Key issues for the Canola Industry in Australia

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Introduction

Rapeseed was first tested in Australia in the early 1960s and was first grown commercially in 1969. Rapeseed breeding commenced in Australia in 1970.The early cultivars used for commercial production were all of Canadian origin. Their quality was poor, with oils high in erucic acid and meal high in glucosinolates. Canadian breeders led the world in the development of improved quality rapeseed, with the first low erucic acid cultivar released in 1968 and the first canola quality (low erucic acid and low glucosinolates) cultivar released in 1974.

These Canadian cultivars were used by Australian breeders as a source of improved quality. Subsequently, the first Australian low erucic acid B. napus and B. rapa cultivars were released in 1978 and 1982 respectively. The first Australian canola quality B. napus cultivars were released in 1980. Both Brassica napus and B. rapa species were grown in the early years; B. napus in the medium to high rainfall areas and B. rapa in the drier, shorter season areas.

High yielding, canola quality, blackleg resistant B. napus cultivars released in the late 1980s became the cornerstone of the Australian industry. The availability of high yielding cultivars, crop management packages and good prices led to rapid expansion in Australian canola production through the 1990s. The area sown to canola in Australia rose from 150,000 ha in 1991 to 1.8 million ha in 1999. Production rose from 99,000 tonnes in 1990-91 to an estimated 2.4 million tonnes in 1999. With only 300,000-400,00 tonnes of canola seed required for the domestic market, significant exports began in 1992. Over 1 million tonnes are now exported annually from Australia. Recent canola production in Australia has ranged from 1.3 million to 1.7 million hectares between 1999 and 2002, depending on seasonal conditions and price. This increased production has led to increased challenges for the industry and as these challenges are met, the Australian canola area will continue to expand.

Agronomic issues

Disease

Blackleg remains the main disease of canola throughout Australia, with many new highly resistant cultivars released since 2001. However, to ensure stability of resistance, alternative sources of resistance are being sought, including those from winter rapeseed and other Brassica species. Studies into the epidemiology of blackleg are continuing throughout Australia and management guidelines to reduce damage by blackleg are being developed.

Sclerotinia has occurred in the last several years particularly in southern New South Wales (NSW). In some cases it has caused greater economic loss than blackleg. Studies into disease prediction and control measures are being conducted in southern NSW while some surveys have also been undertaken in Victoria. A new project being developed in conjunction with Australia, India and China and funded in part by the Australian Centre for International Agricultural Research (ACIAR) aims to develop screening methods for Sclerotinia and to identify sources of resistance.

Beet Western Yellows virus occurs in most states and yield losses of up to 50% have been reported in Western Australia (WA) where inoculated plants have been transplanted into trials. Further work is continuing in WA.

Rotations

In the past, canola has been grown after a legume pasture or a pulse crop to provide additional nitrogen for the canola crop. In recent years the place of canola in the rotation has changed. In much of southern NSW canola is grown in rotation with wheat as other rotations do not provide such a high gross margin. The development of a consistent, high yielding pulse crop would reduce the pressure on canola. In South Australia (SA), canola is now often grown after wheat to allow the wheat stubble to be burnt to reduce snail numbers.

Relativity between canola and wheat yields

In the past, canola yields have been about 55% of the yield of wheat. There are suggestions that the relative performance of canola has decreased in recent years. There are probably many reasons for this, some of which have been discussed above. In seasons with a late break, or a dry finish, canola yields less compared to wheat. Also disease has decreased canola yields in southern NSW, particularly Sclerotinia in 1999 and 2000. In addition to plant death, internal blackleg infection of canola stems has been shown to reduce yield and oil content. In paddock surveys, an average of 30% stem infection has been shown where there was no external evidence of blackleg (Steve Marcroft - unpublished data). Other factors such as trace element nutrition also need to be investigated to ensure high canola yields relative to wheat.

Insect pests

In WA over the past two years, diamond back moth (Plutella xylostella) has caused significant damage to canola crops in northerly growing regions. The moths are a greater pest in warmer, drier seasons and have also occurred in spring sown crops in SA. Insect populations are often resistant to several insecticides and further work is required to control this pest.

In the south eastern states, slugs have damaged emerging crops to a greater extent in 2001 and 2002 than in previous years and many crops have been baited up to 4 times. A major study into the ecology and control of slugs is necessary to ensure good establishment of canola crops. In addition, snails remain a major problem in many areas of SA where alkaline soils predominate. These snails include round snails that can cause damage by feeding on emerging crops and also small conical snails that cause most damage by acting as a contaminant of grain at delivery. Many crops in SA have been cleaned after harvest to remove conical snails while a great deal of work is being done to modify harvesting machinery to eliminate snails from harvested seed.

In addition to perennial problems with red legged earth mite (Halotydeus destructor), the larvae of the bronzed field beetle (Adelium brevicorne) has been a major pest of emerging canola in many areas. This pest has often been incorrectly identified as false wire worm by farmers. Further work is required on the ecology and control of these ground dwelling pests of emerging canola to ensure adequate plant stands are established.

Breeding issues /Breeding programs

The publically funded National Brassica Improvement Program (NBIP) is currently releasing canola cultivars for all areas of Australia. In the longer term, the likely future focus of the NBIP is in the development of germplasm, rather than the release of cultivars. A major priority for breeders is the development of early conventional and triazine tolerant cultivars with higher levels of oil and protein content.

End point royalties are currently being introduced in Australia. To ensure the acceptance of end point royalties by farmers, they need to be applied to superior cultivars with enhanced blackleg resistance, yield and oil content. The development of hybrid cultivars is another means for companies to maintain returns from breeding. This is now the preferred option for several companies in Australia.

Bonification and oil content

At present, in Australia, growers are paid for yield but are also paid a bonus for canola with an oil content of over 42%. As most Australian canola is now exported to countries that do not pay bonuses for high oil content, there is a move to reduce or remove the current bonification system. If bonification is removed from Australian canola there will be a greater focus on breeding for yield, rather than for yield and oil content as at present.

The importance of commodity canola relative to high oleic/low linolenic canola is an issue that needs to be resolved in Australia. The likely size of the high oleic acid market will determine the priority given by breeders to the development of high oleic acid types with better agronomic performance.

GM canola

The development and release of GM canola offers considerable potential benefits to Australian growers. The acceptance of this product by farmers and consumers is a key issue. The introduction of GM canola will require enhanced record keeping by farmers and this will allow traceability and segregation. Thresholds are required to allow co-existence of GM, conventional and organic canola. All information regarding GM canola must be presented to farmers and consumers in an unbiased forum to allow informed decisions to be made.

Low rainfall areas – breeding opportunities

Canola is grown in low rainfall areas throughout Australia but production and quality have been variable. In recent years, the autumn break has often been late and therefore canola has not been sown. Many farmers still grow triazine tolerant canola in these areas because of broad leaf weeds resulting in low oil content, particularly in years with a dry finish to the season. Alternative herbicide tolerance systems need to be cost competitive if they are to be acceptable in low rainfall environments. Higher oil content cultivars adapted to low rainfall areas are required to ensure greater production from these areas.

Indian mustard (Brassica juncea) has been regarded as the main hope for low rainfall areas in Australia and lines with low glucosinolates, low erucic acid and higher oleic acid are being developed. Commercial cultivars of canola quality mustard are now available in Canada, while a cultivar adapted to Australian conditions is still 2-3 years from release to growers.

Other industry issues /Coordination

The Australian canola industry is spread over a wide geographical area and in the last few years a number of agronomic problems have arisen as discussed above. Some of these problems are widespread, but others occur in isolated areas. A more coordinated approach to problem solving is required throughout the industry, with funds set aside for rapid assessment of new problems and the development of solutions.

Costs of production of canola

One problem raised by many canola growers is the high cost of production, associated with high levels of inputs. Further studies are required to determine the necessary level of inputs and eliminate unnecessary costs.

The future?

The Australian canola industry has the potential to increase in area and production over the next few years. However, production is always likely to remain somewhat variable due to seasonal conditions, particularly in lower rainfall areas. The role of biodiesel in the Australian industry also needs to be assessed.

Resolution of identified agronomic issues and issues associated with the introduction of GM canola will allow production to continue to increase, perhaps up to 2.5 million hectares per year.