Agronomic consequences of vegetative groundcovers and reduced nitrogen applications on banana production systems

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Outline

INTRODUCTION
> Why change?

INNOVATIONS
> Fertiliser
> Groundcovers

CONSEQUENCES
> Environment
> Plant growth
> Production

THE BOTTOM LINE
Why Change?

- Sediment movement
- Nutrient movement
- Soil borne diseases

90% of Australian Banana Production $600 mil

Great Barrier Reef

Rainforest

Mareeba

Atherton

Cairns

Gordonvale

Fitzroy Island

High Island

Innisfail

Tully

Dunk Island

Sediment movement

Nutrient movement

Soil borne diseases
Innovations – Fertiliser application

1. Best Practice - 180 kg N/ha / crop cycle
2. Best Practice - 180 kg kg N Entec/ha / crop cycle
3. Farm practice - 350 kg N/ha / crop cycle
Innovations

- Planting Nov 2014
- Environmental monitoring Feb 2015
- Vegetative growth measurement
- Plant crop Harvest Aug-Oct 2015
- 1st Ratoon Harvest Apr-Jul 2016
Environment

Warmer soil temperatures under vegetated groundcover

Higher EC in bare soil

More consistent soil moisture under vegetated groundcover
Slower vegetative growth with reduced nitrogen, which is exaggerated with increasing time.

Slower vegetative growth with vegetated groundcover, which is exaggerated with increasing time.
Delayed, variable bunch emergence with reduced nitrogen, which is exaggerated with increasing time.

Slightly delayed bunch emergence with vegetated groundcover, which is exaggerated with increasing time.
Reduced bunch weight with nitrification inhibitor in the plant crop, no significant difference in 1st ratoon crop

Reduced nitrogen use efficiency with higher nitrogen application
All treatments reduced production

Reduced N application saves $200/ha/yr

All treatments were less profitable than the standard grower practice, by more than $10,000/ha/yr in the first ratoon crop.
Conclusion

> There was greater environmental stability under vegetative groundcover.

> There was reduced vegetative growth and slower crop cycling with reduced N and vegetative groundcovers.

> There was no differences in bunch weight in the first ratoon crop.

> No treatment was as profitable as the standard grower practice 350 kg N/ha/crop cycle on bare soil.

> Better decision management tools and models

> Benefits other than short-term profit and production need to be demonstrated.