

AN UPDATE ON THE CURRENT LEVEL OF COMMERCIAL DEVELOPMENT OF LUPINS IN THE UK

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ABSTRACT

After a number of failed attempts during the 1970s and 1980s, the last ten years has seen the successful introduction of lupins to the UK. Despite difficulty and set-backs, the crop is now well established both as a cash crop with arable producers and increasingly as a forage crop with livestock farmers. Soya UK Ltd is a seed company that has been at the forefront of this commercialisation. The company now supplies 80% of the UK lupin market, and is one of the largest producers of lupin seed in the European Union, with representation of varieties from a wide range of sources and breeders. The development of the lupin crop in the UK has not been without its difficulties, and was nearly thwarted on a number of occasions with successive problems ranging from anthracnose, alkaloids, political interference, commercial interference, and food allergy scares. Despite this, these challenges have been met and largely overcome, however there are plenty of ongoing challenges to overcome in the future.

One feature of the development of lupins in the UK has been the dramatic difference between the way lupins were expected to be taken up in the UK, and the way they actually have been. A new system of using lupin/cereal forage mixtures has taken off with a rapid increase in the area grown since 2004, but with a corresponding drop in the production of lupins on arable farms. This paper also takes a brief look at how the future production and use of lupins may develop in the UK.

KEYWORDS

UK lupins, lupin seed, anthracnose treatments, lupin alkaloids, forage lupins

1997 TO 2003 – THE BIG EXPANSION

From 1997 to 2002, there was a dramatic period of expansion, fuelled by competition between seed companies. Prior to 1997, the main activity on lupins was in winter-sown albus lupins from France, with most development activity taking the form of an investigative project between the seed company Cebeco Seed Innovations and an academic group at Rothamstead research facility. In 1997, a big change took place with the introduction of the angustifolius varieties Borweta

and Bordako by a seed merchants called Gorham and Bateson Ltd. This marked a big change in approach. Not only was it a change from albus to angustifolius, but also from winter-sown to spring-sown, and most crucially, from the academic approach to that of a commercial seed company actively marketing lupin seed to farmers. This had a dramatic effect, and between 1997 and 2000, the UK area of lupins initially grew to around 2000 hectares, mainly angustifolius. In those days of early expansion, the lupin market had a 'wild west' feel to it with growers being sold any old bag of lupin seed, regardless of the variety or situation. There was little good independent advice available, and quite a bit of mis-selling going on. Naturally there were some real disasters, but there were also large numbers of happy growers, and the headlong rush carried on. In autumn 2000, Soya UK Ltd arrived on the scene and launched the variety Dieta into this mix, which was the first spring-sown albus to be commercially grown in the UK. In 2001 another company, Premium Crops joined in, and in 2002 Cebeco Seed Innovations finally abandoned all commercial intention with winter albus lupins, and switched to selling the Australian variety Wodjil as a spring-sown luteus lupin. The net result of this was that due to intense competition and marketing, the UK had moved in 5 years from small-scale winter-sown trials of one species, to having spring-sown versions of the 3 main agricultural species being actively marketed and grown. The area grown had expanded from around 2000 hectares in the year 2000, to around 8000 hectares just two years later in 2002.

Since the UK had 4 seed companies actively competing for acreage in a 'no-holds barred' fight for acreage, there was a dramatic expansion, but there were also negative effects. One serious problem was that fact that this battle put off as many growers as recruited. We had two companies that only sold blue lupins, one company that only sold yellow lupins, and another company who only sold white lupins. Farmers trying to research which lupin to grow would seldom get good un-biased advice, and would often scrap the idea and grow peas or beans instead.

2003 TO 2008 – THE CONTRACTION AND THE CHANGE TO FORAGE

In the 5 years since 2003, we have seen consolidation of the competitive scene, and a more

measured approach to lupin commercialisation. Gorham was picked up by another seed company which licensed the varieties to ourselves at Soya UK Ltd. Cebeco Seed Innovations became increasingly distracted by their activities in oilseed rape, wheat and pulses, and their market share in lupins diminished until their parent company Cebeco sold them off in 2005. They were re-sold in 2006, and they were eventually closed down by their new owners, although their successors do still have some interest in lupins. Similarly, Premium Crops became increasingly distracted by their activities in linseed and flax, and now only sell small quantities of blue lupin seed to a few in-house growers. Soya UK now has around 80% of the market, by virtue of being 'the last man standing'. These days we sell all 3 species without fear or favour and with 9 varieties in the stable, we are able to match the variety to the area, soil type, pH and intended end use. We are also able to give growers good guidance on the agronomy and end use of the crop.

By 2007, the national area of lupins, and lupin-based mixtures had fallen to around 5000 hectares, with 70% of this in the forage mixtures. This contraction has been due to the consolidation in the industry as described, but also because arable farmers have abandoned pulses in favour of producing ever-increasing quantities of wheat and oilseed rape. These crops have been more profitable for arable farmers, so we have lost many of our arable producers, but replaced them with livestock producers. One result of this is that the UK is not a significant producer of lupins for either the export market, or even the domestic compounding markets. Nearly all lupins are fed on the farm that grows them.

PROBLEMS

ANTHRACNOSE

2003 is a year I will never forget. In both 2001 and 2002, we had multiplied Dieta with virtually no anthracnose. In spring 2003, we were complacent enough to be only using Thiram as our main dressing on white lupins. Worse still, for reasons of pure convenience, we were happily blending seed lots at the seed plant to produce more homogenous seed lots. Looking back, it was a disaster waiting to happen, and 2003 produced a dry spring followed by wet and windy weather. We had rampant anthracnose in half of our crops, with the other half affected to some degree. It was a nightmare, which we resolved through swift action, and thankfully we took the decision to advise all growers to spray immediately without delay. The damage was serious, but again we were fortunate in that we chose the correct products in our spray recommendations. Many academics suggested the use of Bravo (chlorothalonil) with Amistar (azoxystrobin), but we rejected this advice and went for a mixture of Bravo (chlorothalonil) and Folicur (tebuconazole). This was a saviour, and whilst I frequently see Amistar being recommended and used for anthracnose treatment, we

have never found it as effective as Bravo with Folicur, or even Bravo with Carbendazim.

We began to resolve our anthracnose issues with the aid of a 3-prong attack. First we co-financed the development of a PCR-based anthracnose test, similar to the one used here in Australia. This was like lifting a veil on our seed lots, and allowed for far greater levels of seed selection and treatment. Our second strategy was to switch seed dressings to a product called HY-TL. This is a mixture of thiram with thiabendazole, and it has proved very effective. Our third strategy was to adopt strict seed production methods, whereby all seed crops are sprayed twice, once in the vegetative stage when they are young, and once during pod-fill to break the anthracnose 'bridge' to the next generation of seed. Whilst the products vary, we always use a mixture of a systemic fungicide partnered with an anti-sporulant. I am glad to say that we eventually won the war with anthracnose, helped by the cold British winters and our fanatical devotion to our 3 pronged defences, which we still maintain today. 2003 was enough to teach me that you cannot compromise with anthracnose.

ALKALOIDS

2004 is a year I will also struggle to forget. Still reeling from the anthracnose problems of the year before, my telephone rang, and it was our seed analyst at the seed plant. His opening words were "We've got a problem with the Basic seed". Until that point, alkaloids had been the last thing on our mind but this was the first sentence in a long-running battle with alkaloids and bitter seeds. Our seed analyst was using the official EU seed test whereby they soak 400 seeds in water, then rinse in lugols solution (potassium iodide and iodine). He hadn't realised the significance of the fact that the percentage had crept up and up, until it reached the 1% which is the threshold for the certification of Basic seed in the EU. (Remarkably, the threshold for C1 commercial seed remains at 2.5% bitter seeds – which is an alkaloid level of 550 ppm in the crop!) We nearly lost our basic seed in 2004 and in 2005, which any seed merchant will tell you is a disaster, but with the aid of colour sortexing ('magic eye' machines), and some special techniques, we have succeeded in producing Dieta which has almost zero content of bitter seeds. Again, we were fortunate in that we do not have bitter lupins growing wild in the UK, so our problems were coming from cross-pollination with a population of bitter seeds within the crops. This made eradication much easier, but it has still taken us 4 years to fully overcome the problem.

ALLERGIES, AND KNEE-JERK POLITICS

2005 is a year I really enjoyed – we had a bumper harvest of beautiful lupins that were as white as snow. With our plan to eradicate anthracnose going well, and a plan to overcome the bitter contamination, things were beginning to look up. That was until someone in France ate a battered onion ring and went into anaphylactic shock. It was never fully ascertained what caused it, but

the batter contained lupin flour (it is used for its yellow colour), and it got the blame. This started a lupin witch-hunt, and one of the national millers of bread wheat in the UK announced (without consultation or warning) that they were re-classifying lupins as a 'serious risk' material in the same category as peanuts. This is a nightmare scenario, since hauliers will often refuse to haul serious risk material due to the difficulties it causes when they are delivering other commodities. The agricultural trade body for all combinable crops initially indicated that they would adopt this 'serious risk' re-categorisation, across the board, and began drafting this recommendation with DEFRA (our latest name for the ministry of agriculture). This would have effectively excluded lupins from the national haulage fleet, and we could not have moved them without having dedicated trucks. This serious problem was overcome by rallying all of the lupin-growing farmers, and pulse trade representatives, and lobbying the wider industry for a compromise. The biggest problem in this situation, is getting people to admit they acted hastily, and re-visit the issue (no-one likes to admit they were wrong). Final compromise came in the form of lupins being classified as a 'sensitive' material as opposed to a 'serious risk' material. This has still caused us difficulties, but these days lupin movements on trucks are routine and common sense has prevailed. It very nearly went the other way, and would have left us in an impossible situation. I believe allergy to lupin could be a serious consumer issue in the future, and the lesson from the UK is that when the panic begins, logic goes out of the window. Even now, I take the trouble to occasionally discuss this issue with our trade bodies in the UK, just to remind them of the reasons why lupins are not the same as peanuts, and why hauling them is a relatively low risk activity.

FORAGE LUPINS

Since 2004, we have seen a dramatic swing away from cropping lupins as a dry grain, and into their use as a forage crop, particularly in mixtures with Spring Triticale. This swing away from dry harvesting and into forage has happened for a number of reasons.

The infamous British weather suits forage better than dry harvesting. Many growers found lupins to be a wonderful feedstuff, but the harvesting was often late and difficult.

In 2003 spring triticale was introduced to mainland UK (by Soya UK Ltd). Until then, livestock farmers looking at wholecrop cereals had been restricted to wheat, barley and oats, since only winter triticale had been available. In spring triticale, we found the ideal partner for forage albus lupins, being of similar height, competitiveness, and coming ready for harvest at roughly the same time.

By 2004, we noticed that although forage was a minor activity, a greater and greater percentage of the growers were livestock farmers growing the crop for

home-feeding as a dry grain. These growers were only too happy to switch across to lupin-based forages instead.

European livestock farmers have been forced to grow more protein at home. After BSE (mad cow disease), was found in France in 2001, the EU banned the use of not just meat and bone meal, but also fish meal in ruminant diets. This meant a big swing into soya, (around 62% of the supplemental protein fed in Europe is soya), but soya has continuing problems associated with the European public's aversion to GM crops and has been increasingly expensive. In the UK, growing a lupin-based forage mix is now an accepted way of dramatically reducing this cost.

Arable farmers have abandoned pulses in favour of producing ever-increasing quantities of wheat and oilseed rape. As a result, we have lost many of our arable producers, but replaced them with livestock producers.

The swing to forage has been accentuated by political change with the implementation of the EU mid term review in 2005. Previously, foraging a crop meant it did not directly qualify for subsidy, whereas dry harvesting meant it did qualify. The change to the single farm payment system in 2005 removed this problem, allowing much greater flexibility in the use of crops for forage.

2008 AND THE FUTURE

As I have said, by 2007, the national area of lupins, and lupin-based mixtures had fallen to around 5000 hectares, with 70% of this in the forage mixtures. Arable farmers have abandoned pulses in favour of producing ever-increasing quantities of wheat and oilseed rape. In 2005, we shipped a few hundred tonnes to Egypt. This year we did not ship any, and I do not know if or when the UK will ever return to this market, despite the fact that we can grow 5 tonnes a hectare of good quality white lupins on arable land.

I will predict that the area of lupins grown in the UK will steadily climb again, but it will be in the form of forage mixes, and not on arable units. If and when wheat does tumble back in price, then lupins will be back in vogue, but until that happens lupins look set to remain principally a forage crop in the UK.

Personally, my greatest sense of pride comes from knowing that in the last 8 years we have played a large part in the introduction and establishment of agricultural lupins into the UK. Many of our growers used to buy in soya-based feeds at a cost that rendered their whole enterprise unprofitable. We now have countless growers who have found home-grown lupin protein to be more than equal to bought-in soya feeds, and are still in business as a result.