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Lupins in Poland

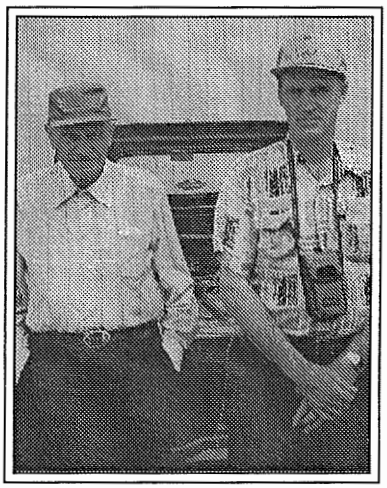
Professor Wojciech Swiecicki and Dr Wiktor Swiecicki

Lupins were introduced into Poland in the middle of the 19th century. There were two main reasons for this introduction: firstly 40 per cent of the agricultural soils of Poland are light sandy soils and in the months of May and June these soils are often in a water deficit situation especially to those crops with the bulk of the root system in the surface soil layers. Tap rooted crops such as lupins have an obvious advantage on such country. Secondly lupin seeds, after the bitter alkaloids were removed, provided a high protein component for livestock fodder.

A typical rotation incorporating lupins is potato or sugar beet, spring cereal, lupins, winter cereal. The yellow lupin *L. luteus* and the narrow-leafed lupin *L. angustifolius* are grown as spring crops with sowings at the end of March and harvesting in August.

The white lupin *L. albus* is not widely grown as the current varieties are too vegetative and late maturing. Breeders have been working on these problems as they believe that the white lupin can become an important, high yielding legume with 36 per cent protein and 11 per cent oil in the seeds.

The importance of lupins clearly increased after low alkaloid mutations were selected by von Sengbusch in Germany in the early 1930s. The first low alkaloid yellow lupin cultivars and narrow-leafed lupin cultivars were bred in the middle of the 1930s and the white lupin (albus) at the end of the 1940s.



Professor Wojciech Swiecicki and Dr Wiktor Swiecicki

Mixture sowings with cereals and lupins became very popular.

The area of lupins in Poland in the 1930s reached 380,000 ha and even increased in the 1940s and 1950s. A downturn in the popularity of lupins took place in the 1960s caused by susceptibility to the fungal disease *Fusarium* in yellow lupins and by pod shattering in narrow-leafed lupin. Those cultivars also had a long vernalisation (chilling) requirement and as a consequence, late sowings caused longer vegetation of the plants which were additionally affected by virus diseases. These disadvantages had to be eliminated by the breeders.

On the other hand soyabean prices were rising (Poland imports about 600,000 tonnes per year) and this gave some encouragement to lupin growers.

In the 1970s new yellow lupin cultivars resistant to *Fusarium* were followed by thermoneutral cultivars – Juno, Teo, Idol and Popiel – characterised by normal plant development despite late sowings. The thermoneutrality allowed these varieties to escape virus diseases and as a result yields are higher and more stable.

Thanks to the cooperation with Australian breeders, non shattering genes were used for breeding narrow-leafed cultivars, Saturn and Polonez.

So called 'self -completing' (restricted branching) cultivars were also registered – Radames in yellow lupin and Wersal and Ernami in narrow-leafed lupin. 'Self-completion' in Poland is the ability of plants to mature despite seasonal conditions which are usually wet and cool at the end of the summer. This is achieved by restricted branching of the main stem.

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Continued overleaf...

Such a strong change in plant architecture caused lower yields in the first unbranched cultivars. They should be genetically improved during the breeding process. In Poland, improvement of lupins through breeding is making rapid progress.

Despite this progress in the breeding program an obstacle for increasing the area of lupins in Poland is the unfavourable economic relations during the introductory period of the creation of a free market economy. The income from 1 hectare of wheat is at least two times greater than from lupins. For farmers, direct income is more important than the indirect advantages such as nitrogen fixation, organic manure etc. As a consequence the share of cereals in the national growing structure in about 70 per cent.

Also lupin seed production decreased because high prices caused farmers to grow their own seed which is difficult due to the climate in Poland.

In order to see a large increase in the area planted to lupins in Poland lupin growing should be governmentally subsidised, as it is in other EC countries.

Control of aphids and CMV with insecticides

Debbie Thackray and Roger Jones

A trial at Badgingarra in 1996 examined the effectiveness of unregistered insecticides in reducing the spread of CMV in lupins through control of its aphid vectors. The trial was colonised by green peach aphids, many of which proved resistant both to alpha-cypermethrin and methamidophos foliar sprays. However, the seed dressing imidacloprid, which belongs to a new chemical group, controlled them for at least seven weeks after planting, with no signs of insecticide resistance. Alpha-cypermethrin significantly reduced both aphid numbers and the spread of CMV, but methamidophos, was less effective. Scoring visible symptoms greatly underestimated actual infection levels.

Spraying plots sown with infected seed with either insecticide resulted in higher yields than not spraying them. To overcome insecticide resistance problems, in addition to imidacloprid other insecticides belonging to different chemical groups need to be assessed. The use of tested clean seed remains the key to effective control, complemented by the management package of cultural measures reported previously in *Lupin Logic*.

Further reading: *Lupin Logic* 13, 50, 62; Bulletin 4294.

Anthracnose quarantine ends

Peter Stubbs, Anthracnose Project Manager

A total of 133 properties quarantined for anthracnose in 1996 are now having quarantine removed. All properties currently under quarantine will have quarantine removed by 30 April 1997.

The only regulatory requirement for anthracnose in Western Australia then will be the ban of albus lupin production in 1997.

This follows adoption by industry groups and Agriculture Western Australia of ongoing strategic management of anthracnose, as the best way to minimise the impact of this disease on lupin production. Eradication is no longer seen as feasible. Quarantine measures were an important factor in limiting the early spread of anthracnose.

This strategic shift in emphasis in no way diminishes the importance of anthracnose. It does, however, recognise the important gains made over the past six months in finding ways to deal with this disease.

Introduction of new technologies and best management practices this growing season will enable production of lupins without significant loses due to anthracnose.

Key factors in minimising your risks of being affected by anthracnose will be:

- use of clean seed;
- use of recommended fungicide treatments (particularly important for Northern Agriculture areas);
- getting rotations right;
- control of volunteer lupins; and
- monitoring of crops throughout the growing season.

Just two months ago there were no fungicide treatments for anthracnose on lupins. There are now three fungicides registered to assist in managing the anthracnose problem.

Importantly, Agriculture Western Australia is well advanced in screening for resistant varieties. So in 1998 there will be recommendations indicating what varieties show best resistance to anthracnose.

Ongoing research is continuing in the following areas:

- development of clean seed systems;
- better fungicides;
- survival of anthracnose on stubble;
- resistance breeding; and
- varietal testing.

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