

Adelaide

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## **Expanded plant phenomics facility to accelerate crop development**

The Australian Plant Phenomics Facility (APPF), Australia's national plant phenomics research infrastructure, will receive \$60 million in core funding over the next five years to expand its world-leading network of facilities across Australia and accelerate the development of improved crops.

APPF headquarters is hosted by the University of Adelaide and supported by the Australian Government National Collaborative Research Infrastructure Strategy (NCRIS).

"The University of Adelaide is proud to be the host of this truly world leading facility, which will enable scientists to tackle the challenge of feeding the world in new and diverse ways," said University of Adelaide Deputy Vice Chancellor (Research) Professor Anton Middelberg.

The \$60 million NCRIS investment is planned to be matched by contributions from university partners, state governments and industry for a total investment of nearly \$135 million.

The funds will be used to expand APPF's national network to nine partner nodes and provide a greater diversity of controlled growth environments and field phenotyping facilities. This will enable researchers to study plant development across the full range of Australian growing conditions, while supporting job opportunities in plant science around the country.

Plant phenomics is a rapidly developing field that combines biology, engineering, robotics and data to measure how plant genetics are expressed under different growing conditions. Plant breeders and scientists can use phenotyping to accelerate their understanding and development of higher yielding and more nutritious crop varieties, greater resilience to climate change, and more sustainable agricultural practices.

High-throughput multispectral imaging and measurement of plants, supported by advanced data collection and analysis, make it easier to identify and isolate desirable traits in new cultivars, sometimes years faster than conventional breeding trials.

Key elements of the new infrastructure investment will include:

- Additional controlled environment growth facilities to develop new phenotyping methodologies.
- Fixed field sites, including GM-capable bio-secure facilities, for evaluating new plant types.
- Mobile phenotyping equipment to support high-throughput phenotyping on field trial sites and farm paddocks.
- Advanced environmental sensors.

- A standardised national data infrastructure to utilise data from across the Australian agriculture research system.
- Whole-tree facilities for phenotyping important arboreal crops such as fruit and nuts.
- Facilities for phenotyping the root structure and development of living plants.

APPF Interim Executive Director Richard Dickmann said the investment will accelerate the translation of essential science into farmers' fields to deliver new improvements sooner.

"This expansion will mean APPF can accurately evaluate exciting new advances in grain, tree crop, horticulture and fibre crops across cool, temperate and tropical regions."

APPF has established itself as a global leader in plant phenotyping with facilities to precisely simulate conditions of drought, heat and salinity, supported by a range of high-throughput RGB, infrared, hyperspectral and X-ray CT imaging systems to characterise plant development above and below ground.

"APPF operates as a team of supremely talented technicians, mechatronics engineers, computer scientists, data scientists and support staff," Mr Dickmann said.

"We are looking forward to announcing our partners in the coming months, and working together to accelerate the delivery of new, improved crops.

"We appreciate the support of NCRIS and our co-investors, and look forward to enabling a step-change in Australian food production, plant research and data science capacity."



**Photo:** Australian Plant Phenomics Facility Interim Executive Director, Mr Richard Dickmann.