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Crops in the woolbelt: current options and emerging prospects

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Crops in the woolbelt: current options and emerging prospects

It has traditionally been more profitable to grow sheep for wool in the medium rainfall parts of the south-west of Western Australia than to grow crops.

Crop production has been difficult owing to the hilly terrain, the frequency of waterlogging, the high incidence of damaging frosts in some areas, the frequency of losses from diseases, difficulties with wet weather at harvest, and a lack of adapted crop varieties. Advances over the past decade have made cropping on a limited scale potentially profitable in the woolbelt. There may now be scope for farmers to consider the possibilities for crop production, especially given the current state of the wool market.

The following factors are now better understood for producing profitable crops in the higher rainfall woolbelt:

- Market requirements and factors affecting grain quality.
- Selection of well-drained sites with about a metre of root zone, high in the landscape where frost is less likely.
- The importance of break crops for nitrogen supply and control of root diseases in cereals.
- The importance of grass weed control to reduce cereal root diseases.
- The usefulness of resistances to leaf diseases in newer varieties.
- The appropriate development patterns for long season crop production.
- The use of chemicals for the control of diseases, insects and weeds.

Some of the more profitable cropping options and some emerging prospects are briefly discussed in this article. Their profitability will depend on fitting them into the existing farm system (for example, suitable rotations, loss of grazing for sheep, availability of machinery and labour) as much as the intrinsic attributes of the crops themselves.

This article is intended to bring the various options for crop production to the attention of wool growers. Further detailed information will be required for successful production and is available from your local office of the Department of Agriculture.

Wheat

Current options
Varieties suitable for the Australian Standard White, Australian Soft, Noodle and the Australian Hard grades can be grown in one part of the woolbelt or another.

Recent research has shown that crops grown in the higher rainfall areas need not produce low protein levels provided suitable rotations and grass weed control are practised. Some varieties and cropping systems may be more profitable than others in some places (consult your local adviser), but it is important to match the variety to the sowing date as illustrated in Table 1.

Emerging prospects
There are several new crossbreds at advanced stages of testing that are longer season types with potential for earlier sowing in the woolbelt. Both Noodle and Australian Soft types with improved disease resistance are showing promise.

Research into production methods for the newer varieties, including disease and insect control (particularly aphids) and agronomic practices, is aimed at improving the reliability of producing wheat in the wetter areas of the State.
Barley

Production of barley in Western Australia is dominated by the malting variety, Stirling. Since the 1986–87 season it has accounted for about 75–80 per cent of barley sowings. The domination of production by Stirling reflects the relatively high premiums for malting over feed barley during recent years.

Although world trade in malting barley and barley malt is small compared to wheat, it is likely that the premiums for malting barley will remain at their current levels. Therefore, there will be a continuing incentive for growers to produce malting rather than feed barley.

In recent years, several high yielding feed barleys have been developed. In some situations their yield advantage will more than offset the malting premium.

The choice of growing a malting or feed barley will also be influenced by the likelihood of achieving the malting grade. Crops in some areas of the woolbelt, and particularly southern coastal areas, are prone to weather damage, which can lead to downgrading of malting barley varieties to feed grade.

Emerging prospects

A large effort is being made to increase the quality of the Western Australian malting barley crop, both by releasing superior varieties and by developing technology that enables growers to produce high yielding crops of good quality malting barley. The aim of this effort is to ensure that the barley industry remains competitive in the heavily subsidised, international market. This will be achieved by increasing the range of malting barley varieties available for production.

Production of Franklin barley is an important option for farmers receiving more than 500 mm of rainfall a year. Although this variety is prone to produce small grain, its high yield potential, strong straw strength and disease resistance make it an attractive proposition for barley growers.

Barley variety by time of planting by crop rotation systems are being developed in research funded by the Grains Research and Development Corporation, to assist growers produce high yielding malting quality crops in medium rainfall districts.

Table 1. Approximate sowing times for various wheat varieties in the woolbelt

Consult the Department of Agriculture's annual Crop Variety Sowing Guide (Bulletin 4273 in 1994) for more detailed information. Dark shading indicates preferred sowing times.

* Not on the south coast owing to poor quality and/or low yield.
** H5 East only.
**Field peas**

*Current options*

Field peas have been grown successfully for many years in the woolbelt for hay or as a standing fodder crop for prime lamb production. Field peas can also provide an attractive cash return from sale of the grain.

**Lupins**

*Current options*

Lupins can be grown successfully in the woolbelt to provide a cash crop and strategic summer grazing, and also a break-crop for cropping rotations. Production trends in Western Australia are shown in the graph.

*Emerging prospects*

A particular problem facing lupin growers in high rainfall areas is that of excessive vegetative growth and poor seed production. Plant breeders are developing varieties with shorter branches to try and overcome this problem, while agronomists are researching mechanisms that control seed set.

Another lupin species, the European white lupin *L. albus*, is being grown on the more fertile soils. It is anticipated that between 30,000-50,000 ha of albus will be grown in 1994. This lupin species can be freely marketed.

Other lupin species such as the yellow lupin *L. luteus* and two wild species *L. atlanticus* and *L. pilosus*, may become available to growers over the next few years, so further broadening and environments in which lupins can be grown.

Lupins are already used in human foodstuffs in Australia. Testing is underway in Britain for international acceptance of Australian lupins, which will further enhance their market prospects.

If you are a first-time lupin grower you should buy the Western Australian Department of Agriculture’s Bulletin 4179 ‘Producing lupins in Western Australia’ and also place your name on the mailing list for the free monthly newsletter ‘Lupin Logic’. These publications will provide detailed information on lupin production.

**Field peas**

*Current options*

Field peas have been grown successfully for many years in the woolbelt for hay or as a standing fodder crop for prime lamb production. Field peas can also provide an attractive cash return from sale of the grain.
Faba beans are tolerant of transient waterlogging, as this crop at Moora shows.

Grain legumes such as field peas can play a major role in producing quality wheat by improving soil nitrogen fertility, acting as a break crop for cereal root diseases, improving weed control, and helping to maintain soil fertility and soil moisture.

In 16 out of 17 rotation trials, wheat following field peas with no additional nitrogen has out-yielded wheat following wheat by an average 37 per cent (470 kg) and improved grain protein by almost 2 per cent. The ‘field pea effect’ is longer than one year, with the second wheat crop after field peas yielding on average 15 per cent (223 kg) more grain and protein levels 0.6 per cent higher than wheat after wheat.

Field peas, unlike all other grains in Western Australia, may be freely traded and do not need warrants or permits. Field peas are readily sought after by the domestic stockfeed market and export markets.

Emerging prospects
The revival of the canola (rapeseed) industry may also result in increased local demand for field peas. Domestic feed compounders plan to substitute field pea/canola meal for soybean within broiler rations.

Throughout South-East Asia there is demand for grain legumes between December and March, when both local stocks and northern hemisphere imports are almost exhausted. Given Western Australia's proximity to South-East Asia and our time of harvest, from late October to late November, we are well placed to meet the increasing demand for field peas as stockfeed and human consumption for this region. With effective promotion the Asian market is capable of absorbing the entire Western Australian field pea export trade of more than 70,000 t.

If you are considering growing field peas for the first time or growing them after a break, you should obtain the Western Australian Department of Agriculture's Bulletin 4239 'Growing Field Peas' and also place your name on the mailing list for On the Pulse, the Department of Agriculture's new newsletter for grain legume industries. Both these publications will provide detailed information on successful field pea production.

**Faba beans**

As a result of the successful incorporation of lupins (*Lupinus angustifolius*) in the farming system on sandplain soils, farmers with other soil types are interested in including alternative grain legumes in their rotational system.

Neutral to alkaline plus shallow duplex soils occupy an estimated 6.5 million hectares throughout southern and south western Australia. Narrow-leaf lupin is poorly adapted to these soil types and the high yielding faba bean could be one option for many farmers. Prices of up to $235 per tonne for good quality faba beans could offer excellent cash flow.

**Table 2. Wheat yields (t/ha) and protein per cent (at 11 per cent moisture) in a field pea: wheat or a continuous wheat rotation at Konnongorring**

<table>
<thead>
<tr>
<th>Year</th>
<th>Field peas</th>
<th>Field peas: wheat</th>
<th>Continuous wheat</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yield t/ha</td>
<td>Grain protein</td>
<td>Yield t/ha</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>1988</td>
<td>0.94</td>
<td>2.95</td>
<td>8.0</td>
</tr>
<tr>
<td>1989</td>
<td>1.25</td>
<td>3.18</td>
<td>9.0</td>
</tr>
<tr>
<td>1990</td>
<td>1.25</td>
<td>3.15</td>
<td>9.5</td>
</tr>
<tr>
<td>1991</td>
<td>0.85</td>
<td>3.27</td>
<td>10.4</td>
</tr>
<tr>
<td>1992</td>
<td>NH</td>
<td>3.15</td>
<td>10.5</td>
</tr>
</tbody>
</table>

NA Not applicable
NH Not harvested owing to early insect damage
Faba beans grow best on heavy, loamy or alkaline soils (pH greater than 5.0 in calcium chloride). However, the crop can be grown on a wide range of soil types. At the low end (pH 5-6), pH should increase with depth, so growers should avoid coarse textured soils with low pH. Plant growth and yield suffer dramatically on poorer sandy soils. The faba bean should be inoculated with the new Group E rhizobium. The most important nutrient requirements for best yields are phosphorus, lime (for soils with low pH), and zinc.

Two major diseases, chocolate spot and ascochyta blight, can cause severe yield losses and result in discoloured seeds. Both diseases can be alleviated by tactical application of foliar fungicides and proper crop rotation.

Studies of two disease resistant varieties, Icarus and Ascot, in Western Australia in 1993 already show some promising results. The ascochyta blight resistant variety Ascot will be released in 1995. Ascot has a similar flowering time and other characteristics to Fiord. Ascot yielded slightly more than Fiord when grown in the presence of ascochyta blight in 1993 and the quality of the Ascot beans was significantly better than Fiord. Ascot will have a significant impact on the southern wheatbelt where ascochyta blight is the major disease.

The chocolate spot resistant variety Icarus, released in 1994, is a medium-sized, light green seed that weighs twice as much as Fiord and is later flowering. This makes it only suitable for high rainfall areas.

For detailed information on faba bean production in the wheatbelt refer to Department of Agriculture Farmnotes 34/93 ‘Faba bean production in the wheatbelt’ and 35/93 ‘Faba beans: controlling weeds, diseases and pests’. 

Faba beans have several benefits common to many grain legumes, however, their tolerance to transient waterlogging and their high yields makes them stand out from other crops.

Faba bean is an erect, multi-stemmed plant with vigorous early growth and competes well with most weeds. The crop is easy to harvest.

The small seeded variety, Fiord, has a brown seed coat, yellow cotyledon and a seed weight of 35–45 g per 100 seeds. The late maturing broad bean, Aquadulce, is grown as a horticultural crop for the domestic human consumption market.

Faba beans yield best in regions with more than 400 mm annual rainfall. Fiord has a flowering time of about 75–80 days after sowing. Faba beans are more frost tolerant than other grain legumes, but temperatures above 30°C during flowering cause pod abortion. Recent research by the Department of Agriculture has shown some promising results, with a mean seed yield of 1.22 t/ha and 2.87 t/ha respectively in 1991 and 1992. With early sowing, faba beans produced a mean seed weight of 3.02 t/ha in 1993.

Ascot faba bean, a variety that is resistant to ascochyta blight.

Faba beans: growing on heavy, loamy or alkaline soils (pH greater than 5.0 in calcium chloride). However, the crop can be grown on a wide range of soil types. At the low end (pH 5-6), pH should increase with depth, so growers should avoid coarse textured soils with low pH. Plant growth and yield suffer dramatically on poorer sandy soils. The faba bean should be inoculated with the new Group E rhizobium. The most important nutrient requirements for best yields are phosphorus, lime (for soils with low pH), and zinc.

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Canola
Canola is a long term alternative enterprise for wool growers.

Canola is a high input, high return crop that gives wool growers the opportunity to crop less land for equivalent returns.

Where rainfall is greater than 450 mm, wool growers can expect to grow 1.5 to 2.0 t/ha canola crops.

Canola is marketed solely through the Grain Pool of Western Australia and sold both into the domestic and export markets. The Grain Pool has been able to guarantee a minimum price for canola to growers that is expected to remain about $270–$280 per tonne. In 1994, the guaranteed minimum price is $300. Therefore, wool growers can be confident of a good market for canola.

The world demand for vegetable oils has increased at a rate of 1.9 million tonnes a year since 1981. An array of products is being developed from oilseeds, one example being the use of canola oil as a bio-degradable lubricant for the forestry and mining industries.

Variety options
The three main canola varieties that can grown in the woolbelt are Barossa, Oscar, and the new variety Dunkeld for high rainfall areas. The differences in yield between these varieties is soon overshadowed by in-crop management; the latest varieties are no substitute for poor management.

Paddock selection and preparation are crucial to growing canola successfully. Well drained gravelly soil types are ideal for canola, as are pasture paddocks that have been manipulated or spraytopped.

Canola is an ideal break-crop out of the pasture phase for cereals, its break-crop effect being similar, if not better, than that of oats for a following wheat or barley crop. However, canola crops need close monitoring during establishment for pest and disease attack, similar to inspections for fly strike in sheep during the summer, at least once a week.

Cost of production ranges from $180–$230 per hectare, with net returns per hectare ranging from $200–$350 per hectare.

The cereal crop following canola will also be free of root diseases owing to canola’s ‘biofumigation’ properties. Some data from CSIRO in the Eastern States suggest that residues from a canola crop actually suppress the development of soil-borne pathogens that can attack cereal crops.

Canola can:
• act as a one year in, one year out crop for pastures;
• reduce the need to crop large areas;
• lengthen and provide more flexible crop rotations;
• improve the clover base in a pasture;
• spread the workload over harvest;
• aid water use in a catchment; and
• improve overall farm income without increasing cropping area.

An array of products is being developed from oilseeds, one example being the use of canola oil as a bio-degradable lubricant for the forestry and mining industries.

Canola is well suited to the forest gravel soils typical of the Boyup Brook district.