Canola : golden oil for farmers and consumers

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Favourable returns

According to the MIDAS whole farm economic model for the Great Southern (500-600 mm rainfall zone), net farm income is maximised when canola is included in the cropping program. With an on-farm canola price of only $260 per tonne and a wool market indicator of 800 cents per kilogram clean, this has meant for an average farm of 1000 ha that net farm income is increased, the amount depending on canola yield. This model is based on a five-year cropping rotation where canola yield averages 1.4 t/ha on typical gravel soils of the Great Southern. Canola production costs range from $180 to $240/ha - about double that for wheat or barley, with the main expense being extra fertiliser and harvesting costs. Harvesting costs vary depending on whether the farmer is relying on contractors or has existing machinery which can manage the crop, as most do in the wheatbelt.

Canola is one of the fastest expanding broadacre crops in Western Australia, indeed Australia, and its future is looking bright. About 112,000 tonnes averaging 40.3 per cent oil - excellent considering the dry year - were delivered into Co-operative Bulk Handling bins across Western Australia last harvest; more than double the previous 46,500 t, which was four times that of 1992.

In 1994-95 the gross value of canola produced in Western Australian will exceed $38 million, most of it sold by the Grain Pool as unprocessed seed to Japan.

Production in the eastern States has increased also from about 55,000 t in 1984 to 300,000 t in 1993. Drought last year reduced the harvest to less than 200,000 t, making Western Australia the leading producer for the first time.

Farmers are turning to canola for several reasons including uncertainty in the wool market, volatile coarse grain prices, dissatisfaction with lupin returns in southern cropping areas, and consistent yields from new canola varieties in medium rainfall areas. Wool and wheat farmers are including it in rotations as a risk management strategy in volatile markets and as a break-crop.

Making the break

Canola has benefit as a break-crop, bringing flexibility to tired crop rotations. Many wheatbelt farmers are moving from continuous wheat-lupin rotations as they encounter more disease and herbicide resistance. Growing canola after lupins not only provides two break-crops between each wheat planting but also extends the time between lupin crops. Advantages include less disease, better grass weed management and increased long-term gross margins.

The cereal crop following canola will have less root disease thanks to canola's 'bio-fumigation' properties. Some eastern States data suggest that canola residues actually suppress the development of soil-borne pathogens that attack cereals.

Growers pursuing high yielding cropping packages are using canola to extend their rotation to five years, for example wheat-canola-barley-lupins-oats or canola-barley-lupins-wheat-oats. Canola also spreads the farm workload over harvest.

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Dr Narendra Roy was responsible for development and release of two blackleg-resistant rapeseed varieties, Wesbrook and Wesroona, in 1984. Local production had then fallen to 200 t a year.

His last variety, Narendra, released in 1991, is now the second most widely grown in Western Australia. Royalties from this variety have been used to finance the salary of

After the fungal disease known as blackleg destroyed more than 35,000 ha of rapeseed in 1972 the Australian industry realised it could not rely on overseas breeding programs.

The Department of Agriculture established its own breeding program with the appointment of Dr Narendra Roy in 1975. Breeding programs were also established in the eastern States, one under the direction of Greg Buzza at the Dryland Crops Research Institute in Horsham, Victoria, and a second by Neil Wratten for the NSW Department of Agriculture at Wagga Wagga.

These were connected into a national program in 1980. Canola research now concentrates on identifying varieties suitable for different areas and evaluating interstate and overseas varieties.

Crops are delivered to Cooperative Bulk Handling bins which usually open from late October in the northern wheatbelt and later in cooler areas.

**National breeding program**

Western Australia's rapeseed industry began with the varieties Ario and Target which were derived from Canadian breeding programs. The main growing areas were then bounded by Katanning, Mount Barker and Boyup Brook. However, yields were often very low because of inappropriate management - poor paddock selection, inadequate harvest equipment and low resistance to blackleg.

But high costs are offset by better returns - last year about $310 to $315 per tonne net on the farm.

Current varieties yield about 60 to 70 per cent of wheat grown under similar conditions, an increase from about half the wheat yield of rapeseed varieties grown during the early 1970s.

Maturing crops are frequently windrowed or swathed before harvesting to prevent grain loss through shattering and to allow even ripening. This is not essential in all districts. Growers in drier eastern and northern wheatbelt can direct head (harvest standing crops) to reduce costs.

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Canola Development Officer, Matthew Appelbee, who began work in Katanning in August 1994. He provides support to the canola research and extension program of the Department of Agriculture, which is primarily funded by the Grains Research and Development Corporation.

Matthew’s work will include a survey of the slug problem that emerged in crops in 1994 and improving quality control of canola seed production.

**Local processing**

When crushed, canola seed yields more than 40 per cent oil and the rest is meal. Davison Industries, with a factory at Pinjarra capable of processing over 20,000 t of canola seed each year, is currently the only local oilseed crusher in Western Australia.

Meadow Lea buys about 4500 tonnes of unrefined oil annually for processing at its Bunbury refinery and then packaging at Palmyra.

Shortfalls in domestic requirements for canola oil are made up by imports of soybean oil from overseas, usually South America.

Canola can be used in a diverse array of products which helps act as a price buffer against large supply changes. Even with floods in the American mid-west or a big chill in Canada, the canola price tends to be less volatile than wool or wheat.

Canola oil contains very low levels of saturated fatty acids (7 per cent) compared with olive oil (14 per cent). It has the second highest level (60 per cent) of mono-unsaturated fatty acid (oleic acid) among the major vegetable oils after olive oil at 77 per cent. Both of these factors make it highly desirable for use in foods and cooking products.

Flowering canola crop near Moora.

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Canola meal contains up to 35 per cent crude protein which is about 7 per cent more than lupins. It also has a more favourable range of amino acids than lupins for pig or poultry rations. The biggest users are local broiler producers taking up to 90 t each week. Other users include stock feed manufacturers and the local horse industry.

Department of Agriculture trials have illustrated that increased milk production can be achieved by using canola meal in dairy rations as a substitute for other protein supplements such as fish meal.
Other products being developed by Davison are canola dog biscuits and stock blocks for cattle and sheep which contain up to 20 per cent canola meal.

Canola Check
Canola Check is a product of the Department's concerted extension program to promote canola into the farming system and to promote good management.

Twenty three groups consisting of 10 to 15 growers meet up to four times a year in local areas. Agents, consultants and private agronomists are encouraged to organise meetings in conjunction with Canola Specialist Advisers.

The idea was first developed in NSW and adapted to Western Australia from 1992.

Growers learn how to improve their yields and returns beyond the district average. They also exchange ideas, identify weed and insect problems and obtain feedback on gross margins.

History of rapeseed (and subsequently canola) in Australia is comparatively short. Although known in Europe during the thirteenth century, it was not grown extensively until the advent of steam power when rapeseed oil was found to cling to water and steam-washed metal surfaces better than any other lubricant.

Critical shortages of rapeseed oil during World War II brought Canada into production to supply the urgent need for lubricant for the rapidly expanding numbers of steam engines in allied naval and merchant ships.

The first edible rapeseed oil was extracted in Canada in 1956 when its significance as a food crop was realised. However, nutritional aspects were questioned by health authorities during the 1960s and breeders responded rapidly to reduce its erucic acid content.

In 1974 the first 'double-low' rapeseed variety was released in Manitoba, Canada, with both low erucic acid and glucosinolate levels. This variety was eventually to become known as Tower.

The name ‘canola’ was born with its initial registration by the Western Canadian Oilseed Crushers Association for oil, meal, seed and seed hulls produced from this variety. The term was derived from the words Canada and oleic, referring to the oleic acid in the oil which produces good frying characteristics.

To gain the title of canola, a rapeseed variety must contain less than 2 per cent erucic acid in the oil and less than 30 micromoles of glucosinolates in the meal.

Both of these compounds are undesirable in high concentrations and they previously limited rapeseed use in human and animal feedstuffs.

Today canola has been adopted worldwide. Canada is the major exporter with more than 40 per cent of the world market and producing about 7 million tonnes last season.

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Origins of rapeseed and canola

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Stock blocks for sheep and cattle and dog biscuits are among newer products made from canola meal by Davison Industries at Pinjarra.
State Oilseeds Adviser, Paul Carmody, travels widely around the agricultural areas attending field days and farmer meetings.

Area and production of Western Australian rapeseed/canola have increased dramatically, particularly in the last few years.

Canola is now widely grown in the State's agricultural areas. Initial growing area for rapeseed enclosed by dashed line.
Warnings for new players

Canola now belongs in the farming system but requires a systematic approach for efficient production. It can no longer be seen as a quick fix crop to overcome poor cash flow. Production has a lead time of one year and paddock selection and preparation need to be one, if not two years in advance.

Canola is adapted to many Western Australian soil types except deep white sands and those prone to waterlogging. Avoid paddocks high in broad-leaved weeds, especially the related cruciferous plants, radish, turnip and mustard. Only diligent weed management over many years will allow these paddocks to become suitable for canola.

One triazine-resistant canola variety, Siren, is now available allowing weeds to be sprayed without damaging the crop, and improved varieties are expected in the next couple of years. But this will never be a replacement for good weed management elsewhere in the farming system.

Cruciferous weeds have been seen as a major constraint for the industry in Western Australia. In future, better management of weeds through use of on-farm weed seed harvesting systems, strategic herbicide programs and planned rotations should lead to fewer of these weeds in the wheatbelt.

Such weeds not only compete with the crop but are a serious threat to quality. A limit of 4 per cent dry weight of any of these weed seeds applies to maintain the high standard of canola in Western Australia.

Paul Carmody is the State Oilseeds Adviser based at Katanning.
For more information contact Paul or Matthew Applebee on (098) 213 333

Bio-fuel prospects

Besides diverse uses in human and animal feeds and lubricants, exciting new prospects could develop for rapeseed/canola as a bio-fuel. Such crops could provide renewable, environmentally friendly fuel sources and it is feasible that within ten years Western Australian farmers in low rainfall areas could be growing their own lubricants and fuel.

European areas for bio-fuel production have grown to 500,000 ha within two years, mostly in Italy, France and Germany.

The mining industry has already expressed interest in the use of vegetable oils as a lubricant in drilling operations. Western Australia is in a prime position to develop this technology and export it to other environmentally conscious countries.

New rapeseed lines with higher levels of erucic acid – High Erucic Acid Rapeseed or HEAR oils containing up to 55 per cent erucic acid – may soon be available also. These are favoured by chemists for industrial use as a substitute for mineral oils.

At present only a few HEAR oil varieties are being developed in Australia and the industry is concerned about the need for segregation from canola. Until this question is resolved, adoption of HEAR varieties will lag behind Europe, Canada and the United States.