

18ME17 Retaining Open-Pollinated (OP) canola seed on-farm

Authors Mark Seymour

Location of trial Merredin

Summary (Key messages)

- At Merredin in 2018 the OP TT canola variety ATR Bonito produced similar yields and higher oil than hybrid TT's.
- Retaining ATR Bonito seed 'on-farm' for 4 years produced similar yields, oil and financial returns to purchasing new seed.
- Using ATR Bonito seed stored for 4 years produced plants lacking in vigour and overall poorer performance than growing out and retaining seed each year or purchasing new commercial 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. Growers are asking, "How long can I keep using my existing OP TT seed?"

Aim

To evaluate if retaining OP canola seed leads to reduced yield or oil.

Trial Details

- Property: Merredin Research Station Latitude S 31.48, E118.28
- Growing Season rainfall (GSR, April to October) = 218 mm
- Soil type: Clay Loam (0.45% organic carbon, pH 7.2)
- Sowing date May 15
- Herbicides – IBS 1.5 L/ha Trifluralin 480EC + 1.1 kg Atrazine 900DWG, PostEm, 19th July Clethodim and 1.1 kg Atrazine 900DWG
- Machine Harvested 9th November

Treatments

Trial design was row column design (Blocking = Group/(Rep+ColRep), Treatments were Type/VarietyOp/(VarietyHyb*Density) where type – OP or hybrid, Density = target density of 25 plants/m² for hybrids or 50 plants/m² for OP's and hybrids.

All seed was tested for seed size and seed rates adjusted to aim for target density assuming hybrids would have a field establishment rate of 65% and OP's 50%.

Table 1 List of treatments and seeding rate information

Treatment name	Seed rate (kg/ha)	Germ	Seeds per kg	Seed size (mg)	Seeds sown per sqm	Viable seeds sown per sqm
ATR Bonito Commercial 2017	5.2	95	204,082	4.9	105	100
ATR Bonito Commercial 2014	4.9	89	229,885	4.4	112	100
ATR Bonito Retained 1 year Graded	6.2	81	198,807	5.0	123	100
ATR Bonito Retained 2 years Graded	7.1	71	198,020	5.1	141	100
ATR Bonito Retained 3 years Graded	5.9	83	204,082	4.9	120	100
ATR Bonito Retained 4 years Graded	6.8	75	196,078	5.1	133	100
Hyola 350TT 25 plants/m²	3.3	91	129,032	7.8	42	38
Hyola 350TT 50 plants/m²	6.6	91	129,032	7.8	85	77
InVigor T 4510 (Bayer) 25 plants/m²	2.2	95	183,486	5.5	40	38
InVigor T 4510 (Bayer) 50 plants/m²	4.4	95	183,486	5.5	81	77
Nuseed HyTTech Trophy 25 plants/m²	2.1	95	196,078	5.1	40	38
Nuseed HyTTech Trophy 50 plants/m²	4.1	95	196,078	5.1	81	77
Pioneer 44T02 TT 25 plants/m²	1.7	96	240,964	4.2	40	38
Pioneer 44T02 TT 50 plants/m²	3.3	96	240,964	4.2	80	77

Results

Establishment

At Merredin in 2018 the experiment was sown dry in mid May. The opening rains fell two weeks after sowing resulting in lower than expected establishment with OP canola averaging 37% field establishment and hybrids 42% - lower than our anticipated 50-65%. Retained ATR Bonito seed established just as well as newly purchased commercial seed. For example, ATR Bonito retained for 4 years established 40 plants/m² - equivalent to that of new ATR Bonito seed at 35 to 45 plants/m². Hybrids sown at a target of 50 plants/m² produced on average 32 plants/m² - similar to ATR Bonito at 37 plants/m². Size of seed sown ranged from 4.1 (44TO2) to 7.8 mg (Hyola 35TT) but this had no effect on field establishment – i.e larger seed was of no advantage.

Seed yield, oil, oil yield and gross margin.

Average yield of canola at Merredin in 2018 was 1.0 t/ha. Hybrids out-yielded OP by 110 kg/ha but plant density and retaining seed had no significant effect on the yield of canola. The OP variety ATR Bonito produced higher oil (40.5%) than most hybrid treatments. Hyola 350TT and HyTTech Trophy sown at 25 plants/m² produced lower oil (36.5%) than other treatments. Combining seed yield and % oil into oil yield indicated no differences between treatments ($P>0.05$). Similarly most treatments produced the same gross margin (mean of \$230/ha).

During the year, we observed canola sown from Commercial seed kept in storage from 2014 to have less vigour in the field. The 2014 stored seed produced slightly lower but not significantly lower yields than other OP treatments, but when combined with higher seed prices of commercial seed than retained seed it resulted in lower gross margins (\$105/ha) for seed stored since 2014 – indicating growers may be best off producing seed each year rather than storing seed for extended periods.

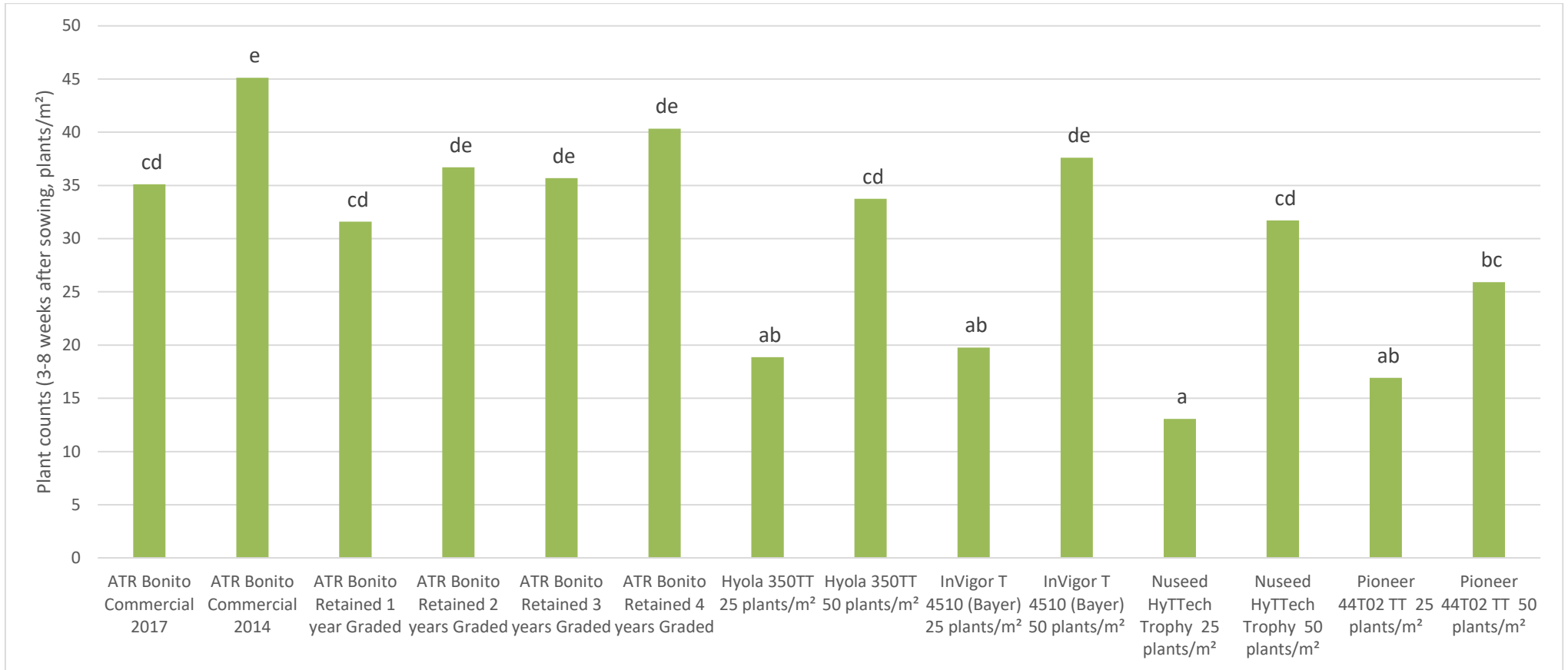


Figure 1 Plant establishment (plants/m²) of canola in retained seed experiment at Merredin in 2018 (18ME17).

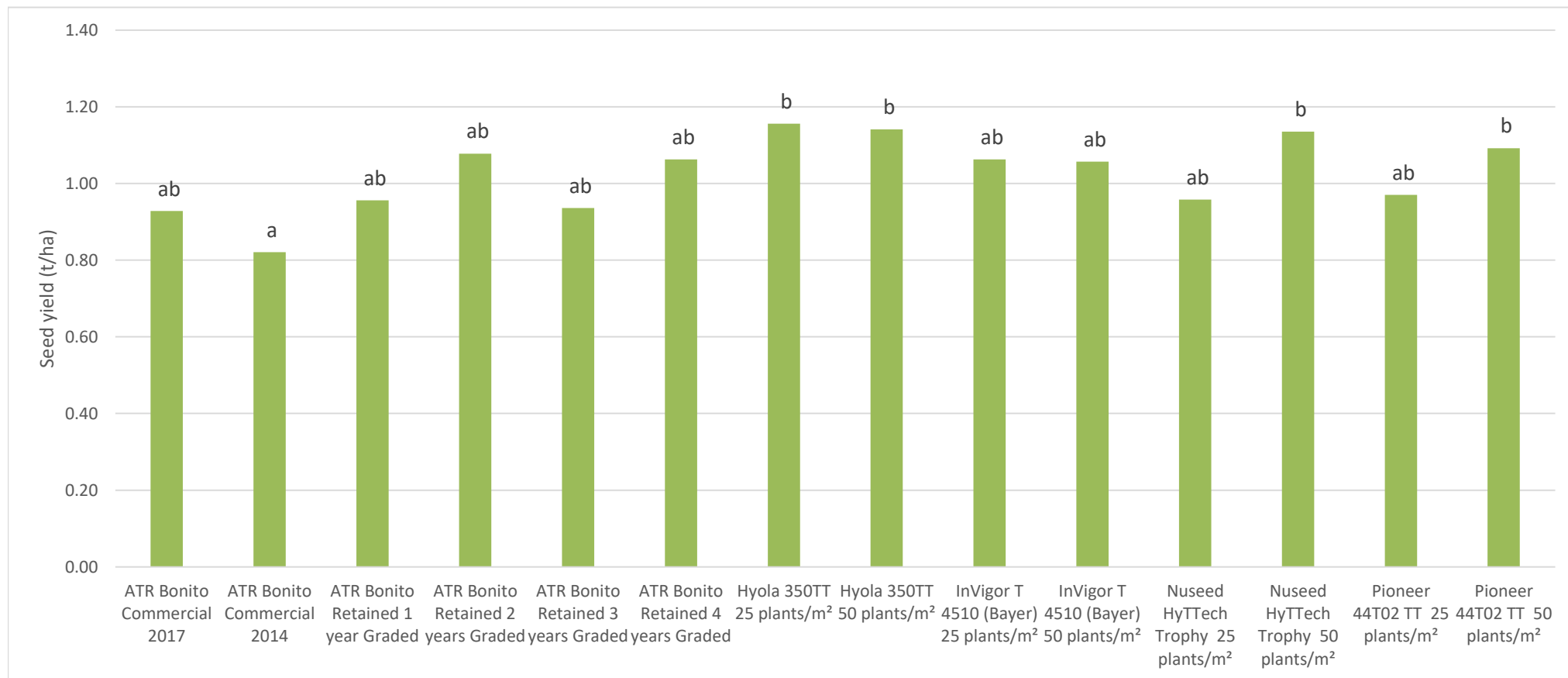


Figure 2 Seed yield (t/ha) of canola in retained seed experiment at Merredin in 2018 (18ME17).

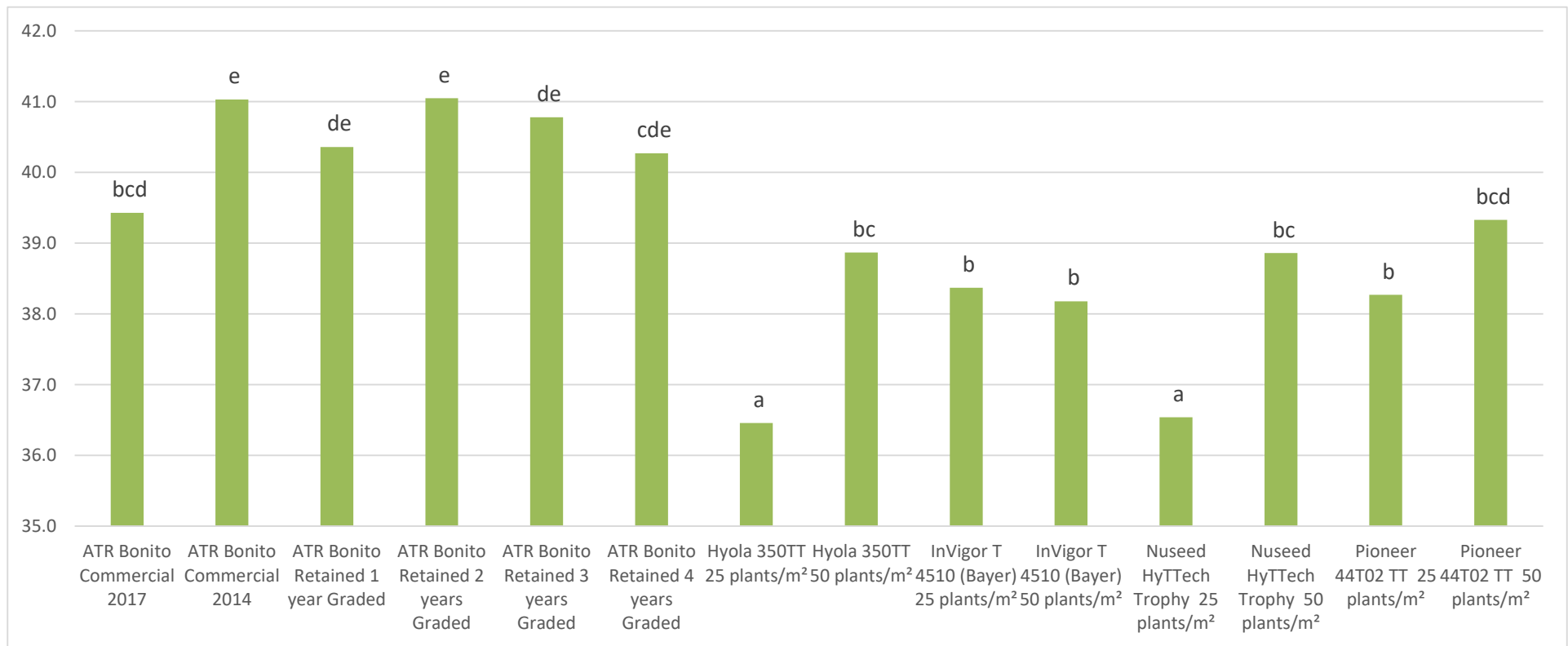


Figure 3 Oil concentration (%) in canola from retained seed experiment at Merredin in 2018 (18ME17).

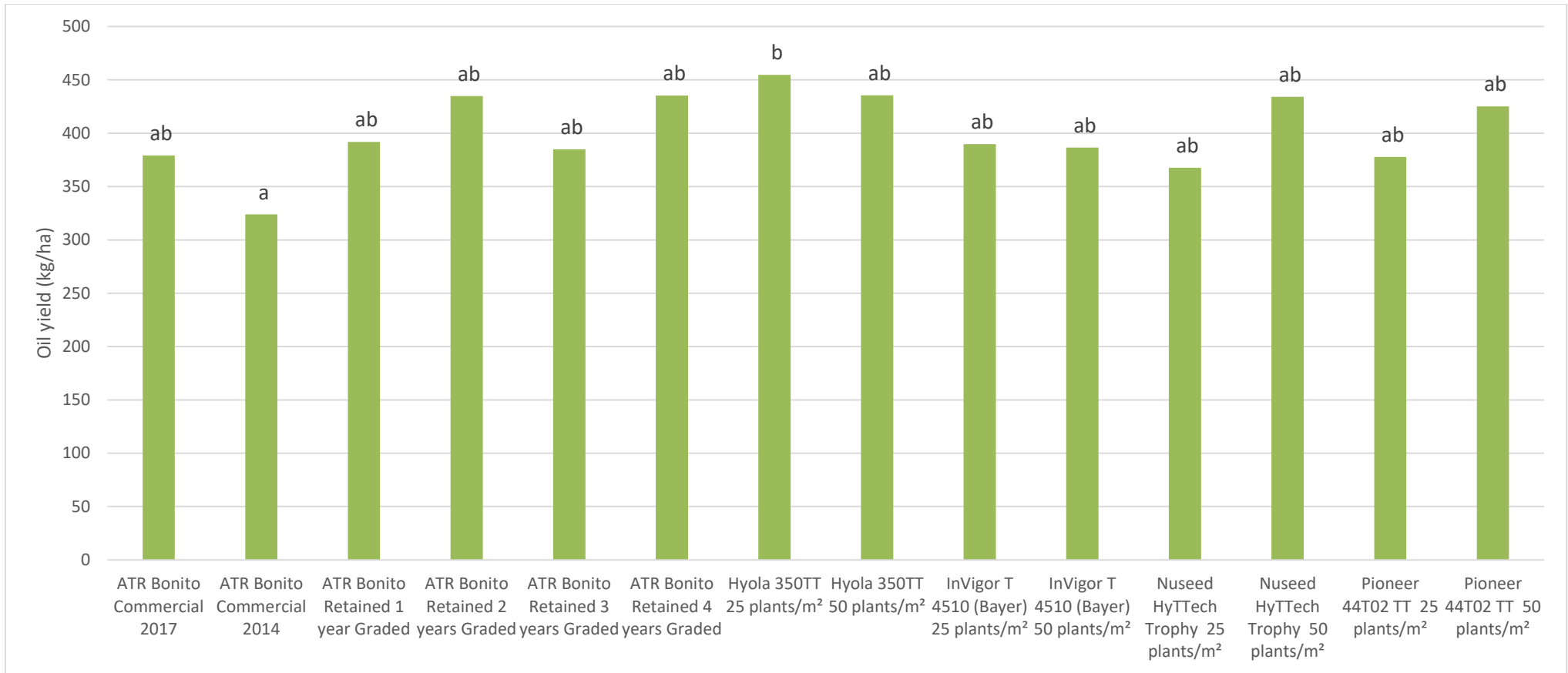


Figure 4 Oil yield (kg/ha) of canola from retained seed experiment at Merredin in 2018 (18ME17).

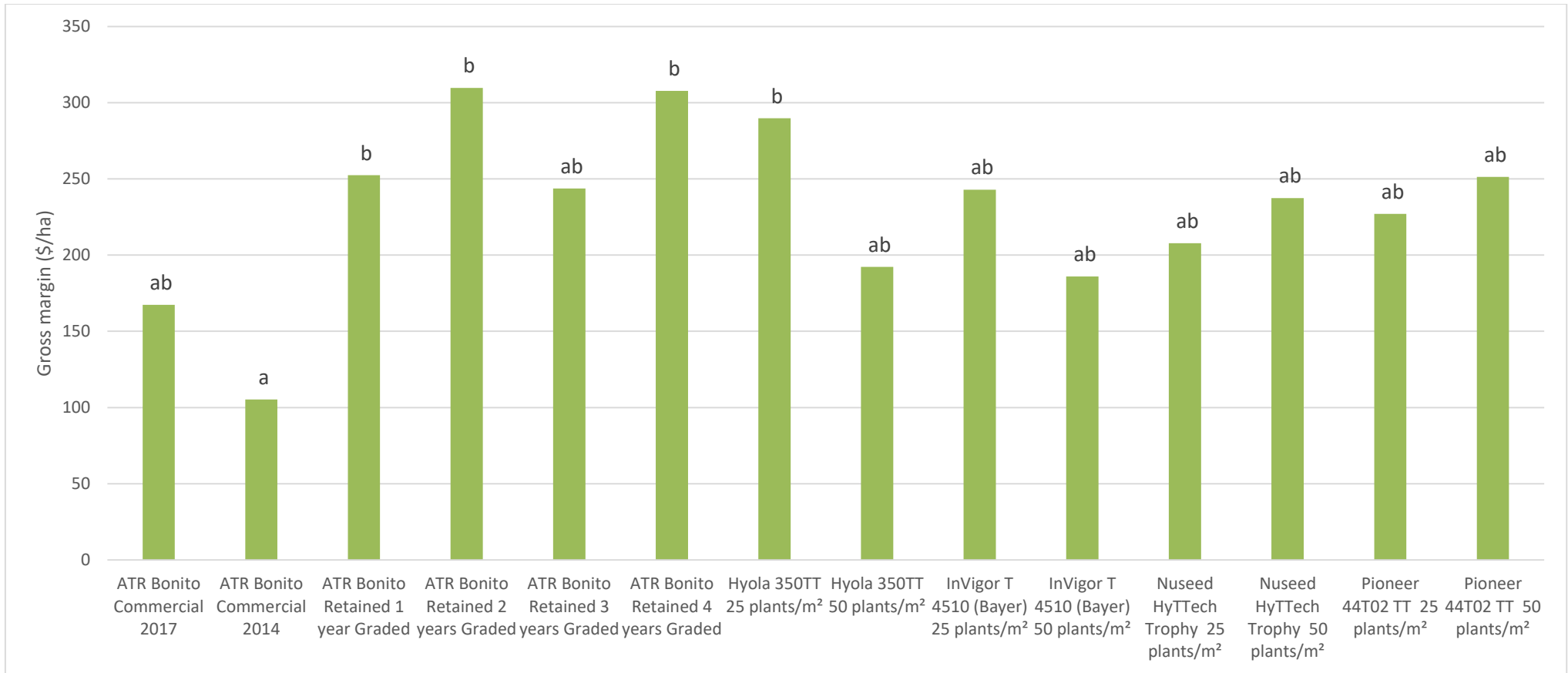


Figure 5 Gross margin (\$/ha) of canola from retained seed experiment at Merredin in 2018 (18ME17).



Acknowledgements

This experiment is one of a series conducted throughout WA as part of the GRDC/DPIRD co-funded project "Tactical Break Crop Agronomy in Western Australia". Thanks to the Merredin TSU for trial management and Salzar Rahman and Pam Burgess for providing technical assistance to ensure all treatments and measurements occurred in a timely and accurate fashion.

Links

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

For more information contact

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

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