



Chickpea variety development

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Summary

Chickpea lines (kabuli and desi) with improved ascochyta blight resistance have been commercialised to Australian Agricultural Commodities by the Victorian Department of Natural Resources and Environment. These new varieties will require fewer fungicides applications to manage ascochyta blight disease and reduce risk.

The Coordinated Improvement Program for Chickpea in Australia (CICA).

The immediate goal of the CICA program is to improve and release new ascochyta resistant varieties that will restore the chickpea industry in south east Australia. At least one new ascochyta blight resistant desi and kabuli line will be released to growers in 2004. The use of resistant varieties will be a major component of the overall ascochyta blight management package for growers which also includes wide rotations, delayed sowing, seed dressing, crop monitoring, foliar fungicides and stubble management.

New desi varieties

ICCV96836, Barwon-MR, Sona-4028, Sona*98CZH4009 and Sona*98PBC4019 are moderately susceptible to ascochyta blight but have better resistance than Howzat. Ascochyta blight management will be similar to that used for Howzat but the risk of yield loss will be lower. **Sona*98PBC4019** shows great promise and is an early flowering, tall, vigorous cultivar with good grain quality. It has been higher yielding than Howzat and similar to Sona*98CZH4009 in SE Australia. **FLIP94-508C** has excellent ascochyta blight resistance and will require less fungicide applications than Howzat. It has dark brown seed similar to Tyson but has been lower yielding than ICCV96836 and Howzat.

New kabuli varieties

S95342 and **FLIP94-92C** are moderately resistant and resistant to ascochyta blight respectively, and the risk of yield loss is significantly lower than for Kaniva. It is likely that its fungicide management will involve applications during podding to produce high quality, disease free seed. Both have a seed size slightly smaller than Kaniva and similar or greater yields. They have the potential to be grown in all areas where Kaniva is currently grown and expand production due to lower costs associated with ascochyta blight control.

FLIP94-90C and **S95362** are resistant to ascochyta blight and it is likely that fungicides would only be used during podding to produce high quality, disease free seed. They have a medium size grain that is smaller than Kaniva, but are higher yielding than Kaniva and similar to the desi variety Howzat. Due to their high yield they have the potential to be grown as a higher yielding but lower value alternative (smaller seed) to the larger seeded kabulis or as an alternative to desi chickpeas if the price is similar or higher.

Crop Production Issues

- Kabuli returns compare well in favourable areas (ie. southern Wimmera), even with high fungicide costs. However the risk of crop loss due to ascochyta blight with current varieties remains high.
- Howzat is the best desi chickpea variety presently available for Victoria (available through The Lentil Company).

Table 1. Yield and grain size data for Kabuli lines in south eastern Australia.

Line	Grain weight (g/100 seeds)	Mean yield (t/ha)		Mean yield (% of Kaniva)	
		2001 Stage 3 6 trials	2000-01 11 trials	2001 Stage 3 6 trials	2000-01 11 trials
Kaniva	39.5	1.45	1.58	100	100
FLIP94-90C	32.1	1.75	2.05	121	130
S95362	30.0	1.56	1.91	107	121
S95342	36.8	1.63	-	112	-
FLIP94-92C	35.9	1.38	-	95	-

Table 2. Mean yield and grain size data for desi lines in south eastern Australia.

Line	Grain weight (g/100 seeds)	Mean yield (t/ha)			Mean yield (% of Kaniva)		
		2001 Stage 2 5 trials	2001 Stage 3 8 trials	2000-01 13 trials	2001 Stage 2 5 trials	2001 Stage 3 8 trials	2000-01 13 trials
Howzat	20.4	1.51	1.51	1.79	100	100	100
Tyson	13.7	1.43	1.45	1.74	95	96	97
ICCV96836	18.4	1.71	1.48	1.75	113	98	98
FLIP94-508C	16.1	1.53	1.22	1.52	101	81	85
Sona-4028	20.2	-	1.21	1.49	-	80	83
Barwon-MR	15.0	1.53	-	-	101	-	-
Sona*98CZH4009	14.6	1.66	-	-	110	-	-
Sona*98PBC4019	21.0	1.62	-	-	107	-	-

Table 3. Mean yield loss due to ascochyta blight when comparing no fungicide applications with fortnightly fungicide applications and the use of strategic fungicide applications (early, flowering and podding), and strategic fungicide applications compared to fortnightly fungicide applications.

Line	Ascochyta blight resistance	Mean yield loss (%) 2001 Horsham		
		No fungicide vs fortnightly	No fungicide vs strategic	Strategic vs fortnightly
Desi types				
Howzat	MS	41	36	7
Tyson	S	65	47	35
ICCV96836	MR	25	22	3
FLIP94-508C	R	9	3	6
Sona-4028	MS-MR	41	36	7
Kabuli types				
Kaniva	VS	92	69	75
FLIP94-90C	MR	4	3	2
S95362	R	24	15	11
S95342	R	12	5	7
FLIP94-92C	R	0	4	0

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