

# An industry wide approach to lifting productivity in the Australian Processing Tomato Industry: 2019 to 2021

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## Introduction

The Australian processing tomato industry produces around 230,000 tonnes from 2,200 hectares on sub-surface drip irrigation. To address static commodity prices and rising costs, the industry set a long-term target of achieving yields of 200 t/ha (average yields in 2021 were 106.13 t/ha). Priority areas received investment in cultivar evaluation; disease control and management; identification of soil constraints; improved irrigation design and extension of knowledge.

The purpose of these studies was to identify and outline the APTRC's strategy to lifting productivity in the Australian processing tomato industry.

## Strategies for increasing productivity

### APTRC cultivar evaluation trial program

- New cultivars are assessed in small plot screening trials.
- Promising selections then advance to replicated, machine harvest trials.
- Several varieties identified between 2019-21 have matched or exceeded the current industry standard H3402—as seen in **Figure 1**.
- This program has improved industry robustness and reduced seed supply risks by diversification of seed suppliers.

### Research investment—PhD project at The University of Melbourne, completed in 2020.

- A complex of root and collar rot pathogens, contributing to yield losses, have been identified, notably *Fusarium oxysporum* and *Pythium* spp.
- This work has informed industry about limitations to production from soil borne disease and the potential influence of continuous cropping, which has laid the foundation for further work into its management.

### Investment—Study by NSW Department of Primary Industries (DPI) into factors limiting yields of drip irrigated processing tomatoes

- Accumulated water stress, either in excess or deficit, accounted for 80% of yield variability. **Figure 2** illustrates this variability based on water stress.
- Attributed to less capillary flow away from emitters, this smaller wetted zone around the drip tape was often waterlogged, together with dry areas on the shoulders of beds and a steep hydraulic gradient between the two.

### Investment—NSW DPI and Deakin University—Modelling of sub-surface drip irrigation systems

- Moisture characteristics of 2 representative soils was determined from in-situ, paired soil water content and potential measurements.
- The HYDRUS model was used to simulate emitter flow rates, spacings & depths of placement to determine potential improvements in sub-surface tape design.
- Potential deep drainage losses under sub-surface drip irrigation were identified, with modelling indicating water losses of 20-30%.
- An example of modelled drainage losses in a duplex soil with different configurations is illustrated in **Figure 3**.
- Implications regarding nutrient supply to crops via fertigation must now be assessed.

### APTRC Industry Development

- The APTRC identified needs and invested in R&D to answer some important questions relating to limitations and productivity.
- This knowledge is being extended via a searchable database <https://aptrc.asn.au/rd-research/> newsletters, magazines, crop inspections & pest/disease updates via their Workplace App and website [www.aptrc.asn.au](http://www.aptrc.asn.au).

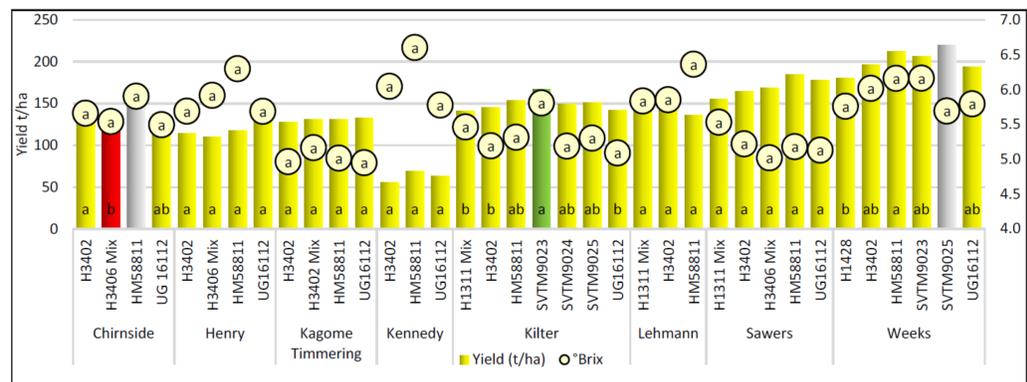
## Industry outcomes

- Based on these findings, the industry formulated a new strategic plan with input from growers, researchers and industry consultants.
- The industry identified a need for further investments into a systems-based approach to address disease risks and to develop a more profitable and sustainable rotation.

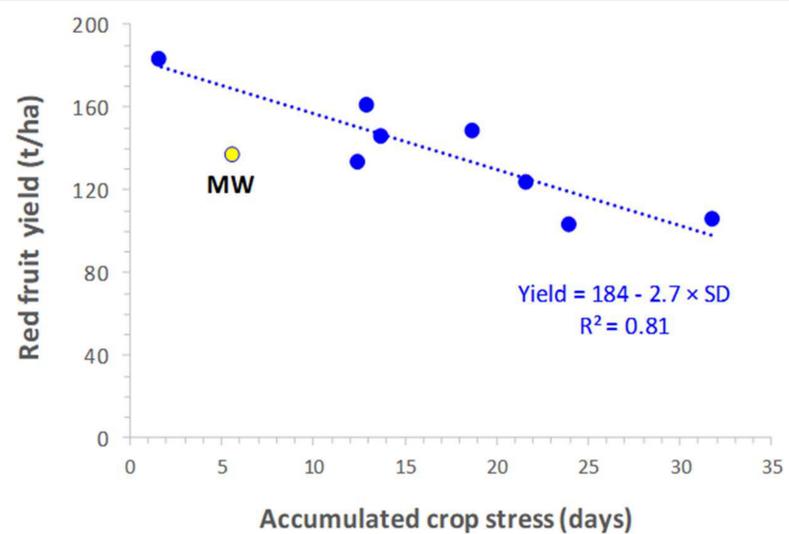
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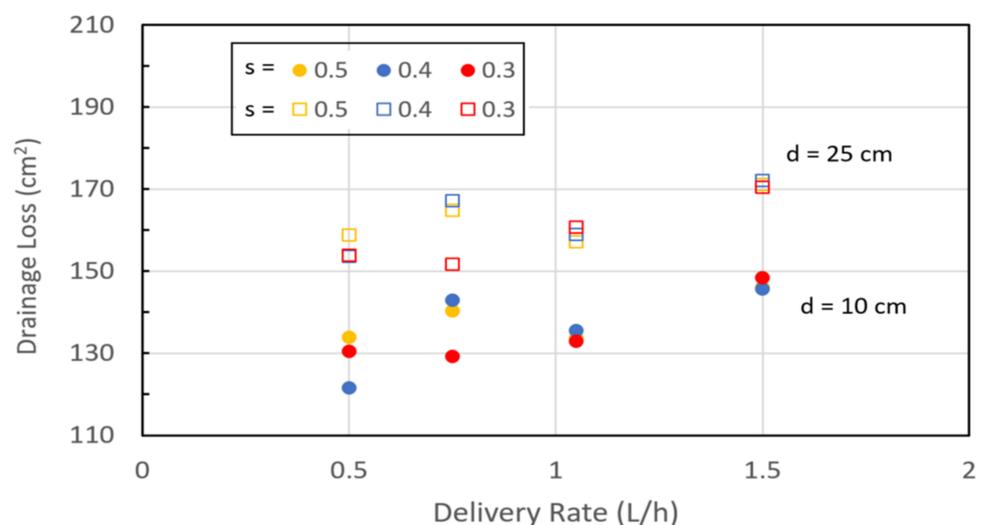
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**Figure 1:** Yield & °Brix for trial cultivars Vs current industry standard H3402



**Figure 2:** Relationship between fruit yield and number of days soil in centre of bed at each site was too dry or too wet during Jan and Feb 2020.



**Figure 3:** Drainage loss in duplex soil as modelled using 'HYDRUS'

## References

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