



A Word from the CEO

The events of the last 12 months have emphasised the importance of good science to modern society. Scientists didn't just quickly identify and sequence the novel coronavirus behind this pandemic; they also created new and highly effective vaccines within

months. As vaccination accelerates globally, we can thank science for its outstanding contribution and look forward to the pandemic drawing to a close.

Of course, good science underpins Legume Technology's work, too. In this issue, R&D manager Diane Wilkinson discusses her current work in the lab, and we also examine the growing interest in lupins - the legume with the highest protein levels and a crop with enormous potential. Just last year, French scientists finally sequenced its genome - a vital step in further unlocking its potential, particularly its valuable low-input role.

Back here in Britain we're coming to terms with the reality of being outside the European Union. Exports continue, albeit we're getting accustomed to new procedures for moving our products across borders.

It's too early to say when we can resume international travels and see our products in action in the field. Regardless, we're looking forward to continuing to work and support our partners around the world.

Bruce Knight
Founder and Managing Director

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FROM THE LAB



Research investment, ongoing development and improvement of our products is at the heart of Legume Technology's mission to identify and commercialise environmentally beneficial inoculants that increase crop yield. In this regular new feature, our R&D manager Diane Wilkinson will share some of her recent work and findings.

Since joining the Legume Technology team late last year I've been getting to grips with the entire product range. It's exciting to head up an in-house R&D function like we have here, where we enjoy direct dialogue with the customer in the field.

That means I can initiate research to reflect market needs and customer feedback, from trials as well as commercial usage out on farm.

Of course, our work in the lab relies on a range of specialist equipment. I had been requested some new 'kit' and my

wish list has arrived and is now operational. The project? Well, without giving too much away we've started work on what we're calling 'the next generation' of liquid inoculants, suitable for soy, peas and lupins. These should form the first of many 'pipeline' products for Legume Technology.



” Attention’s also focused on improvements to an existing product, PELLIFiX. This is a clay-based pelleting additive, designed to improve the handling, uniformity and plantability especially of smaller seeds like clover and lucerne.

The clay coating incorporates the inoculant bacteria, providing a more efficient distribution of bacteria and maintaining the inoculant closer to the seed, while increasing the post-treatment planting window. New trials,

in plant chambers, have assessed the impact of different formulations on plant growth with some strong results.

Another new technology we’ve brought into the lab is allowing us to examine even more closely the bacterial strains and concentrations that constitute our products, with a view to improving performance still further. We’ve just sent out some ‘revised’ product for evaluation. All I can say for now is... watch this space!

Experiment to test the effect on the performance for lucerne plants while 1) treating the seeds with PELLIFiX, 2) storing the treated seed in 2 different temperature environments for 3 to 5 months before planting and 3) evaluating the plant performance.



Control, no treatment.
Planted on 04.12.2020



Treated with PELLIFiX on 03.07.2020.
Stored for 5 months in a temperature of 10 C.
Planted on 04.12.2020.



Treated with PELLIFiX on 03.07.2020. Stored for 5 months in standard warehouse temperature.
Planted on 04.12.2020.



Treated with PELLIFiX on 09.10.2020. Stored for 2 months at a standard warehouse temperature. Planted on 04.12.2020.

FOCUS ON: LUPIN



As a new feature within each issue of our newsletter, we'll be taking a more in-depth look at an individual crop and how to use inoculants to maximise its performance and yield.

It might surprise you, but it's lupins, not soya, that provides farmers with the best quality protein they can grow.

Outranking other go-to protein sources, such as peas, beans and even straights such as rape meal, lupins are particularly attractive to European farmers, as they offer a viable alternative to imports of soyabeans.

Soya is a primary protein component across a range of fish and livestock feed. But the majority of soya used in Europe is imported, either from the USA or South American countries like Brazil. The EU imports its entire population's bodyweight in soybeans each year – around 36 million tonnes, or 95 per cent of its soya meal requirement.

This dependency on imported protein is often referred to as the EU's 'protein gap'. There's great concern that this reliance leaves the bloc exposed and vulnerable to fluctuations in commodity prices or breaches in supply chains. Given that European soya production can supply only 5% of needs, there's a growing interest in alternative sources of protein destined for animal feed.

Hence the interest in lupins, where the protein content in lupin grain can be as high as 42%. Compare that to 20 to 30% for peas and beans, and around 40% for soya. They also offer farmers greater harvesting flexibility, as they can be dry combined (like soyabeans) or whole cropped for silage.

White or blue lupins are the standard choices for field varieties. As with any crop, choice of variety is determined by region, with soil type and pH also important considerations. Being legumes, lupins also benefit from the application of inoculants: these will optimise their atmospheric nitrogen-fixing abilities and maximise yield.

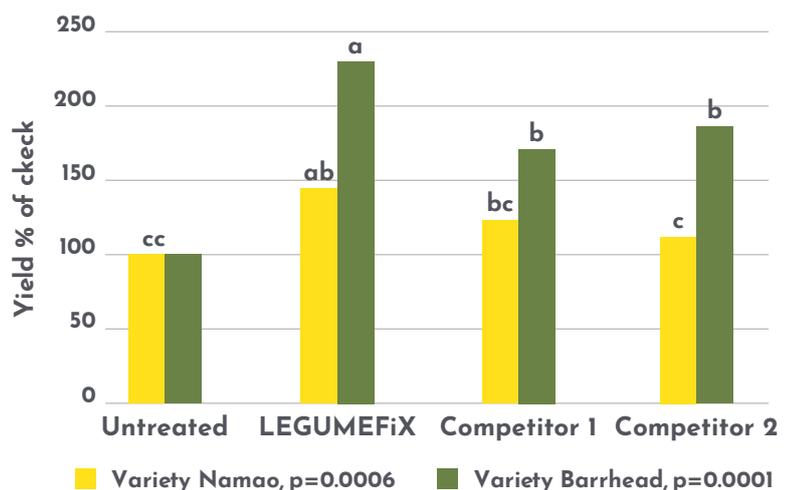
“In land that's never had the crop before, appropriate use of inoculants can increase yield by up to 100%, explains Bruce Knight, Managing Director of Legume Technology.

“We recommend either LEGUMEFiX or LIQUIFiX for lupins, with their carefully selected elite strains of *Bradyrhizobium Lupinus*.”

“We talk a lot about ‘precision farming’ these days, but inoculants truly provide the real deal,” he says. “The nodules that form after inoculation provide a highly targeted nitrogen application direct to the crop's roots.

“Trials results confirm that inoculation can be more effective than a nitrogen fertiliser, and there's also no issues with nitrate leaching or weeds taking advantage of ‘free’ nitrogen in the soil.”

Lupin relative yield response to different inoculation treatments, Central Alberta, 2019



On-farm trials using the variety Barrhead, treated with LEGUMEFIX and two competitor products, were conducted in Central Alberta, Canada, during 2019. LEGUMEFIX delivered more than 200 per cent of the control yield, outperforming the competitor products by nearly 50% points.

“Inoculants will also increase protein content in the lupin grain by 1-4%,” adds Bruce, “especially important for growers who might be considering the whole crop route.”

“Inoculants will deliver a performance increase in almost any situation,” says Bruce, but he suggests they’re especially useful for crops

grown in harsh climates. “Extreme hot summers, drought or cold winters will all present a challenge to soil microbial populations.”



You can learn more on our product range for lupins [here](#)

LUPIN SEED IN DEMAND

Lupins are not just being touted as a potential replacement for protein in animal feeds, but in human diets too.

Sweet lupins – the low-alkaloid varieties now commonly grown – are seen by European food manufacturers as an attractive raw material for the production of plant-based ‘milks’. Lupin protein has similarities with dairy protein, simplifying production, while offering viable alternatives to proteins derived from soy, rice, almonds and coconut – crops which are largely grown outside Europe.

But can production keep up with this growing demand?



Fabian von Beeston

Agronomist and Owner of Gartensoja

“Lupin cultivation is rapidly increasing in Germany and other central European countries,” says Fabian von Beeston of Gartensoja, a specialist adviser and distributor in Germany’s Upper Rhine.

“Interesting new varieties are starting to appear which, aided by some subsidies in some areas, are encouraging growers to adopt this leguminous, low-input crop within their farming operations.”

“There’s no doubt that lupins benefit from an inoculant application, particularly where they’ve not been grown before, so we’ve gained many new customers for LEGUMEFIX lupin this season.”

“But another problem is emerging: there is a critical shortage of lupin seed, especially for some of the most promising new white varieties,” Fabian reports.”

Luděk Novák

Owner of Agrinova Consulting

In neighbouring Czechia, Luděk Novák of distributor Agrinova, has also seen increased demand for lupin inoculant. **“Attention has turned to Legume Technology’s products, thanks to its perceived quality and reliability.** Limited inventories of BASF’s HiStick, following withdrawal, are also having an effect,” he says.



POST-BREXIT UPDATE

Few readers can have missed news of the last-minute deal between the United Kingdom and the European Union, agreed on Christmas Eve, setting out the future trading relationship after the UK left the bloc on December 31, 2020.

Now, more than a month after the UK became a 'third country' in trade terminology, outside the Single Market and customs union, there's little evidence of the widespread disruption that some were predicting - and for us here at Legume Technology, it's largely business as usual.

"Some sectors are experiencing increased delays and difficulties," says Jacky Knight, Legume Technology's Director, "and it's true to say that customers may see an increase in our delivery times during this spring season of 2021," she warns. "In part, this is down to the extra paperwork that's now required for shipments into the EU. This must be checked at every stage."

"EU customers need not to worry about their ability to secure their orders for the coming season," Jacky reassures. "There are aspects beyond our control due to delivery time and paperwork required at the moment, but we have processes in place to try and smooth the delivery process as much as possible. We are also in close contact with our delivery partner - Kuehne Nagel, who are extremely helpful in the

UK and respective delivery countries. Therefore we do ask for an understanding at this stage, but are confident that once the processes are well established, it will be business as usual for everyone.

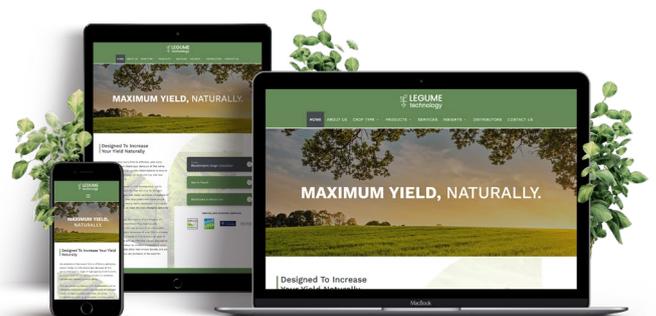


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