

GRDC invests \$3.6M to improve disease management for grain growers in Australia by tracking airborne disease spores

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An Australian project by Grains Research and Development Corporation (GRDC) is harnessing technology to track airborne disease spores to improve disease management for grain growers. Growers now have access to localised and accurate data.

In the three-year, \$3.6 million project, growers and advisers will have an earlier opportunity to detect blackleg, botrytis, leaf blights and spots (alternaria species), cereal powdery mildew, and general rust. The GRDC investment is led by BioScout with support from several research and commercial partners across Australia.

As part of the project, a network of sensors that capture airborne particles containing fungal spores has been installed. When combined with artificial intelligence (AI) approaches, the data from these sensors allow for early alerts as to potential crop infection, when spores are microscopic and plants are asymptomatic, providing growers with the opportunity for more informed and timely disease management decisions.

GRDC Manager Agriculture Technology Peter Thompson said that growers are reactive to fungal diseases, with detection possible only once the disease is visible in crops. Growers are already on the back-foot once visual symptoms can be spotted by the eye.

During early infection, spores are microscopic, and plants are asymptomatic, making disease difficult to detect. But early infection is the optimal stage to apply fungicides. This project is providing more accurate and localised disease risk information for growers, so they can make more informed decisions on when and where to apply foliar fungicides, helping maximise profit from fungicide use and delay the onset of resistance.

As part of the project, 60 BioScout SporeScout units have been deployed across Western Australia, South Australia, New South Wales, Victoria and Queensland.

The units use air sampling to trap fungal spores, which are photographed using automated microscopy. An AI function then compares these photos to a database of images to detect and identify fungal diseases.

Data from SporeScout units is displayed on BioScout's online dashboard, with graphs containing airborne spore concentrations of specific pathogens.

BioScout CEO Lewis Collins said that over the 2024 season the network sampled nearly 1 billion litres of air, tracking and reporting on around 1.6 million unseen disease-causing spores in near real-time. This sampling revealed a staggering 1.2 million general alternaria spores.

The project is led by BioScout with support from Queensland Department of Agriculture and Fisheries (QDAF), Elders Rural Services Australia, Pairtree Intelligence, WA Department of Primary Industries and Regional Development (WA DPIRD) and the South Australian Research and Development Institute (SARDI), a division of the department of Primary Industries and Regions South Australia (PIRSA).