

RIPPA spearheads field day in Richmond, NSW

Field trial and event update - December 2017

The RIPPA™ (Robot for Intelligent Perception and Precision Application) was the main event at the recent Robotics Field Day in Richmond NSW, backing up a similar event at the Riverina Vegetable Innovation Field Day in Griffith NSW earlier in the year.

Created through the Horticulture Innovation Centre for Robotics and Intelligent Systems at the University of Sydney's internationally-recognised Australian Centre for Field Robotics, RIPPA aims to benefit the vegetable industry by:

- Operating autonomously 24 hours 7 days a week
- Automatically removing weeds through a wide variety of implements
- Autonomously detecting and removing foreign objects
- Determining crop health and soil status
- Conducting autonomous precision spraying on each individual plant
- Monitoring crop growth and estimating yield through intelligent data analytics.



Figure 1: Participants in the field with RIPPA at the Greater Sydney LLS demonstration farm (Photo credit: Good Fruit & Vegetables)



Figure 2: Growers and industry representatives get the latest updates from the University of Sydney research team



Figure 3: 'Under the hood' of RIPPA with Mark Calleija from the University of Sydney (Photo credit: Good Fruit & Vegetables)

The aim of RIPPA is to reduce farm input costs such as labour and fertiliser, as well as improve marketable yield of vegetables.

Over 60 people attended the event hosted at the Greater Sydney Local Land Services' demonstration farm in conjunction with the VegNET NSW project (Figure 1). An overview of the robot and its functionality was provided by Mark Calleija and Nathan Apps from the research team at the University of Sydney (Figure 2), before participants were able to have an open Q&A session with the project team and see the technology demonstrated on a lettuce crop (Figure 3).

The main components of the robot and intelligent systems that were tested during the trial included autonomous row following, mechanical weeding and Variable Injection Intelligent Precision Applicator (VIIPA) functionality (Figure 4). This was coupled with a presentation and videos of RIPPA on previous demonstrations and farm mapping visualisations.

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The trial provided a great opportunity to collect data on a lettuce crop where no weeds had been removed from the beds, unlike a commercial farm. This:

- Contributed to the ongoing development of weed detection algorithms (Figure 4)
- Aided the characterisation of the mechanical weeding system (Figure 5).

RIPPA will continue to be developed and improved based on the findings of the trial and the important feedback received from growers and industry representatives (Figure 6). This includes documentation of grower feedback in project planning, particularly in relation to the desired outputs (or visualisations) from the data collected by RIPPA to assist decision making on-farm.

The next steps for the research team include beginning work on quantifying the accuracy of the mechanical weeding system, as well as developing data visualisations for further grower and agronomist feedback.

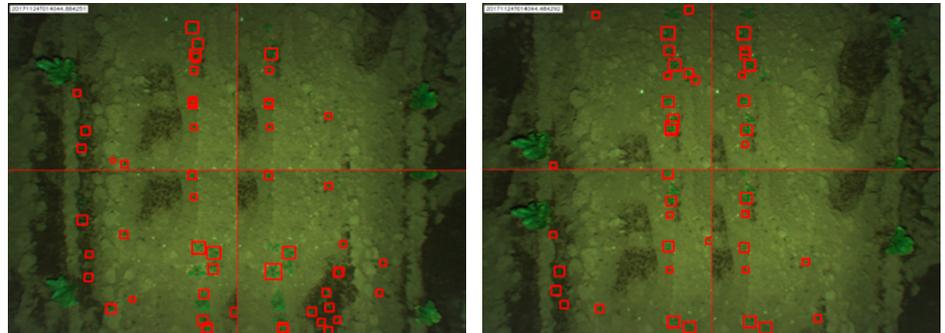


Figure 4: Weed detection in lettuce row and the view from on-board RIPPA



Figure 5: Mechanical weeding demonstration using a tine under the robot (Photo credit: Good Fruit & Vegetables)

FURTHER INFORMATION

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

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or visit www.sydney.edu.au/acfr/agriculture.

The event was also covered by Good Fruit & Vegetables, and you can see more photos here: <http://www.goodfruitandvegetables.com.au/story/5097150/growers-gather-to-see-robot-tech-in-action-photos/?cs=4920>



Figure 6: The research team gets feedback during the open Q&A session (Photo credit: Good Fruit & Vegetables)

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