The Great Barrier Reef Foundation
Mackay Whitsunday Water Quality Program

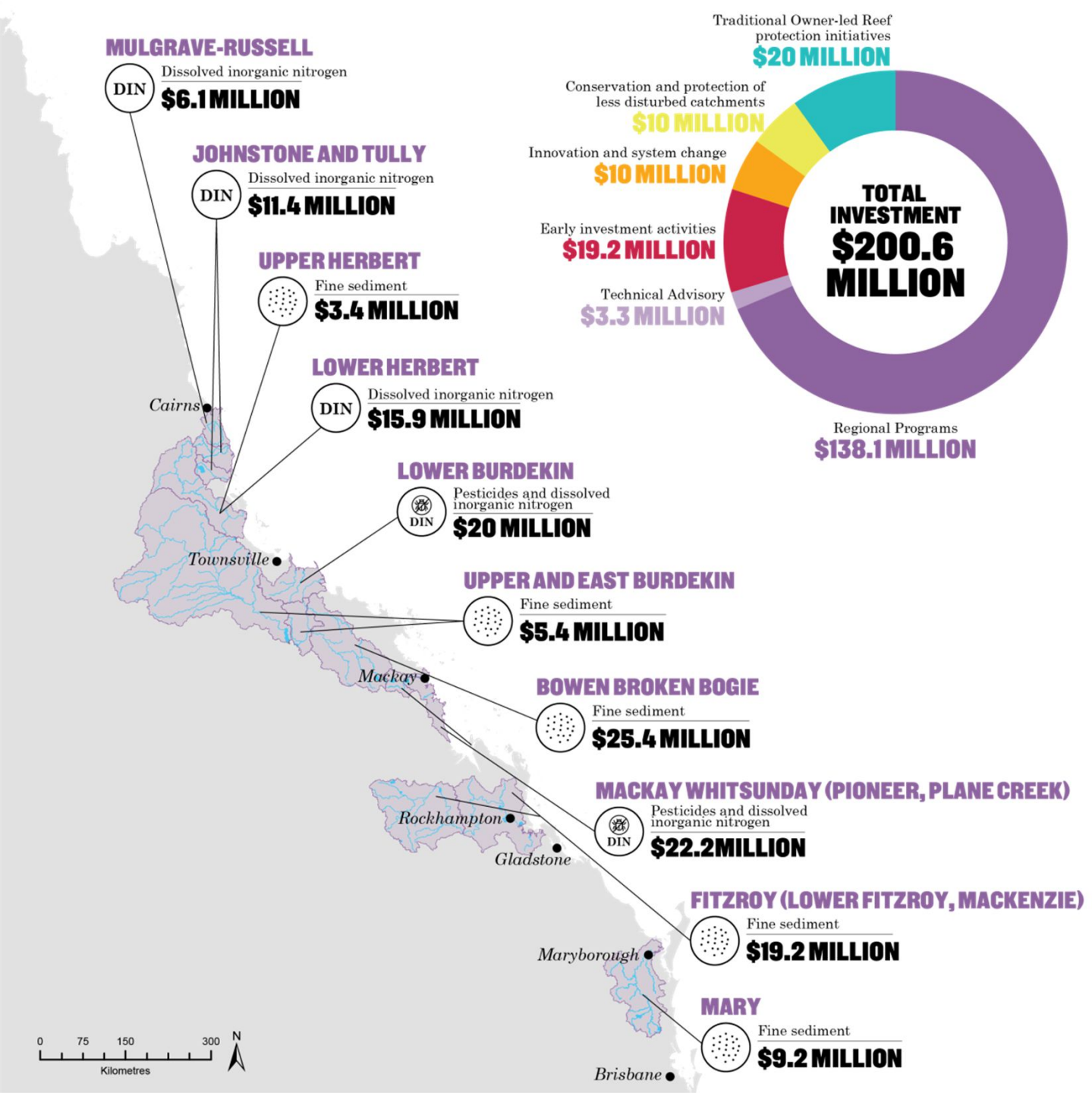
Paddock to Reef Forum Mackay May 2023

Mackay Whitsunday Water Quality Program

Australian Government's Reef Trust and the Great Barrier Reef Foundation Partnership

Total investment $443.3M six-year investment

$200.6M investment for Water Quality



Mackay Whitsunday Water Quality Program

- One of ten regional projects included in the $138.1M investment
- Total investment of $22.2 Million over four years

MWWQP Targets:

- 26 tonnes of DIN
- 215 kilograms of pesticide active ingredients (2.9M Risk Units)
- Nine projects delivered regionally by eight Delivery Providers
- Water Quality improvements estimated using Projector Tool or alternative lines of evidence

Mackay Whitsunday Water Quality Program

Organisation	Project	Priority Target Pollutant
MAPS	Nutrient Management Planning and AGTRIX Farming software support	DIN
Liquaforce	LAND – A local area nutrient datahub	DIN
Catchment Solutions	Project Catalyst Broader Adoption Program	DIN
Farmacist	Point of Difference	DIN
CANEGROWERS	Mackay Irrigation Project	DIN
Green Collar	Reef Credits	DIN
Farmacist	Project Bluewater II	Pesticides
Reef Catchments	Major Grants Project – Grower Incentives	DIN and Pesticides
Sugar Research Australia	Cane to Creek	DIN and Pesticides

Mackay Whitsunday Water Quality Program

Commenced in 2020 and will be completed in June 2024

Initially targeting the Pioneer and Plane Basins – now expanded into the O'Connell and Proserpine Basins

Over 50 500ha engaged

458 individual projects

REEF TRUST PARTNERSHIP

Water Quality

Australian Government | REEF TRUST | Great Barrier Reef Foundation

SCOPE

Date

July 2018 - December 2022

Catchment

Mackay Whitsunday

Industry

All

There are a number of on-ground and supporting projects that either occur across multiple regions or have no explicit regional location. These projects are accounted for in the total number of projects/component committed funds but not this map.

COMPONENT OVERVIEW

$175.8M Committed

$124.2M Co-invested

151 Partners

120 Projects

PARTNERSHIP OUTCOMES

PROGRESS TOWARDS RTP POLLUTANT LOAD REDUCTION TARGETS

Dissolved Inorganic Nitrogen

157% (42.2t)

progress towards 27t from projects completed and underway

Pesticide

73% (2,161.0K ru)

progress towards 2,960K ru from projects completed and underway

Sediment

No target (5.1kt)

progress towards 0kt from projects completed and underway

INNOVATION

$11.5M

Invested

22

Innovation projects

HOW OUTCOMES HAVE BEEN ACHIEVED

460 landholders have improved management of 66,980 ha of cane land to reduce nutrient and pesticide runoff

There are no grazing projects reporting in this area

There have been 2,070 records of landholders attending education and awareness events for water quality improvements

gullies and streambanks restored on properties to prevent erosion.

MAPS
Nutrient management Planning and AGTRIX support

- Increase the confidence of growers to implement 6ES by providing tailored agronomic advice and support.
- Deliver 90 projects over 8,640ha

  - Facilitate data recording using AGTRIX and provides grower training
  - Address soil constraints
  - Support growers to increase legume fallow's (loan equip)
  - Update AGTRIX to allow grower N and P budget planning and calculations

MAPS
Nutrient management Planning and AGTRIX support

Grower's story:

- Septimus grower participated in the MWWQP project in 2022.
- 220 ha. under cane
- Without jeopardising the cane yield, the grower reduced 15 kg of nitrogen usage in plant cane (140 kg to 125 kg); & in the ratoons reduced it by 10 kg (155 kg to 145 kg).
- Projected WQ savings of 50kg/DIN
- Received minor grants of $2,000 to purchase a PTO pump to apply liquid fertilisers to his sugarcane.

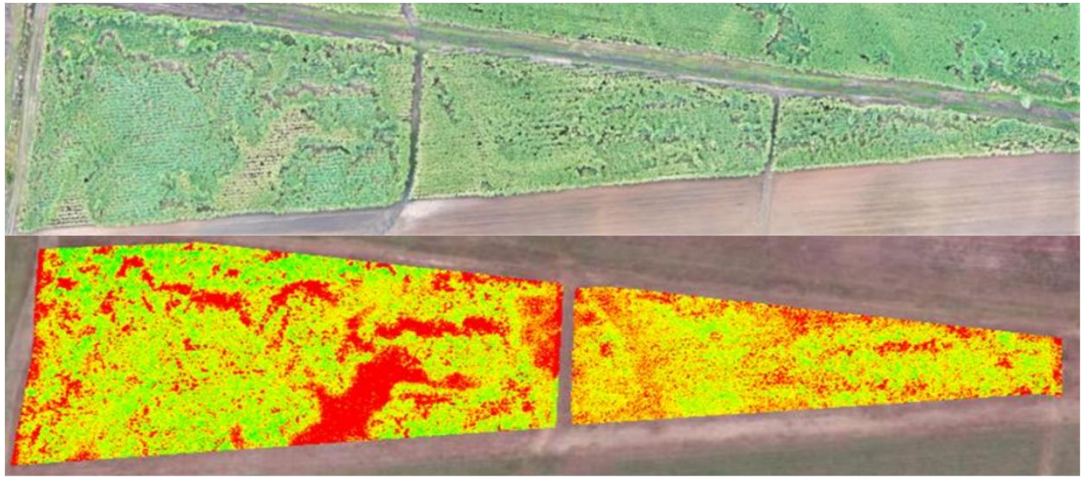
Farmacist - A Point of Difference

Project aims :

- Increase adoption of precision agriculture technology to match nutrient and ameliorant rates to crop potential and known issues
- Upskill growers in use of their GPS and precision ag technology
- Fast track essential base data collection to understand soil conditions, constraints and variability
- 130 project over 13,600ha

Project includes:

- ✓ EM Mapping on all farms including RTK boundary mapping
- ✓ Drone and yield mapping
- ✓ Individual and group GPS screen/tech training
- ✓ Variable rate fertiliser and ameliorant planning
- ✓ Minor grant funding for technology and equipment upgrades



Farmacist - A Point of Difference

D.I.N Saving of 471 kg

Joined Project P.O.D in 2021 , at this point he had no GPS equipment . Through support from Farmacist, the grower installed a full hydraulic upgrade to his fertiliser box to enable it to apply variable rate fertiliser and he purchased a new GPS and rate controller .

Farmacist agronomist's Zoe and Jess, installed the GPS and ensured the machine was calibrated and working. The grower used the applicator for the end of the 2021 season and commented that it "Worked very well, it did have a few teething issues associated with the GPS at the start, and at first the fertiliser rate was a little slow to start on the ends, however this has been sorted. By the tonnage applied, the machine is quite accurate, and it has saved me time and money".

FARMACIST

MWWQ LF01 Project LAND - A Local Area Nutrient Datahub

- LandHub supports growers electronically store and make use of all farm data collected historically and through the project
- Project focus is on supporting and educating growers on the interpretation of this data using the LandHub platform
- Deliver 30 projects over 4,000ha
- New data captured for growers includes:
  - ✓ EM mapping
  - ✓ Drone based imagery for accurate paddock boundaries and crop health information
  - ✓ Ground truthing through geo-located additional soil testing
  - ✓ WQ monitoring data
- Projects growers get an optimal 6ES NMP and training in using LandHub and the grower App

landhub
FARMING KNOWLEDGE

Mackay Whitsunday Water Quality Program

MWWQ LF01 Project LAND - A Local Area Nutrient Datahub

Grower LF 31 & FL32

150ha south of Sarina
Soils often waterlogged with sodicity issues

Soil testing cross-referenced with EM mapping and drone crop health and biomass imagery collected and loaded into LandHub

- ✓ Adapted surface dunder to subsurface and incorporated application of liquid gypsum
- ✓ Looking to incorporate GPS rate control for zonal management

- ✓ Projected WQ savings: 211kg/DIN

landhub FARMING KNOWLEDGE

Major Grants Project

- Up to 50% contribution towards eligible activities

- Split : 68% Pesticides

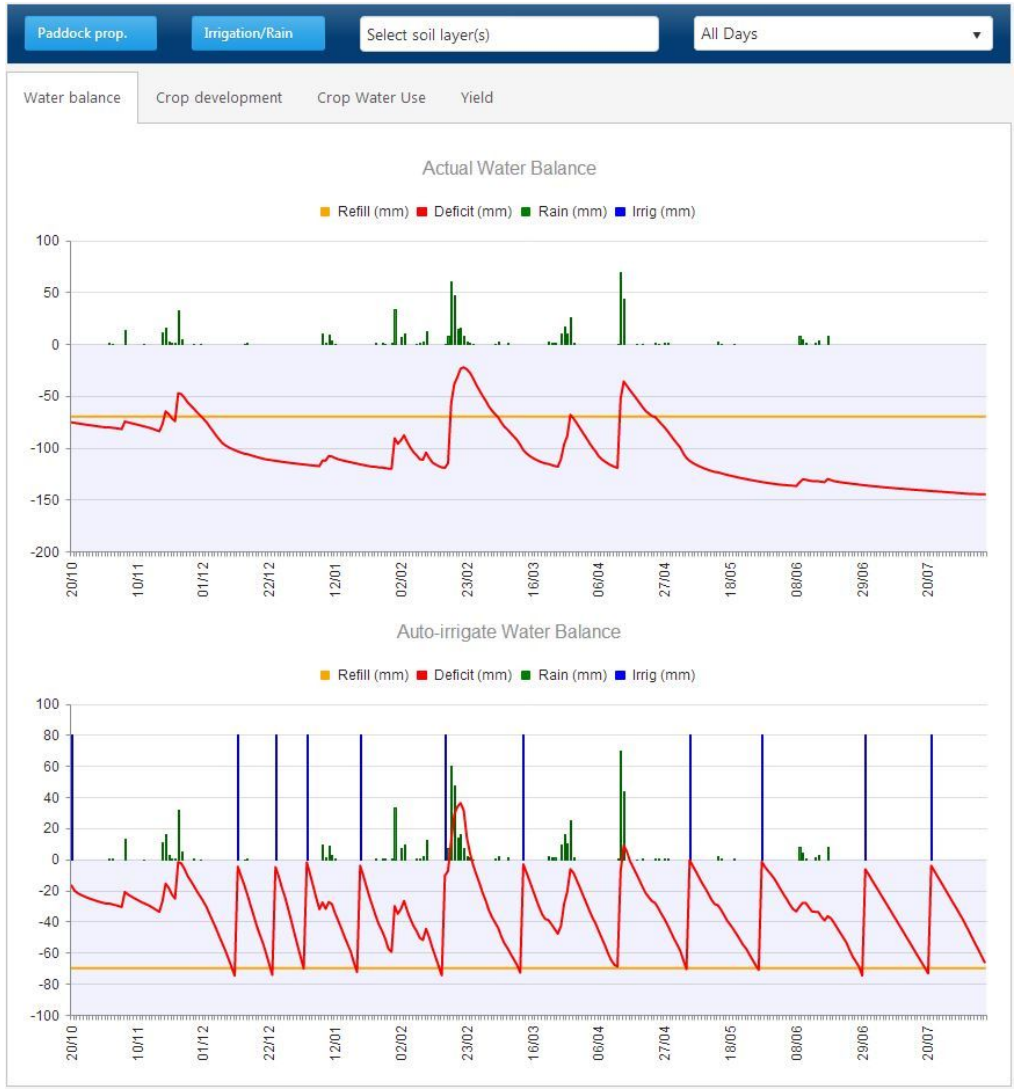
  32% DIN

- $2,733,613 grower contribution
- Total number of grants to date - 79

- High-rise spray rigs / legume planters/ GPS rate controllers / Spray boom modifications / yield monitor

CANEGROWERS - Mackay Irrigation Project

- Working with growers to optimise energy consumption and water use efficiency
- Irrigation scheduling informed by real-time data from soil moisture probes and crop growth modelling platforms
- Reduce N surplus through productivity improvement via improved irrigation
- Deliver 27 projects over 4,500ha



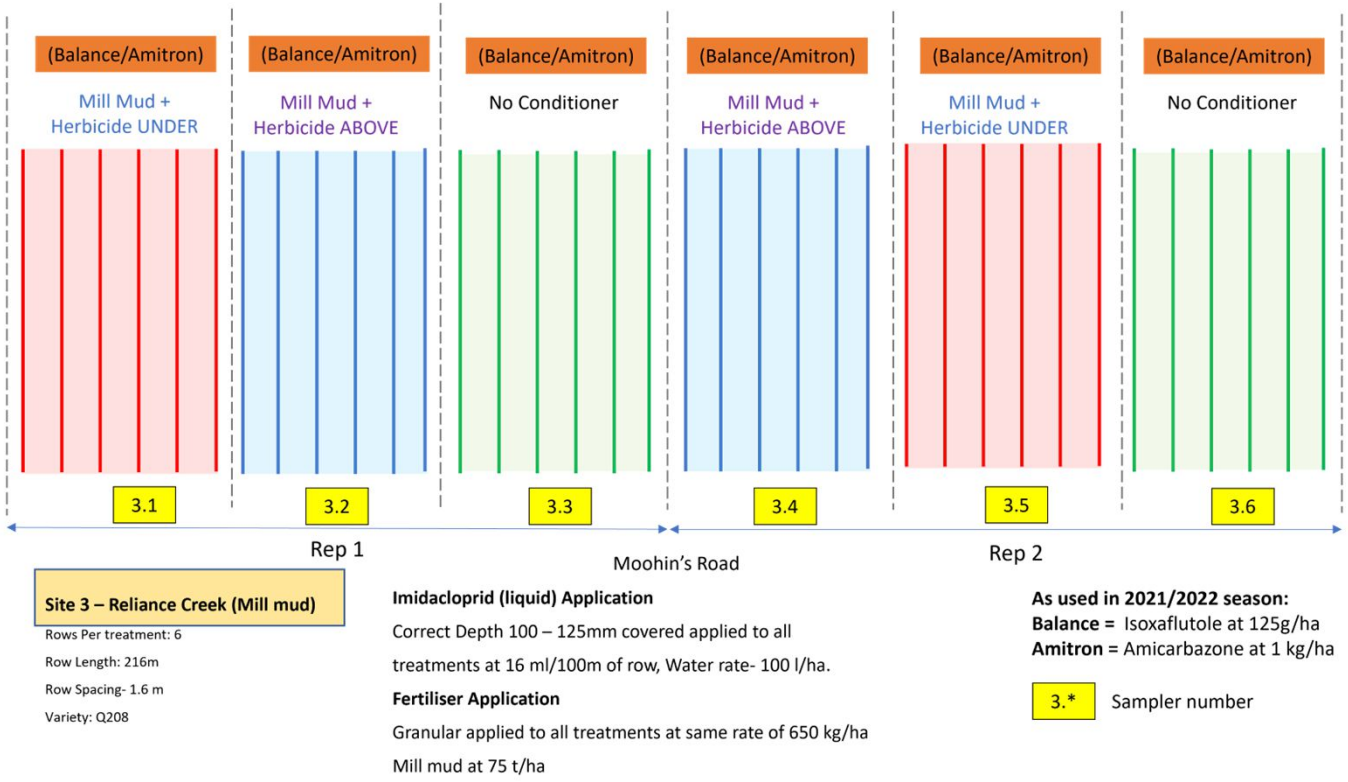
- ✓ On farm irrigation system audit
- ✓ 36 soil moisture probes installed
- ✓ Soil cores and characterisations
- ✓ Irrigation system grants
- ✓ Integrated data platforms

CANEGROWERS Mackay Irrigation Project

Project ID	NUE Calculations (kgN/Tc)				Yields				
	Hectares Cane	N Applied	NUE 2021	NUE 2022	10 Year Average	2021 t/ha	2022 t/ha	Difference t/ha 21/22	Increase from 10 Year average t/ha
1	37	150	1.50	1.35	94	103	112	9.28	18.08
2	94	128.69	1.38	1.20	95	96	105	9.30	10.30
3	65	150	1.63	1.47	73	93	103	10.05	29.87
4	121	146.74	1.54	1.38	92	97	108	11.21	16.00
5	161	125.12	1.30	1.17	88	99	111	11.90	22.90
6	45	148.9	1.44	1.34	77	98	111	12.80	33.80
7	178	145.50	1.62	1.43	77	89	103	13.50	25.60
8	113	149.7	1.45	1.27	88	100	115	15.10	27.10
9	64	145.37	1.70	1.42	83	86	103	16.70	20.10
10	42	105.31	1.23	1.03	81	89	107	18.37	26.04
11	175	150	1.83	1.37	92	82	110	28.20	18.20
Totals/ Averages	**1,095**	**141.36**	**1.54**	**1.32**	**94,382**	**101,685**	**118,289**	**16,604**	**23,906.79**
Average t/ha Increase					**86**	**93**	**108**	**14**	**22.5**

Sugar Research Australia - Cane to Creek

- Aims to bring WQ science direct to growers
- Compare and communicate the water quality runoff of different farming practices through demonstrations
- Report on cane yield for practices trialled
- 3 replicated demonstration / trial sites established
- In-field assessments of liquid imidacloprid applicators
- Using CSIRO ADOPT Tool to estimate the adoption of practices and results from trials to determine WQ improvement



SRA - Cane to Creek Results and conclusions from years 1 and 2:

Data supports established industry knowledge:

- ✓ Importance of correct depth placement (100-125 mm) of liquid imidacloprid in ratoons to minimize run-off losses.
- ✓ Most surface herbicide losses occur in the first flush run-off event.
  - Aim to apply herbicides away from high rainfall events.
  - In periods of storms/heavy rains, consider herbicides with less mobile actives
  - Herbicides are highly vulnerable to run-off in the first 48 hrs following application
- ✓ Similar DIN run-off results for surface applied liquid dunder and sub-surface applied granular fertiliser.

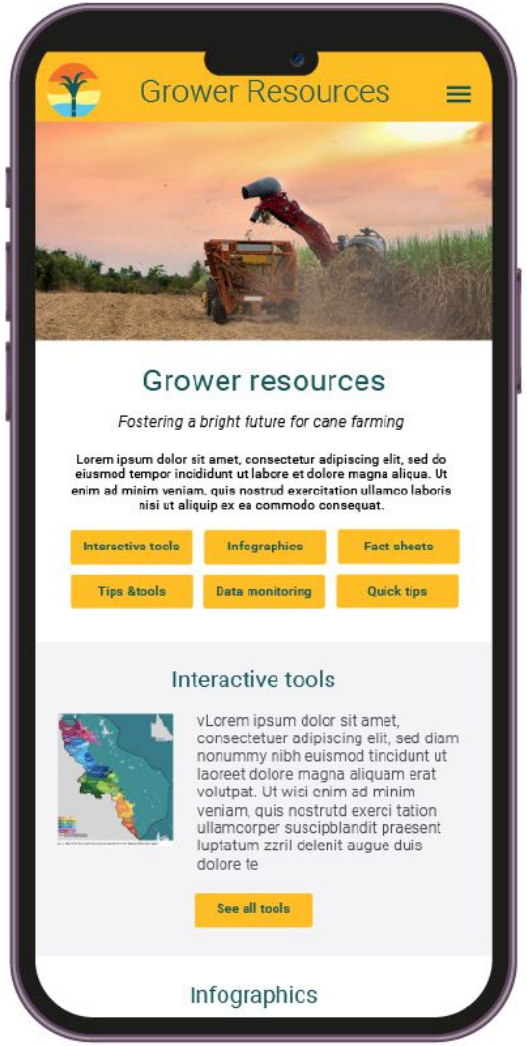
New information to build industry knowledge and understanding:

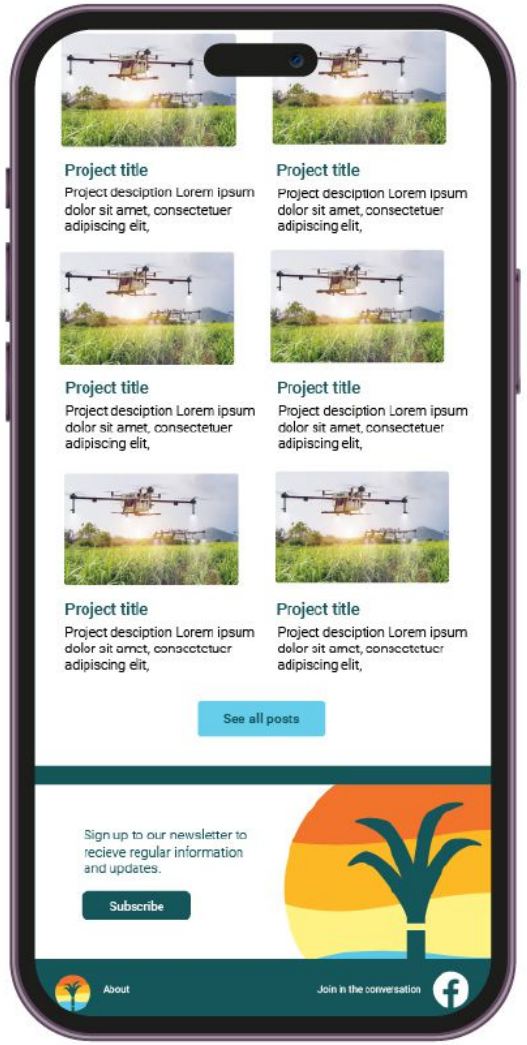
- ➢ Similar DIN and imidacloprid run-off results for sub-surface applied LiquaForce and sub-surface applied granular fertiliser.
- ➢ Similar DIN, imidacloprid and residual herbicide run-off results for aerator inter-rows and non-treated inter-rows.
- ➢ Increase in herbicide run-off in presence of banded mill mud in ratoons. Unexpected result.
- ➢ Liquid imidacloprid applied in ratoons, in some paddocks high run-off of imidacloprid observed.

Mackay Whitsunday Practice Chane Strategy

CANERISE

- Development of a grower portal to support growers and encourage engagement
- Specific to the Mackay Whitsunday region
- On-line by EoFY
- Highlights:
    - Funding opportunities
    - Grower Resources
    - Events
    - Innovation





Thank You

For more information on the MWWQP please visit:

- The Great Barrier Reef Foundation
- Reef Catchments
- Delivery Provider websites

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