

Healthy Country

managing the land for healthy waterways

Sustainable pineapple production

FarmFLOW
growth through good practice

Controlled release fertiliser

Precision nutrient management in crops like cane, strawberry and ginger has improved yields, reduced inputs and increased profits. Can this be achieved in pineapple crops?

Controlled release fertilisers (CRF) can increase nitrogen availability over a longer period while also reducing leaching. Farm trials undertaken throughout 2007-08 compared two standard granular fertilisers (SGFs) against three controlled release fertilisers (CRFs).

What did we want to find out?

- Which fertiliser type (SGF or CRF) is best suited to the sandy loams common in the Pumicestone Catchment?
- How long did nitrogen remain available to the crop for both types of fertiliser?
- How did nitrogen levels differ in and beyond the root zone over the 12 week post-planting period?



Two sizes of Mottes tubes were used to collect soil-water solution.

Trial set up

Three CRFs were compared against the farm's standard choice over 12 weeks. Mottes® soil solution tubes collected soil-water solutions at 150 mm and 400 mm depths; measuring nitrate, nitrite (NO_x), ammonia (NH₃) and total nitrogen (TN) levels.

What did we find?

As this trial was for demonstration purposes only, the findings are indicative and not a result of rigorous trial design. However some interesting trends were identified.

- CRF2, CRF3 were the most consistent performers. Both had consistently high NO_x availability over the 12 weeks at both depths, ensuring that TN levels remained high over the trial period. It also indicates that both are delivering NO_x levels over the industry recommended requirement of 120 ppm (mg/L is equal to ppm).
- All CRFs were still delivering TN or NO_x at industry recommended levels (120ppm) after 12 weeks.
- Slowing the ammonia to nitrate process was most consistent for CRF1. CRF1 shows a trend of depleting NH₃ and an increasing or consistent NO_x levels at both depths.
- While SGF1 delivered consistent nitrogen over the 12 weeks, the levels remained under the recommended requirement.
- SGF2 degraded very quickly with levels heavily reduced by week 12.

Healthy Country partners:



Controlled fertiliser trial results...

Table 1 – Soil nitrogen availability

Type \$/t	N kg/t applied	week	mg/L at 150 mm			mg/L at 400 mm		
			NH ₃	NOx	TN	NH ₃	NOx	TN
SGF1 \$970	180	3	35.6	0.5	35.7	29.3	1.9	30.1
		6	31.4	4.2	36.5	20.5	2.2	23.1
		9	22.5	45.8	65.4	18.3	19.9	38.6
		12	8.9	97.8	104.6	4.9	69.3	74.1
SGF2 \$780	156	3	51.3	83.2	145.2	619.8	100.9	720.9
		9	7.9	83.4	86	3	60.8	64.5
		12	0.9	18.4	20.9	2.1	19.7	23.8
CRF1 \$980	120	3	14.3	1.8	16.2	126.4	41.0	251.2
		6	15.0	7.2	23.2	187	38.8	226.3
		9	14.7	20.1	37.2	132.3	54.8	189.0
		12	1.8	21.8	23.6	118.1	36.7	154.8
CRF2 \$1200	123	3	63.6	168.0	243.4	1.8	111.4	113.6
		6	19.9	389.0	409.0	0.2	140.3	141.3
		9	0.8	339.0	340.0	0.2	153.0	153.0
		12	0.1	143.5	143.6	0.1	118.4	148.0
CRF3 \$1600	145	3	300.2	250.0	616.1	1.7	48.8	51.5
		6	52.4	466.4	518.4	1.6	73.6	75.6
		9	2.7	243.3	245.2	0.3	84.1	84.1
		12	0.02	122.7	171.1	0.2	113.3	114.4

What does this mean for growers?

While not statistically significant some general observations could be made from the data including:

- Some of the findings do indicate a potential to reduce fertiliser application rates.
- CRFs have nitrogen available at recommended levels after 12 weeks.
- Nitrates have greater potential to leach through the soil profile and beyond the roots of immature plants.
- Some fertiliser types increase the risk of nitrates moving beyond the root zone at industry recommended levels for fertilisers.
- There is a need to evaluate recommended fertiliser programs and incorporate the use of more efficient fertiliser types and methods.

What information is still needed?

- While the results from this trial are an indication it does provide a base that looks towards more precise nutrient use for the pineapple industry.
- Further trials are needed to test current nitrogen rate recommendations during the bed forming and initial growing period.

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