Charles Sturt University

foodagility

Global Digital Farm

Australia's first hands-free commercial farm

Australia's first hands-free commercial farm demonstrates the future of farming through technology and data innovations.

Charles Sturt University, in partnership with Food Agility Co-operative Research Centre, is transforming the university's 1,600 hectare commercial farm, located at the Wagga Wagga campus in News South Wales, Australia.

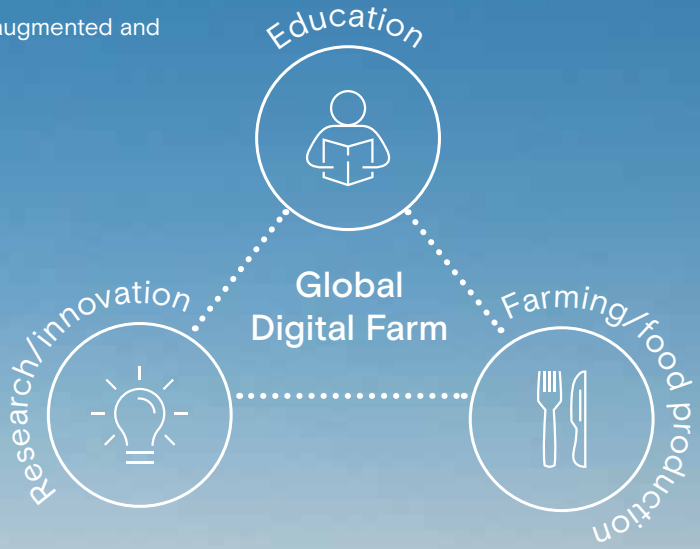
The Global Digital Farm is an integrated digital learning, innovation and research environment working within a full-scale, commercial, mixed farm operation.

The Global Digital Farm is changing modern farming practices by incorporating digital technology to help farmers make the right decisions at the right time. And hands-free is more than just deploying robots. It also includes static and mobile sensing technologies, telecommunications innovations and data-fueled insights and decision making - everything that influences the how, the when and the where of day-to-day decision making.

What is a Global Digital Farm?

The Global Digital Farm is a physical and virtual hub that includes:

- A control centre that brings together real-time data from across the farm.
- Interactive technology demonstrations and testing, where industry can develop and showcase the latest innovations.
- An extended reality hub to visualise and experiment using augmented and virtual reality.
- A technical lab, to unravel complex interactions between plants, soil and water.
- An innovation centre, with facilities to foster collaboration.
- A training facility, where seeing is learning and doing is knowing.



Technology on the Global Digital Farm

On-farm Wi-Fi Innovations

Reliable, farm-wide, high-speed internet is necessary to enable many of the on-farm, technical innovations heading our way. In addition to providing the necessary connectivity to support commercial activities, research and teaching, the Global Digital Farm is also a testing and proving ground for some of the latest in telecommunication innovations.

Animal Performance Innovations

Automated, in-paddock, livestock weighing systems can remotely track and forecast animal liveweight gain. Getting the best out of such technologies requires substantial work in understanding the intrinsic variability between animals in a herd and over time, and a multidisciplinary approach involving livestock scientists, data analysts and farm managers.

Animal Sensing Innovations

Technologies to remotely and continuously monitor the location and disposition of livestock offer producers enhanced ability to manage herds, their security and their feed-base. They also validate the capability of other value chain participants including feedlots, processors and ultimately consumers to support lifetime traceability, provenance and food safety.

Landscape Laboratory

Remote and proximal sensing and surveying technologies create data layers that provide greater understanding of spatial variability of plant-soil-water interactions. Like on-the-go yield and quality mapping, such sensors are a ubiquitous part of precision agriculture and pave the way for site-specific management of crops and pastures.

The Internet of Assets

Innovations in long range telecommunications (both on-ground and via satellite) are providing opportunities to connect more ‘things’ on our farms. On-farm, the Internet of Things (IoT) is the ‘internet of assets’ and producers seek to be able to monitor them for a range of reasons including safety, security and for informing day-to-day decision making.

Airborne Sensing and Operations Innovations

Remote monitoring from satellites, airplanes and drones provides a unique, synoptic view of the landscape. Significant advances in large data capture, analysis through machine learning and other advanced analytics - along with an array of new digital technologies for measurement - offers new possibilities to help land mangers understand the changing farming landscape.

The Digital Dashboard

The Digital Dashboard will be the control centre of the Global Digital Farm, aggregating data and providing a single entry point into various systems and data sources. The dashboard will allow the team to monitor all aspects of the Global Digital Farm and will issue alerts when unusual data patterns indicate a problem.

Meet the team

Jon Medway

Jon is Charles Sturt's Senior Research Fellow, Spatial Agriculture, with the Gulbali Institute. He currently serves as the director of the Global Digital Farm initiative. Jon grew up on a family farm on the Liverpool Plains in Northern NSW. He attended Farrer Memorial Agricultural High School before completing an agricultural science degree at Charles Sturt University in the mid-1980s.

Following a few years in corporate farming he returned to Charles Sturt University's Farrer Centre where, in the 1990s along with only handful of colleagues around Australia, he was at the forefront of the development of precision agriculture (PA). His early foundational work included the application of yield mapping, EM38 and airborne remote sensing to crop management.

In 2000 he established a spatial data consultancy that - during its 19 years and 2,500 projects - provided services to family and corporate farms, industry, research organisations and government across Australia and internationally.

Professor David Lamb

David is a physicist whose research interests include applied optics and precision agriculture. He has worked in precision agriculture for more than 25 years and has led more than 40 industry-funded R&D projects. He currently serves as the Chief Scientist of Food Agility Co-operative Research Centre. In the early 2000s he established the internationally renowned University of New England SMART Farm project and recently completed numerous reviews of telecommunications challenges and opportunities for Australian agriculture. As well as serving as an adviser on a number of agricultural sector-specific, technical innovation groups and communities of interest, David currently serves as the Australian representative for the International Society for Precision Agriculture. In 2016 he received the McClymont Distinguished Professorship (Research) at the University of New England in recognition of his ongoing service to agriculture innovation and research leadership.

Partner with us on the Global Digital Farm

Contact Charles Sturt University if your company would like to partner with us in the Global Digital Farm to research, test or showcase your agrifood innovations.

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