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Wetland remediation

Improving irrigation efficiency benefits wetland water quality



Many people drive through farming landscapes without realising the important role bushland lagoons play in improving water quality. This is not the case for Cowal Agriculture's Hamish Millar and Greg Kauter.

Cowal Agriculture operates nine irrigation properties totalling 6,400 hectares across the Emerald Irrigation Area, in central Queensland. The operation focuses on cotton, supplementing production with grain, mungbean and chickpea crops.

When the company purchased Brayland in October 2013, they knew its irrigation system would need to be redesigned. Managing Director Hamish Millar said water was previously pumped from the Nogoia River into a supply channel and then used to fill Brayland Lagoon. Water would then be re-pumped from the lagoon to a head ditch.

"When the infrastructure was built in the 1980s, electricity was cheap, diesel was cheap, water was cheap, and there wasn't the same legislation or focus on water quality of these areas," Hamish said.

"We had identified within the first month of purchasing the property that this was one of the key legacy issues that we wanted to sort out. However, it was placed in the 'too-hard basket' while we focused on getting the operation rolling."

Wetland importance

Brayland Lagoon is a significant wetland covering 113 hectares with links to the Nogoia River and its anabranch. In a heavily fragmented landscape, the wetland retains important remnant bushland and a small pocket of endangered sub-dominant coolibah woodland.

In addition to being an inefficient way to deliver irrigation water, Brayland Lagoon was used to drain irrigation tailwater and stormwater run-off from 180 hectares of irrigated fields, substantially increasing the risk of contaminants reaching the Nogoia River.



With the help of Liz Alexander of Blue Dog Agribusiness, Cowal Agriculture's Hamish Millar and Greg Kauter were able to increase their water efficiency while protecting Brayland's important lagoon.

With the support of Fitzroy Basin Association Inc. (FBA) through funding from the Australian Government's Reef Programme, Cowal Agriculture redirected irrigation supply, tailwater and excess stormwater via earthen supply channels instead of using the wetland, thus reducing the risks to the wetland and Nogoia River.

Hamish also worked with FBA contractor Liz Alexander from Blue Dog Agribusiness to develop the significant infrastructure investment project, which started in July 2015 and took over four months to complete. The task involved extensive earthworks to lay 220 metres of 900mm pipe underneath the wetland, which was no small feat. This pipe created an inverted syphon between two supply channels on either side of the lagoon. Not only is the wetland now protected, but irrigation is significantly more efficient as water is only pumped once.



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Immediate results

Since the project's completion, Hamish and Greg have seen substantial improvements in water use efficiency, production efficiency and the quality of the lagoon's vegetation. According to Hamish, they have reduced their pumping and delivery costs by 25 per cent, or about \$8 per megalitre, resulting in changes to their production decisions.

"We wouldn't bring parts of the Brayland farm into production because there was higher cost, now it's on par with the rest of the farm," said Hamish.

Because the wetland relies on natural rainfall and water flow, Cowal Agriculture continues to release clean water through the lagoon to maintain the system's health. They have also identified other areas of environmental importance across the farm and have a cautious approach to pesticide application. To minimise the risk of drift, herbicides are not applied by air adjacent to sensitive areas or the Brayland Lagoon.

Best management practices

Hamish and Greg worked with Liz to complete the water quality related modules from the cotton industry's best management practices program, myBMP, and said he would recommend the program and catchment management activities to others.

"It's always difficult to put a value on activities like this. Sometimes on-farm projects can't be linked to a direct financial benefit and we need to think more broadly about value. Cotton myBMP is a great example; people sometimes see BMP as a cost, but if you think of the indirect benefits provided it's clearly of value," Hamish said.

"If you can meet all of the BMP targets around water use efficiency, you might save 1 or 2 megalitres per hectare, which you can then apply to another crop or capture as increased productivity."

Protecting off-farm habitats

While the Reef is not always front of mind, the Cowal Agriculture team are always thinking about where their water goes. In the past 15 years, cotton irrigators have focused on building reticulation infrastructure to prevent irrigation tailwater from leaving their farms, and now it is an industry norm.

When talking about the Brayland Lagoon, Hamish says that it is an area of real value. "Greg and I are just in awe of it; they are beautiful, these waterways. We haven't yet, but we want to get some kayaks and go for a paddle into the wildlife and just enjoy what is down there," he said.



Hamish Millar, pictured with his son Oliver, believes the waterways across Cowal Agriculture's holdings are valuable and worth protecting for future generations.



The scale of earthworks to install 220 metres of pipe was impressive, and created an inverted siphon beneath Brayland Lagoon.