

DAW00227

Tactical Break Crop Agronomy in Western Australia

13ED19 Retained canola seed options – Grading harder, buying new seed, upping seed rate, mixes or living with it

Authors	Mark Seymour
Location of trial	Geoff Sanderson's, Bishops Road Grass Patch

Summary (Key messages)

- In dry years open-pollinated canola can produce small seed in low rainfall areas. Sowing the small seed at a low seeding rate of 2 kg/ha reduced yield and farmers could benefit by increasing the seeding rate to 4 kg/ha in the following year or purchasing fresh seed
- Grading small seed hard was not as reliable as increasing the seeding rate to 4 kg/ha
- F2 hybrid seed produced lower yields than F1 seed unless seeding rates are increased to 4 kg/ha or mixes are made with F1 seed.
- Hybrid TT was less productive than open pollinated TT canola

Background

In low rainfall areas farmer retained seed of varieties like CB Telfer TT can be small. Farmers and their agronomists approached DAFWA to determine if the retained small seed which had been commercially cleaned was less vigorous and yielded less than newly purchased seed, or if it was worth grading the seedlot further to retain larger seed or should they simply increase seed rate?

We thought this experiment would also be a good place to see how much yield, if any, was lost if farmers retained hybrid TT F2 seed – and to test if similar strategies such as grading, seeding rate and using mixes of F1 and F2 seed would compensate for genetic drift in the F2 seed.

Aim

To investigate if retained open pollinated seed which is smaller than commercially available seed is less productive than new seed, and if grading or increasing seed rates can compensate.

Trial Details

- Property: Geoff Sanderson's, Bishops Road Grass Patch
- Agzone 5, Growing Season rainfall (GSR) = 224 mm, GSR + stored water (estimate) = 320 mm
- Soil type: Loam (0.97% organic carbon)
- Paddock rotation Barley 2012 1.7 t/ha, 2011 Wheat 2.26 t/ha, 2010 Canola 0.87 t/ha, 2009 Wheat 1.86 t/ha

Trial Details

- 14 treatments:—see Table 1;
- 3 replicates
- Sowing date April 18
- Seeding rate – see Table 1
- Fertiliser (kg/ha) 99 kg/ha of Allstar at seeding (13.1%N, 14.8%P, 15%S, 0.1% Cu, 0.2% Zn, 7ppm Mo, 0.02% Mn), 120 kg/ha of Muriate of Potash and 400 kg/ha of gypsum (17% Ca, 14% S) topdressed over whole site 4 weeks after seeding, 145 L/ha of UAN (32%N) June 3.

Treatment detail

Table 1 Treatment details for 13ED19 at Grass Patch in 2013

No.	Name and sowing rate (kg/ha)	Seeds per kg	%above 1.85mm screen
1	CB Telfer farmer graded 2 kg/ha	325,000	6
2	CB Telfer farmer graded 4 kg/ha	325,000	
3	CB Telfer farmer >1.85 cm slotted 2 kg/ha	251,889	
4	CB Telfer farmer >1.85 cm slotted 4 kg/ha	251,889	
5	CB Telfer new seed 2 kg/ha	281,690	27
6	CB Telfer new seed 4 kg/ha	281,690	
7	HT F1 2 kg/ha	297,619	20
8	HT F1 4 kg/ha	297,619	
9	HT F2 2 kg/ha	285,714	18
10	HT F2 4 kg/ha	285,714	
11	HT F1 25% HT F2 75% 2 kg/ha	288,690	18
12	HT F1 25% HT F2 75% 4 kg/ha	288,690	
13	HT F2 >1.85mm slotted 2 kg/ha	250,000	
14	HT F2 >1.85mm slotted 4 kg/ha	250,000	

HT = Hybrid triazine tolerant variety (cultivar name not disclosed), F1 = first generations hybrid seed as if purchased from Seed company, F2 = second generation hybrid seed.

Farmer graded seed = graded by Hannafords.

>1.85 cm slotted = small grading sieves used by DAFWA for seed testing – Technically Hannafords can repeat this grading.

Assumptions used in Gross Margins

Oil bonus +/- 1.5% per unit of oil (%) either side of 42%, with no oil ceiling.

Additional costs such as seeding, harvest, fertilisers, herbicides and insecticides assumed to be \$229/ha. Grain worth \$502/t (CBH Pool Esperance 5/11/13).

Seed costs – retained OP and hybrid seed \$2/kg, new OP seed \$11/kg, hybrid seed \$24/kg

Results

Comparisons to retaining CB Telfer and sowing at 2 kg/ha

Grading seed over a 1.85mm slotted sieve did not increase plant establishment, with the only reliable way to improve plant numbers being to increase seed rate. Compared to sticking with the farmer retained CB Telfer seed and sowing it at 2 kg/ha, only purchasing new CB Telfer seed and sowing it at either 2 or 4 kg/ha and purchasing the new hybrid variety (cv. name not disclosed) and sowing it at 4 kg/ha increased grain yield. However the extra expenses incurred resulted in no treatment producing higher returns than the farmer retained CB Telfer seed sown at 4 kg/ha.

Comparisons to retaining hybrid TT seed and sowing at 4 kg/ha

F1 hybrid seed is relatively expensive at \$24/kg, therefore seeding rates are usually on the low end at ~ 2 kg/ha. If farmers were to retain hybrid TT seed and sow the F2 at 2 kg/ha they would lose yield and be financially worse off than buying fresh F1 seed. However as F2 hybrid seed cost is reduced to ~ \$2/kg farmers are more likely to increase seeding rate to 4 kg/ha. In which case yields and returns similar to F1 sown at 2 kg/ha could be achieved. The mix of 25% F1 and 75% F2 was not quite as productive as 100% F1 seed but indicated it might be more productive than 100% F2 seed.

Of note in this experiment was the observation that the F2 hybrid TT was the earliest flowering variety at the site – even earlier than CB Telfer. Another observation was that in the good conditions experienced in 2013 at Grass Patch we did not observe any visual differences in vigour between F1 and F2 hybrids.

Despite improving the performance of hybrids by higher seeding rates etc. – at Grass Patch in 2013 the open pollinated CB Telfer produced similar yields and higher gross margins.

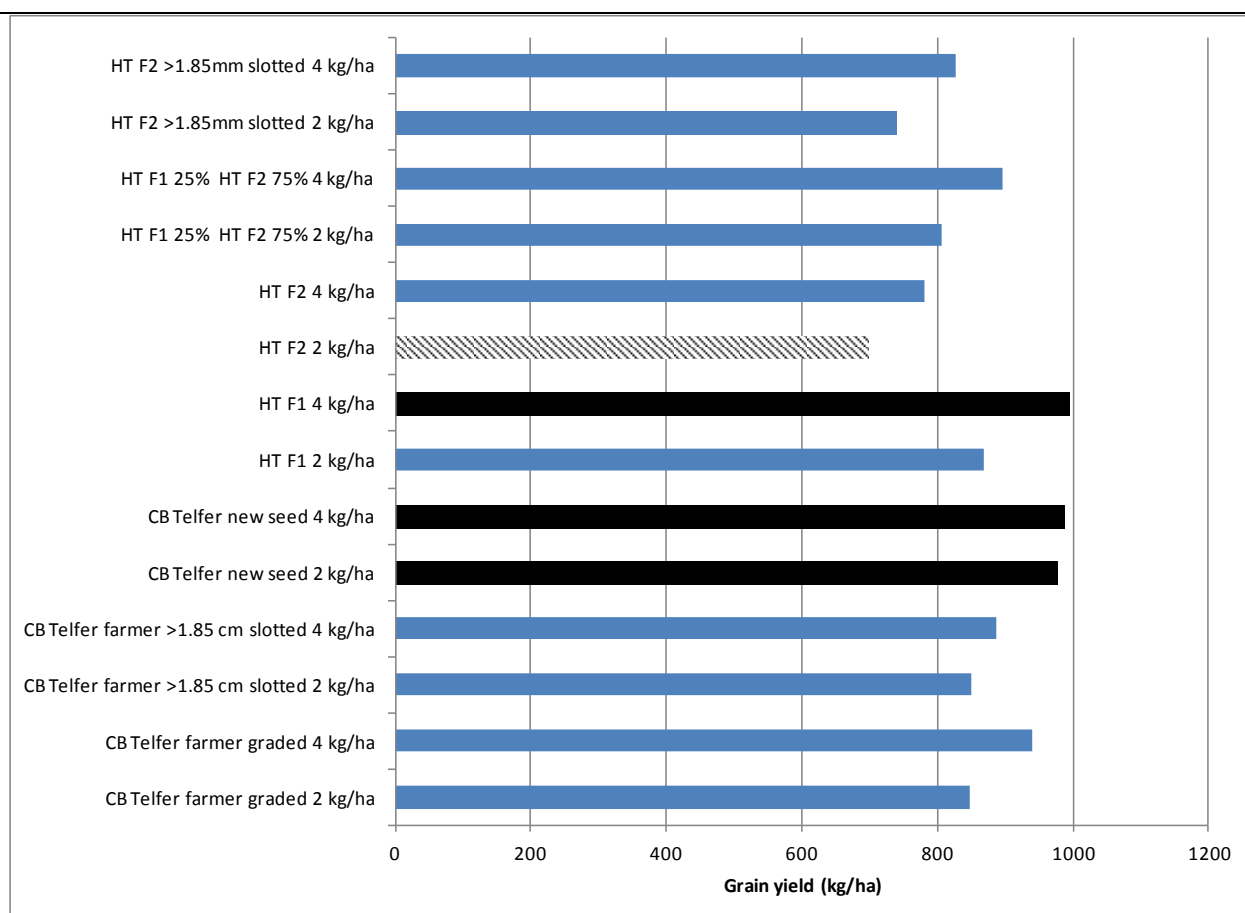


Figure 1 Purchasing new seed of CB Telfer increases the yield compared to retained seed sown at 2 kg/ha at Grass Patch in 2013. Black bars are significantly higher yielding than CB Telfer at 2 kg/ha, patterned bar is lower yielding. LSD = 121 kg/ha

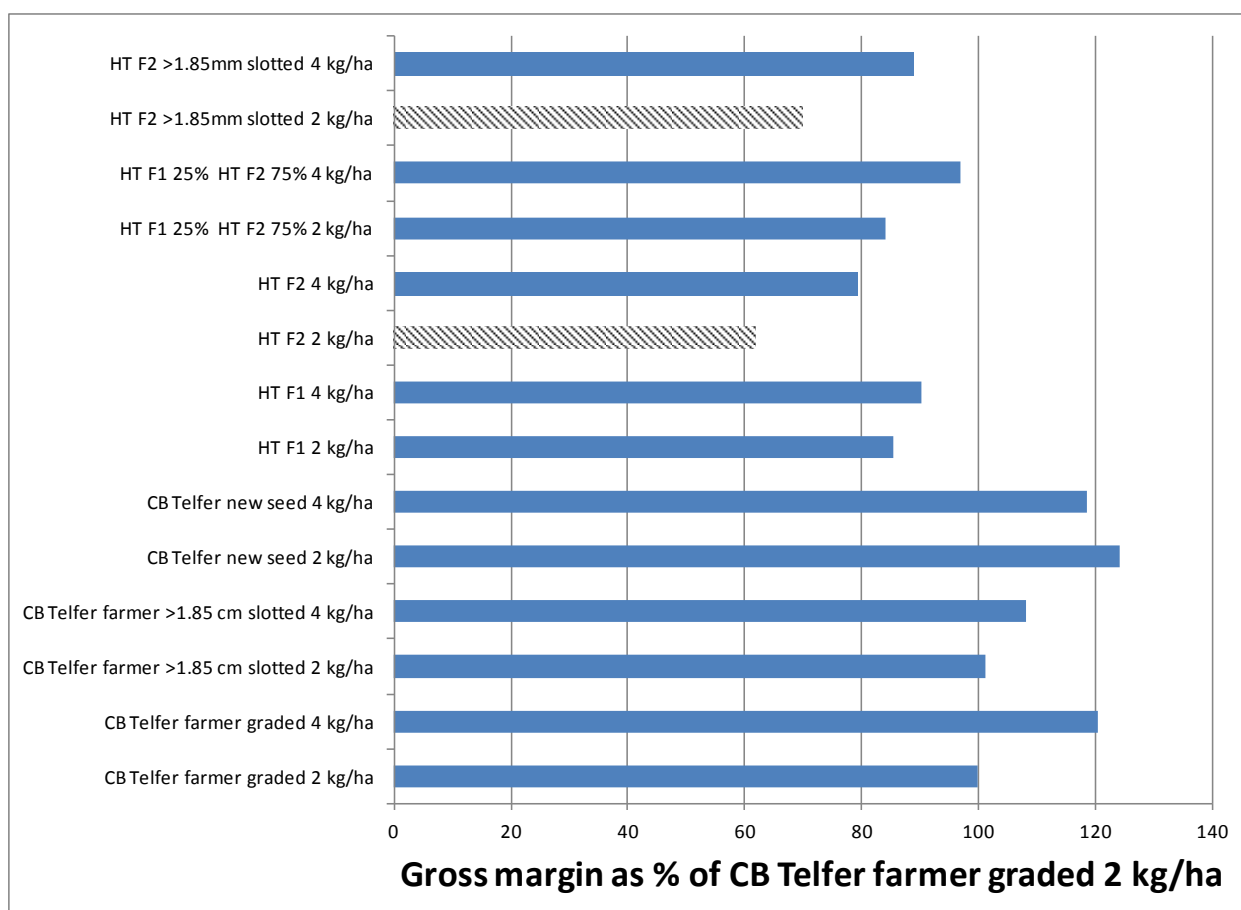


Figure 2 Retaining hybrid seed and sowing at 2 kg/ha decreases gross margins at Grass Patch in 2013 . Patterned bars are lower grossing than CB Telfer new seed sown at 2 kg/ha and solid black bars are higher grossing. LSD = 30%

Conclusion

At Grass Patch retaining seed of CB Telfer from a dry harvest in 2012 resulted in small seed. This seed was then graded by a commercial cleaner and further graded with 1.85mm slotted sieve to try and get a higher proportion of large seeds. If the crop was sown at 2 kg/ha - the highest yields of CB Telfer in 2013 were obtained by purchasing fresh seed from the seed company. However if the seeding rate was increased to 4 kg/ha then farmer retained seed produced similar grain yield and equal gross margins to purchased seed. Thus the approach of tackling issues with small seed in canola by increasing seed rate appears feasible.

Hybrids are yet to prove themselves in lower rainfall areas in WA, and at Grass Patch in 2013 the older TT hybrid variety we used was not as productive as the OP TT variety CB Telfer. However, the treatments in this experiment were conducted as if a farmer had decided to grow hybrids and then retained seed from his F1 seed crop. It was clear that if farmers retained F2 hybrid seed and sowed it at the same rate of 2 kg/ha as F1 seed purchased from the seed company they would lose yield and financially worse off than purchasing new F1 seed. However if they increased the seed rate of the F2 hybrid to 4 kg/ha or made mixes of F1 and F2 then it appears some of the loss in performance can be overcome. It should be noted that farmers will need to ensure they have the legal right to retain and grow F2 seed prior to undertaking such operations.

Acknowledgements

This trial is one of a series conducted throughout WA as part of the GRDC/DAFWA co-funded project “Tactical Break Crop Agronomy in Western Australia”. Thanks to Geoff Sanderson and family for hosting the trial and to the Esperance RSU for trial management. Pam Burgess (DAFWA, Esperance) provided technical assistance to ensure all measurements occurred in a timely and accurate fashion.

Links

For other reports related to this trial see NVTplus

For more information contact

Mark Seymour, Senior Research Officer, Esperance on 90831 143.

Email: mark.seymour@agric.wa.gov.au