Bankless channel irrigation a good fit in the Gulf

A grower case study: Etta Plains Ag

PROPERTY NAME

- Etta Plains Ag, Julia Creek, Qld.
- Lucas Findley
- Farm area: 29,000 ha
- 2,500 ha of irrigation
- Surface water from Flinders and Cloncurry Rivers
- Soil type: black and grey vertosols
- Annual rainfall: Summer dominant 550mm

What SIP2 research was adopted?

Bankless channel in 2020 - ongoing

What were the primary factors contributing to the decision to adopt?

Labour supply: The Findley family is pioneering an irrigation development at Etta Plains, 125 km north of Julia Creek in one of the most remote cotton growing regions in Queensland's Gulf catchment. Lucas Findley is candid when it comes to choosing a design- he had "no other realistic option" other than to install bankless irrigation, given the labour productivity benefits associated with the layout. On the family's holdings in the Namoi Valley, NSW Lucas cut his teeth on siphon irrigation, low water volumes during droughts, bores and remarked at the amazing labour productivity that comes with bankless irrigation. "One man can do 1000 ha on a change, it's fantastic. We plan to continue to roll out this system design for the remaining stages at Etta Plains".

Figure 1 Radford Ag agronomist, Chris Radford and Lucas Findley with the first round module produced at Etta Plains, Julia Creek,

Water efficiency: Growing cotton in a tropical monsoon environment presents challenges around managing intense storm events, that can lead to run-off, erosion and put pressure on pump returns. One advantage of bankless is the ability to hold the water in-field and allow the heavy vertosol soils to absorb the water and utilise the 300mm Plant Available Water holding Capacity (PAWC), which has efficiency benefits for cropped fields, or those in fallow. "I monitor my pump height thresholds during a storm event, unlike a furrow irrigated system where your tail return can be easily overwhelmed by stormwater. During an irrigation season, at a guess I would say we are reticulating 20-30% less water than I expected"

Value creation of higher productivity: A co-benefit of choosing an efficient irrigation layout can flow on to the balance sheet at some point in the future. Lucas feels that water and labour productivity measures will be reflected in the overall value of his farming development. "Although bankless uses slightly more land, there is growing evidence that a more efficient and productive layout will command a premium of siphon irrigation farms, and with rural labour tightening and more economic pressure to use water wisely, that theory stands to reason"

What worked well? (installation/ and benefits)

Greenfield developments, such as that at Etta Plains require budgeting discipline, and with cost pressures of setting up the farm ongoing, the engineering concepts for the layouts were relatively minimal risk in the

scheme of things. “Bankless layouts are regarded as mature technology, so we were very happy that our contractors came in close to budget with the development. On a new development like this, it was quite easy – as opposed to re-engineering something existing. With 34 ha bays, we can achieve good machinery efficiencies on turns, especially with picking. Bankless irrigation does not seem to move the nitrates and other nutrients from one end of the field to the other - that we can tell, like a siphon layout, but as we gather more field data in-field variation this will be something to watch” Lucas said

What did not work so well in installation or ongoing management? (What were the challenges?)

For irrigators looking at converting or developing bankless layouts, the new paradigm is the sheer volume of water needed to flood irrigate a field to capture the labour and water efficiencies. With that, comes bigger gates, weirs and pumps and shifting a lot more dirt in the design phase. Lucas believes there would be cost-effective solutions to convert smaller capacity bore irrigated sites, and it is something that he has thought about for his Namoi Valley holdings “We have our hands full at the moment, but I have learnt a lot through the Etta Plains bankless development. By choosing the optimal bay sizes I reckon the Namoi siphon irrigation layouts could be converted in stages, utilizing existing pumps, earthmoving machinery, and infrastructure. The other challenge is losing some land to accommodate for the extra volumes of water moving around the farm. Overall, I think it is worth the cost, particularly after experiencing just how productive the labour and water inputs can be over a large area.”

What would you have done differently as part of the investment/adoption?

Over the staged development, Lucas will only make very minor changes from those developments completed to date. The natural fall and soil types suited the system implementation nicely.

Do you have plans to further upgrade the system going forward?

At the moment, the Etta Plains bankless layout only has gates, pump and water reticulation is done manually. Lucas is keen to explore sensor technologies that refine these processes for improved timeliness, water efficiencies and agronomics. “We’ve only recently established WiFi connectivity at Etta Plains in the last 12 months, so communications are something that we are still working on. The pump, gate, soil pressure sensors and capacitance probes for optimizing yield is something very much on the horizon for us. Objective measurement from remote sensing technology, overlayed with our irrigation experience, is definitely where we are headed in future, but what we have right now is still highly productive and the staff really enjoy operating the current bankless system”

Figure 2 Lucas walking into cotton produced on a bankless layout at Etta Plains in July 2021

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