WEED smart
every weed every seed
every farm every year

ASK AN EXPERT – CAN DRONES PROVIDE EARLY WARNING OF HERBICIDE RESISTANCE?

With Tristan Steventon, director, StevTech

FINDING time to scout for weeds or monitor paddocks after a spray application is almost impossible as growers are typically managing larger cropping areas than ever before.

Tristan Steventon, StevTech drone and data specialist says ultra-high-resolution cameras on drones provide a practical way to rapidly and remotely collect weed data for spray jobs and to monitor changes over time.

"Drone cameras can collect very high-resolution data, and when paired with computer vision AI technology, can create a herbicide spray map for use in a nozzle or section control spray boom," he says. "The technology can identify weed species, and there are innumerable applications for both fallow and in-crop situations."

In just the last six months, StevTech and Ripper Corp received approval to install drone docking stations on farms and operate them remotely. This will enable drones to be another monitoring device, like an on-farm weather station, soil moisture probes, or tank sensors. Having a drone based on the farm and ready to fly means data can be collected regularly without someone standing in the paddock operating the drone.

"The weed maps also provide meaningful data about weed pressure and the effectiveness of herbicide applications," says Tristan. "Growers may not notice herbicide resistance until it is close to full-blown, but regularly monitoring a paddock with a drone gives a whole paddock view and early warning of weeds that are surviving treatment."

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Drones can collect data that helps maximise a consulting agronomist's impact in a cropping business, including the implementation of the WeedSmart Big 6 strategy to keep weed numbers low in cropping systems.

How does drone weed mapping save me money?

Like optical spot spraying, drone-to-tractor weed mapping can vastly reduce the quantity of herbicide applied to a paddock. One map can be used for multiple applications, such as double-knocking fleabane in fallow.

A weed map generated from the processed drone images is suitable for use in any spray rig with section control.

Contract drone weed mapping (image capture plus processing) costs around $4–7 per hectare, depending on the task. The flight time for a 100 hectare block is around 1.5 hrs. The reduction in herbicide applied can offset the mapping cost, and the paddock-wide data collected allows the agronomist to make recommendations without needing an on-farm inspection.

Having a drone stationed on-farm has many benefits. The first is the benefit of immediacy or routine monitoring. Being set up and ready to fly removes the costs and logistical difficulties of accessing a drone and pilot to fly the farm when needed. StevTech's 'drone-in-a-box' system has just been CASA-approved for 'beyond visual line of sight' (BVLOS) use, which opens up many more practical uses of the technology in agriculture.

A detailed paddock history can highlight looming problems, such as low-level resistance to a herbicide mode of action.

Until now, regular drone monitoring has been fairly cost-prohibitive, but the deployment of a docking station significantly changes these calculations.

Can I use my own drone?

Yes, but collecting suitable data at scale requires a professional-grade drone, costing around $30,000 to set up properly.

Drones are increasingly being used for aerial application of agricultural chemicals, and the industry is learning more about accurate and safe application methods.

CASA has made special dispensations for drone use on farms. A concise description of the rules can be found on their website.

Can the drones do other agronomic scouting work?

The data collected in one drone flight can be interrogated for multiple agronomic purposes. For example, you can conduct crop emergence checks, scout for insect pests and beneficials, symptoms of crop disease or nutrient deficiency/toxicity, as well as weed detection and identification.

GRDC's current Grain Automate project will demonstrate the practical use of drone scouting in a 100 hectare field in Central West NSW. The aim is to provide all agronomic recommendations for a complete fallow and cropping cycle without the agronomist entering the paddock. The paddock treatments will also be automated, and the outcomes compared to an adjacent 100 hectare block managed traditionally. ■

HOW TO ASK A WEEDSMART QUESTION

Ask your questions about maximising herbicide efficacy on the WeedSmart Innovations Facebook page *WeedSmartAU* or Twitter/X *@WeedSmartAU*

'WeedSmart' is the industry voice delivering science-backed weed control solutions to enhance on-farm practices and promote the long term, sustainable use of herbicides in Australian agriculture.

WeedSmart has support from the Grains Research and Development Corporation (GRDC), major herbicide, machinery and seed companies, and university and government research partners, all of whom have a stake in sustainable farming systems.

The GRDC is a Platinum investor in WeedSmart to ensure Australian grain growers have access to world class research in strategies to mitigate weeds and control herbicide resistance.