

# Retaining hybrid canola seed

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## Key findings

- Early growth of commercial, retained and mix seed treatments was similar.
- In 2013 fluquinconazole had no effect on the yield for any of the varieties.
- The conventional variety Hyola 50 was consistently higher yielding in 2013 (and 2012) when grown from commercial seed.
- The triazine tolerant variety showed no yield difference among the different seed sources in both years of trials.
- Significant yield reductions can result from retaining hybrid seed of some varieties.

## Why do the trial?

Many canola varieties are now hybrid, meaning that they rely on a specific gene combination from two selected parents. Hybrid varieties are recommended to be grown from commercially produced seed to ensure maximum production. The seed is expensive (about \$26/kg) compared to open pollinated or farmer retained seed (\$5/kg) and so can significantly increase the cost of growing canola. Previous trials with open pollinated varieties have shown that they generally do not lose any grain yield or varietal characteristics when grown from farmer retained seed (F1 – first year of harvested seed). However, these were not hybrid varieties.

This trial was conducted to compare the performance of commercial hybrid seed against farmer retained (F1) seed using conventional, triazine and imidazalinone tolerant varieties.

## How was it done?

**Plot size:** 1.4 m x 10 m      **Fertiliser:** DAP (18:20) 2% Zn @ 75 kg/ha  
**Seeding date:** 18<sup>th</sup> May 2013      UAN (42:0) @ 75 L/ha, 11<sup>th</sup> July 2013

Trial was a randomised complete block design consisting of 3 replicates and 18 canola treatments.

Varieties – Hyola 50 (Conventional), Tumby HT (Triazine Tolerant) and 45Y82 (Clearfield) were assessed.

Seed source treatments –

- Commercial - certified commercial seed from bags
- Retained – collected from farmer seed sources and graded
- Commercial/Retained blend - 33% certified commercial seed + 66% farmer seed sources and graded

All the canola plots were sown with the aim of 50 plants per square metre and seeds were treated with or without fluquinconazole (eg. Jockey) at 20 L/t. All plots were assessed for early vigour, plant number, plant height at flowering, grain yield and oil content.

## Results and Discussion

### Plant growth and height

Early in the growing season the growth of canola treatments was similar (photos displayed at end of article). However, by late flowering differences in total plant height between commercial and retained treatments was visible. For the mixed commercial and retained treatments there was considerable variation in plant height with in these plots. This was compared to the commercial and retained seed treatments on their own which had more uniform plant height.

Varieties Hyola 50 and 45Y82 CL had greater plant height at flowering than HT Tumby, but Hyola 50 showed the greatest height variation between the seed sources (Table 1). The Hyola 50 retained seed had the shortest plant heights for this variety, which were about 10 cm shorter compared to the commercial seed. The retained/commercial mixes for Hyola 50 did not differ compared to the commercial seed. The mixing of commercial and retained seed sources increased the plant height so that it was no longer different compared to commercially obtained seed.

For 45Y82 CL treatments plant height did not differ between treatments (Table 1). Similarly, for HT Tumby there were small differences in plant height however, the overall plant height only ranged from 81-89 cm.

Table 1. The plant height of three canola varieties, from commercial, retained or mixed seed sources, with or without fluquinconazole seed treatment. Measurements were taken at late flowering, 30<sup>th</sup> August 2013, at Hart. A plant height annotated by a different letter is significantly different from another (variety x seed source LSD  $P \leq 0.05 = 6.47$ ).

Treatment	Hyola 50	HT Tumby	45Y82 CL
	Plant height (cm)		
Commercial + fluquinconazole	103.8 a	88.8 cde	111.6 a
Retained + fluquinconazole	89.6 cd	83.5 def	98.3 ab
Commercial (33%)+ Retained (66%) + fluquinconazole	96.9 ab	82.9 ef	108.0 a
Commercial	103.3 a	81.2 f	109.7 a
Retained	92.3 bd	86.9 cdef	96.9 ab
Commercial (33%) + Retained (66%)	101.0 a	81.4 f	106.5 a

### Grain yield and oil content

Similar to the results obtained in the canola agronomy trial at Hart in 2012 the variety Hyola 50 resulted in the greatest variation in grain yield between treatments (Table 2). The commercial and commercial/retained mix plus fluquinconazole gave the highest yield 1.73 t/ha and 1.56 t/ha, respectively. Both the retained and mix seed sources without fluquinconazole produced lower yields, ranging from 1.33 - 1.49 t/ha.

HT Tumby showed no significant differences in grain yield for the different seed sources (Table 2). For the variety 45Y82 CL the commercial and retained / commercial mix yielded the highest (1.47-1.59 t/ha). The retained seed for 45Y82 CL was the lowest yielding treatment with (1.35 t/ha) and without (1.41 t/ha) fluquinconazole were lower yielding compared with the commercial. The results show that for this variety a mix between retained and commercial seed was able to yield similar to commercially obtained seed.

There was no significant interaction between fluquinconazole applied to the seed for any varieties in 2013. Internal blackleg infection was not scored however, visual observations showed increased internal infection when the sowing seed was retained.

*Table 2. The grain yield (t/ha) of three canola varieties, from commercial, retained or mixed seed sources and with or without fluquinconazole seed treatment, at Hart 2013. Significant differences in grain yield for each canola variety are followed by a different letter.*

Treatment	Hyola 50	Tumby TT yield t/ha	45Y82 CL
Commercial + fluquinconazole	1.73 a	1.08	1.59 a
Retained + fluquinconazole	1.38 bc	1.00	1.35 c
Commercial/Retained Mix + fluquinconazole	1.56 ab	1.04	1.47 ab
Commercial	1.73 a	1.00	1.58 a
Retained	1.33 c	0.97	1.41 bc
Commercial/Retained Mix	1.49 bc	1.00	1.48 ab
LSD (P≤0.05)	0.21	ns	0.12

Overall, yield loss from sowing a commercial/retained mix ranged from 4 to 14% and retained seed ranged from 7 to 23% in 2013 (Table 3). Slightly different results were seen in 2012 for Hyola 50 where yield loss was 16 to 30% and Tumby TT and 45Y82 CL yielded similar or greater than commercial seed (Table 3).

*Table 3. Trial results from Hart in 2012 and 2013 showing yield as % of Commercial + fluquinconazole treatment (standard).*

Treatment	2013			2012		
	Hyola 50	Tumby TT	45Y82 CL	Hyola 50	Tumby TT	45Y82 CL
	% of Commercial + fluquinconazole					
Commercial + fluquinconazole	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
Retained + fluquinconazole	80	93	85	84	94	104
Commercial/Retained Mix + fluquinconazole	90	96	92	-	-	-
Commercial	100	93	99	101	92	131
Retained	77	90	89	70	104	104
Commercial/Retained Mix	86	93	93	-	-	-

There were no significant differences between any of the treatments for oil content (Table 4). This is in agreement with the results from Hart in 2012 where oil content was not affected when retained seed was sown.

Table 4. The oil content (%) of three canola varieties, from commercial, retained or mixed seed sources and with or without fluquinconazole seed treatment, at Hart 2013. There was no significant difference between any treatment interactions.

Treatment	Hyola 50	Tumby TT	45Y82 CL
	Oil content (%)		
Commercial + fluquinconazole	44.4	40.9	43.1
Retained + fluquinconazole	44.5	41.2	43.0
Commercial/Retained Mix + fluquinconazole	44.2	41.7	42.9
Commercial	44.3	41.2	43.4
Retained	43.6	41.1	42.9
Commercial/Retained Mix	44.7	41.4	42.7
LSD (P≤0.05)	ns	ns	ns

#### Financial returns from different seed sources

Relative financial returns for 2012 and 2013 yield data were calculated (Table 5) based on the following assumptions; grain price \$500/t, commercial hybrid premium \$6/t, grading and fungicide coating for retained seed \$6/ha, \$26/kg commercial seed (seeding rate 2.5 kg/ha) and a cost of production \$300/ha (excluding seed cost). On a tonne to tonne comparison of commercial and retained seed the cost is around \$60/ha more when sowing commercial seed.

In 2012 and 2013 commercial seed was more profitable for Hyola 50 compared to retained or the commercial/retained blend (Table 5). In 2013 for HT Tumby there was \$5/ha increase in return for retained seed and the mix, respectively. The same trend was seen for HT Tumby in 2012.

For the variety 45Y82 CL the results in 2012 were conflicting between commercial and retained seed plus or minus fluquinconazole. However, in 2013 there was almost \$100/ha greater return for commercial over retained or mix seed plus fluquinconazole.

Table 5. Difference in \$ return in 2012 and 2013 from commercial and retained seed at Hart.

Treatment	2013			2012		
	Hyola 50	HT Tumby	45Y82 CL	Hyola 50	HT Tumby	45Y82 CL
	\$/ha return					
Commercial + fluquinconazole	<b>510</b>	<b>181</b>	<b>440</b>	<b>75</b>	<b>-97</b>	<b>-26</b>
Retained + fluquinconazole	384	194	369	59	-56	44
Commercial/Retained Mix + fluquinconazole	454	194	364			
Commercial	510	141	434	80	-117	80
Retained	359	179	399	-1	-31	44
Commercial/Retained Mix	419	174	414			





**FUNGICIDE**      **NO FUNGICIDE**  
Hyola 50 Commercial 16<sup>th</sup> July



**FUNGICIDE**      **NO FUNGICIDE**  
TT Tumbby Commercial 16<sup>th</sup> July



**FUNGICIDE**      **NO FUNGICIDE**  
45Y82 Commercial 16<sup>th</sup> July



**FUNGICIDE**      **NO FUNGICIDE**  
Hyola 50 Retained 16<sup>th</sup> July



**FUNGICIDE**      **NO FUNGICIDE**  
TT Tumbby Retained 16<sup>th</sup> July



**FUNGICIDE**      **NO FUNGICIDE**  
45Y82 Retained 16<sup>th</sup> July



**FUNGICIDE**      **NO FUNGICIDE**  
Hyola 50 CS/RS Mix 16<sup>th</sup> July



**FUNGICIDE**      **NO FUNGICIDE**  
TT Tumbby CS/RS Mix 16<sup>th</sup> July



**FUNGICIDE**      **NO FUNGICIDE**  
45Y82 CS/RS Mix 16<sup>th</sup> July