

## Better Oilseeds trial: A comparison of retained and commercial hybrid and open pollinated canola seed: effect on factors affecting yield (2009).

Trial locations: Dunkeld, Victoria and Naracoorte, South Australia

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### Key Messages

- The performance of retained hybrid seed differs between cultivars, but in most instances the F1 hybrid seed was superior to the retained hybrid seed. F1 Hybrid seed produced more vigorous seedlings, more consistent plant height and more even maturity. Unfortunately water logging resulted in very low yields, but in all cases the F1 hybrid yielded more than the retained hybrid.
- Retained hybrid seed in all cultivars had at least twice the blackleg severity compared to the F1 hybrid seed. For example, Hyola 50 went from no plant death (F1 hybrid) to over 30% dead plants in the retained seed. Blackleg resistance in hybrids is created by combining the resistance genes from both the male and the female parents into the F1. The retained seed will segregate back to the resistance of only the male or female, not the combined resistance.
- It is strongly recommended to not sow retained hybrid seed as blackleg resistance of the retained hybrid seed is unknown and will be inferior to the F1 hybrid.

### Background and aims

The trial was designed to measure the difference in crop growth of F1 hybrid commercial seed compared to retained F2 hybrid seed. Many growers have questioned if they can retain hybrid seed and if the expected loss of grain yield from the retained hybrid is off-set by the seed cost savings. This trial aimed to investigate the yield differences as well as any other measurable differences such as vigour, maturity, pod set and blackleg resistance.

### Method

#### **Site 1, Dunkeld, Western District of Victoria.**

The F1 hybrid seed was commercial seed obtained from the seed companies, the F2 seed was the seed harvested from the hybrid seed sown in the 2008 NVT yield evaluation sites. Seeding rates were adjusted according to seed size so that all plots were sown with 100 seeds per m<sup>2</sup>.

Data recorded:

- Emergence- all plants to emerge in the 2nd row of each plot were counted.
- Crop vigour – visual score 1-4 (4 being most vigorous).
- Blackleg mortality – The number of plants in the 2nd row in each plot were counted and the number of dead plants from blackleg recorded.
- Yield – undertaken with a mechanical plot harvester.

#### **Site2 –Naracoorte, southeast of South Australia**

Commercial seed of the F1 Hybrid 45Y77CL was obtained from Pioneer Hibred, farmer retained seed of the same cultivar was obtained from a grower. The trial was sown in plots in a complete randomised design. Within each plot, 40 consecutive plants from the 2nd row were removed and assessed for the following measurements.

Data recorded:

- Plant height – 120 individual plants measured with a ruler.
- Maturity – 120 individual plants measured by visual inspection of each plant, scored 1-4, where: 1 = plant completely green, 2= plant yellowish, 3= plant brownish, 4= plant naturally senesced.

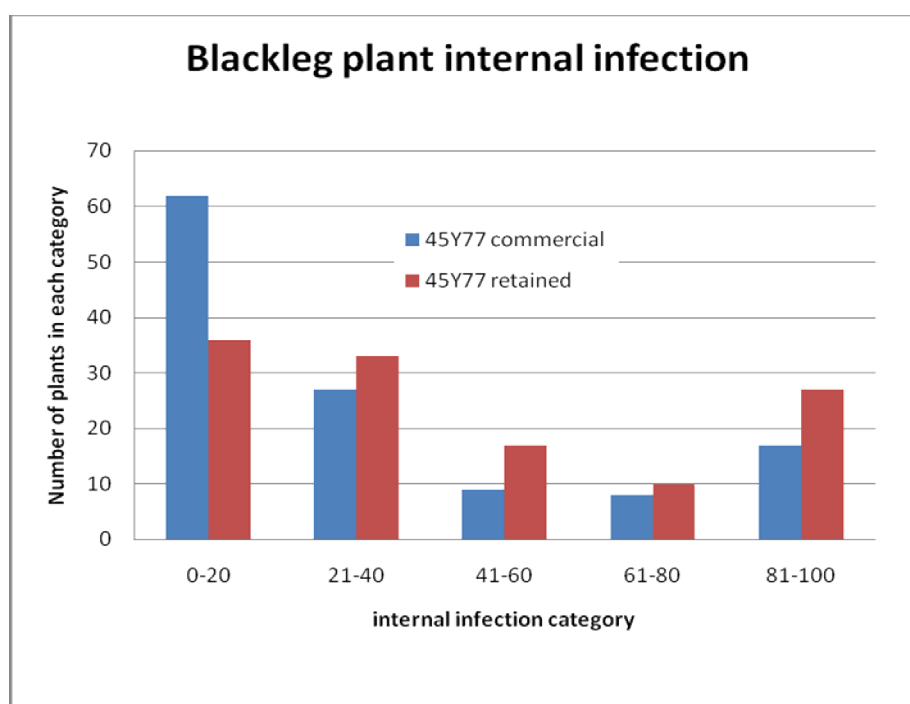
- Blackleg internal infection – 120 individual plants measured, each plant was severed at the roots to expose the crown. The crown was then visually inspected for the presence of internal blackleg infection and scored as either 0, 5, 10, 20, 30, 40, 50, 60, 70, 80, 90 or 100% infection.
- Percent missing pods – 120 individual plants measured, each plant was visually inspected for missing pods and recorded as a percentage of total pods.

Results

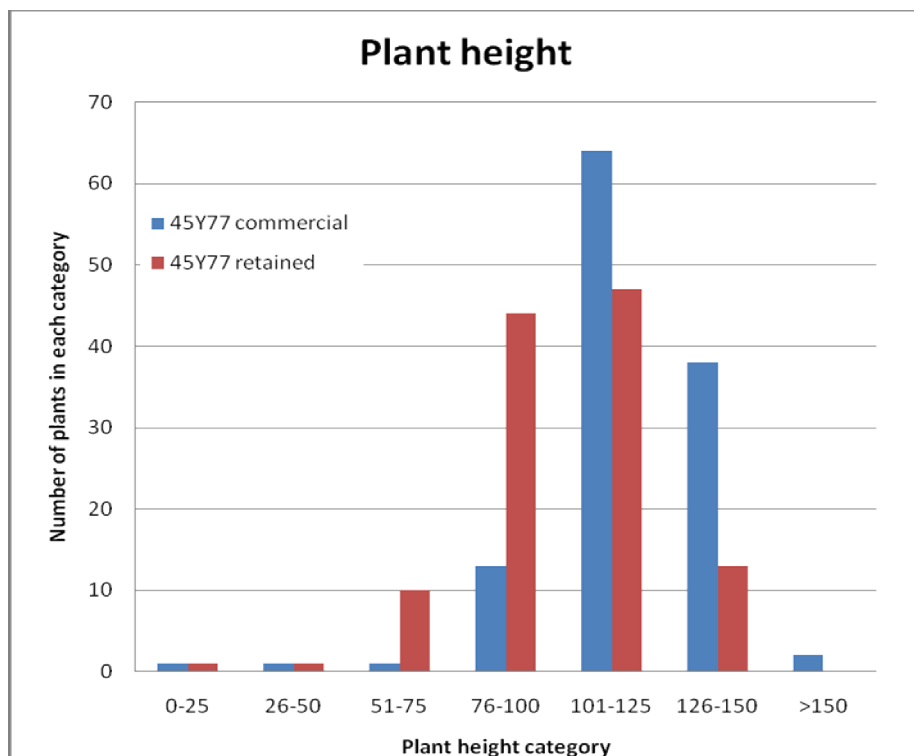
**Table 1.** Dunkeld site – Differences in emergence, vigour, and blackleg mortality between certified F1 hybrid and retained hybrid seed.

| Variety and seed source | Emergence | Vig 1-4 | Blackleg Plant mortality | T/ha   |
|-------------------------|-----------|---------|--------------------------|--------|
| 46Y78                   | 118a      | 3.7a    | 17a                      | 0.688a |
| 46Y78 retained          | 116a      | 1.3b    | 39b                      | 0.459b |
| ATR-Marlin              | 74a       | 1a      | 58a                      | 0.304a |
| ATR-Marlin retained     | 97a       | 1a      | 48a                      | 0.405a |
| AV-Garnet               | 93a       | 1.7a    | 15a                      | 0.677a |
| AV-Garnet retained      | 103a      | 1.7a    | 10a                      | 0.612a |
| Hyola 76                | 112a      | 2a      | 6a                       | 0.748a |
| Hyola76 retained        | 123a      | 2a      | 22b                      | 0.587a |
| Hyola50                 | 89a       | 2.3a    | 0a                       | 0.872a |
| Hyola50 retained        | 96a       | 1.3b    | 32b                      | 0.586b |
| Hyola571CL              | 94a       | 2a      | 6a                       | 0.744a |
| Hyola571CL retained     | 109a      | 1.3a    | 12b                      | 0.561a |
| CV%                     | 14.2      | 10.2    | 13.1                     | 19.6   |

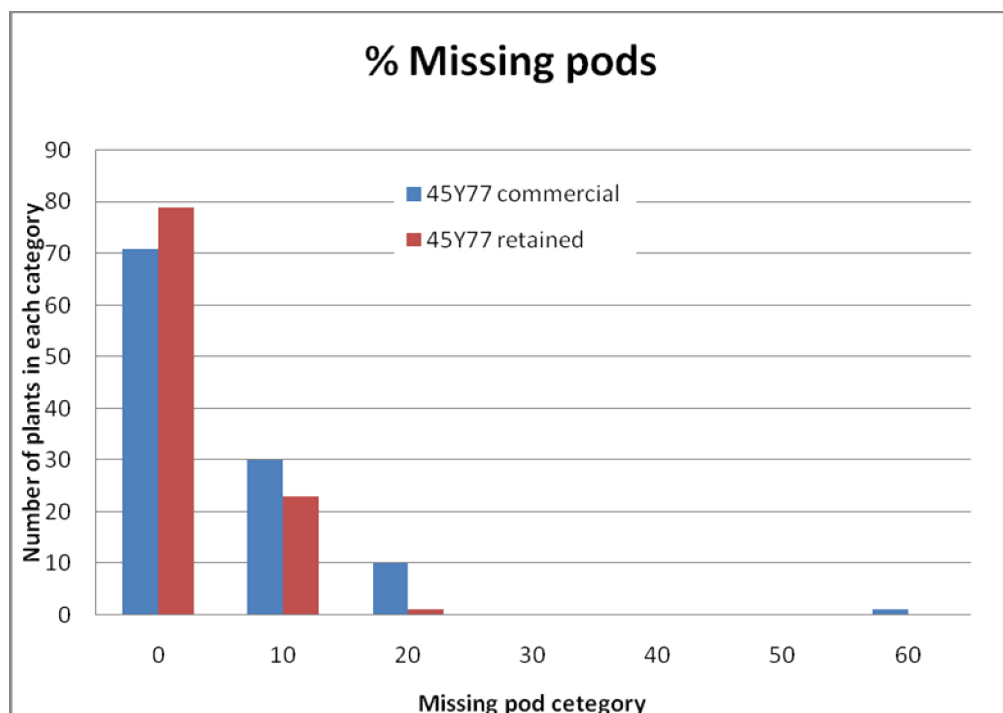
The F1 hybrid and the retained hybrid of the same cultivar that have the same letter are not significantly different at the 95% confidence interval.



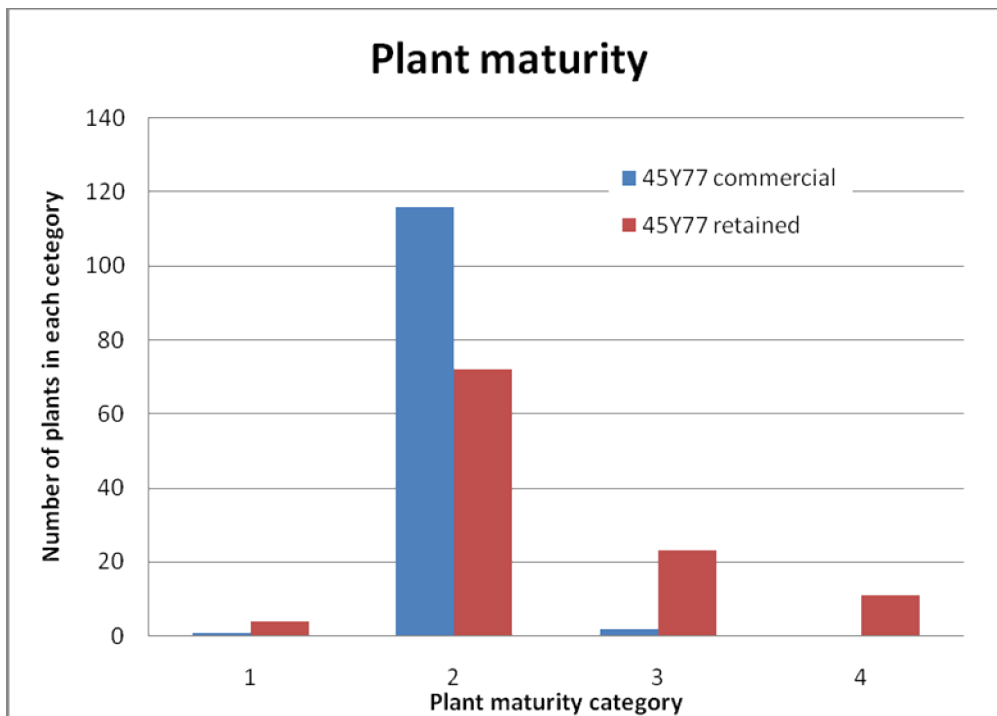
**Figure 1:** Naracoorte site – blackleg severity of both hybrid and retained hybrid seed. The F1 hybrid seed had a higher proportion of plants in the low blackleg infection category.



**Figure 2:** Naracoorte site – Plant height of both hybrid and retained hybrid seed. The F1 hybrid seed had a higher proportion of plants in the 100-150cm range with fewer shorter plants.



**Figure 3:** Naracoorte site –Percentage of missing pods of both hybrid and retained hybrid seed. There appeared to be no difference between the hybrid and retained hybrid seed. Retained hybrid seed does have a percentage of male sterile (no pollen) flowers. In this trial the pollen from surrounding flowers must have been sufficient to pollinate all flowers.



**Figure 3:** Naracoorte site –Percentage of plants maturing at the same time for both hybrid and retained hybrid seed. The F1 hybrid plants matured evenly, the F2 retained hybrid plants were more variable in their maturity date.

**Summary**

Hybrid seed should not be retained for future sowing. Retained hybrid seed produced plants that were less vigorous and more variable in their height and maturity. The blackleg resistance was much reduced in the retained hybrid seed. The likely blackleg resistance of retained hybrids is completely unknown. In relation to blackleg, the risk from sowing retained hybrid seed is too high.