



BUSINESS RESEARCH AND INNOVATION INITIATIVE

Revolutionising agricultural spray application

Fact sheet

Challenge summary

The Cotton Research and Development Corporation (CRDC) is seeking innovative technology solutions to reduce spray drift – the off-target movement of agricultural chemicals such as pesticides. Technology solutions could include:

- interactive virtual reality (VR) tools that will deliver improved and consistent training for spray application
- automated and integrated capture of current farm data to improve record keeping (e.g. data related to product usage, spray quality and equipment operation)
- virtual augmentation of chemical labels and spray patterns
- real-time measurement and alert of spray drift or droplet quality, or
- other technical solutions to address the efficiency and effectiveness of spray application.

Potential themes

Precision agriculture, farming, pesticide control, virtual and augmented reality.

Overview of challenge

Pesticides are used in farming to protect crops against pests, weeds and diseases, and help ensure Australian agriculture remains productive, profitable and sustainable. Movement of pesticides beyond the target is undesirable as it represents wastage of product and exposure to sensitive, non-target areas.

Spray application is complex and there is currently no way of receiving immediate feedback to indicate if spray set up and operation is correct. Spray drift and movement of pesticides is a global issue. A key element to successful impact of spray drift extension is the technical and applied skills of the experts delivering content in an engaging way that drives behaviour change.

The challenge is to find technology solutions that support spraying best practice and decision making to reduce the impacts of spray drift and improve agricultural productivity, profitability and sustainability.

A non-exhaustive list of possible technology solutions, includes:

- VR to improve and ensure consistency of training
- automated and integrated capture of farm data and decision making
- virtual augmentation of chemical labels and spraying patterns, and sensors to alert operator during spraying that drift is occurring or likely to occur
- technical solutions to improve the efficacy or effectiveness of spray application.

Solution requirements

Despite extensive research, development and extension, spray drift remains an annual problem in Australia and globally.

Existing approaches such as training, new technologies for spray planning and application, and weather and farm management apps, have been successful in addressing aspects of spray application. This BRII challenge will focus on innovation that supports on-farm decision making to help address the complexity of spray application.

This may be achieved through building applicator capacity using innovative approaches not currently used (e.g. VR), or developing technologies to automate or reduce the complexity and improve certainty. Weather and time of spraying alerts are not within scope.

Your solution may consider any of the following:

- integration with farming technology platforms
- compatibility with farming equipment and technologies
- best practice pesticide application
- end user needs (e.g. solutions that are easy to use and maintain)
- potential for use during planning or in the field
- accessibility (and, possibly, shareability to bring other users, such as pesticide users, into the decision making process)
- limitations of regional/rural usage, including connectivity
- compatibility for use on farms (taking into account variables such as dust and temperature extremes)
- any legal requirements associated with chemical use and application
- applicability to a range of agriculture commodities.

A solution should also have scope for commercialisation on a national or global scale.

Benefits of the solution

In 2018, while less than 10 per cent of Australia's cotton crop was impacted by spray drift, the financial impact was an estimated \$18 million. Spray drift and movement of pesticides is a global issue that can threaten the social and financial fabric of communities. In Australia, spray drift on to sensitive crops may reduce market access to key pesticides, or result in the detection of unwanted residues on products in commercial markets. Inappropriate use or movement of pesticides in water, soil or air can contaminate that water, soil or air, and negatively impact vegetation.

Addressing spray drift is a global and cross-commodity problem. Effective solutions for Australian broad acre cropping will likely also have significant commercial application in overseas markets with similar cropping systems, such as those in the United States of America.

Beyond the current likely target market for spray applicators, the technological solution for spray drift may extend to other markets, including regulators, retailers and agronomists.

How to apply

For information on how to apply, visit business.gov.au/BRII