

RIPPA reporting from warmer weather

Field trial and event update - July 2018

The Robot for Intelligent Perception and Precision Application (RIPPA) attended two National Vegetable Extension Network (VegNET) workshops in the Sunshine State last month. Visiting both Simons Farms in Gatton, and the Bundaberg Research Facility, RIPPA aimed to collect data over various growth stages of crops, as well as outline its ability to produce crop mapping visualisations. Events were conducted in conjunction with VegNET South-East Queensland and VegNET Burnett Mary Queensland precision agriculture workshops.



Figure 1: RIPPA out in the field demonstrating its crop mapping capabilities (Photo credit: Pat Salter)

Created through the Horticulture Innovation Centre for Robotics and Intelligent Systems in the University of Sydney's internationally-recognised Australian Centre for Field Robotics (ACFR), the autonomous robot aims to reduce inputs, including labour and fertiliser, and increase the marketable yield of vegetable crops. In order to reach these goals, RIPPA has been designed to complete tasks 24 hours a day 7 days a week. These tasks include being able to:

- Automatically remove weeds through a wide variety of implements
- Autonomously detect and remove foreign objects
- Determine crop health and soil status
- Conduct autonomous precision spraying on individual plants
- Monitor crop growth and estimate yield through intelligent data analytics.

Field day participants had the opportunity to see how RIPPA works in-field (Figure 1), get a closer look under the hood (Figure 2), and also get an overview of the project from the University research team's Justin Clarke (Figure 3).



Figure 2: Growers and industry representatives get a closer look at the inner workings of RIPPA (Photo credit: Michelle Haase)



Figure 3: Justin Clarke from the University of Sydney outlines how RIPPA has the potential to benefit the vegetable industry (Photo credit: Michelle Haase)

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The events attracted a combined total of over 60 participants, eager to see what the robot could bring to the vegetable industry. The objectives of the demonstrations were to showcase RIPPA's functionality, how it had developed since the project's inception, and also gather feedback from growers and industry representatives. This included presenting its ability to collect data over various crop stages, which provides information on the health of individual plants, and influences a range of crop management decisions. Crop mapping visualisations were also created from information gathered to show spatial variability in crop growth and health (Figure 4).

Crop mapping

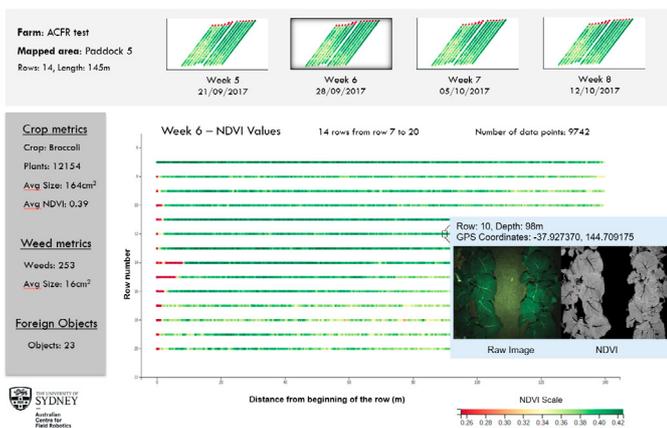


Figure 4: Crop mapping generated by RIPPA from the information gathered from on-board sensors and cameras

As well as collating and disseminating information gathered from the two field days, the University of Sydney team will continue to conduct trials to ensure RIPPA is meeting the ongoing demands of the vegetable industry (Figure 5). This includes running a 10 week trial out at the University of Sydney's research farm in Camden, NSW, which will monitor size, normalised difference vegetation index (NDVI), and overall health of individual plants, and then see if variable rate fertiliser application has the ability to create a more uniform crop. This information will feed into future work and help increase the benefit RIPPA can deliver to industry.



Figure 5: Field day participants provide feedback to the University of Sydney's research team on RIPPA (Photo credit: Michelle Haase)

VIDEO

Couldn't make it to the field day? Watch an overview of the robots's functionality and hear the latest updates from the research team here: <https://www.youtube.com/watch?v=kITGHCTmCoY&feature=youtu.be>



FURTHER INFORMATION

To find out more, including information on upcoming events, please contact:

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