

## MEET JOE THE AUTOMATED SPRAYER - HE'S HERE TO HELP

**Meet Joe - the robotic boomsprayer, built to tackle some of the more tedious and repetitive jobs growers face onfarm.**

Boasting a 27.2 metre boom, Joe is a titan among autonomous sprayers and the first of its kind to be manufactured in Western Australia.

The machinery, which is the brainchild of Brookton-based Calibre Spraying director Daniel Watkins in partnership with Queensland-based SwarmFarm Robotics, was brought to life, after six months of late nights, early mornings and careful planning.

Trucked to Esperance in recent weeks, Joe is preparing for full-time work as a farmhand, spot spraying crops over summer.

**Unlike other new workers, it doesn't need to undergo an induction.**

All the grower needs to do is map out where they want Joe to go and what

they want it to do through a smart device application developed by SwarmFarm.

They can then use the app to track, control or change any of the sprayer's movements remotely and communicate with it.



*Recently Joe was sent on his first trial shift at a paddock in Brookton, and Mr Watkins could not have been prouder.*

**Mr Watkins decided to join the robotic revolution, after watching the demand for autonomous farming equipment continuously grow.**



With five SwarmFarm robots already being used across WA, fitted on boomsprayers sourced from the Eastern States, he wanted to give producers an opportunity to purchase the machinery locally.

As well as Joe, another two orders for the Calibre Spraying utonomous boomsprayer have been made from Bruce Rock and NSW - their names are not yet known.

"I reached out to SwarmFarm and told them I really wanted to build sprayers to suit their robots," Mr Watkins said.

"It makes sense for WA growers, who want to get into autonomy farming, to have a WA-based manufacturer supporting them.

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"SwarmFarm was phenomenal to work with and it has been a successful six-month collaboration."

About two weeks ago, Joe was sent on his first "trial shift" at a paddock near Brookton, and Mr Watkins could not have been prouder.



**He said the custom-built autonomous sprayer was completely self-sufficient and in line with, and as accurate as, any other agricultural technology currently on the market.**

However it was different in that it could be maximised and used at any time.

Mr Watkins said the core benefit of having an autonomous boomsprayer was labour restraints, particularly for producers in remote areas, who struggle to source workers.

"No one wants to sit in a spot sprayer for three to four months over summer," he said.



Joe is fitted with a 3000 litre main tank.

The boomsprayer was custom-built to suit autonomous farming, meaning it can only be pulled by a robot like Joe and cannot be put on a tractor.

**"This is about working smarter, not harder.**

"Essentially Joe comes in and does what needs to be done, before taking itself back to a workshop, shed or certain point in the paddock that has been marked on the app.

**"That means whoever would normally be assigned to spray crops can be doing something else onfarm.**

"Someone does need to keep an eye on it by making sure diesel and chemical supplies are up, but it does free up labour significantly."

It is powered through a diesel engine with hydraulics onboard supplying the sprayer and allowing it to function.

**While Joe doesn't need internet coverage to operate, it does need it to communicate with and be controlled by its owner.**

If for some reason, an issue or error arises while the robot is out of range, it will carry those issues until they can be flagged to SwarmFarm.

SwarmFarm mechanical engineer Tom Holcombe, who was at Brookton earlier this month, said the robot can be programmed via the app to go, stop and come back to a certain point to be refilled in the paddock.

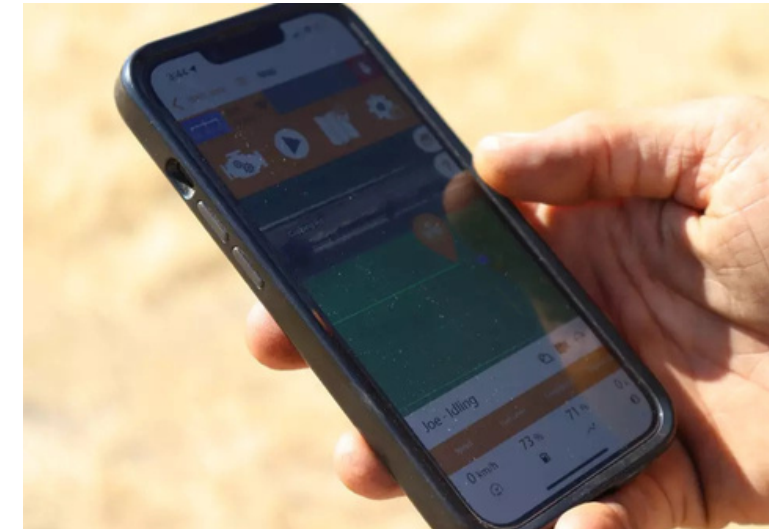


Mr Watkins said the custom-built autonomous sprayer was completely self-sufficient and in line with, and as accurate as, any other agricultural technology on the market.

However, if the grower needed to, for whatever reason, manually or physically drive the SwarmBot to a certain point it needed to be directly connected to the robot.

"The Swarmbot is fed as much information as possible before being put to work," Mr Holcombe said.

Obstacles, including power poles, dams and whatever else in the paddock, are mapped out before it is set to work, along with boundaries of the paddock and any internal farm roads.



All the grower needs to do is map out where they want Joe to go and what they want it to do through a smart device application developed by SwarmFarm.

**If an obstacle appears that wasn't there when the grower first mapped out the machinery's path, it will be detected.**

In Joe's instance, with 14m boom width either side, it will slow down if an obstacle is within about 10m and come to a complete stop within 5m.

"Say if, for example, you leave a tractor in a paddock that wasn't there previously or an animal moves in front of it, it will pull up for that animal," Mr Holcombe said.

"If the animal moves out of the way within a couple of minutes the boomsprayer will keep going, if not it will shutdown and notify the grower that there is something in front of it and it needs help."

**Joe keeps things simple and cost-effective by running off a 210 litre diesel tank.**

Mr Holcombe said its fuel efficiency was similar to or even less than standard, heavier machines.





"It'll tick over and do the jobs it has been assigned.

"Generally when we are talking to growers, boundaries are being pushed in terms of spray applications as there are deadlines that need to be reached, whether its family commitments or incoming weather.

"But if we can be spot spraying and staying on top of weeds all the time in summer or a fallow situation, then we are utilising 100pc of that opportunity window to do the job."

**Joe is fixed with 28 infared cameras that spray chlorophyll or detect live weeds in a particular area, as opposed to spraying the entire paddock.**

Mr Watkins said this meant growers could save anywhere up to 90pc in chemicals used.

"The good thing with Joe is that you can send it out on a relatively small weed density that you traditionally

wouldn't send a worker out to deal with," he said.

"It can be kept ticking along to stay on top of it.

"Joe isn't restricted to an eight-hour day and doesn't have a wife or kids to go home to at night.

"There is a lot about this that makes sense."

**What sets Joe apart from other autonomous sprayer models is that Mr Watkins designed it to complement the features of SwarmFarm's platform.**

For example, it has extra ground clearance of one metre underneath the robot, compared to a tractor.

The machine also goes against tradition with a gooseneck, to ensure compactness and weight distribution.

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"Joe is quite happy that it has the weights where it wants them," Mr Watkins said.

"That will definitely shine through in its performance."

SwarmFarm robots have been working in Australian paddocks since 2018, and the demand has only continued to rise.

To date the company has sent 70 autonomous robots, which are built at a farm at Emerald, Queensland, across the country.

Mr Holcombe said it was good to have a homebuilt machine in the west, and local people like Mr Watkins, solving local problems.

**"People are investing in this technology because they want to add more value to their time, by freeing themselves up to make decisions and do other jobs," he said.**

"Beyond that, it is also about engaging young people into the agricultural sector and showing them

them what opportunities are out there.

"It is not about sitting in a tractor, it is about being in the paddock and making those decisions."

Mr Holcombe said the feedback SwarmFarm had received so far was overwhelmingly positive.

He said growers, particularly those in the east coast, had been crying out for technology like this for quite some time.

"As is the case with all new technologies, there have been some challenges we have had to overcome and problems to solve," Mr Holcombe said.

"However, the more machines we get out there, the more time that you spend with them and the more people we visit, we end up solving a lot of those problems from grower feedback.

**"The value we see with robotics is it opens up so many more opportunities for changing the way we farm.**

"That is by slowly going through a paddock, making decisions on a plant-by-plant basis and doing things smarter."

When asked 'where to next?' Mr Watkins said there were so many doors that could be opened in terms of what robots could do and what could be done with them.

He said tractors and traditional towed implements were getting to a point where they were so refined over so many years.

However, the minute people started talking about robots the code was cracked on all of it.

**"It creates another whole path for us innovators and inventors, collectively to make things easier for farmers, which is what allows the world to progress," Mr Watkins said.**

"All of a sudden we are designing implements to suit robots, whereas since the horse and cart era we've only ever really had tractors."

For Mr Watkins it has been surreal to watch how agriculture has evolved over the years, and to be a part of that shift at the tail end, heading into full autonomy.

He said generations had passed through the farm Joe was being trialled at, with the farmer's father being 101-years-old.

"He's been here through the horse and cart days into the first tractors and now he is able to watch robots running around on his farm," Mr Watkins said.

"To see that in his lifetime, on this particular land, is pretty cool."