Tech irons out the kinks in lupins

By **PERRI POLSON**

❒ Lupins play an important role in WA's agronomic systems and Ben Cole hopes by creating a valuable protein ingredient market, growers will be encouraged to incorporate more lupins into their cropping programs.

❒ Technological advances in how lupins are processed means it is now able to be used in a range of different ways, from drinks to baked goods.

FOR years there has been talk of lifting lupins into the trendy marketing category of 'superfood' in human diets instead of that of livestock, but it has never truly made a mark on supermarket shelves.

Working quietly in the background on lupin ingredients, and perhaps shrouded in mystery, is Wide Open Agriculture (WOA), best known for its food retail outlet, Dirty Clean Food.

In 2024, WOA separated from Dirty Clean Food after lupins started to show some real promise.

During the COVID-19 pandemic, WOA's two sides of business rapidly expanded, Dirty Clean Food was kicking goals and lupins saw a technological breakthrough.

In 2019, Curtin University introduced WOA to novel methods of lupin processing which resolved its key faults – it tasted bitter, and had a grainy texture.

Products at the time were limited time to lupin flour or flakes, which failed to win the hearts and palates of consumers.

Seven years later, the lupins of today are processed into fibre, oil, and protein isolate, or protein powder, which is clean tasting, and has a smooth mouthfeel.

The technology improved lupin's functionality, and can be used in baking, or dissolved in water or milk, and has found its way into ice cream, yoghurt, bread and biscuits in overseas supermarkets.

WOA sales manager Ben Cole said lupins won't win buyers with their sustainability story, but will by demonstrating a clean tasting, smooth protein.

The fact that lupins can tick these boxes could place it ahead of other plant proteins, such as soy and pea in terms of preference.

Knowing they could continue ahead with just one business, WOA chose lupins as a business-to-business ingredient producer.

"We can't be a food brand providing online retail and hospitality services, and a food ingredient manufacturer and innovator," Mr Cole said.

"When we started the business, we had a bold ambition to offer farmers who were focused on soil health and biodiversity a pathway out of commodity markets to recognise that they were farming differently, and give them access to consumers who wanted to align to that.

"It was always a challenge to scale that to global markets.

"Our investors really backed us and believed in what we were doing, and could see the growth,

"But the lupin project just kept getting better."

On its journey to realise the potential of lupins, WOA had to scale from a lab that could only produce half a gram of lupin protein per day, to a pilot plant based in Kewdale, with the help of CSIRO in Melbourne.

Today WOA's lupin protein isolate is manufactured in Germany, selling to customers in eight countries.

Mr Cole said the biggest markets were in South America, where lupins have a traditional place in consumer diets.

It's progressing validation that shows WOA is meeting the requirements of global food and beverage companies.

Next on the to-do list is to bring manufacturing into Asia, delivering to markets in China and Korea, at a volume of 1000 tonnes per year.

Following that, Mr Cole said it was important to WOA to build up a base at home.

The vision is to operate a facility in WA which can produce 10,000 tonnes of processed lupins per year, with a pre-feasibility study for that project on the way.

"It's always been really close to our heart to have WA technology actually leading into WA jobs and new ideas showing that lupins can be more than just a feedstock," Mr Cole said.

It's estimated five tonnes of lupins are needed to make one tonne of lupin protein isolate.

This would require volumes of high-quality lupins to be supplied from WA, and Mr Cole said WOA wants to start the conversation with growers

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about how to bring them on board.

"We know how hard it is, from a gross margins perspective, it's not a great crop, and we know farmers struggle with that," he said.

"But we also know farmers love to have it in their rotation.

"We'd love to hear from growers about their thoughts towards building a food grade supply of lupins.

"Who does it interest? Why does it interest them? What sort of specs would they need to know to feel confident to grow into it?

"We know these things take time, but the conversation should start sooner rather than later.

"This is different to any other lupin product they have tasted before."

Lupin prices tend to move around and by building a food-grade market it's hoped to provide price stability.

At the moment, lupin protein can fetch four times the price of pea protein.

It's been a risky journey for WOA, selling off a business and venturing into new technology, but consumers are starting to open up to lupins.

"During the pandemic, there was a real wave of plant protein and a couple of big companies went a little too hard, a little too early on, saying everything needs to go plant-based, and I think there was a response from the market against that," Mr Cole said.

"We track all the trends, and now there is this really steady, organic growth in people not necessarily eliminating animal proteins, just looking for new sources.

"Our timing is just right now, if we can meet that demand it could be really exciting for lupin growers all over WA.

"What we want to do is just offer consistent demand."

The WA Sweet Lupin Association was formed in 2023 to raise the profile of lupins worldwide, working with the Grain Industry Association of WA and the Grains Research and Development Corporation.

WOA is one of its members, all of which have different product lines and offerings.

WA Sweet Lupin Association chairman, Mark Sweetingham, said the organisation was sharing the word of lupin with consumers, health professionals and food technologists.

"These products have the highest combined protein and fibre content found in any grain, and is also low in carbohydrates and low in fat," Mr Sweetingham said.

"That is a really nice package for someone who might be pre-diabetic and needs to control their carbs, and to eat more fibre and protein.

"Consumer acceptance is growing, but it's fair to say at the moment it's still in its infancy in terms of the volumes that we have aspirations to produce."

Mr Sweetingham said in recent years, food producers were 'spooked' by lupins from an allergen perspective, when allergen labelling was not required.

Now that it is a known allergen, lupins are required to be labeled on food packages.

"There was even some pushback from some food companies who said it was not going to touch lupins, which I think was an over-reaction because there is a huge global peanut food industry and peanuts are a very difficult allergy.

"There is a very low incidence of lupin allergy in Asian markets, so I don't think it's the blocker that it once was."

While promotion of lupins is the biggest hurdle, the association is also working with Australian Grain Technologies to breed lupins with low alkaloids.

Mr Sweetingham said it was easy enough for lupin varieties on the market today to reach the requirements for human consumption, which is an alkaloid measure of less than 0.015 per cent.

"Most of the current varieties grown by growers can meet that standard in most years, but not every year," he said.

"Alkaloid levels are partly controlled by the genetics of the variety, but also by the growing conditions.

"It's a bit like growing a malting barley variety, some years you don't hit the malting spec."

Mr Sweetingham said the success of canola and canola prices have placed downward pressure on lupin adoption in WA.

Last harvest, WA growers grew more than 900,000 tonnes of lupins, but this number is lower than what it has been in the past, with Mr Sweetingham recalling a record crop of more than 1.5m tonnes in 1999.

Research takes aim at button grass weed

RESEARCH to combat an increasingly challenging weed in Western Australia's broad-acre cropping systems was in the spotlight at the recent Grains Research and Development Corporation (GRDC) Grains Research Update in Perth.

Department of Primary Industries and Regional Development (DPIRD) research scientist, Arslan Peerzada, said button grass (Dactyloctenium radulans) was of growing interest to graingrowers, particularly in the northern grainbelt.

Dr Peerzada discussed screenhouse and field trials evaluating control options for the weed in summer fallows at the recent event at Optus Stadium.

"Button grass ranked as the second most damaging and third most common summer fallow weed in WA's northern grainbelt according to the 2025 GRDC report, Impact of Weeds on Australian Grain and Cotton Production," Dr Peerzada said.

"As a native summer annual weed, button grass germinates rapidly following summer rain, develops sprawling tillers and produces up to 15,000 seeds per plant."

❒ DPIRD research scientist, Dr Arslan Peerzada, said the weed button grass was of growing interest to graingrowers, particularly in the northern grainbelt.

Researchers conducted screenhouse trials to test herbicide susceptibility and field trials at Pindar and Wubin during the summer fallow period to compare various control methods, including single application, double-knock strategies, and mowing as simulated grazing.

The DPIRD research trials, undertaken during the 2024-25 season, were supported by a collaborative project between GRDC and University of Queensland.

"The results showed variable levels of susceptibility to commonly used herbicides, especially under hot and dry conditions," Dr Peerzada said.

"Field trials showed that glyphosate plus 2,4-D, followed by paraquat/amitrole, produced the most effective suppression, but full control of mature plants was challenging.

"However, the rapid growth of button grass makes it difficult to target all plants at the seedling stage.

"To avoid seed setting and lower the persistence of button grass populations, early intervention where possible, well-timed spraying and double-knock strategies are critical."