Smartcane BMP Registration

Business Information

Business Name:	
Contact Name:	
Phone:	
Email:	
Address:	
Locality / Town / City:	
Post Code:	
State	

Farm Information

Farm 1 Name:	
Farm 1 Lot Plans:	
Farm 2 Name:	
Farm 2 Lot Plans:	
Farm 3 Name:	
Farm 3 Lot Plans:	
Farm 4 Name:	
Farm 4 Lot Plans:	
Others:	

Module 1. Soil Health and Nutrient Management

The good dirt on productivity: Soil Health and Nutrient Management

Providing adequate nutrients, especially N, P and K, has long been the focus of soil management for sugar cane growers.

However, soil and nutrient management has changed significantly in the past 20 years, greatly improving the efficiency of crop production. Recommendations for optimal N rates have become more accurate and specific, there is greater attention to ensuring all plant nutrients are in adequate supply, trash retention has reduced erosion, controlled traffic farming and/or reduced tillage have improved soil structure and reduced costs, and well-managed legume fallows help break pest and disease cycles while reducing fertiliser costs and improving soil health.

These practices aim to reduce soil constraints to crop production, be they physical like compaction or chemical like sodicity, and therefore greatly improve the effectiveness of applied fertilisers. This, in turn, can improve the bottom line of the business.

It is these practices, and others, that are the subject of the Soil Health and Nutrient Management module of the Smartcane BMP program.

The topics covered in the module include:

- Improving soil health:
  - Managing compaction
  - Trash management
  - Fallow management
  - Preparing land for planting
  - Tillage management in crop
  - Managing salinity, pH and sodicity
- Optimising nutrient management:
  - Soil testing of samples from all fallow blocks
  - Use of the Six Easy Steps to estimate and refine fertiliser requirements
  - Calibration of application equipment
  - Placement and timing of fertiliser application

As with all of the BMP modules, the first step is to benchmark, through self-assessment, your own practices against those considered to be industry standard. There are only 12 topics, and corresponding sets of practices, in this module. For example, the industry standard for fallow management is:

Soil cover is maintained throughput the wet season either through the use of a trash blanket and sprayed out cane or through the growth of a fallow crop. No living cane is present during the fallow to help break pest and disease cycles.

You simply indicate if you meet the best practice standard and, if not, what actions you need to take to meet the standard. There may be variations to a practice that reflect the conditions in your district or farm. For example, burning of cane is common in the Burdekin due to the production system, so trash cover is not present and ley crops are their main option for maintaining cover.

Once the self-assessment is completed for this module and for the other two core modules (Irrigation and drainage; Weeds, pests and diseases), and your practices are at industry standard or better, you can seek BMP accreditation. This requires evidence for each topic in a module to be available for independent assessment. For the example of fallow management, the evidence required is:

Farm observation of the soil cover and a spray record where appropriate.

In this case, the evidence is a declaration by your local BMP facilitator that he/she has seen your fallow blocks and the type of soil cover (part of the 'farm observations'), plus a spray record where cane regrowth has required chemical control. Much of the evidence required in each of the BMP modules is provided via the farm observations made during the on-farm accreditation audit.

If you have not yet participated in the BMP program, your local facilitator will help you register and take you through a self-assessment and will even enter the information onto the BMP database. If you have completed self-assessment in the 3 core modules, your local facilitator will help you identify any gaps in the required records and other documentation. He/she will also assist with gathering items like farm maps and will provide easy-to-use templates for any additional records you need to keep over the coming season.

Once you have gathered the evidence, the local facilitator does a check that all necessary evidence is in place (a pre-audit).

Required evidence for the Soil Heath and Nutrient Management module

The documentation required for at least one year of crop production includes:

- Soil test results
- Nutrient recommendations
- Fertiliser application records
- Ameliorant application records
- Harvest dates

Module 1. Soil Health and Nutrient Management

Standards

1.1.1 Managing compaction

Practices:

○	Below Industry Standard	Row spacing is not matched to wheel spacing and/or Machinery is operated in wet field conditions.
○	Industry Standard	Row spacing and most machinery wheel spacings are matched. Rows initially established using either GPS guidance or an appropriate marking out strategy. Where possible, machinery operations are delayed to avoid operating in wet field conditions.
○	Above Industry Standard	Row spacing and all machinery wheel spacings are matched, GPS guidance is used for all field operations: bed forming, planting, spraying and harvesting. Machinery is not operated in wet field conditions.

1.1.2 What is your current row spacing?

○	Less than 1.6m
○	1.6m – 1.79m
○	1.8m – 2.0m
○	More than 2.0m

1.2.1 Trash management

Practices:

	Below Industry Standard	○ Green cane trash blanket is not retained on suitable soils, e.g. cane is burnt prior to harvest Or ○ Green cane trash blanket is burnt or incorporated or baled after harvest
○	Industry Standard	Green cane trash blanket is retained on suitable soils. In cold environments trash is raked from the stool and maintained in the interspace or cane is burnt prior to harvest. Where a water logging risk exists, cane is burnt prior to harvest.
○	Above Industry Standard	Green cane trash blanket is retained throughout the crop cycle and after the final ratoon as fallow cover.

1.3.1 Fallow management

Practices:

○	Below Industry Standard	Fully cultivated bare fallow over the wet season where weed growth is controlled by a series of cultivations, or no fallow period is used as plough-out replant is practiced.
	Industry Standard	○ Soil cover is maintained throughout the wet season through a trash blanket and sprayed out cane. No living cane is present during the fallow period to break pest and disease cycles. Any weeds are sprayed before they seed. Or ○ Soil cover is maintained throughout the wet season through the growth of a fallow crop like legumes. No living cane is present during the fallow period to break pest and disease cycles. Any weeds are sprayed before they seed.
○	Above Industry Standard	Well managed rotational crops are grown on all fallow land to break weed and pest cycles. Residues from rotational crops are maintained on the soil surface and not incorporated between crop cycles.

1.3.2 How is the soil cultivated prior to planting the fallow crop

○	Full Cultivation
○	Zonal-tillage
○	Zero till

1.4.1 Preparing land for planting

Practices:

○	Below Industry Standard	Plant cane is established using excessive cultivation with soil cultivated to a fine tilth through multiple machinery operations.
	Industry Standard	○ Plant cane is established after a fallow using zonal tillage appropriate to soil and conditions, to reduce impacts on soil structure. Or ○ Plant cane is established after a fallow using a reduced number of passes appropriate to soil and conditions (typically less than 6 passes), to reduce impacts on soil structure.
	Above Industry Standard	○ Plant cane is established after a fallow using zonal tillage with a minimum number of passes appropriate to soil and conditions (typically 1 – 3 passes), to minimise impacts on soil structure. Or ○ Plant cane is established after a fallow using minimum tillage into preformed beds on a controlled traffic configuration

1.5.1 Tillage management in-crop

Practices:

○	Below Industry Standard	Multiple tillage events in both plant and/or ratoon crops are conducted.
○	Industry Standard	Tillage in plant cane is kept to the minimum necessary to establish row profiles and irrigation furrows and to apply fertiliser and pesticides. For GCTB, no tillage in ratoons other than for fertiliser and pesticide applications.
○	Above Industry Standard	Permanent beds with only strategic cultivation as required. Cultivation in plant and ratoon crops limited to coulter-applied fertilisers and pesticides.

1.6.1 Managing salinity and sodicity

Practices:

○	Below Industry Standard	The presence / risk of salinity and sodicity is unknown, or no specific management of a known salinity and sodicity risk is practiced.
○	Industry Standard	The presence / risk of salinity and sodicity is determined and monitored through soil tests and on-farm management practices including application of soil ameliorants. Current knowledge regarding local shallow groundwater conditions is used to manage salinity. The quality of irrigation water and its effect on the presence / risk of salinity and sodicity is considered and managed. Measures are taken to reduce the source of salinity in line with any relevant regulations.
○	Above Industry Standard	Where the presence / risk of salinity or sodicity has been identified, regular monitoring of root zone soil and groundwater conditions is conducted.

1.7.1 Soil Sampling and Analysis

Practices:

○	Below Industry Standard	No regular soil sampling program prior to planting.
○	Industry Standard	Soil samples that meet industry and legislative requirements are collected from blocks to be planted and sent for analysis. Records are kept to help refine nutritional programs.
○	Above Industry Standard	Soil types are mapped and management zones developed and soil samples are collected for each management zone. Location sample sites are recorded to identify trends in fertility.

1.8.1 Calculating optimum nutrient rate

Practices:

○	Below Industry Standard	Nutrient application rates do not match the recommendations derived from soil tests and the Six Easy Steps methodology as described under the industry standard
○	Industry Standard	Nutrient and ameliorant recommendations for each plant crop and its subsequent ratoons are derived from soil tests and the Six Easy Steps methodology. For N, recommendations are based on district yield potential with adjustments according to the soil N mineralisation index (based on organic carbon percentage). Deductions are made for other significant sources of N including irrigation water, mill mud and legumes. Fertiliser and ameliorant applications (e.g. lime for managing soil pH) to plant and ratoon blocks follow these recommendations.
	Above Industry Standard	○ Six Easy Steps Nutrient Management program is employed, which includes developing a whole farm nutrient management plan to ensure the amounts of N and other nutrients applied are optimal for crops on each major soil type Or ○ Six Easy Steps Nutrient Management program is employed, which includes yield monitoring and use of the results from leaf testing and fertiliser strip trials, to ensure the amounts of N and other nutrients applied are optimal for crops on each major soil type or management zone.

1.8.2 Fertiliser Application Rates

What is the rate of nitrogen (kilograms N/hectare) that you generally apply under normal conditions to

Fallow plant following spray out or cultivated fallow	kg/ha
Fallow plant following a good legume crop	kg/ha
Ploughout/replant	kg/ha
Ratoon crops	kg/ha
Late cut/lower yield potential ratoon cane	kg/ha

1.8.3 Cane yield estimates

What cane yield (tonnes/hectare) do you expect to produce under normal conditions

plant Cane	t/ha
ratoon Cane	t/ha
Late ratoon	t/ha
Old ratoon cane (e.g. 5th ratoon)	t/ha

1.8.4 Mill Mud Use

a. what percentage of your farm do you apply mill mud/ash each year

◯	Do not apply mill mud or ash
◯	Less than 10%
◯	10-50%
◯	50-75%
◯	75-100%

b. At what rate do you apply mill mud or ash

◯	banded less than 100 wet tonnes per hectare
◯	broadcast less than 100 wet tonnes per hectare
◯	broadcast between 100-150 wet tonnes per hectare
◯	broadcast more than 150 wet tonnes per hectare

1.9.1 Placement of fertiliser

Practices:

	Below Industry Standard	○ Fertiliser is broadcast. Mill mud is applied broadcast in ratoons, or in the interspace. Or ○ Fertiliser is applied banded on the surface. Mill mud is applied broadcast in ratoons, or in the furrow Or ○ Liquid fertiliser is applied banded on the surface. Mill mud is applied broadcast in ratoons, or in the furrow
	Industry Standard	○ Granular fertilisers are applied subsurface in the drill (i.e. stool split or side banded). Mill by-products are applied on the row, not in the interspace. Or ○ On steep slopes only (i.e. Innisfail on Red Ferrosol soils), fertiliser is applied banded on the surface. Applied when crop root system has developed. Mill by-products are applied on the row, not in the interspace. Or ○ Surface-banded applied fertiliser products are incorporated by overhead irrigation as soon as possible or within 7 days. Mill by-products are applied on the row, not in the interspace. Or ○ Liquid fertiliser products are applied subsurface, or on the surface only under pressure. Mill by-products are applied on the row, not in the interspace.

1.9.2 Timing of fertiliser application

Practices:

○	Below Industry Standard	☐ Fertiliser is applied soon after harvest before the new root system has developed. And / Or ☐ All fertiliser for the plant crop is applied in one application.
○	Industry Standard	Fertiliser is applied to actively growing ratoons with moist soils, where practical. For late cut cane, fertiliser is applied when practical taking weather into consideration. Fertiliser is never applied when runoff from storms is expected before the nutrients can penetrate to the root zone. Fertiliser for the plant crop is applied in split applications. After fertilisation of irrigated crops, watering does not occur for at least 2 days.

1.10.1 Calibration of application equipment

Practices:

○	Below Industry Standard	Equipment is calibrated annually or less.
○	Industry Standard	Application equipment is calibrated prior to the season and at each product and batch change. Contractors applying fertiliser also conform to this practice.
○	Above Industry Standard	Use of correctly calibrated automatic controllers and variable rate application equipment.

1.11.1 Record keeping

Practices:

○	Below Industry Standard	No records kept of nutrient management.
○	Industry Standard	Records are kept of soil tests, application rates, products, placement, and person making the record. Records are used to review and modify future nutrient management.
○	Above Industry Standard	Records are kept in digital form linked by GPS for operations and used to monitor and modify future nutrient management.