

AN EAGLE EYE FOR MACHINERY INNOVATION

On any day of the week, the quiet western Wheatbelt town of Brookton hardly seems like a centre for innovation.

But in agricultural machinery design and manufacture, it is.

Up the far end of Richardson Street, opposite the CBH receival site, is Eagle Eye Engineering run by Brookton born and bred Daniel Watkins,

28 - a qualified boilermaker turned remarkable self-taught industrial designer - and his wife Whitney, 29.

The couple started Eagle Eye Engineering in 2018, the same year they were married, initially operating out of a small rented shed next to their current location, repairing equipment for local farmers.

operate out of five much larger sheds - each shed housing a different aspect of fabrication, painting, assembly, electronics and finishing a range of agricultural machines.

They employ 18 people, six of them apprentices.

Their first product was a trail sheep feeder Mr Watkins designed - after repairing many others and talking to farmers about the shortcomings of their feeders and what issues they would like resolved.

It is now built in four sizes, from 2.5 to 4 tonne capacity, with particular design attention to the feedout choke and area around the auger so it will feed a variety of grains or lupins cleanly.

An innovative large square bales chain-drive feeder trailer, again designed by Mr Watkins, was next, with two-bale and four-bale designs.

"That was something the industry hadn't seen before," Mr Watkins said last week when Farm Weekly called in.

"You can load up four bales and tow it with a ute and the fact you can feed hay out from the cab of the ute was, from a safety perspective, an extreme innovation.



Self-taught Brookton industrial designer Daniel Watkins (left) and business partner and Brookton spraying contractor Scott Morrell with the Calibre towed boomsprayer they designed and now build for customers in agriculture.

"It was also innovative from a time effectiveness perspective - what was taking guys six hours previously could be done in two hours."

Then Mr Watkins switched his attention from steel fabrication to electronics and Eagle Eye Engineering produced its Target Control for automatic shut off and accurate data recording, unique to its trail feeder range.

"You can now log on through your phone, bash out your weights and it records the date, time and kilograms and every drop of grain that runs out of (the feeder) is accounted for," he said

"Obviously load cells existed on feeders before we came along,

but no one had ever taken the industry to this level of pin-point accuracy (any variation within 5-10 kilograms over a 3000kg load).

"Basically, Target Control is an accountant on wheels so you've got actual numbers of when, what and how much you fed out - not assumptions.

"We can make a significant difference to your feed program across 12 months by helping eliminate overfeeding or underfeeding with that pin-point accuracy through the smart system that we created and which no other feeder had ever been able to do before.



Mechanical fitting apprentice Riley Schiller helping assemble the chassis of another Calibre boomsprayer built by Eagle Eye Engineering.

"That was a pretty exciting milestone for the business to get to."

Mr Watkins said further development was progressing on Target Control looking to incorporate a GPS component.

The trail feeders, bale feeders and Target Control have all won awards including New Innovation, Farm Inventor, Best Emerging Technology and New Release, at Wagin Woolorama and Dowerin and Newdegate machinery field days in 2021 and 2022.

During establishment of Eagle Eye Engineering, Mr Watkins formed a second business partnership with local long-time agricultural contractor Scott Morrell and together they designed and began manufacturing the Calibre towed boomsprayer.

The aim was to bridge the perceived market and technology gap between trailed and self-propelled (SP) sprayers.

Calibre also turned out to be a winner with New Release, New Release - Machinery, New Release - Machinery Attachments and New Innovation Awards in 2021 and 2022 at Wagin, Dowerin and Newdegate field days.



Daniel Watkins with Eagle Eye Fabrication trail sheep feeders.

Like the enterprise with his wife, Calibre Spraying - which operates out of the same address in Richardson Street with Eagle Eye Engineering doing the manufacturing - started with repairs to a boomsprayer and transitioned on a handshake agreement to design and manufacture.

"Scott was looking at having to buy a new sprayer after a catastrophic failure in the middle of seeding and I said to him 'why don't we build our own because there's a big hole in the market, we've got the opportunity to build something unique'," said Mr Watkins.

"He was pretty taken aback because it was such a big call.

"But I was pretty confident and said to him 'I know we can do it mate'.

"From there it was just two mates who said 'let's build a boomsprayer' and that's what we did.

"That first machine is still used by Mr Morrell in his spraying business and has been over more than 30,000 hectares without modification."

With 5000 litre or 10,000L tanks, engineered structured booms from 24.3 metres to 48.8m and a unique hydraulic boom ride system designed by Mr Watkins to cushion boom pitch and roll when the sprayer is towed over undulating ground, the Calibre sprayer is his biggest project yet.

"It had been 25 or 30 years since there had been a new one (boomsprayer) on the market, so we took a fresh approach," Mr Watkins said

"Calibre is the middle ground in that it's a trailed implement and the operator is sitting in a tractor, (but) as far as the booms go and the technology - which is what matters in getting spray to plant - you could take our technology and put it on the back of a \$1 million SP sprayer and it would be competitive - no question - in terms of boom ride, performance and technology.

"We create that bridge where guys who already have an SP sprayer and appreciate and understand the technology, and who want it on a back-up sprayer or a second machine, can now get it.

"Or guys who are in the market for an SP sprayer but see our machine and go 'well I don't have to buy an SP because I can get all this technology at one third to half the price'.

"The same level of tech, through to the 100 hertz PWM (Pulse Width Modulation) and turn compensation, we can now offer."

An option on Calibre sprayers is the proprietary 'green-on-brown' WEED-IT spot spraying system.

But Mr Watkins is already evaluating adapting green-on-green systems.

"We don't shy away from technology, we embrace it," he said. He admits "it takes a lot of engineering minds to do what we do".

So, he consults with engineers around Australia and overseas and relies heavily on farmer feedback.



Welder Ashley Thurnwood working on a Calibre boom sprayer chassis at Eagle Eye Engineering.

His designs are assessed in France by a process called 'finite element analysis'.

"Engineers run my designs the computer and predict what's going to happen in years to come," Mr Watkins explained.

"That allows us to make something that is structurally sound right from the get go.

"My specialty is probably lean manufacturing - how to build stuff time effectively from a business perspective - and how to get ideas to ground.

"So, I use other engineers' expertise in other areas."

With that in mind, he has carefully assembled a team of innovative people around him.

"There's probably five in our team where it's not uncommon to have round-table innovation meetings where we are all in the discussion," he said

"But realistically, I'm facilitating a team of innovative thinkers that are all trying to change the agricultural industry."

In the past four years Mr Watkins and his team have built and sold 280 sheep feeders, somewhere between 60 and 80 hay feeders in the past three years and 25 Calibre boom sprayers - and he is certain there is more innovation to come.

"We've got a couple of major projects that we've built and they are being tested in the paddock at the moment, so we can't say too much about them," he said..

"We're not stopping (inventing) any time soon.

"My big goal is to bring innovation to the field days in WA so that farmers can always see something is happening."

Agricultural machinery is not stagnant, Mr McKillup said.

"I also want to inspire other young people to take that leap and not just be a repair shop, but to transition to manufacturing," he said.

"I'd like to see more government support to encourage young people to drive local manufacturing because that's what will make Australia great.

"I would love to see a big boost to Western Australian manufacturing because I'm very passionate about that."

For information about Eagle Eye Engineering or its products, including Calibre boom sprayers, phone 0408 012 354, or go to eagleeyeaus.com or calibrespraying.com.au