

Evolution of Rapeseed in Australia

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Rapeseed was first grown as a commercial crop in Australia as recently as 1969. Initial cultivars grown in Australia were Canadian and European types. In 1970 Target was the most widely grown cultivar and by 1978 Midas, Tower and Span were the recommended cultivars. With the introduction of wheat quotas in the country in 1969-70 and the collapse of the wool market in 1970-71, rapeseed was seen as a good alternative crop for farmers. Blackleg disease caused large losses to farmers crops in the first few years resulting in a depression in rapeseed production. The return of good wool prices in 1972 and removal of wheat quotas in 1974-75 also contributed to a decline. Figure 1 indicates considerable fluctuation in production since the earlier periods. However the release of several new cultivars in recent years with good blackleg resistance and far better agronomic characteristics have resulted in annual increases in production. From the illustrated comparison of yield and area sown in Figure 1 it can be seen that a large part of the increase in production is due to higher yielding cultivars.

Breeding

Australia has four main breeding programs including:

1. NSW Agriculture, ARI, Wagga Wagga, NSW
this research group is government funded and has been the source of many of the major cultivars produced in recent years including Oscar, Maluka and Shiralee.
2. Victorian Institute for Dryland Agriculture, Horsham, Victoria
is government funded and has produced several cultivars including Marnoo, Tatyoon and Dunkeld.
3. Ag-seed Research Pty Ltd, Horsham, Victoria:
a privately owned company. Ag-seed Research have marketed several of the cultivars from the government breeding programs.
4. Pacific Seeds, Toowoomba, Queensland:
a privately owned company which has produced several hybrid cultivars including the Hyola lines.

Australian rapeseed is now routinely referred to as canola. Canola is a name developed in Canada and used to describe seed of the species *Brassica napus* or *Brassica rapa*, the oil component of which seed contains less than 2% erucic acid and the solid component of which seed contains less than 30 micromoles of any one or any mixture of 3-butenyl glucosinolate, 4-pentenyl glucosinolate, 2-hydroxy-3-butenyl glucosinolate and 2-hydroxy-4-pentenyl glucosinolate per gram of air dry, oil-free solid as measured by the gas chromatograph method of the Canadian Grain Commission. Australian canola is today of world class quality. The limits of canola are easily met by current and new cultivars. Erucic acid in the oil has been reduced to only trace amounts. Similarly, glucosinolate levels in the meal are negligible in relation to the canola limits. Furthermore, Australian canola has no chlorophyll problems.

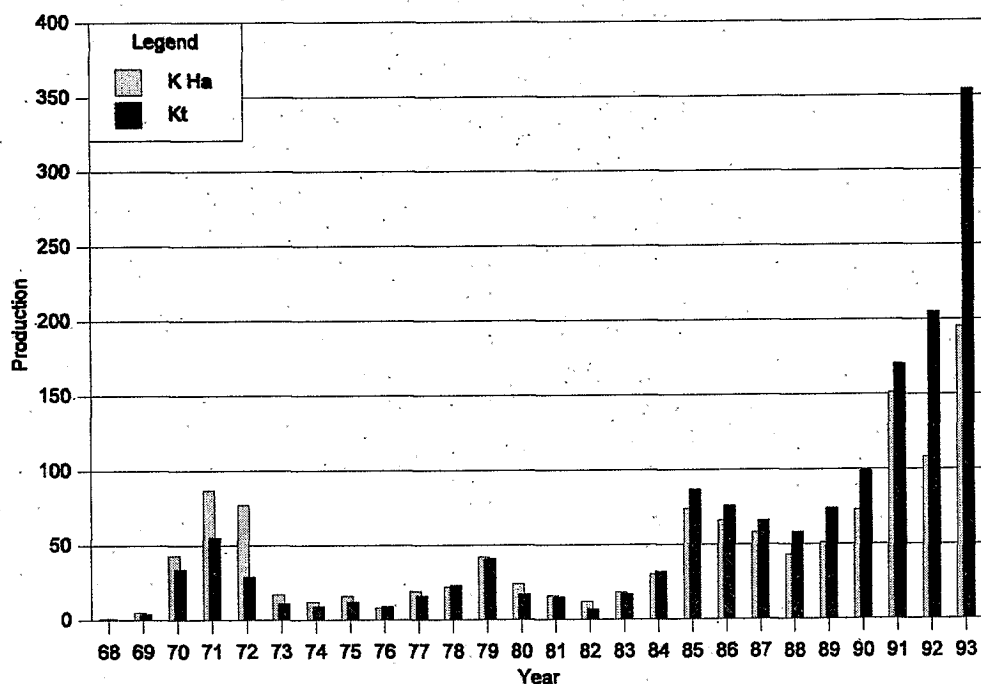


Fig. 1. Increases in canola production since 1968. A dramatic increase in production per ha is apparent from the graph.

Current Production

In 1993, the season was a very favourable one for growing canola. Crops were planted a little later than ideal but good rains and growing conditions occurred during winter and spring. The spring was cooler, and longer than usual, resulting in above average yields and oil levels. Average yields were about 1.8 t/ha, compared to a record 1.9 t/ha in 1992, and oil content averaged 41.6%. Many crops in NSW and Victoria yielded up to 3 t/ha, with the top crops making 3.4 and 3.6 t/ha. Australian farmers planted an estimated at 195,000 ha in 1993, up from 108,000 ha in 1992. Industry sources indicate that seed deliveries totalled 354 Kt nationally (213 Kt in 1992), domestic consumption was 242 Kt (164 Kt in 1992) and exports were 102 Kt (49 Kt in 1992). Production, domestic consumption and export tonnages were all records for Australia in 1993.

Table 1. Canola Production in Australia for 1992-93 and Predictions for 1994-5

State	1992 ¹	1993 ¹	1994 ²	1995 ³
New South Wales	162600	218790	56000	156000
Victoria	29800	71480	55000	117000
South Australia	9000	16810	35000	32500
Western Australia	10500	47355	110000	195000
TOTAL	211900	354435	256000	500500

Source ¹ Canola News #44 April '94

² Canola Association Teleconference 10 Nov '94

³ Winter Oilseed Consultative Group Oct. '94 (predicted ha x 1.3 tonnes)

The crop in Eastern Australia harvested from 1994 sowings has been affected by serious drought conditions possibly the worst for 40 years. Despite a record area sown to canola of 342,000 ha, estimates of production have been considerably reduced. However, Western Australia has begun to realise its potential with an estimated canola crop of around 110,000 tonnes. This will result in a national crop of over 250,000 tonnes despite the drought. This is a clear indication that with the return of normal seasonal weather, Australia can produce in excess of 500,000 tonnes of canola.

Improvements in Rapeseed Quality

There are many factors considered in selection of new cultivars for the wide range of environmental conditions under which it is grown in Australia. These include agronomic traits, disease resistance and product quality. Many advances have been made in all of these fields, particularly with rapeseed quality. In a recent project, all cultivars which have been grown commercially in Australia were included in a series of trials at three environmentally different sites. This provided a comparison of the earliest types with new lines. Table 2 shows the results of chemical analysis of seed from these trials and the improvements, particularly in relation to glucosinolates and erucic acid. These improvements have been achieved simultaneously with disease resistance and agronomic traits.

Table 2. Historic Trials - cultivars grown in Australia from 1968 to 1993 (mean of three sites)

Year Release	Sample	Oil ¹ Content	Protein ² Content	Erucic Acid	Glucosinolates Content ³
0	Target	43.7	33.3	28.9	45
1979	Wesway	42.6	30.8	0.1	32
1980	Marnoo	43.1	32.2	6.5	28
1980	Wesroona	42.1	32.0	0.7	13
1984	Wesbrook	42.5	32.8	0.6	14
1986	Tatyoona	43.1	32.3	1.5	22
1988	Maluka	42.7	33.1	tr	11
1988	Shiralee	43.1	32.0	0.6	9
1988	Taparoo	42.2	31.4	2.5	10
1988	Nindoo	42.7	32.3	1.1	17
1989	Eureka	42.2	32.2	1.4	7
1990	Barossa	42.4	31.7	tr	7
1990	Yickadee	43.6	33.1	0.5	9
1991	Narendra	42.1	29.8	0.4	11
1992	Oscar	43.0	31.1	0.1	6

¹ 8.5% moisture basis; ² 13% moisture basis in oil-free meal; ³ total glucosinolates at 8.5% moisture in seed
N.B. Target is a Canadian bred cultivar.