Key characteristics of improved management practices
A sugarcane grower's perspective

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Synopsis

The impact of cane farming across North Queensland is of significant downstream concern due to the proximity of farm land to the Great Barrier Reef (GBR). A key mechanism to improve water quality entering the GBR catchment area is the adoption of agricultural improved management practices. Management practice adoption is a complex decision-making process. Accordingly, a survey of North Queensland cane growers was conducted to investigate factors influencing adoption decisions.

The management practices with the highest adoption rates were: varying herbicide rates between blocks (95 per cent); directed herbicide application (93 per cent); and, variable nutrient rates between blocks (91 per cent). These practices were perceived as being compatible with the existing farming system and easy to trial, while requiring only a limited amount of new skills and a low capital investment. Furthermore, these practices were perceived by growers to have a positive impact on profitability.

The management practices with the lowest adoption rates were: variable nutrient rates within blocks (7 per cent); knockdowns and strategic residual use (23 per cent); and electronic records (36 per cent). These practices were perceived to require a high capital investment and a large amount of new skills. These practices were also perceived by growers to have a negative impact on farm profitability.

Research design

An in-person survey was completed by 61 North Queensland cane growers. Table 1 lists the number of growers who completed surveys from each cane growing area.

Area	Ayr	Ingham	Tully	TOTAL
Growers Surveyed	30	26	5	61

Table 1: Location of Growers Surveyed

Table 2 lists the management practices examined in the survey. For each management practice growers were asked:

1. If they had adopted the practice
2. How they perceived adopting the practice would affect their production costs, the production of sugar, enterprise profitability, and the variability within production.
3. To comment about key characteristics of the practice including whether they believed adoption required high capital investment or contractors to perform the practice, whether the practice is compatible and may be trialled within the existing farming system, and whether new skills and information were required.

Management Practices
Variable nutrient rates within blocks (based on EC mapping, yield mapping and soil tests)
Variable nutrient rates between blocks (based on Six-Easy-Steps principles)
Cover legume crop
Low tillage (e.g. zonal tillage)
Knockdowns and strategic residual use (only where needed; excluding Diuron, Atrazine, Hexazinone and Ametryn).
Herbicide rate varies between blocks with consideration of weed type and pressure
Use of precision and directed herbicide application equipment with appropriate nozzles (e.g. Two Tanks, Electronic Rate Controller, banded spraying and Air Inducted nozzles).
Use of directed herbicide application equipment and appropriate nozzles (e.g. Air Inducted Nozzles).
Electronic records (nutrients and herbicides)
Nutrient and weed management plans developed by an agronomist.

Table 2: Management Practices Surveyed

For each management practice the rate of adoption was identified. Grower perceptions were collated and contrasted with management practice adoption rates to demonstrate how perceptions are likely to influence the adoption decision.

Barriers to adoption

Figure 1 maps the average response from growers to each survey question. The average response from all growers has been colour-coded to represent grower's perceptions towards each improved management practice.

For example, characteristics or economic impacts that are expected to discourage adoption are colour-coded in red. Alternatively, the characteristics of a practice that are expected to encourage its adoption are colour-coded in green. The reported adoption rate for each practice is also displayed in the right-hand column.

	Production costs	Sugar Production	Profitability	Production Variability	Capital investment needed	Contractors needed	Compatibility	Trialability	New Skills	Adoption Rate
Knockdowns & Strategic Residual Use			*							23%
Vary Herbicide Rate Between Blocks									*	95%
Precision & Directed Herbicide Application								*		48%
Directed Herbicide Application									*	93%
Electronic Records					*			*		36%
Nutrient & Weed Management Plans	*					*				54%
Cover Legume Crop					*	*			*	68%
Low Tillage						*			*	75%
Variable Nutrient Rates Within Blocks	*						*			7%
Variable Nutrient Rates Between Blocks									*	91%

* Perceptions were divided

Constraint to adoption ⟵ No impact ⟶ Encourages adoption

Figure 1: Barriers to management practice adoption

More information

Thompson, M., Collier, A., Poggio, M., Smith, M., & van Grieken, M. (2014). Adoption Innovation Profile Report. Department of Agriculture and Fisheries (DAF), Queensland.

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