

DAW00277

Tactical Break Crop Agronomy in Western Australia

16ES07 Retaining canola seed

Authors

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Location of trial

Grass Patch

Summary (Key messages)

- ***Farmers can safely retain OP seed for at least two years***
- ***Retained and graded hybrid TT seed had lower % establishment, variability in flowering, higher % of sterile flowers, lower oil and yield – but in this environment with yields below 1.5 t/ha the effects were not large enough to reduce gross margins compared to purchasing hybrid TT seed.***

Background

WA canola growers in low rainfall areas mostly grow OP TT canola. However the rate of release of OP TT canola has slowed down in recent years. Currently there is only one company who has released OP TT canola over the last 3 years – Nuseed, and their continued support is reliant on farmers paying EPR. It is possible farmers may end up with no new OP TT canola varieties in a few years' time. With this in mind questions arise from growers such as "How long can I keep using my existing OP TT seed?" "can I use F2 and F2 hybrid seed?" Additionally there is some interest in mixing different season length canola in low rainfall areas to allow for adaptation to different length of seasons.

Aim

To determine if retaining canola seed leads to reduced yield, oil and financial return.

Trial Details

- Property: Danny Sanderson's Grass Patch
- Growing Season rainfall (GSR, April to October) = 258 mm
- Soil type: Scaddan loam (0.92% organic carbon), SYN estimate of available N = 75 kg N/ha
- Paddock rotation 2016 canola, 2015 barley, 2014 barley, 2013 barley, 2012 barley
- Randomised block design, 8 treatments x 4 replicates
- Sowing date April 28

Treatments and Assumptions used in Gross Margins

8 treatments:–, Bonito Commercial 40 plants/m², Bonito retained for one year (F2) Grass Patch 40 plants/m², Bonito retained for two years (F3) Grass Patch 40 plants/m², F1 Hyola 450TT 25 plants/m², Hyola 450TT F2large (seed > 1.8mm sieve) 40 plants/m², Hyola 450TT F3large 40 plants/m², Bonito and ATR Wahoo (50/50 mix) 40 plants/m², ATR Wahoo 40 plants/m².

Each variety of seed originated from same line and then sourced from same site.

Oil bonus +/- 1.5% per unit of oil (%) either side of 42%, with no oil ceiling. Grain worth \$550/t. Newly purchased OP seed valued at \$17/kg and Hybrid at \$31/kg. Retained and graded OP and hybrid seed valued at \$2/kg. Non treatment costs of \$251/ha.

Results

Conditions were better than expected at sowing and emergence was higher than we targeted. For example, we targeted 25 plants/m² for Hyola 450TT F1 based on a 65% emergence rate and a 94% germination lab test and achieved 39 plants/m² - equivalent to an emergence rate greater than 100% - therefore more seeds germinated in the field than in the lab. Both ATR Wahoo and Hyola 450 TT F1 seed had higher field establishment than ATR Bonito. There appeared to be no difference in the field establishment rates of first generation and retained ATR Bonito seed, whilst retained hybrid seed had lower field establishment than first generation commercial seed.

There was a trend for earlier flowering in the retained hybrid treatments and hybrid seed grown out for 2 years (F3) had the highest rates of sterile flowers – 9%. There appeared to be some very early flowering genotypes within the retained hybrid seed and later in the year we could find the occasional plant with no pods at the bottom of the main stem raceme – apparently these plants had male sterile flowers and flowered early when no other pollen was around to pollinate the female flower parts. Perhaps as a consequence of reduced pollination and pod number, Hyola 450TT F3 seed ended up being slightly larger than Hyola 450TT commercial (F1) seed.

There was a trend for retained ATR Bonito plants to flower slightly late (not significant), whilst retaining OP seed had no effect on rates of flower sterility.

Seed yields ranged from 1.18 t/ha for Hyola 450TT F3 to 1.46 t/ha for ATR Bonito. Retaining hybrid seed reduced yield, oil and oil yield but did not affect gross margins due to the cost of purchasing hybrid seed. Retaining OP seed did not reduce seed yield, oil, oil yield, seed size or gross margins.

Table 1 Soil analysis at Grass Patch in 2016

Trait	Unit	Depth		
		0-10	10-20	20-30
Colour		LTGR	GRBR	BRGR
Gravel	%	5-10	5	5
Texture		Loam	Heavy clay	Heavy clay
Ammonium Nitrogen	mg/Kg	3	4	3
Nitrate Nitrogen	mg/Kg	18	3	4
Total Nitrogen	%	0.08	0.04	0.03
Phosphorus Colwell	mg/Kg	23	11	3
Potassium Colwell	mg/Kg	140	416	619
PBI		17.6	86.1	125.7
Sulphur	mg/Kg	6	10.5	18.9
Organic Carbon	%	0.92	0.38	0.24
Conductivity	dS/m	0.148	0.202	0.24
pH Level (CaCl ₂)	pH	5.4	8.3	8.8
pH Level (H ₂ O)	pH	6.2	9.5	9.8
DTPA Copper	mg/Kg	0.53	0.49	0.45
DTPA Iron	mg/Kg	70.3	19.83	23.3
DTPA Manganese	mg/Kg	3.02	1.07	1.02
DTPA Zinc	mg/Kg	1.51	0.42	0.16
Exc. Aluminium	meq/100g	0.041	0.088	0.064
Exc. Calcium	meq/100g	1.47	5.51	6.44
Exc. Magnesium	meq/100g	0.77	4.81	6.26
Exc. Potassium	meq/100g	0.36	1.07	1.59
Exc. Sodium	meq/100g	0.5	2.63	4.69
Boron Hot CaCl ₂	mg/Kg	1.02	8.87	14.34
Aluminium CaCl ₂	mg/Kg	0.25		

Table 1 Establishment counts (May 17, plants/m²), NDVI during the vegetative stage, dates of 50% flowering and % of sterile flowers of canola at Grass Patch in 2016.

Treatment	Establishment counts (plants/m ²)	% field establishment	Flowering date	% of sterile flowers
Bonito Commercial	52	65%	29 July	0
Bonito F2 Grass Patch	58	71%	29 July	0
Bonito F3 Grass Patch	59	74%	31 July	0
Hyola 450TT F1	39	105%	26 July	0
Hyola 450TT F2large	60	78%	24 July	0
Hyola 450TT F3large	63	77%	24 July	9
ATR Wahoo	76	92%	13 Aug	0
Bonito and ATR Wahoo (50/50 mix)	63	77%	6 Aug	3
P	<0.001	<0.001	<0.001	<0.001
lsd	9	13%	3	3.22
CV%	10		0	

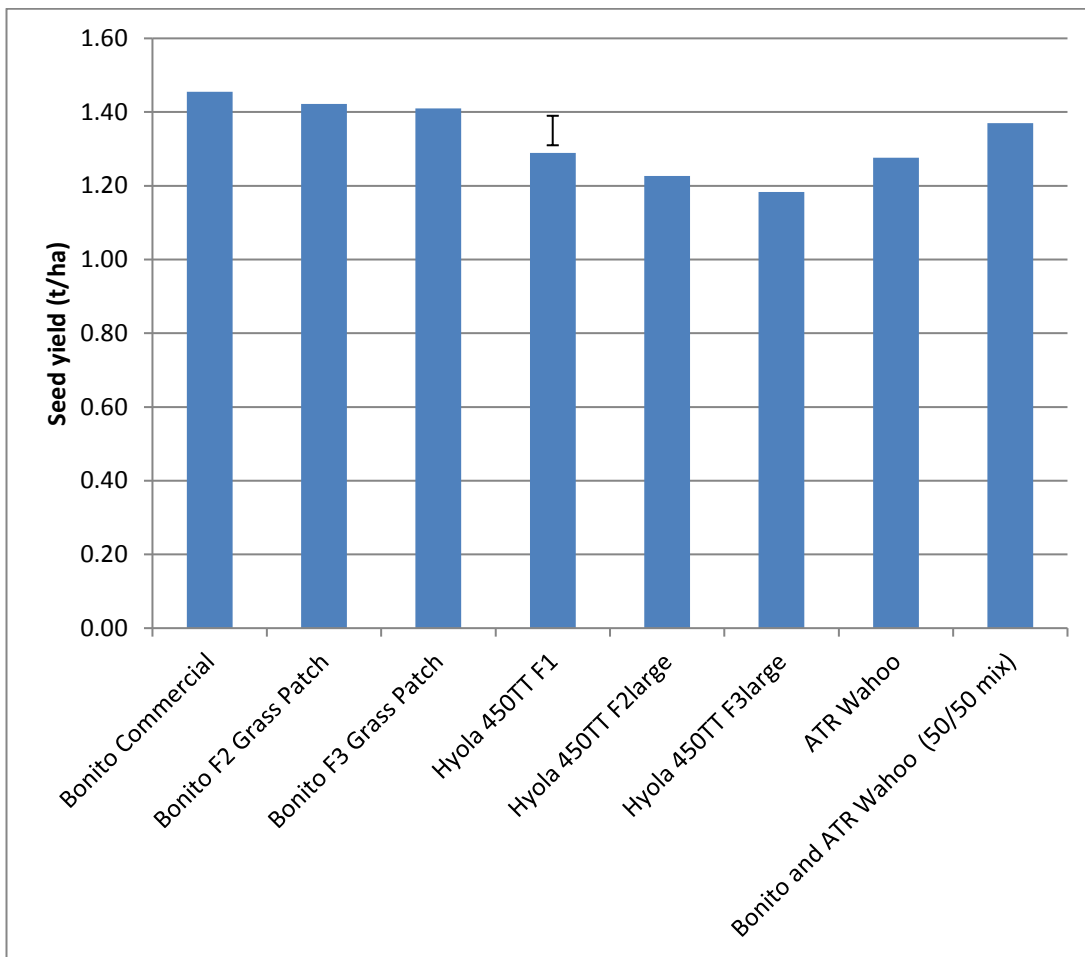


Figure 1 Seed yield of canola at Grass Patch in 2016.

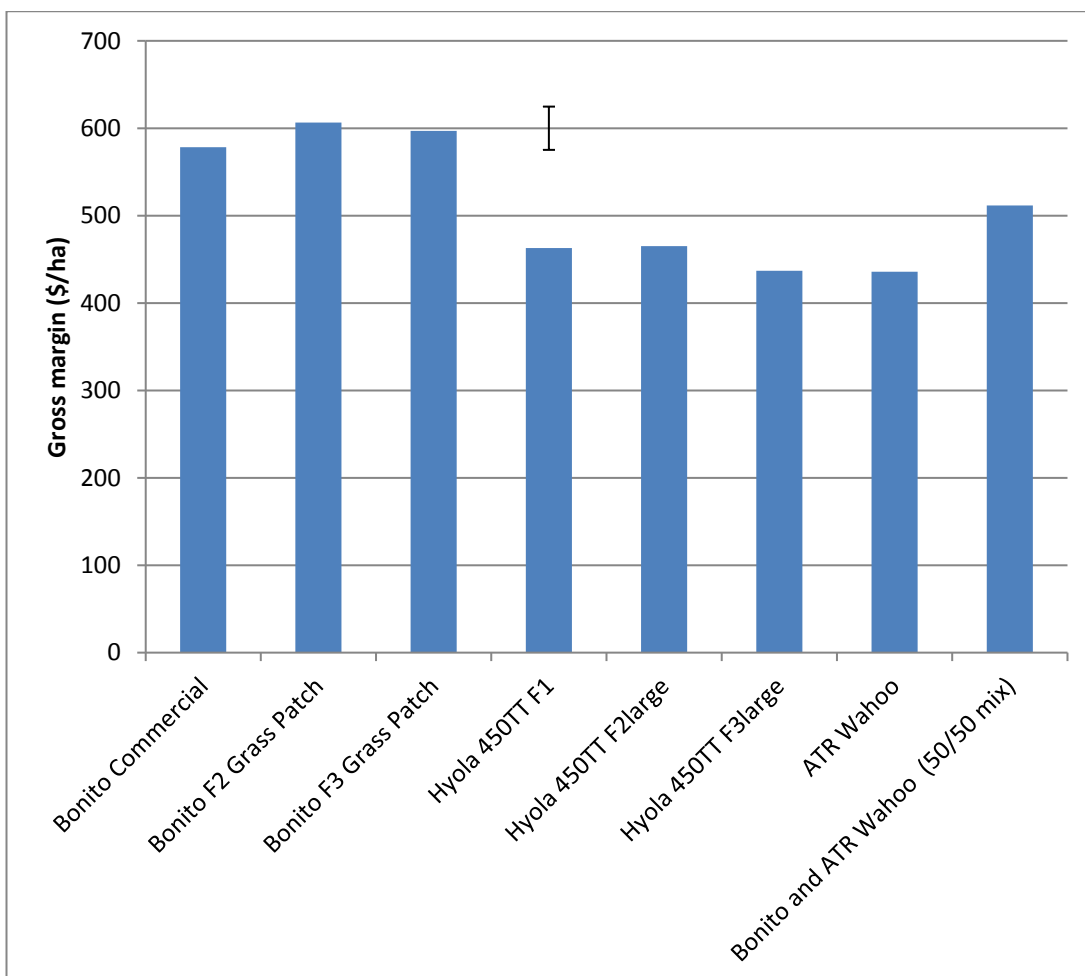


Figure 2 Gross margin of canola at Grass Patch in 2016.

Conclusion

At Grass Patch in 2016 there appeared to be no overall downside in retaining OP and hybrid canola seed for at least two years. The OP variety ATR Bonito continued to outperform the hybrid variety Hyola 450TT. In a season which in theory may have suited slightly longer maturing varieties ATR Wahoo and mixes of ATR Wahoo and ATR Bonito did not equal the yield of ATR Bonito. It appears a mid-season variety with improved adaptation or yield potential is required before mixes are likely to be viable in this environment.

Acknowledgements

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Links

For other reports related to this trial see <https://www.agric.wa.gov.au/canola> or visit GRDC's on-farm trial web site at <https://www.farmtrials.com.au>

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