Plant Biosecurity Research Initiative

PLANT BIOSECURITY
RESEARCH INITIATIVE

AgriFutures Australia
CRDC
Australian Government Department of Agriculture, Fisheries and Forestry
FWPA Forest & Wood Products Australia
GRDC Grains Research & Development Corporation
Hort Innovation
sra Sugar Research Australia
Wine Australia

Who are we?

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Established in 2017.
Seven (plant-focused) RDCs and the Department of Agriculture, Fisheries and Forestry.

Jo Luck
Program Director








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What do we do?

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Purpose
Research collaboration for better plant biosecurity outcomes.

Scope
Research, Development and Extension that minimises the impact of damaging endemic and exotic pests, diseases and weeds that affect Australia's plant industries, regional communities and the environment.

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Potential dual use case

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Sensing in plant industries

- Scalable, adaptable and affordable sensing of biological (eg pathogen spores) and chemical (pesticides, smoke)
- Needs affordable architecture appropriate for agriculture that can enable improved decision making, and considers sensitivities (regulatory, trade, social license).

Focus for this challenge:

Support targeted use of chemical application through a rapid and cost - effective ability to sensitively detect (binary or quantifiable) levels of agricultural chemical with capability for detection data to be transmitted over a long range.

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Cotton industry impact

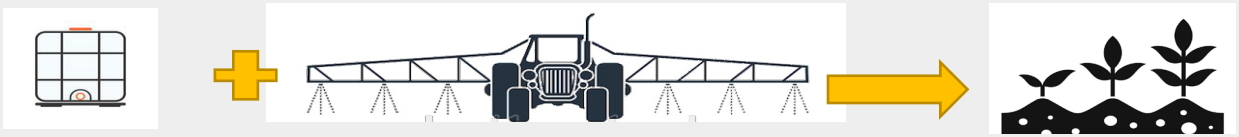
Cotton is sensitive to spray drift from Group 4 herbicides (phenoxy herbicides including 2,4-D).

- On average, 48 per cent of survey respondants 22/23 crops were affected.
- The average cost of this drift to each affected grower was $254,000. (Macintyre/Balonne average $855,000) (CRDC 2023 Grower survey)

Global Challenge

- The Australian cotton experience is not unique.
- Represents wastage of pesticides, low efficacy and linked to resistance.
- Potential for impact on community and environment leading to reduced social license and pressure on ag chemistry.

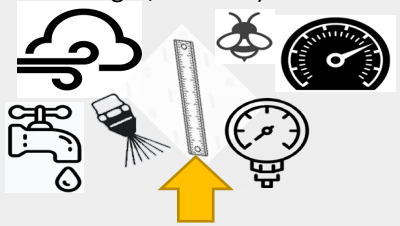
Why is spray application difficult?



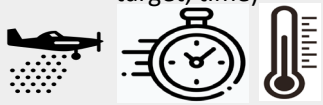
Complex process

Product choice & Tank mix

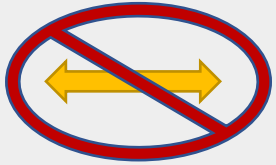
Spray operation (droplet size, nozzle choice, pressure, speed, boom height, weather)



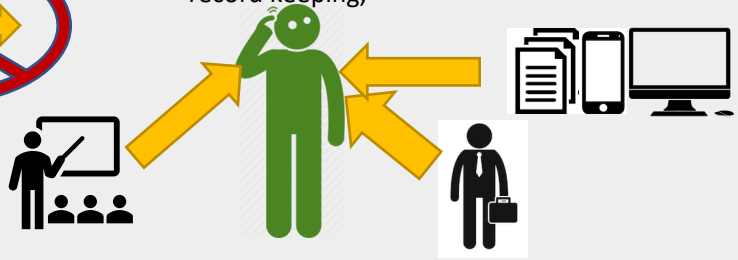
Crop protection (pest target, time)

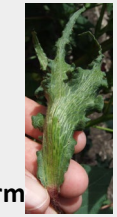


No feedback loop



Requirements: Label, Training & accreditation, Awareness of sensitive areas, record keeping,





Sensing to inform
- Spray operators
- Impacted crops manaers
- R&D to improve best practice
- Regulators

The sensing challenge

Closing Feedback loop

- Sensor location? Height? Number sensors?
- Presence/absence or Detection levels?
- What does detection mean ?

The sensing challenge

Closing Feedback loop

- Sensor location? Height? Number sensors?
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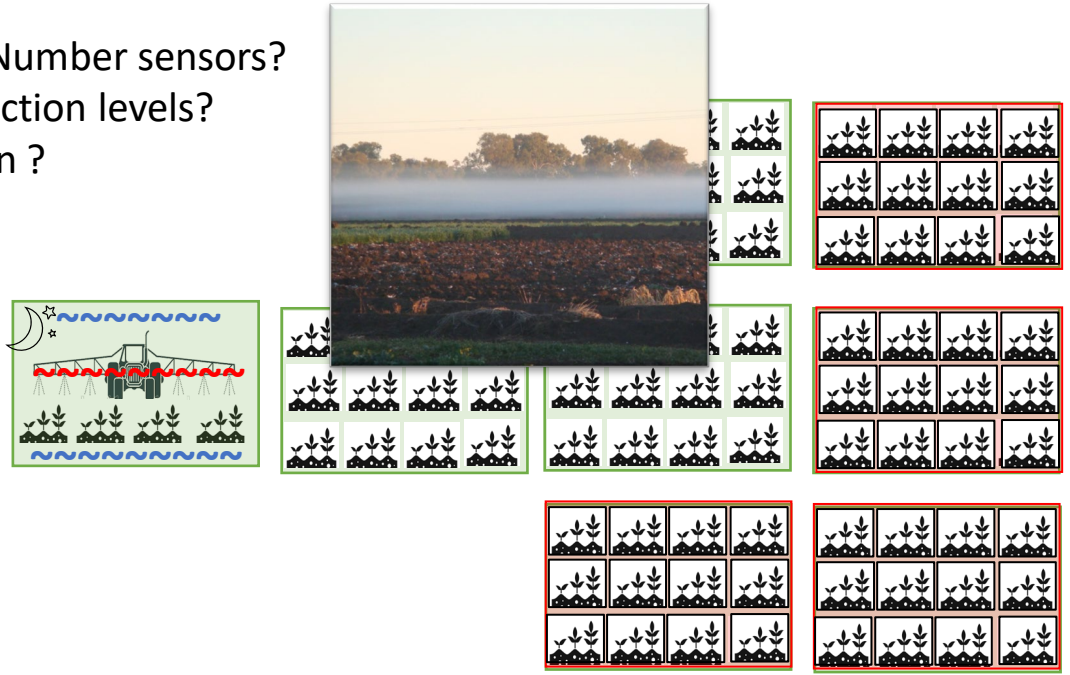
Physical Drift

The sensing challenge

Closing Feedback loop

- Sensor location? Height? Number sensors?
- Presence/absence or Detection levels?
- What does detection mean ?



Surface temperature
Inversion

Scalable, adaptable and affordable airborne chemical awareness attribution and monitoring systems

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Solutions need to consider Australian Ag context:

- Compatibility for use on farms (taking into account variables such as dust and temperature extremes and rural connectivity)
- Interpretation of sensor data in context of drift problem
- Cost effective and consider commercialisation pathway in Ag (who would pay – sensors Vs infrastructure)
- Ability to manage sensitivities (trade, social license, regulatory) in analytics and reporting

Opportunity

- PBRI partners may consider investment in R&D to progress concepts also relevant for agriculture
- Agriculture setting provides compelling surrogate testing ground for future demonstration of DIP activator project outputs.

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Thank you

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