



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 2. Irrigation and Drainage Management

Water sense - Irrigation and drainage management

Irrigation management

Irrigation is vital for crop production in many areas. For the Mareeba and Burdekin areas, crops could not be grown successfully without irrigation and, apart from the Wet Tropics, all other regions rely to some extent on supplementary irrigation to boost crop growth.

Best practice irrigation management aims to apply sufficient water for crop growth while minimising the amount of excess water that is lost as either run-off or deep drainage. Irrigation water is the conduit for the movement of pesticides, nutrients and sediments off farm. A well designed and managed system that minimises deep drainage and run-off, while capturing and reusing unavoidable run-off, will substantially reduce potential losses.

Irrigation requirements and practices vary by farm and region depending on local climate, water availability and the application method used.

The irrigation topics covered in this module include:

- Calculating how much water to apply
- Calculating how much water to apply
- Calculating how often to apply
- Seasonal allocation
- Reducing run-off and deep drainage
- Water quality

Required evidence

The evidence required depends on the amount of water applied in a typical year. For growers applying greater than 4ML/ha/year, more detail is required on irrigation scheduling and on the design and efficiency of the system.

Records required may include:

- Soil map showing water holding capacity of different soils
- Information used to schedule irrigation
- Records of irrigation
- Water quality test results

Drainage management

While moisture stress can be a major factor limiting sugarcane production in many districts, the opposite situation, waterlogging – usually caused by poor drainage – can also have a significant impact on production in most districts.

Drainage problems commonly occur where natural drainage is inadequate for prevention of waterlogging, where clearing of natural vegetation or irrigation has raised watertables, or where farming operations have interfered with natural drainage pathways.

Such situations arise in all cane growing areas, but drainage problems are more acute in the high-rainfall districts on flood plains. Successful sugar production in these situations requires improvement of natural drainage to promote better disposal of both surface runoff water and subsurface drainage water.

The drainage topics included in the module include:

- Appropriate design and performance of surface drainage
- Where appropriate, installation of an effective sub-surface drainage system.
- Erosion management

Required evidence

All farms, irrigated or not, require the following:

- Surface drainage plan
- Where appropriate, a sub-surface drainage plan
- Farm inspection of drainage works, grass cover on headlands and drains, and fallow cover.

Completing the module

As with all of the BMP modules, the first step is to benchmark, through self-assessment, your own practices against those considered by industry to be best practice. There are only eight issues, and corresponding sets of practices, in this module. For example, the best practice standard for Calculating how often to apply water is:

Simple monitoring tools are used to decide the frequency of irrigation, OR Data from district-based sites that monitor soil moisture for corresponding crop stages are used with crop observations and rainfall records to determine the frequency of irrigation. Short-term weather forecasting is taken into consideration.

You simply indicate if you meet the best practice standard and, if not, what actions you need to take to meet the standard.

Once the self-assessment is completed for this module and for the other two core modules (Soil health and Nutrients; Weed, Pest and Disease Management), you can seek BMP accreditation. This requires evidence for each topic in a module to be available for independent assessment.

Module 2. Irrigation and Drainage Management

Standards

2.1.1 Calculating the amount of water to apply

Practices:

	Below Industry Standard	The water holding capacities of the farm soils are not known. The volumes of water being applied are not known.
	Industry Standard	Water holding capacity of farm soils has been determined from soils maps or published data. Irrigation application amounts are known and vary in accordance with estimated crop water use. Tools providing generalised/district wide information are used to calculate the crop water requirement and irrigation is applied accordingly. For supplementary irrigation, irrigation amounts are consistent with soil water holding capacity.
	Above Industry Standard	Water holding capacity of soils has been determined on farm, and irrigation is applied based on crop requirements that have been calculated using tools customised for the farm.

2.1.2 Calculating How Often to Apply Water

Practices:

	Below Industry Standard	Water is applied on a set cycle without regard for crop water use.
	Industry Standard	<p>Simple monitoring tools are used to decide the frequency of irrigation. Short-term weather forecasting is taken into consideration. The tools used are (tick the appropriate ones):</p> <p>Mini pans Evapotranspiration estimates and crop factors Irrigweb or other crop model software</p> <p>Or</p> <p>Data from district-based sites that monitor soil moisture for corresponding crop stages are used with crop observations and rainfall records to determine the frequency of irrigation. Short-term weather forecasting is taken into consideration.</p>
	Above Industry Standard	Water is applied based on infield monitoring of soil moisture (e.g. capacitance probes, tensiometers, or gypsum blocks). Weather and climate forecasting are used when making irrigation decisions.

2.1.3 Seasonal Water Allocation Management

Practices:

	Below Industry Standard	Total crop water requirements are not known. Irrigation water use is unplanned.
	Industry Standard	Seasonal water allocation is known and a water use strategy developed based on historical rainfall data and seasonal climate forecasts. Water use is monitored throughout the season.
	Above Industry Standard	Seasonal water allocation is known and a water use strategy developed based on historical rainfall data and seasonal climate forecasts. Tools/calculators are used together with seasonal climate forecasts to chart water use and predict deficit/surplus.

2.1.4 How much water do you use on your farm each year (megalitres/hectare)?

_____ ML/ha

2.2.1 Run-off and Deep Drainage Management

Practices:

Below Industry Standard	Management of irrigation run-off or deep drainage through matching application volumes to soil water deficit is not practised.
Industry Standard	Irrigation is managed to minimise run-off and deep drainage by matching application volumes to soil water deficit.
Above Industry Standard	Irrigation is managed to minimise run-off and deep drainage by matching application volumes to soil water deficit. Run-off is captured in tail water systems and recycled on farm.

2.2.2 Which best describes irrigation runoff in your situation?

No irrigation run-off
Limited run-off on occasions
Most irrigated blocks have some run-off
Irrigation water lost from all blocks each irrigation

2.2.3 Irrigation runoff is captured?

No runoff is captured
Runoff from part of the irrigated area is captured
Runoff is captured from all the irrigated area

2.2.4 Recycle Pits

Practices:

	Below Industry Standard	<p>Capacity of pit/s are too small and cannot capture all irrigation run-off;</p> <p>Or</p> <p>Capacity of pit/s are sufficient but the pumping capacity is too low;</p> <p>Or</p> <p>Pit/s have been poorly sited and leak, or access the groundwater table.</p>
	Industry Standard	<p>Pit/s have been designed to capture all irrigation run-off and some rainfall run-off; and pumping capacity is sufficient to re-use the water quickly; and the pit/s are well-sited and do not leak or access the groundwater table. Water is pumped in a timely manner to capture any irrigation run-off.</p>
	Above Industry Standard	<p>Pit/s have been designed and located to capture all irrigation run-off and significant rainfall run-off. The pit/s are managed such that there is sufficient free storage to capture most storm events.</p>

2.3.1 Irrigation Water Quality Testing

Practices:

	Below Industry Standard	<p>Water is not regularly tested for its suitability for irrigation.</p>
	Industry Standard	<p>Irrigation water quality has been tested. Water quality limitations are known and considered in planning seasonal allocation. Regular testing, including for salinity, is undertaken with frequency dependent on water quality and seasonal context.</p>

2.3.2 Using Effluent Water for Irrigation

Practices:

	Below Industry Standard	Recycled water is used without regard to the regulatory requirements regarding its use.
	Industry Standard	The recycled water has been tested for nutrient and salt levels. A management plan that takes into account nutrients supplied by the water and aims to minimise the risk of salinity occurring has been developed. Water is managed as per local scheme requirements and any regulatory requirements. Use of recycled water is appropriately signed and measures have been taken to control access to the water source.
	Above Industry Standard	As above plus an ongoing monitoring program has been put in place. Tail water recycling has been implemented.

2.4.1 System Management – Furrow

Practices:

	Below Industry Standard	Row length and profile are not matched to soil type. Inflow rate is too low or high leading to deep drainage or run-off.
	Industry Standard	Row length and profile are matched to soil type Inflow rate is managed to ensure soakage while minimising deep drainage and run-off losses System is adequately maintained. System is managed to minimise runoff and deep drainage
	Above Industry Standard	At industry standard but with automation. Assessment of system performance is undertaken periodically.

2.4.2 System Management - Overhead high pressure

Practices:

	Below Industry Standard	Tow path spacing is too wide or narrow leading to poor application patterns – dry areas or excessive overlap. Application rate is not matched to soil type. Irrigators are operated regardless of wind conditions. No check is made of the nozzle or application pattern.
	Industry Standard	Tow path spacing is matched to the machine and operating conditions Application rate is matched to soil type. Irrigators are only operated in low wind conditions. Nozzles are checked to ensure they aren't worn and are operating correctly. System is adequately maintained. System is managed to minimise runoff and deep drainage
	Above Industry Standard	System performance is assessed annually, including the uniformity of distribution.

2.4.3 System Management - Overhead low pressure

Practices:

	Below Industry Standard	Application rate is not matched to soil infiltration rate. Sprinklers are never checked.
	Industry Standard	Overhead low pressure Application rate is matched to soil infiltration rate across whole span of boom Sprinklers are regularly checked to see if they are operating correctly System is adequately maintained. System is managed to minimise runoff and deep drainage
	Above Industry Standard	Precision irrigation technologies are used. System performance is assessed annually, including the uniformity of distribution.

2.4.4 System Management – Drip

Practices:

	Below Industry Standard	Emitter spacing and output are not matched to soil type or crop requirement. Filtration system is inadequate and not maintained.
	Industry Standard	Emitter spacing and output are matched to soil type and crop requirement. Filtration system is adequate and maintained. System is adequately maintained. System managed to minimise runoff and deep drainage

2.5.1 Surface Drainage System Design

Practices:

	Below Industry Standard	The farm has no surface drainage system and water pools on farm or, water drains too quickly and causes erosion and downstream flooding.
	Industry Standard	A whole of farm (or area) drainage plan has been developed and maintained; plan is current and drainage lines are maintained. Water is removed from the farm within 72 hours (or as quickly as possible given local conditions) while minimising erosion and downstream flooding.
	Above Industry Standard	As above with a sediment retention basin to filter sediment and chemicals.

2.5.2 Subsurface Drainage System Design

Practices:

	Below Industry Standard	No subsurface drainage has been installed even though high water tables or soakage areas are affecting yield.
	Industry Standard	A drainage system that removes excess water from the root zone has been implemented. Presence of Acid Sulfate Soils is known and legislative requirements are followed. Saline drainage water is disposed of in a manner that does not contaminate waterways.

2.6.1 Erosion management

Practices:

	Below Industry Standard	Headlands and drains are sprayed out or cultivated. No wet season fallow cover.
	Industry Standard	Grass is maintained on headlands and drains. Cover is maintained on fallow ground.
	Above Industry Standard	Grass is maintained on headlands and drains. Cover is maintained on fallow ground. Sediment traps have been constructed and used.

2.7.1 Net water use and water use efficiency (Bonsucro only)

	Below Industry Standard	Net water use and water use efficiency are not monitored, or do not meet the threshold values.
	Industry Standard	Net water use (on all farms), and water use efficiency (on fully irrigated farms), are monitored and meet the threshold values.