

The Plant Accelerator[®]

Student Education –

High throughput phenomics infrastructure enhances student project

Rhiannon Schilling had planned on becoming an agronomist but a summer scholarship in plant science made her review her career options.

Growing up on a family farm in country South Australia, Rhiannon embarked on a bachelor degree in agricultural science at the University of Adelaide in 2007.

“The course was fantastic as it brought together a relatively small group of students, primarily from the country who shared a similar interest,” says Rhiannon.

During her undergraduate study, Rhiannon undertook a summer scholarship at the Australian Centre for Plant Functional Genomics on the Waite Campus of the University of Adelaide, which for the first time, made her consider a career as a research scientist.

“The thought of conducting research to help develop new cereal crop varieties that are capable of performing better in suboptimal growth conditions really appealed to me,” says Rhiannon.

Rhiannon’s Honours project investigated the expression of a gene that enabled transgenic barley plants to store sodium in a non-toxic way; helping the plants to perform better under saline conditions.

“I very much enjoyed combining the molecular biology and plant physiology aspects of this project, as well as the use of the automated high-throughput phenotyping system at The Plant Accelerator[®],” says the student.

Rhiannon ran two experiments on the phenomics platform of the Australian Plant Phenomics Facility (APPF) in Adelaide to investigate the performance of transgenic barley lines under salt conditions.

“The Plant Accelerator enabled me to undertake large scale projects using non-destructive shoot imaging

and automatic watering of pots. Without this technology, I would not have been able to accurately measure the growth rates of several hundred transgenic plants under salt stress and, as a consequence, I would have had less insight into the salt tolerance of these transgenic barley lines,” says Rhiannon.



The projects confirmed results from previous work undertaken in hydroponics and provided new ideas for follow on projects.

Supported by four co-supervisors with expertise in the areas of salinity, nitrogen use and phosphorus uptake in plants, Rhiannon is now addressing these follow on projects in her PhD. This also involves testing the transgenic barley lines at a saline field trial in Western Australia.

Promisingly, measurements of shoot biomass and leaf sodium from this field work are consistent with those collected in the greenhouse experiments and Rhiannon will submit her findings for publication shortly.

“I have been fortunate to learn and appreciate a variety of areas in plant science during my PhD. Having access to modern laboratories, greenhouses and state-of-the-art phenomics technologies has certainly made a huge difference,” says Rhiannon.

Rhiannon is looking forward to a research career aimed at developing better performing crop varieties to support sustainable farming.