

Better Oilseeds trial: Effect of retained hybrid canola seed on yield and blackleg (2009)

Trial locations: Southeast South Australia and Eyre Peninsula, SA; southern NSW and western Victoria.

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Key Messages

- Retained hybrid seed can produce lower grain yields than the original hybrid
- Retained hybrid seed often resulted in more plant mortality or internal infection with blackleg than when the original hybrid was sown.
- The use of farmer retained hybrid seed must be questioned based on these and other trial results.

Background and aims

The effect of retaining hybrid seed for sowing in the next year was tested at a range of sites in 2009.

Methods

Seed from the hybrid 45Y77 was collected from farmers' crops in 2008 and sown at Struan, South Australia, Horsham, Victoria and Wagga Wagga, New South Wales, in yield plots and in blackleg nurseries at Bordertown, South Australia, Wonwondah, Victoria, Lake Bolac, Victoria and Wagga Wagga. These F1 and F2 hybrids were also sown with and without the seed treatment Jockey[®]. As well, a trial was conducted by Cummins Ag Services in conjunction with the LEADA group on Eyre Peninsula.

Results

In the trial conducted on Eyre Peninsula (Table 1), F3 seed of 45Y77 and F2 seed of Hyola produced significantly lower grain yield than the original hybrids.

Table 1. Effect of successive generations on grain yield of canola hybrids, Eyre Peninsula 2009, trial conducted by Patrick Head, Cummins Ag Services and LEADA

Variety	Seed Generation	Yield (kg/ha)	Oil %	% Stem Infection
45Y77	F1	2,817 <i>a</i>	46.4	41.3
	F2	2,525 <i>a (-10%)</i>	46.2	43.0
	F3	2,114 <i>b (-25%)</i>	46.6	36.8
	LSD	466		
Hyola 571CL	F1	2,328	46.2	16.7
	F2	2,147 <i>(-8%)</i>	46.5	17.0
	LSD	ns		
Hyola 50	F1	3,417 <i>a</i>	46.5	5.3
	F2	2,781 <i>b (-19%)</i>	46.2	11.5
	LSD	368		

In the trial conducted at Struan, 40 individual plants per plot were taken at random and scored for internal infection of blackleg, plant height and also stage of development. The retained 45Y77 had a greater number of plants showing increased internal infection with blackleg than the original hybrid seed (Table 2). Plants sown with retained seed tended to be shorter than the original 45Y77 (Table 3) and the maturity scores (Table 4) showed that a greater proportion of green plants occurred in the original hybrid seed (more plants with a lower score).

Table 2. Effect of retained versus original hybrid on blackleg internal infection per plant at Struan, 2009, number of plants in each category

Line	Internal infection %				
	0-20	21-40	41-60	61-80	81-100
45Y77 commercial	62	27	9	8	17
45Y77 retained	36	33	17	10	27

Table 3. Effect of retained versus original hybrid on height per plant at Struan, 2009, number of plants in each category

Line	Height (cm)						
	0-25	26-50	51-75	76-100	101-125	126-150	>150
45Y77 commercial	1	1	1	13	64	38	2
45Y77 retained	1	1	10	44	47	13	0

Table 4. Effect of retained versus original hybrid on maturity score per plant at Struan, 2009, number of plants in each category.

Line	Score*			
	1	2	3	4
45Y77 commercial	1	116	2	0
45Y77 retained	4	72	23	11

*Score: 1 = green plants to 4 = dead plants

At Dunkeld there was no significant difference in emergence between retained or original seed. However some hybrids had reduced vigour when sowing seed was retained as well as increased plant mortality (Table 5). Grain yield data must be treated with caution because the site suffered severe waterlogging.

Table 5. Effect of retained versus original variety on emergence, vigour, mortality and grain yield at Dunkeld 2009

Line	Emergence	Vig 1-4	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
LSD	24.6	Transformed	Transformed	0.2
CV%	14.2	10.2	13.1	19.6

Analysis only between certified vs retained of the same cultivar

Table 6. Effect of retained versus original hybrid on survival in blackleg nurseries in 2009.

Line	Bordertown	Lake Bolac	Nurcong	Mean
45Y77_Commercial	47	7	26	26
45Y77_Commercial_Plus Fungicide	69	21	54	48
45Y77_Nil (1)	50	4	29	28
45Y77_Plus Fungicide (1)	64	25	44	44
45Y77_Nil (2)	51	5	15	24
45Y77_Plus Fungicide (2)	59	29	37	42
45Y77_Nil (3)	40	8	16	21
45Y77_Plus Fungicide (3)	71	28	41	47

Survival in blackleg nurseries is shown in Table 6. Retained hybrid seed from three farmers had some variation for survival at Nurcong, Vic, but little effect at the other sites.

Summary

Some trials showed that retained hybrid seed produced lower grain yields than the original hybrid. However, this was not always the case. Retained hybrid seed often resulted in more plant mortality or internal infection with blackleg than when the original hybrid was sown.

The use of farmer retained hybrid seed must be questioned based on these and other trial results.