

Drought and climate adaptation program

Demonstrating the real monetary value of improved management decisions

Background

This case study presents examples of real monetary value savings reported by 16 collaborating vegetable and supply chain managers who used the Drought and Climate Adaptation Program's (DCAP) experimental forecast information to make improved management decisions.

Temperature is a major driver of horticultural crop yield potential and crop quality. The project team believed that improved management decisions throughout the marketing and supply chain could and would occur as a direct result of information from accurate and dependable long lead time forecasts. This case study demonstrates that improved management decisions were made by growers and supply chain participants in the Queensland vegetable industry because they had access to accurate forecasts, especially long-lead time maximum temperature forecasts.

This is a shortened version of the full case study available to read in [the project's Final Report](#). For reason of length some imagery and examples have not been included. This is a project under the Queensland Government's Drought and Climate Adaptation Program.

Introduction

The primary goal for the project team was to test the ability of an ACCESS-S based regional forecast to provide our collaborating Queensland based vegetable and supply chain business managers with better long lead-time forecast information. This information drives, supports and enhances improved business decisions along the entire marketing and supply chain.

Improved decisions benefit our collaborating growers, individual supply chain businesses and ultimately all retail customers. Improved decisions based on quality science delivering long lead time forecasts improves product quality, supply consistency, reduces losses and enhances business turnover and profit potential.



Table 1. Collaborating business managers' benefits from the use of Experimental Forecasts.

Collaborating business managers' specific stated benefits received as emails or texts	Reported business benefit \$	**Business reference number
A significant Granite Belt (GRANITE BELT) hydroponic leafy vegetable and herb growing business specialising in supplying Qld supermarkets over the summer, sent an email detailing how just one of the DCAP Experimental Forecasts project teams Heatwave Advisory forecasts allowed him to quickly adjust his nutrient mix and watering regime—saving crop loss from tipburn.	\$60 000	1
A large multi-site Granite Belt vegetable grower took notice of the DCAP Experimental Forecasts in the summer of 2019 (when high temperatures and low rainfall were forecast). With irrigation dams half empty, and above average maximum temperatures forecast, he decided to cut the planned weekly plantings that summer, reducing crop irrigation water use. This strategy paid off. The business retained all permanent workers and the last half of the season saw on-farm prices for all vegetable lines they grew rise sharply, due to the drought impacts on other Queensland and interstate growers, greatly boosting income. The improved management decision paid off handsomely. The business income benefit quoted here is just for iceberg lettuce.	\$23 000	2
A capsicum grower in the Granite Belt said their business made improved crop management decisions - reduced fertilizer load and applied fruit sunscreens when above average maximum temperatures were forecast by the DCAP forecasts. "Being better prepared for approaching heatwaves and harvesting some fruit blocks sooner than usual, maximised fruit quality and sales volume," they said.	\$12 000	3
DCAP Heatwave Advisory forecasts sent to Granite Belt and Lockyer Valley collaborating businesses throughout the project's life benefited all collaborators. Several detailed anecdotes reflect this impact. Being very conservative, if each of the 48 business made a better-informed crop management decision just once (again very conservative) over the 3 years of the project and that resulted in only \$500 of extra income. The total (very conservative) benefit to these businesses appears in the next column.	\$24 000	4
One Granite Belt capsicum grower stated that advanced knowledge of approaching heatwaves, thanks to the DCAP project, allowed him to delay scheduled plantings of bought in transplants. He said that every time he was able to do this, he got better plant establishment (higher plant survival). This saved	\$5000	5

him sending workers into the field a few days later to replant heat stressed or dying plants.		
Perfection Fresh utilised the extra information from the DCAP vegetable project to alter their Broccolini contract supply locations and growers based on the summer forecast. The Queensland manager moved production to regions where no excessive summer temperatures were forecast in 2019. See Appendices to read the detailed anecdote.	\$25 000	6
The One Harvest national supply manager stated after attending a DCAP project meeting and becoming aware of the DCAP long lead-time forecast, they moved a large portion of their contracted leafy vegetable production to alternate production sites for 2020-21 summer season. The strategy was to minimise the potential impact of the forecast 2020-21 La Nina. This decision was aimed at ensuring contracted daily supply to the east coast supermarket chains, and it paid off.	\$30 000	7
In the extreme heat of 2019, a key Aldi supplier decided to harvest several mature pumpkin plantings early after reading our DCAP Heatwave Advisory forecast. He stated that this prevented crop and price loss from sunburn damage resulting in a 45% boost in income for those crops.	\$61 000	8
A Granite Belt agronomist who has attended all our local experimental forecast forums stated in an email that he advised all his clients of our Heatwave and bi-monthly forecasts (<i>printed and handed them to his key growers</i>). He suggested better crop management decisions to them and wrote us an email estimating the increased value (increased yield and income) achieved by just his capsicum cropping clients, per hectare of crop.	\$10 000/ha For each of his clients' crops. This agronomist manages a total of more than 15ha of capsicum crops grown by 4 or 5 clients. Total impact (15 ha) \$150 000	9
A Granite Belt strawberry and apple grower stated that in the summer of 2019 alone, DCAP forecasts helped his management decisions by achieving improved crop quality, harvested yield, and sale value.	\$15 000	10
A baby leaf salad producer in the Lockyer stated that the forecasts helped better manage watering schedules and they were able to extend their planting season into the winter of 2019-20 that was forecast to have minimum temperatures that were above average – allowing quality cropping longer into the winter.	\$18 000	11
A large multi-location corporate farm extended their Granite Belt season for an extra two weeks longer than usual, avoiding crop loss they would have incurred had they planted on their usual start date in	\$50 000	12

the Lockyer Valley. As a result, they avoided the extreme late Autumn heat damage other growers experienced in the Lockyer Valley.		
Two major corporate farms took notice of DCAP Heatwave Advisory and bi-monthly forecasts. This improved heatwave awareness & better management of green bean crops. Improvement in both quality and yield outcomes = more \$ returns.	\$30 000	13
Multi-location Lockyer Valley based sweet corn growers and processors stated that the experimental forecast information allowed them to better manage, alter and revise weekly planting plans and maximise marketable yield by better aligning irrigation timing and volume to ensure crops are better watered, especially during temperature sensitive crop growth phases like silking—when high temperatures and poor crop management can decimate marketable yield.	\$80 000	14
Tomato growers in the Granite Belt stated the DCAP Heatwave Advisory forecasts alone improved crop outcomes by allowing them to pre-irrigate crops before the heatwave event arrived and apply sunscreen products to reduce fruit loss.	\$5000	15
A Lockyer Valley multi-location grower and specialist food service industry processor and packer who delivers product every day to their food service customers, emailed us stating that their improved business decisions, based on the experimental forecasts, had significantly benefited their bottom line and assisted their business growth, over the three years they have worked with project staff.	\$100 000	16
Total reported monetary benefit to collaborating Queensland vegetable business collaborators.	\$688 000	Total

**Collaborating business report reference

Ref 1; Specialist herb hydroponic grower – Granite Belt

Ref 2; Lettuce sales improved from multi crop/multi location grower - Granite Belt

Ref 3; Premium capsicum grower - Granite Belt

Ref 4; Multiple business (48) one heat wave warning min \$500 benefit each (we issued a total of 17 Heatwave warnings in 3 years.) – Lockyer Valley and Granite Belt

Ref 5; Capsicum grower in Granite Belt improved decisions around plant date saved plant loss

Ref 6; Perfection Fresh - Supply Chain Manager across numerous businesses and locations

Ref 7; One Harvest Supply Chain Manager across numerous businesses and locations

Ref 8; Aldi supermarket supplier Pumpkin crops in summer season 2018 - Lockyer Valley

Ref 9; Agronomist report improved return per fruiting hectare - Granite Belt

Ref 10; Granite Belt hydroponic Strawberry, in-ground strawberry and Apple growing business

Ref 11; Lockyer Valley baby leaf salad grower - \$ impact reported by the Supply Chain Manager who contracts supply from this Lockyer Valley business

Ref 12; Lockyer Valley based corporate multi-location vegetable producer, processor, and major employer

Ref 13; Lockyer Valley based suppliers/growers/packers, delivering fresh and semi-processed green bean product weekly to supermarket chain stores along the east coast of Australia

Ref 14; Lockyer Valley based suppliers/growers/packers of Qld sweet corn fresh and semi-processed to all the major Australian supermarkets

Ref 15; Large tomato grower/packer in the Granite Belt reported reduced heat impacts thanks to Experimental forecasts

Ref 16; Lite & Easy suppliers - Lockyer Valley and Granite Belt

NOTE: References have been made anonymous to protect collaborating business manager's private details.

Real business income benefits reported

The above total income benefit is only from businesses that have decided to disclose by email or SMS the detail above. Many other businesses (48 collaborating businesses in total) directly engaged by and actively worked with project staff, have also benefited from the DCAP Experimental Forecasts. They too have stated that they have improved their management decisions and forecast knowledge since we began working with them in mid-2018. They just have not revealed to us the detail (or have calculated) the dollar value of these improved management decisions.

Project funding for the four years of work that was provided by the Queensland Government's Drought and Climate Adaptation Program was \$264 000 in total.

Queensland business income benefits detailed above to these 16 Queensland businesses alone is \$688 000 (this is a conservative figure) and only represents 16 of the 48 businesses engaged by the Project Team. This equates to over 260% return on investment.

This evidence-based analysis just considers the income benefits accrued to these 16 reporting business who took the time to convey these benefits to our DCAP funded Hort Project team "The Use of Bureau of Meteorology Multi-Week and Seasonal Forecasts to Facilitate Improved Management Decisions in Queensland's Vegetable".

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