimmera and Mallee reduced yields at Birchip, Quambatook and Laen as did late frosts in October and early November at some sites. Late rains assisted some locations. Generally Mallee average yields were slightly below long term averages (Table 1). Lower yields at Birchip and Quambatook contrasted with high yields at Ultima. In the Wimmera mean yields were slightly above long term averages at most sites except Laen, where dry conditions reduced seed set (Table 2).

Yields of Howzat and ICCV96836 in Victoria are close to those achieved by previous varieties (eg Sona, Heera, and Lasseter) before ascochyta blight devastated the industry. Howzat and ICCV96836 were similar or higher yielding than Tyson in the Wimmera and Mallee. Tyson was affected by ascochyta blight at Horsham. FLIP94-508C has the best ascochyta blight resistance of the desi lines tested, but it was generally lower yielding (Tables 1-3). In a bad ascochyta blight year, or where use of fungicides is uneconomic, FLIP94-508C may find a role.

Average yields of the resistant kabulis compared well with Kaniva (Table 3). At Horsham fortnightly sprays were required to maximise yields in Kaniva. Three fungicide sprays (at 6 weeks post sowing, at flowering and at podding) will enable moderately resistant varieties to yield near their potential. Resistant varieties should yield well with only two sprays (flowering and podding) in all but the worst ascochyta blight years.

Kabuli returns increase with grain size and the new releases will require a combination of improvements over Kaniva in ascochyta blight resistance, yield and grain size. Each ascochyta blight resistant kabuli in Table 3 has good attributes but none have all the attributes.

Acceptable kabuli yields and grain quality have been achieved using regular fungicide sprays. Although profitable, risk, time, stress and costs are all major drawbacks. Use of resistant varieties is one component of ascochyta blight management. Others include wide rotations, seed dressing, stubble management, crop monitoring, fungicides and delayed sowing. However yields can drop if sowing is delaying too late. Late rains in 2000 and 2001 lifted many returns.

Commercial Practice

- Kabuli returns compare well in favourable areas (eg southern Wimmera), even with high fungicide costs. However, risk of crop loss with current varieties remains high. Kabulis often disappoint in drier districts.
- Howzat and ICCV96836 are less risky than existing desi options and require fewer fungicides. They may allow the re-adoption of desis in rotations. Required sprays will vary according to ascochyta blight levels.
- Howzat will be the best desi chickpea variety for Victoria (available 2002 through The Lentil Company). ICCV96836 is less susceptible than Howzat to ascochyta blight, but is still at major risk if unsprayed.