



## Development of the ABCD framework for horticulture farm practices

The ABCD framework for horticulture farm practices in the Burdekin-Bowen region was developed through a collaborative process that involved Growcom, Queensland Primary Industries and Fisheries, CSIRO, Bowen District Growers Association, Burdekin grower representatives, and NQ Dry Tropics.

The framework has been designed to provide producers with guidance when establishing best management practices concerning the quality of water leaving farms and entering the Great Barrier Reef. The ABCD framework provides a definition and scale of improvement from 'old' to 'cutting edge' practices. The framework is based on criteria relating to:

- soil management;
- nutrient management;
- pesticide management;
- irrigation and water management;
- planning and recording; and
- machinery.



## The ABCD framework:

- has been developed in consultation with local growers;
- promotes sustainability;
- promotes long-term profitability;
- supports Reef Rescue;
- supports on-farm innovation;
- is supported by the horticultural industry;
- will benefit our region's waterways;
- will optimise nutrient and chemical use; and
- will optimise water use.

For more detailed information on the ABCD framework go to [www.nqdrytropics.com.au](http://www.nqdrytropics.com.au) or contact:

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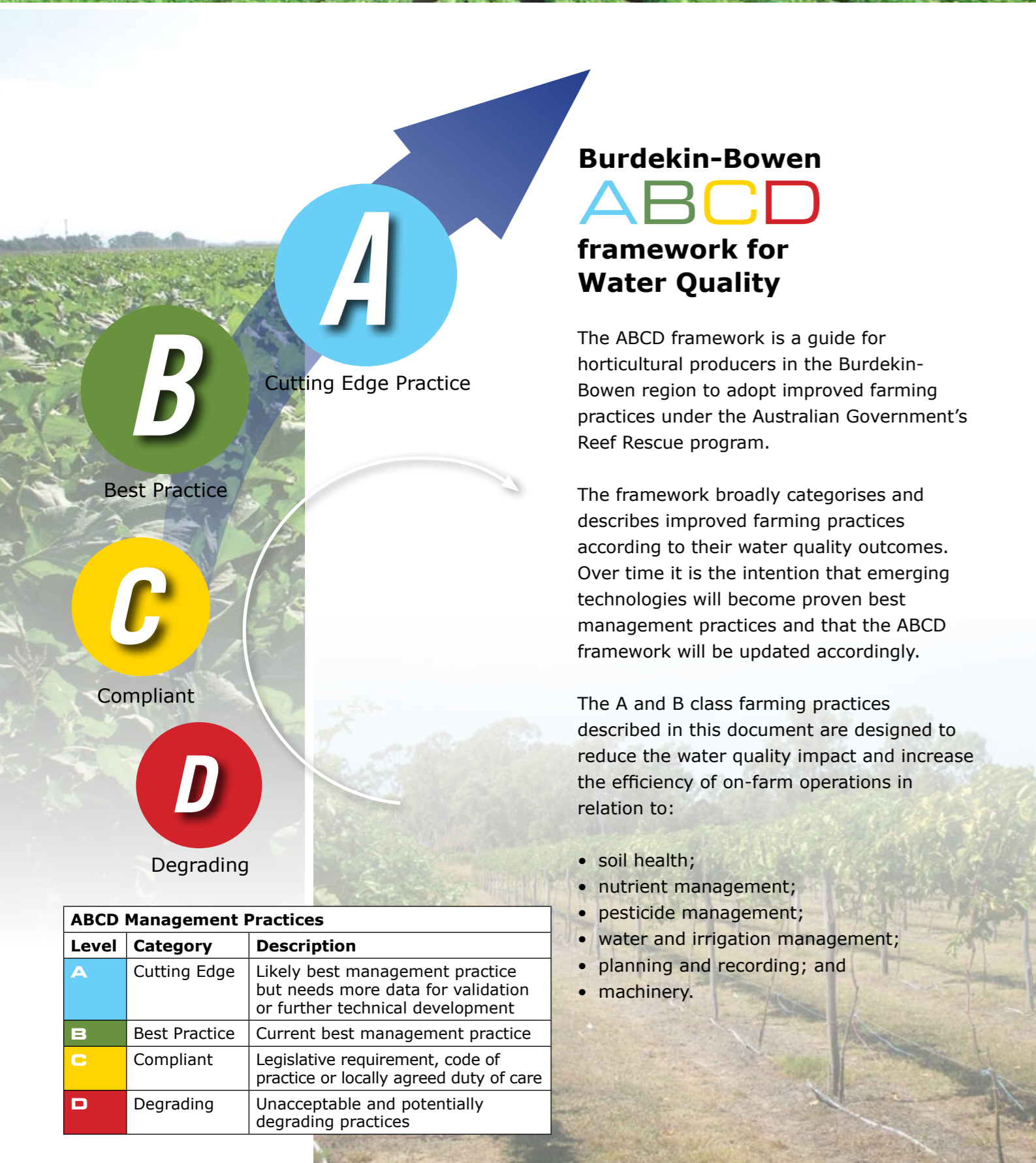
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# REEF RESCUE ABCD FRAMEWORK



CARING FOR OUR COUNTRY





## Burdekin-Bowen ABCD framework for Water Quality

The ABCD framework is a guide for horticultural producers in the Burdekin-Bowen region to adopt improved farming practices under the Australian Government's Reef Rescue program.

The framework broadly categorises and describes improved farming practices according to their water quality outcomes. Over time it is the intention that emerging technologies will become proven best management practices and that the ABCD framework will be updated accordingly.

The A and B class farming practices described in this document are designed to reduce the water quality impact and increase the efficiency of on-farm operations in relation to:

- soil health;
- nutrient management;
- pesticide management;
- water and irrigation management;
- planning and recording; and
- machinery.

ABCD Management Practices		
Level	Category	Description
A	Cutting Edge	Likely best management practice but needs more data for validation or further technical development
B	Best Practice	Current best management practice
C	Compliant	Legislative requirement, code of practice or locally agreed duty of care
D	Degrading	Unacceptable and potentially degrading practices

	D Degrading	C Compliant	B Best Practice	A Cutting Edge
<b>Soil Management</b>				
1.	Trees (mangos, avocados, oranges, lychees, etc.). Cultivated establishment phase. Inter-rows cultivated.	Same as Class D, mulched beds, bare inter-rows.	Mulched bed, inter-rows maintained with as much ground cover as practicable.	Same as Class B, with active management of groundcover e.g., mulching and mowing.
2.	Plantation (bananas, papaws, pineapples, etc.). Cultivated establishment phase for plantation. Inter-rows cultivated.	Same as Class D, mulched beds, bare inter-rows.	Mulched bed, inter-rows maintained with as much ground cover as practicable.	Same as Class B, with active management of groundcover e.g., mulching and mowing.
3.	Annuals (tomatoes, beans, capsicums, corn, melons, pumpkins, eggplants, etc.). Full area cultivation – multiple passes, cultivated bare fallow.	Crop area tillage with three or more passes.	Minimum tillage with less than three passes. Use of multi-task machinery to form beds, lay plastic and drip irrigation.	Permanent beds with minimum tillage, use of control traffic farming (CTF) and GPS guidance for all farming operations.
4.	Fallow Management. Bare soil.	Grass as ground cover.	Maintain as much cover as possible.	Cover crop, CTF and GPS for all farming operations.
5.	Headland Management. Bare access roads and headlands.	Maintained headlands.	Grassed headlands, drains and waterways managed to minimise erosion.	Same as Class B, with dust management on access roads.
<b>Nutrient Management</b>				
1.	Fertiliser Application Rates. One application rate for whole crop with application rate based on historical application rates or rule of thumb.	One or two rates for each commodity specific crop and application rates based on industry recommendations and soil testing.	Variable rates for commodity specific crops between paddocks based on optimum needs for maximum productivity and product quality but with nil off site impacts.	Same as Class B plus, where possible, variable rates within the paddocks.
2.	Application Timing. Calendar-based timing of fertiliser application. Crop development not considered.	Total nutrient requirement spread equally throughout the crop season.	Based on crop growth stage (crop phenology), soil type and weather forecast.	Same as Class B.
3.	Application Method. Broadcast surface applied.	Banded surface, or overhead fertigation.	Mix of incorporated banding and fertigation.	Fertigation depending on soil type, crop phenology and weather conditions.
4.	Accuracy of Application. Fertiliser application systems not calibrated.	Fertiliser application systems rarely calibrated.	Fertiliser application systems calibrated seasonally.	Fertiliser application system calibrated seasonally, and with any changes to equipment.
5.	Planning and Monitoring. No nutrient management planning or monitoring.	Basic planning with nutrient monitoring undertaken rarely or irregularly.	Regular soil tests and leaf analysis to appropriate fertiliser rates and timing.	Same as Class B, using soil test and leaf analysis support (external consultant) to refine matching fertilisers applied to crop requirements, product quality and farm management systems
6.	Fertigation Timing. All fertiliser injected.	All fertiliser injected in the middle of irrigation event for a short time, and smaller amounts per application.	Fertiliser applied during whole irrigation event. Small amounts applied to consider soil constraints.	Automated fertigation system and applied amounts change with crop requirement.
<b>Pesticide Management</b>				
1.	One crop protection strategy for each crop based on historic application rates or rules of thumb.	One or two crop protection strategies for each crop.	Implementation of new application technology for improved placement and timing to improve application efficiency, accuracy and to extend the window of opportunity.	Use of computerised equipment to target crop covers.
2.	Often uses maximum label rate systemic and preventative products irrespective of necessary control needed.	Often uses systemic, broad spectrum and preventative products at rates appropriate to control needed.	Pesticides that are selective to target species replace residual/broad spectrum pesticides where practical (strategic residual pesticides use only).	Same as Class B.
3.			Timing pesticide applications with respect to crop stage, irrigation and rainfall.	Same as Class B.
4.			Variable pesticide strategies between paddocks.	Variable pesticide strategies within paddocks.
5.			Use of integrated pest management.	Same as Class B.
<b>Irrigation and Water Management</b>				
1.	No scheduling criteria applied.	Scheduling is based on guess-estimation.	Scheduling based on soil moisture monitoring, daily evaporation data and crop consumption, soil type, soil structure and crop stage.	Same as Class B combined with the use of weather forecasting from official stations and the use of automation software for irrigation.
2.	Furrow irrigation in use.	Irrigation application based on other farms management practices. Irrigation area based on unreliable water availability.	Irrigation area based on reliable water availability.	Irrigation area based on availability of water with adequate quality.
3.			Conducts irrigation water test every season.	Conducts water test for each water source at season start and at time of high consumption if water comes from bores or reservoirs.
4.			Conduct assessment of water distribution uniformity every season.	Conduct an irrigation system audit every season.
5.			Effective maintenance of irrigation infrastructure.	Same as Class B.
6.		Bare beds (no mulch).	Use of bed mulch to minimise evaporation.	Use of organic/biodegradable mulch.
7.	Inappropriate management of natural wetlands.	Basic management of natural wetlands.	Natural wetlands managed to minimise impacts from farm activities.	Collection of farm runoff including first flush of stormwater to minimise nutrient and chemicals of the farm.
<b>Planning and Recording</b>				
1.	No written records.	Keep basic records of farm activities in pocket notebook.	a) Keep records (including timing of operations, rates, product, yield, wind speed and block spraying rate). b) Develop resource map. c) Identify soil types and productivity zones for each paddock using soil mapping.	a) Effective record keeping using industry-recognised systems. b) Develop GIS-based property plan. c) Identify soil types/productivity zones within each paddock using GPS yield and soil mapping and remote sensing.
2.		Develop basic soil management plan.	Develop soil management plan based on differing soil types.	Same as Class B.
3.		Conduct soil tests.	Conduct soil tests and leaf analysis.	Same as Class B.
4.		Develop basic nutrient management plan.	a) Develop nutrient management plan using yield, soil mapping and leaf analysis. b) Attend nutrient management training. c) Adjust soil management and change or adjust fertiliser rates between paddocks for next year if required.	a) Develop GPS-based nutrient management plan using yield, soil mapping and specialist interpretation. b) Same as Class B. c) Adjust soil management and change or apply variable fertiliser rates within paddocks.
5.		Develop basic pesticide management plan.	a) Develop pesticide management plan using pest pressure, crop stage and yield mapping. b) Identify pest types/pressure, for each paddock. c) Attend pesticide management course. d) Change pesticide strategy between paddocks. e) Monitor pest pressure. f) Keeps Material Safety Data Sheets (MSDS) and first aid procedures.	a) Develop GPS-based pesticide management plan using pest pressure, and yield mapping. b) Identify pest types/pressure, within each paddock using GPS yield and soil mapping. c) Same as Class B. d) Apply variable pesticide strategies within paddocks. e) Same as Class B. f) Same as Class B.
6.			a) Record irrigation scheduling, crop age, application volume/wetting depth. b) Pre-season planning of planting and crop areas based on farm history, market and availability of water.	a) Automated recording of irrigation applications. b) Same as Class B.
7.			Seek advice on natural wetland management.	Develop and implement riparian and wetland management plan.
<b>Machinery</b>				
1.	Standard cultivation equipment.	Same as Class D.	Crop establishment for annual and plantation crops: bed former, strategic till equipment, minimum till seed/seedling planter.	a) Same as Class B, but including GPS guidance. b) In-crop operations for annual and plantation crops: use of rubber tracks for operations during moist soil conditions.
2.	Surface spread fertiliser box.	Sub-surface spread fertiliser box.	a) Variable rate application of granular sub-surface or liquid surface with manually controlled rate variable and/or fertigation equipment. b) Use of implement to incorporate fertiliser evenly on beds, and fertigation and/or foliar application.	a) Same as Class B, with use of GPS guidance. b) No use of cultivation for fertiliser incorporation. c) Use of fertigation and foliar application equipment only.
3.	Standard spray equipment.	Same as D.	a) Hooded sprayers, more accurate nozzles (matched to job), multiple tank setups with machinery appropriate to job required. b) Herbicide application for annual crops: Multi-row spray application.	a) Same as Class B, and specific nozzles, volume, pressure and droplet size matched to specific chemical and variable rate screen. b) Same as class B, but including computerised application: GPS and/or sensor controlled, and/or control droplet.
4.	Diesel pump.	Electrical pump.	Same as Class C.	Same as Class C.
5.		Machinery calibrated regularly.	Spray application technology up to date.	Same as Class B.
6.			Automatic flushing to clean filtration system.	Same as Class B.
7.			a) Irrigation infrastructure well design. b) Use of high pressure irrigation system.	a) Same as Class B. b) Use of controllers and automation for irrigation and fertiliser application. c) Use of pressure compensated emitters.
8.				Use of continuous soil moisture measurement equipment.