

2007 CANOLA & JUNCEA CANOLA TRIALS

better OILSEEDS Canola sowing rates by variety trial.

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- Three trials were undertaken in South Australia to compare the effects of sowing rate on grain yield of conventional open pollinated canola varieties and a hybrid. The trials were a part of the Better Canola project, funded by the Grains Research and Development Corporation and the Australian Oilseeds Federation.
- Sowing rate had little effect on the yields of canola in the trials. The only exception was the highest sowing rates of 5 and 7.5 kg/ha, which reduced yields at the low rainfall site of Lameroo.
- At the low yielding site of Lameroo, the yield of ^{AG}Muster exceeded Tarcoola and ^{AV}Jade.
- Canola is a crop that generally compensates well for plant densities outside the optimal range.
- These results suggest that in some cases, yields may be reduced in low rainfall environments by sowing canola too heavily, while the converse may sometimes occur in high rainfall environments.

Introduction

Sowing rates for canola need further testing, particularly in lower rainfall environments and also when hybrids are used in higher rainfall environments.

Method

Three trials were sown in South Australia by the MacKillop Farm Management Group to investigate the effect of sowing rate on the yield of a conventional canola variety, a canola hybrid and a triazine tolerant canola variety.

The first trial site was sown into loam soil at Lameroo in the Murray Mallee region of South Australia on 15 May 2007. The early maturing conventional canola varieties ^{AG}Muster, ^{AV}Jade and Tarcoola were sown at 1, 2, 3, 4, 5 and 7.5 kg/ha in a split plot design. Wheat was sown in the paddock in 2006. Rainfall for 2007 was 363 mm, and growing season rainfall (GSR) for April – October was 184 mm. Chemical application included trifluralin prior to sowing and clethodim as Select[®] and clocyralid as Lontrel* applied on 25 July. Fertiliser at sowing was 120 kg/ha N:P:K:S 18:13:0:10 plus 1% Zn, drilled below seed. Urea and sulfate of ammonia at a total of 50 kg/ha N was applied on 26 July. The trial experienced moisture stress from early August with hot winds just after the start of flowering. Little rain fell in spring.

The second and third trials were sown at Struan, southeast South Australia on 26 May 2007 in a black cracking clay over limestone. The second trial compared the effect of seed rate on yields of the CLEARFIELD[®] variety Pioneer[®]45C75 and the conventional hybrid Pioneer[®]45Y77, with various sowing rates equivalent to 20, 40, 60, 80 and 120

Edited by Felicity Pritchard, Oilseeds Industry Development Officer.

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seeds/m² in a randomised block. The third trial at the same site compared sowing rates of the triazine tolerant canola variety Bravo TT sown at 1, 2, 3, 4, 5 and 7.5 kg/ha in a randomised block.

Wheat was sown in the Struan paddock in 2006. Rainfall for 2007 was 600 mm, with GSR 407 mm. Chemical application included trifluralin as Treflan applied prior to sowing and clethodim as Select® and clopyralid as Lontrel* applied on 19 July. The TT sowing rate trial had simazine applied at sowing and atrazine applied on 13 August. Fertiliser at sowing was 120kg/ha N:P:K:S 18:13:0:10 plus 1% Zn, drilled below seed. Urea and sulfate of ammonia applied at 50 kg/ha total N was applied on 13 August. The trial experienced some moisture stress in spring, but received very good late rain in early November.

Results

For trial 1 at the low rainfall site of Lameroo, plots sown at the two highest sowing rates (5 and 7.5 kg/ha) reduced yield, compared with the lowest sowing rates (1 and 2 kg/ha) (Table 1).

The variety ^{AG}Muster yielded the highest in the dry season, followed by Tarcoola and then ^{AV}Jade.

All varieties responded in a similar way to sowing rate, ie no significant interaction was observed.

Table 1:

Yield (t/ha) of three conventional canola varieties over a range of sowing rates (kg/ha) at Lameroo.

Sowing rate (kg/ha)	^{AG} Muster	Tarcoola	^{AV} Jade	Mean
1	0.66	0.59	0.43	0.56
2	0.69	0.55	0.45	0.56
3	0.75	0.55	0.42	0.57
4	0.61	0.60	0.35	0.52
5	0.66	0.47	0.31	0.48
7.5	0.59	0.47	0.28	0.44
Mean	0.66	0.54	0.37	0.52
LSD (variety) (p)	0.11 (0.005)			
LSD (sowing rate)				0.08 (0.007)
LSD (var x sowing rate)	ns			
CV%	15.75			

There was no significant difference ($p > 0.05$) between cultivars, sowing rates or the interaction between cultivar and sowing rate at Struan (Table 2). Therefore sowing rates of 20 to 150 plants/m² had no effect on yield.

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Table 2:

Yield (t/ha) of CLEARFIELD® canola varieties Pioneer®45C75 and Pioneer®45Y77 hybrid over a range of seed rates (seeds/ m²) at MacKillop Farm Management Group site, Struan.

Seed rate	Pioneer®45C75	Pioneer®45Y77	Mean (t/ha)
20	2.33	2.18	2.26
40	2.46	2.58	2.52
60	2.40	2.56	2.48
80	2.44	2.43	2.44
100	2.43	2.70	2.57
150	2.43	2.60	2.52
Mean	2.42	2.51	2.46
LSD (variety)	nsd		
LSD (sowing rate)			nsd
LSD (var x sowing rate)	nsd		
CV%	8.34		

The triazine tolerant canola variety Bravo TT gave no significant yield response to sowing rate even at rates as low as 1 kg/ha (Table 3).

Table 3:

Yield (t/ha) of triazine tolerant canola variety Bravo TT over a range of sowing rates (kg/ha) at MacKillop Farm Management Group site, Struan.

Sowing rate	Bravo TT
1	1.74
2	1.80
3	1.78
4	1.86
5	1.78
6	1.86
7.5	1.68
Site mean	1.79
LSD(p<0.05)	ns
CV%	4.87

Commercial practice

Low sowing rates can be used for open pollinated and hybrid cultivars of canola provided good control of insect pests and weeds is undertaken. In low rainfall environments care should be taken to keep sowing rates lower rather than higher to avoid yield loss due to drought stress.