



'Smart' Picking System

The Technology

The Growlogic 'Harvest Ant' system is based on a 'smart' picking bag and harness that incorporate several inbuilt sensors. The sensors provide real-time data such as fruit weight, location and time via a dedicated on-farm gateway, to a data analytics program. This data can be analysed to provide individual picking information including weight of bag drop, time between bag drops and picker efficiency. Aggregated data can provide overall harvesting information including yield maps.

The 33L high-visibility canvas bag and lightweight polycarbonate harness are also ergonomically designed to distribute the weight of fruit from a picker's neck and shoulders more evenly across the torso. The harness is attached via adjustable velcro straps.

Trials

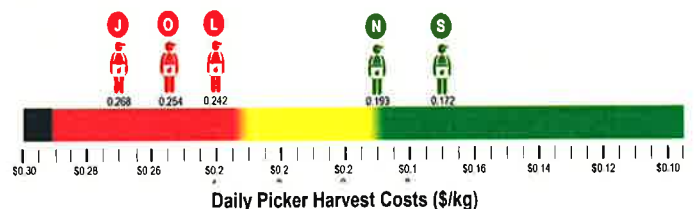
The Harvest Ant system was trialed for harvesting of lychees and avocados, during February and May 2021 respectively. The lychee trial involved 12 bags between 30 pickers and the avocado trial involved five bags between five pickers.

The purpose of the trials was to assess the reliability and comfort of the bags and the value they provided to the grower.

Findings

The bags performed reliably during both trials with no failure of electronic or physical components. Pickers generally reported that the harness provided greater support and comfort than conventional bag systems. Some pickers commented on the additional heat generated by the harness chest plates. Some lychee pickers also noted that reflection from the fluorescent orange bags affected their ability to select ripe fruit based on colour.

An example of picking data from the avocado trial is illustrated below:



The weight of fruit picked by individual pickers was combined with picking durations and pay rates to produce individual "Daily Picker Harvest Costs" (\$/kg of picked fruit). As shown, individual picker costs varied between \$0.17/kg and 0.27/kg - a 59% variation. A similar analysis for the lychee harvest demonstrated a 70% variation.

The avocado data was also combined with growth regulator application rates and farm overlays to produce a yield map. The results indicated yield variations (kg/tree) up to 37% between unregulated and regulated rows.

Costs and ROI

At time of publication, component costs for the 'Harvest Ant' system were:

Component	Cost (\$)
Smart Bag and Harness (Including weight sensors)	250:00
Smart Nodes (1 per bag)	215:00
Gateway	2700:00
Software (Varies according to extent of system)	2500:00

Based on these costs, a producer employing 12 pickers will take approximately 42 days of harvesting to achieve a Return on Investment (RoI) of 10%. This result is based on the following costs and assumptions:

12 x Smart Bags @ \$250:00	\$3,000:00
12 x Nodes @ \$213	\$2,556:00
1 Gateway @ \$2700:00	\$2,700:00
Software	\$2,500:00
Total	\$10,756:00

Solution cost per picker - \$896:00
 Rate per picker - \$27:00 / hr @ 8hr / day
 10% ROI based on 10% gain in picker efficiency

Grower Feedback

Upon trial completion, the growers provided the following combined feedback:

	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
I see value in this technology					✓
I intend purchasing this technology					✓
I recommend this technology to other growers					✓
The system provided greater comfort and safety to pickers				✓	
I am satisfied with the service and support provided by the AgTech company				✓	

Both growers noted that one benefit from the technology was its clear identification of inefficiencies in their harvesting processes. They have since made improvements to reduce grower walking distances, and time the fruit spends in the paddock between bag-drops and packing.

One grower used the data to establish a benchmark picking rate (kg/day) and paid bonuses to pickers who exceeded that rate. He noted a marked improvement in overall picker performance because of this initiative.

Other Considerations

At time of publication, commercial manufacturing of the canvas bags as trialed, was unable to proceed due to international Covid-19 restrictions. Growlogic has since replaced the bag with a polycarbonate bucket which will be trialed with the same lychee grower during the 2021 /22 picking season.

Commercial production and sale of the bucket and harness system is expected to begin in early 2022

Further Information

For further information on this trial, including details of participating growers, please contact:

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