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Lupin Logic

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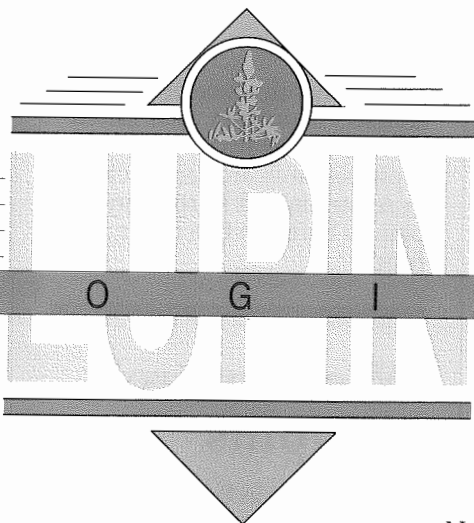
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Grain Pool of W.A.



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## Change and no change

I have resigned from Agriculture Western Australia and joined the Grain Pool of Western Australia as a crop production specialist. This challenging role will widen my involvement with other crops. However, as I stated in the first issue of *Lupin Logic* over six years ago, my approach to agriculture is one embracing farming systems rather than that of an individual crop specialist. I will continue to maintain and strengthen contacts with Agriculture Western Australia, CLIMA and private enterprise agronomists and researchers.

Agriculture Western Australia and the Grain Pool of WA have decided that *Lupin Logic* will continue for a further 12 issues and then its future publication will be reviewed.

## Lupin harvesting

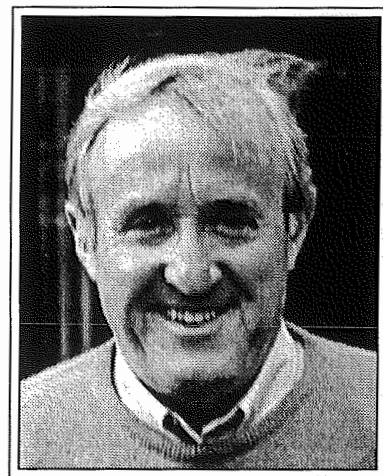
If we spill as much lupin seed on the ground as we have in previous harvests then at current lupin prices we will leave \$40 million on the ground for the sheep, rabbits, kangaroos and to provide expensive nitrogen for next year's cereal crop. Can we stop this waste? I

believe we can substantially reduce this loss by modifying our harvesters. Now is the time to take action. I have included Glen Reithmuller's *Farmnote* on modifying harvesters with this issue of *Lupin Logic*.

## Lupins in the United Kingdom

George Milford and Ian Shield, Rothamsted

The European Union is a major importer of vegetable protein. The United Kingdom alone imports about 2 million tonnes of soya-derived protein each year at a cost of \$A600 million. Because of the similarity of its grain to soya, there have been many attempts over the years to introduce the white lupin (*Lupinus albus*) into the UK. These have all been unsuccessful because, although the crop generally grows well in the cool maritime climate, yields and harvest date were unpredictable and unacceptable in all but hot and dry years, which were few and far between. In the more usual cool and wet summers, plants continued to produce repeated flushes of branches until late in the autumn. The excessive vegetative growth was detrimental to grain yield and made the harvesting of the crop unacceptably late and difficult.



George Milford

As a result of Anglo-French collaboration during the past eight years, major breakthroughs have been made in the development of lupin genotypes that are more suited to cooler, northern-European climates.

The two developments that made this possible were the introduction of winter hardiness that allowed crops to be sown in the autumn and, through this, earlier flowering and a greater yield potential (4-5 t/ha) to be achieved. The second development was the introduction of genotypes with determinate growth habit restricted to a mainstem plus one order of branches. This ensured that the crop consistently ripened naturally by early September.

More recently, dwarf genotypes have been introduced

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which have greater winter hardiness and lodging resistance, and which provide the grower with a wider sowing window. As a result of this progress, lupin growing is now a potential commercial proposition in the UK.

The non-dwarf, autumn-sown, determinate genotypes have been extensively tested, experimentally, at a number of widely dispersed sites in France and the UK. The consistency of their yield and earliness of harvest date have been confirmed. The first registered genotypes are currently being evaluated at the farm scale by commercial seed companies. Meanwhile research is continuing to define the geographic range of the crop, to optimise the agronomy for different regions, and to provide decision support systems to help those growing the crop for the first time.

Normally, this is a prolonged and expensive process involving an extensive program of agronomic trials. An important feature of these new genotypes is that the effects of climate and sowing date on plant structure, and hence yield potential, are easily predicted. Simple physiological models have been developed which, together with meteorological and soil databases, have been used to map the geographic range in England and Wales by classifying the suitability of soils and climates for the crop. In this way, much of the routine experimentation required to optimise the major aspects of the crop's agronomy in different regions has been circumvented. The area available for the cultivation of lupins is estimated to be 7.5 million ha.

Compared with the Australian situation, lupin production in Europe is in its infancy and there is little need to see it as a threat to Australian exports. Australia currently exports about 0.5 million tonnes of *Lupinus angustifolius* grain to Europe. The UK may have the ability (if things go well) to produce an equal amount by the end of the decade. However, the total European imports of soya, which is the market we are both competing for, is currently near to 25 million tonnes and ample for both of us!

Meanwhile, excellent contacts have been established between those involved in lupin research and production in Australia and Europe and we plan to build on this in the future.

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## Weed control in lupins

An article in the July issue recommended a 60 mL/60 g Brodal®/Lexone® mix per hectare. This rate emerged from trials comparing equal cost herbicides and mixes. A \$12–12.50/ha rate was used, being equivalent to about 100 mL of Brodal® or 10 g of Eclipse®. It proved a very effective mix, killing dinner plate sized radish completely within two weeks. (60 g Lexone® = 94 mL Sencor® = 45 g metribuzin ai.)

The three-way mix of Brodal®/Lexone®/simazine at (50 mL/100 g/600 mL)/ha was used in another trial where rates were set at \$17/ha for a situation involving larger weeds. It would only be recommended if doublegee were present as well as radish (100 g Lexone® = 156 mL Sencor® = 75 g metribuzin ai).

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## Cladosporium

Some lupin crops in the north are showing symptoms of leaf and flower death in the growing tips of the 1st or 2nd order laterals. The problem is associated with the fungus *Cladosporium* and occurs from time to time under conditions of high humidity and warm temperatures. Crops will grow away from the problem with a few weeks of fine weather and yield losses will be negligible in almost all cases.

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## Aphid control

When should you control aphids in a lupin crop? The answer is rarely.

Aphids are ephemeral things and the costs of spraying

are significant. Spraying will reduce predators and can predispose the crop to a severe native budworm attack.

In some cases spraying is a necessity, but I suggest you should be able to answer *yes* to all of the following questions before spraying a lupin crop with an aphicide.

1. Is the crop suffering physical damage to the extent that the number of aphids is causing the plant to wilt?
2. Are there 10 per cent or more plants infected?
3. Is the crop at the early or pre-flowering stage?
4. Does the weather bureau predict mild weather with no indication of an approaching cold front or soaring temperatures?
5. Are the aphids disease free? (Brown aphids indicate that a fungus is present which may rapidly control the aphid population.)
6. Will the crop yield 1.5 tonnes per ha or better?

I believe that only in extreme circumstances should aphicides be promoted to prevent virus infections in crops. We already have a robust agronomic package which prevents yield loss due to cucumber mosaic virus (CMV). Further reading *Lupin Logic* 2, 13, 25, 30.

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## Lupins as a food

The advisory committee for Novel Foods and Processes in the UK recommended that the British Ministry of Agriculture, Fisheries and Food accept Western Australian lupin seed (*L. angustifolius*) as a food within the UK.

This breakthrough, achieved by the Grain Pool of WA, provides the potential for further market opportunities for *angustifolius* lupins. Lupins will be accepted as a novel food as long as the alkaloid levels do not exceed 200 mg/kg and the level of phomopsin present in the final lupin product does not exceed 5 parts per billion.