Central Region sugarcane practice management

ABCD Management Frameworks 2021-2022

An updated path for improvement for growers, extension staff and industry service providers

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Introduction

This Fourth Edition of the Central Region sugarcane management practices: ABCD management frameworks has been produced to show the progression of the local industry since the last edition developed in 2013-14. This includes updating the soil, nutrient, chemical and water management frameworks for the region to highlight the importance of improved precision and pre-planning in farming for positive economic and environmental outcomes.

The document continues to support the identification and validation of cane management practices that can improve both end of catchment water quality and marine ecosystem health as identified in the Water Quality Improvement Plan (WQIP), (Drewry, J., Higham, W., Mitchell, C. 2018). A pivotal stage in the WQIP process was the development of the first ABCD frameworks for cane and updated versions have followed since.

The ABCD framework is designed to highlight and facilitate communication about the different levels or standards of management practice (as opposed to resource condition) within the cane industry for different water quality parameters (i.e. sediment, nutrients and chemicals).

The classification provides a definition and a scale of improvement from dated to current industry promoted practice through to future aspirational or new and innovative practices. Although soil, nutrient and chemical management practices are the focus of the WQIP, this document still includes water, financial/business, WHS and harvest management practice frameworks.

Over time, changes in knowledge, technology, costs and market conditions may validate new and innovative aspirational practices so they eventually become industry promoted management practices. When these practices are widely adopted and become the new industry standard, they may become Conventional practices within an ABCD framework. Considerable effort has always been undertaken to consult with cane industry partners when updating the ABCD frameworks and again the local industry were involved directly (Appendix one). It must be noted that there may be a need to adopt practices across several classification levels to successfully manage and operate farming enterprises on a year to year basis.

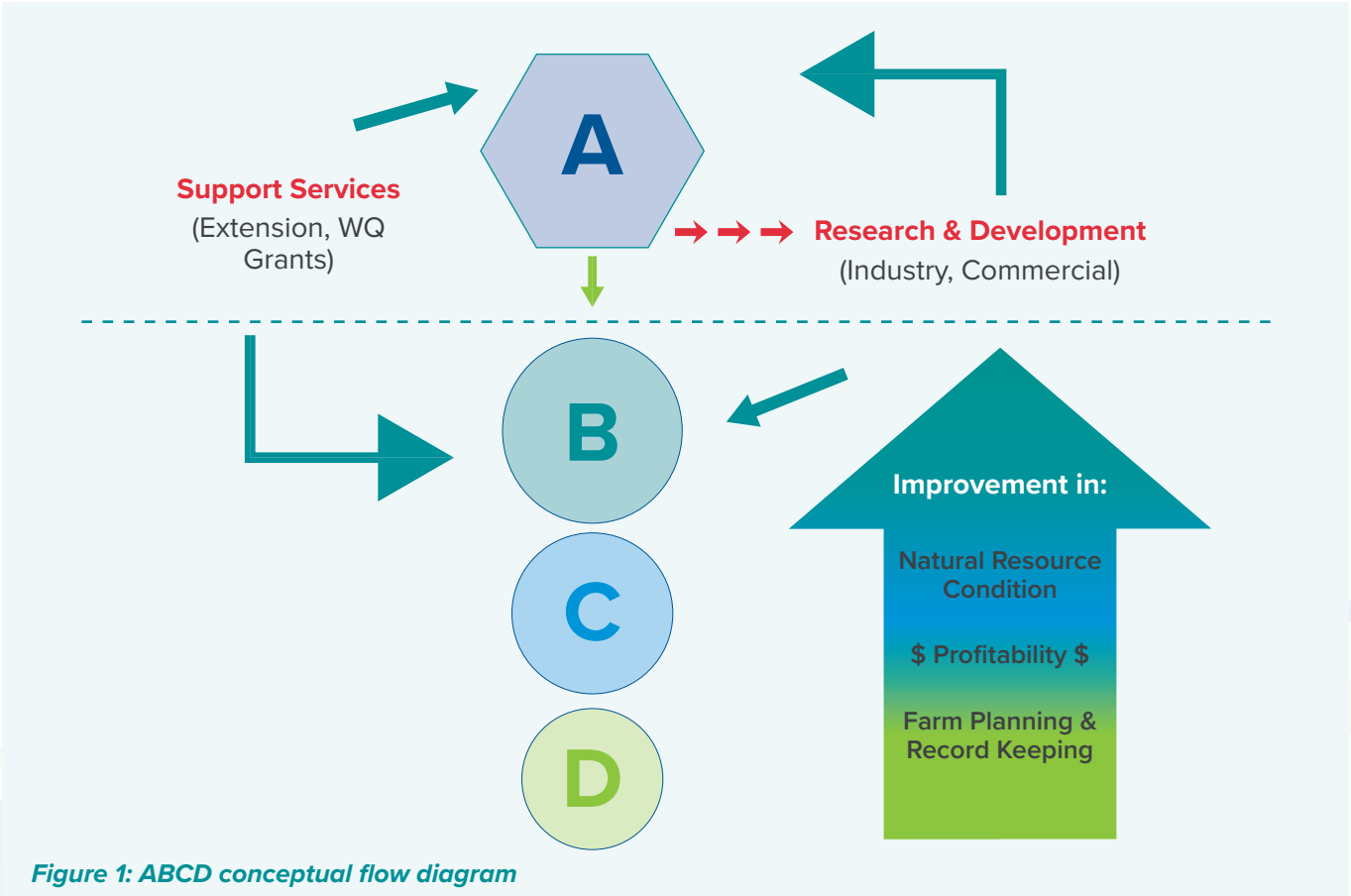

Figure 1: ABCD conceptual flow diagram

While the focus of the outcomes is towards the enhancement of end of catchment water quality and marine ecosystem health, the practices indentified must continue to be quantified in terms of their economic and social benefits to the individual land managers and the broader community prior to being adopted as the most suitable practices.

The current WQIP for the region specifies the current resource condition, resource condition targets, and timeframes, as well as the year of reference for the level of classification. This provides a common reference point and allows the framework to be used to communicate information to water quality researchers, social scientists, economists, industry research and extension organisations, and land managers on:

- The level of water quality improvement that can be achieved through improved management practices;
- The social and economic costs and benefits of adopting improved management practices;
- The level of adoption of management practices required to achieve the Water Quality Targets;
- Emphasising the importance of detailed farm management planning and record keeping to achieve improved resource management, rather than a single technical or individual practice.
- The type and scope of action such as Market Based Incentives (MBIs) required to achieve Water Quality Targets

Table 1 Management classes and definition for ABCD framework for management practices

Class	Description of practice	Effect on resource condition
Aspirational	• New and innovative practices adopted by growers that require further validation to determine industry wide environmental, social and economic costs/benefits. • Validation requires R&D and if appropriate, some validated practices will become recommended best practice. • Development of Farm Management Plans and utilisation of new and innovative technology.	• Validated practices likely to achieve medium to long term target resource condition goals if widely adopted. • Some practices may have good environmental outcomes which may not be universally endorsed as feasible by industry and community.
Best practices	• Current industry promoted practices • Widely promoted by industry to achieve current and future industry expectations and community standards. • Development of Farm Management Plans and utilisation of common technology	• Practices likely to achieve short to medium target resource condition goals if widely adopted.
Conventional	• Common practices widely adopted by industry but meet only basic current industry expectations and community standards.	• Practices unlikely to achieve short term target resource condition goals if widely adopted.
Dated	• Practices superseded or unacceptable by current industry expectations and community standards.	• Practices likely to degrade resource condition if widely adopted.

The WQIP and this booklet are reviewed and updated to always ensure:

- the wording and descriptions of the classifications match current industry terminology and thinking;
- up to date definitions and targets for resource condition indicators;
- improved knowledge on the link of resource condition indicators and the required level of practice to improve or maintain it; and
- actions and activities required to move from one level of management to another further defined.

Frameworks

The management practices for cane are summarised in the following tables. As cane management progresses to B and A class there is increasing planning, precision and efficiency in management of inputs and operations across the whole farm.

For the central region, all frameworks support the use of green cane trash blanket as a Conventional cane practice. The use of equipment as defined in any of the management practices tables can be owned individually, share-owned, or contracted.

Table 2 Soil management practices for cane classified in the ABCD framework

Dated cane soil management Practices that are superseded or unacceptable	**Conventional cane soil management** Farming practices that meet minimum expectations
Description: 1. Cultivated bare fallow 2. Fully cultivated plant cane 3. Cultivated ratoon Planning and record keeping: 1. Records kept in head Machinery: 1. Standard equipment 2. Machinery and equipment does not match crop row spacing	Description: 1. Minimum till. Spray out weedy fallow, with trash retained. Fallow (6 months after last cane harvest) must have some level of ground cover (crops, weeds). 2. Rotational crops may be grown. Plough out replant is only used in exceptional circumstances or on small farms 3. Reduced cultivation of plant cane replaced by strategic chemical weed control 4. Broadcast application of ameliorants (ash, lime, gypsum, etc) 5. Ripping or aeration of wheel tracks in ratoons Planning and record keeping: 1. Written records kept Machinery: 1. Equipment not yet set up to match row spacings. 2. Harvester and haulout equipment does not match crop row spacing

Best practices cane soil management Current practices promoted by the industry	**Aspirational cane soil management** Innovative practices that require further validation
Description: 1. Strategic or zonal tillage of fallow crops and plant cane including bed renovation 2. Controlled traffic permanent wheel tracks matched to harvesting machinery wheel centres 3. Initial row establishment formed with Global Positioning System (GPS) guidance as a minimum 4. Rotational crops grown on all fallow where practicable and managed to maintain some ground cover 5. Site specific banded application of ameliorants based on specialist recommendations from soil mapping and analysis. 6. Strategic ripping of wheel tracks in ratoons, only when necessary 7. Headlands, slashed drains and waterways managed as filter strips Planning and record keeping: 1. Identify soil types and productivity zones using existing maps, digitised mill data and other technology 2. Technology for spatially identifying problem areas 3. Develop computer skills enabling access to digital mill data and Geographic Information System (GIS) software 4. Develop basic 'Soil Management Plan' utilising soil mapping (slope, soil type, flooding, specific soil problems) 5. Records kept in paddock journal and/or electronic data capture Machinery: 1. Matched wheel spacing for planting equipment based on harvesting machinery wheel centre measurements 2. GPS guidance on row establishment equipment 3. Zonal tillage equipment 4. Rotational crop establishment equipment 5. Directed applicator for mill by-products or other organic ameliorants 6. Minimum till rotational crop and cane planting equipment (e.g. Double Disc Opener Planters)	Description: 1. Controlled traffic permanent wheel tracks matched to harvesting machinery wheel centres with GPS guidance on planting, zonal tillage, harvesting and haulout machinery 2. Rotational or multispecies crops grown on all fallow where practicable and managed to maintain good ground cover until planting. Planting of companion crops with plant cane utilised. 3. Strategic or zonal tillage of fallow crops and plant cane including bed renovation as required 4. Utilisation of harvesting technology to reduce impact on crop and soil condition. Utilisation of SLOT software to reduce impact on the crop. 5. Headlands, drains and waterways managed as filter strips Planning and record keeping: 1. Soil management through spatially identified soil types and management zones across blocks and farms utilising remote sensing and Electro Magnetic (EM) soil mapping technology 2. Integrate a spatial based Soil Management Plan, addressing Land and Water Management Plan (LWMP), or current environmental risk management criteria 3. Geo-referenced spatial data captured in GIS software systems 4. Records kept in electronic data capture 5. Use of satellite and drone imagery for crop yield estimates. Machinery: 1. Matched wheel spacing on all equipment based on harvester centres 2. GPS auto guidance systems used on bed-formers, zonal tillage, planting equipment and harvesting machinery including haulouts 3. Automated base cutter height fitted to harvester 4. Yield monitors fitted to harvester

Table 3 Nutrient management practices for cane classified in the ABCD framework

Dated cane nutrient management Practices that are superseded or unacceptable	**Conventional cane nutrient management** Farming practices that meet minimum expectations
Description: 1. No soil testing 2. Application rates based on historic rates or rules of thumb 3. No accounting for mill by-products or other organic sources of nutrients such as legumes 4. No risk assessment conducted prior to fertilising 5. No calibration of equipment Planning and record keeping: 1. Records kept in head Machinery: 1. Surface fertiliser box	Description: 1. Using regulated soil sampling collection methods to identify soil types prior to planting 2. All nutrient application rates based on soil test analysis and current industry recommendations 3. Application of N&P in accordance (does not exceed) to the N&P Budget 4. Mill by-products or other organic sources of nutrients such as legumes only accounted for as required by regulations 5. Some risk assessment conducted prior to fertilising (72 hr rainfall prediction) 6. Some calibration of farm owned equipment 7. Surface applied nutrient incorporated into the soil through irrigation/cultivation where possible, irrigated / cultivated into soil where possible Planning and record keeping: 1. Conduct soil tests 2. Develop basic nutrition management plan 3. Written records kept Machinery: 1. Surface (liquid) or sub-surface (granular) fertiliser box
Best practices cane nutrient management Current practices promoted by the industry	**Aspirational cane nutrient management** Innovative practices that require further validation
Description: 1. Incorporation of surface applied fertiliser as soon as practicable (e.g. within seven days) using overhead irrigation that does not result in runoff 2. Geo-referenced soil sampling in key soil types in blocks prior to planting each year, which may include more comprehensive sampling (e.g. A and B horizon at the same site) 3. Application rates based on latest industry recommendations taking mill by-products, compost, other organic nutrient sources and block history into account 4. Banded and incorporated application of mill mud/mud ash should not exceed crop cycle nutrient requirements	Description: 1. Geo-referenced soil sampling in identified, specific zones in blocks each year, which includes more comprehensive sampling (e.g. A and B horizon at the same site) 2. Application rates based on accredited agronomists' interpretation of the latest industry recommendations using individual block yield potential and taking mill by-products, compost, other organic nutrient sources into account 3. Application of mill mud/mud ash should not exceed crop cycle nutrient requirements and be banded on planting zone 4. Legume crops left as stubble or incorporated just prior to planting to maximise nutrient availability

5. Legume crops incorporated as close to planting as possible to maximise nutrient availability and reduce N loss through denitrification
6. Apply different nutrient program (fertiliser rates or products) between blocks where identified
7. Risk assessment conducted prior to fertilising (48 hr rainfall prediction, weekly forecast, seasonal predictions)
8. Calibration of fertiliser applicator with some changes of product and monitored during operations

Planning and record keeping:

1. Identify soil types/productivity zones for each block
2. Develop Nutrient Management Plan using varieties, yield, soil mapping and latest industry recommendations
3. Timing nutrient applications with respect to crop stage and rainfall probabilities
4. Records kept in Paddock Journal and/or electronic data capture

Machinery:

1. Ability to adjust rate for granular or liquid applicators
2. Directed applicator for mill by-products or other organic ameliorants
3. Granular applicators must have capacity for sub- surface application

5. Apply variable nutrient application program (fertiliser rates or products) between and within blocks where identified
6. Use of Enhanced Efficiency Fertilizer in higher risk areas or during identified higher risk times
7. Detailed risk assessment conducted prior to fertilising (Safeguage for Nutrients, 48 hr rainfall prediction, weekly forecast, seasonal predictions etc.)
8. Calibration of fertiliser applicator with every change of product or application rate
9. Incorporation of surface applied fertiliser within seven days, using overhead irrigation that does not result in runoff

Planning and record keeping:

1. Identify soil types/productivity zones within each block using GPS yield and soil mapping
2. Develop spatial-based crop cycle Nutrient Management Plan using varieties, yield, soil mapping and specialist interpretation of latest industry recommendations
3. Timing nutrient applications with respect to crop stage, irrigation and rainfall probabilities
4. Knowledge of latest nutrient management issues and recommendations
5. Some basic/periodic water quality monitoring or use of online portals with real time data
6. Near-infrared (NIR) data or leaf analysis used to monitor and adjust nutrient rates if required
7. Records kept in electronic data capture

Machinery:

1. Variable rate applicator for granular sub-surface or liquid surface with remote/ automatic rate controller and GPS guidance
2. Banded on-row applicator for mill by-products or other organic ameliorants
3. The majority of nutrients sub-surface applied where practical
4. Outfitting of yield monitors to harvesters and the use of satellite imagery/drones to collect yield estimates and crop vigour data.

Table 4 Chemical management practices for cane classified in the ABCD framework

Dated cane chemical management Practices that are superseded or unacceptable	**Conventional cane chemical management** Farming practices that meet minimum expectations
Description: 1. Whole farm residual herbicide use based on historic application rates or rules of thumb 2. Often uses maximum label rate residual and knockdown products, irrespective of weed pressure. 3. No calibration of spraying equipment 4. No risk assessment conducted before spraying Planning and record keeping: 1. Records kept in head Machinery: 1. Standard spray rig, with conventional nozzles	Description: 1. One or two herbicide strategies for the whole farm 2. Uses residual and /or knockdowns at rates appropriate to weed pressure and in accordance with label recommendations. 3. Follows all label requirements / conditions / no spray windows herbicide application strategies 4. Calibration of spray equipment conducted regularly 5. Some risk assessment conducted prior to spraying (48 hr rainfall prediction, wind speed and direction, following label conditions around humidity, delta T etc.) 6. Follows label conditions / restrictions such as no spray windows, buffer zones, correct nozzles, soil conditions etc. Planning and record keeping: 1. Meet legislative requirements and minimum accreditation and competency standards for chemical storage, application and disposal 2. Develop basic Herbicide Management Plan 3. Keep material safety data sheets (MSDS) 4. Written records kept Machinery: 1. Full boom spray rigs or directed sprayer, with a range of nozzles that meet label requirements for various application tasks
Best practices cane chemical management Current practices promoted by the industry	**Aspirational cane chemical management** Innovative practices that require further validation
Description: 1. A focus on good weed control in fallow and plant cane to ensure minimal herbicide in ratoon stages. Control strategies such as reducing movements between paddocks and blocks and stringent machinery wash down procedures to mitigate seed spread. 2. Knockdown herbicides replace residual herbicides in the inter-row and where practical (residual herbicides only used where weed species and pressure demand it) within blocks. 3. Implementation of new application technology and use of additives/surfactants/penetrants for improved placement (banded/directed spray) and timing (low drift nozzles, high rise equipment etc.) allowing several herbicide strategies across the farm.	Description: 1-5. As per B 6. Use of alternative control technology, such as microwave or steam weeders used in place of chemical control 7. Detailed risk assessment conducted prior to spraying (48 hr rainfall prediction, wind speed and direction, weekly forecast, seasonal predictions, Safeguage for Pesticide) 8. Change herbicide strategies within blocks where identified (e.g. weed pressure on row ends; patches of weeds/vines; turning nozzles on/off), including the use of chemical alternatives (microwave & stem weeders) and the use of spot spray robots

4. Efficient use of pre-emergents to reduce overall chemical application.
5. Calibration of spray equipment conducted before every change of product or nozzle type
6. Knockdown herbicides replace residual herbicides where practical such as in the inter-row.
7. Residual herbicides used where weed species and pressure demands it and incorporated as soon as practicable after application.
8. Risk assessment conducted prior to spraying (48 hr rainfall prediction, wind speed and direction, weekly forecast, seasonal predictions), to include spray water quality condition with a focus on pH, bicarbonates and hardness that are suitable for the chemical being used and either an alternative water source used or the need for an additive to be used.
9. Change herbicide strategy between blocks where identified

Planning and record keeping:

1. Timing chemical applications with respect to crop stage, irrigation and rainfall probabilities
2. Identify – weed types/pressure, soil types and productivity zones for each block
3. Develop herbicide management plan using weed pressure, soil types, crop stage, yield mapping and appropriate chemicals.
4. Maintain some knowledge of latest chemical management issues and recommendations
5. Some monitoring of weed pressure
6. Meet legislative requirements and maintain minimum accreditation and competency standards for chemical storage, application and disposal
7. Adjust herbicide strategy during crop cycle if required
8. Records kept in Paddock Journal and or electronic data capture

Machinery:

5. Standard and/or modified spray rigs, with a suitable range of appropriate nozzles (low drift, air injected, droplet sizes etc.) for various application tasks, an ability to do some banded or directed spraying and a manual rate controller.
6. Shielded sprayers and/or high clearance spray equipment for applying knockdown chemicals in the inter-row or at out of hand stage
7. Multiple tanks for spraying different chemicals simultaneously
8. Multiple tanks for spraying different chemicals or other operation such as chemical injection
9. Use of drones to apply knockdowns on vine patches and to develop weed maps

Planning and record keeping:

1. As per B
2. Identify – weed types/pressure, pests and diseases, soil types and productivity zones within each block using GPS yield and soil mapping. Weed survey of blocks.
3. Develop spatial based Herbicide Management Plan using weed pressure, soil types, crop stage, yield mapping, appropriate chemicals and Integrated Weed Management (IWM) principles
4. Maintain detailed knowledge of latest chemical management issues and recommendations
5. Regular monitoring of weed pressure
6. Meet legislative requirements and maintain minimum accreditation and competency standards for chemical storage, application and disposal
7. Adjust herbicide strategy for next year if required
8. Records kept in electronic data capture (e.g. rate controller)

Machinery:

1. Modified spray rigs, with a wide range of appropriate nozzles (low drift, air injected etc.) for various application tasks, an ability to do all banded or directed spraying and a remote / automatic variable rate controller with GPS guidance.
2. Shielded sprayers and/or high clearance spray equipment for applying knockdown chemicals in the inter-row or at out of hand stage
3. Automated boom height control
4. Weed scanner / sensing equipment

Table 5 Water management practices for cane classified in the ABCD framework

Dated cane water management Practices that are superseded or unacceptable	**Conventional cane water management** Farming practices that meet minimum expectations
Description: 1. No scheduling tools utilised 2. Irrigations based on gut feel 3. Basic drainage considered in original farm layout Irrigation application: 1. Application amount unknown 2. No consideration of matching nozzles to pump Planning and record keeping: 1. Standard spray rig, with conventional nozzles	Description: 1. Scheduling based on visual checks 2. General knowledge of local rainfall history 3. Irrigation strategy based on length of cycle to get around farm and/or prioritised on crop cycle (e.g. plant cane, 1st ratoon over 5th ratoon) 4. Irrigation strategy sometimes matched to water availability 5. Irrigation systems may not match soil and topography 6. Existing farm layout and infrastructure considers drainage – laser levelling Irrigation application: 1. Based on experience 2. Amount often unknown, loosely determined by pump meter reading/time/ha 3. No efficiency checks conducted on equipment 4. May change nozzles to match pump size and pressure 5. Some consideration due to soil type – mainly textural 6. Consideration to land formation and slope 7. Limited water quality testing conducted on some irrigation water sources Planning and record keeping: 1. Records, including water meter readings kept in diary 2. Basic understanding of soil moisture characteristics – based on texture rather than determined Plant Available Water Capacity (PAWC) 3. Costs – energy (e.g. tariffs) 4. Planning based on verification of meter readings, not measured system outputs 5. Planning based on productivity potential and water availability

Best practices cane water management Current practices promoted by the industry	**Aspirational cane water management** Innovative practices that require further validation
Description: 1. Irrigation strategy includes the incorporation of the majority of nutrient and chemical applications where possible 2. Irrigation systems match soil and topography 3. Scheduling tools used manually on main soil type or limiting soil type 4. Weather forecasting models used, including linking to an irrigation based model, eg IrrigWeb, MAPS or CANEGROWERS systems 5. Irrigation strategy developed for each crop year 6. Irrigation strategy based on crop growth requirements and matched to water availability 7. Existing farm layout and infrastructure considers drainage – laser levelling 8. Storm water storages / sediment traps part of drainage system Irrigation application: 1. System efficiency checks conducted annually 2. Application amount matched to soil plant available water capacity (PAWC), infiltration rate and crop stage 3. Water quality testing conducted on some sources of irrigation water such as bores Planning and record keeping: 1. Block based water management plan encompassing: soils; scheduling; efficiency – system check; allocation; farm layout and infrastructure; economics 2. Records kept in Paddock Journal and/or electronic data capture	Description: 1. As per B 2. Scheduling tools utilised with some level of automation 3. Scheduling tools located based on block/ management units or specific soil types 4. Weather forecasting models used 5. Irrigation strategy developed for each crop year 6. Irrigation strategy based on crop growth requirements and matched to water availability 7. Use of low pressure overhead and trickle irrigation systems where practical 8. Possible use of fertigation technology through irrigation equipment 9. Comprehensive drainage plan considering all farm drainage points 10. Storm water storages / sediment traps part of drainage system Irrigation application: 1. As per B 2. Application amount matched to soil plant available water capacity (PAWC), infiltration rate and crop stage 3. Water quality testing conducted on all sources of irrigation water 4. Software scheduling tools used Planning and record keeping: 1. Soil type based water management system encompassing: soils; scheduling; efficiency – system check; allocation; farm layout and infrastructure; economics 2. Records kept in electronic data capture

In March 2008, Sugar Yield Decline Joint Venture (SYDJV) and the FutureCane team identified harvesting as one of two major impediments to the adoption of the 'improved' farming system. Harvesting contractors must be able to directly access incentive money to facilitate adoption of technical equipment, machinery modifications and operating practices which are necessary to enable growers to change practices and extract the full benefits of the ''improved farming system.' As cane harvesting management progresses to B and A class there is increasing precision in management of harvesting practices.

Table 6 Harvesting management practices for cane classified in the ABCD framework

Dated cane harvesting management Practices that are superseded or unacceptable	**Conventional cane harvesting management** Farming practices that meet minimum expectations
Description: 1. Ineffective farm layout: short rows, narrow and rough headlands, harvesting difficulties/ obstacles, ineffective irrigation application Planning and record keeping: 1. Records kept in head 2. Minimal communication between grower and contractor 3. No reference to mill cane quality reports by grower Machinery, capital works actions: 1. Standard harvester with no means of adjustment to meet harvesting best practice	Description: 1. Some consideration given to improving efficiency of farm layout for harvesting & harvesting through blocks is practiced Planning and record keeping: 1. Some written recording 2. Verbal harvest plan agreement between grower & contractor pre-crushing 3. Some reference to mill cane quality reports by grower Machinery, capital works actions: 1. Some improved modifications to harvester
Best practices cane harvesting management Current practices promoted by the industry	**Aspirational cane harvesting management** Innovative practices that require further validation
Description: 1. Farm layout suitable for efficient harvesting Planning and record keeping: 1. Development of harvest management plan between farmer and contractor (includes written contract and price agreement) 2. Records kept in Paddock Journal and/or electronic data capture 3. Access to harvester performance reports at a block level Capital works/landscape actions: 1. Installation of GPS tracking devices onto harvesters 2. Harvester front modifications and elevator extensions, to match row spacing 3. Roller train optimisation and correct matching to choppers 4. Accurate consignment of bins to match harvester position	Description: 1. Farm layout optimised for efficient harvesting Planning and record keeping: 1. As per B 2. Records kept in electronic data capture 3. Access harvester performance reports and yield maps at a block level and use to make better farm layout and harvesting decisions. Capital works/landscape actions: 1. Harvester and haul out utilising GPS guidance equipment plus harvester yield monitor 2. Automatic base cutter height control 3. Roller train optimisation and correct matching to choppers 4. Automatic primary extractor fan speed control linked to harvester pour rate 5. Electronic consignment of bins

As cane workplace health, safety and environmental management progresses to B and A class there is increasing precision in management of workplace health, safety and environmental processes.

Table 7 Workplace health and safety management practices for cane classified in the ABCD framework

Dated cane WHS management Practices that are superseded or unacceptable	**Conventional cane WHS management** Farming practices that meet minimum expectations
Planning and record keeping: 1. Little or no training provided 2. No policies 3. Minimal inductions 4. Minimum understanding of WH&S 5. No record keeping 6. Little or no hazard identification and risk management 7. Lack of personal protective equipment (PPE)	Planning and record keeping: 1. Basic understanding of WH&S 2. Conducts mental risk assessments 3. Provides verbal warning and instructions 4. Provides basic inductions 5. No formal records kept 6. Basic PPE 7. Basic emergency procedures
Best practices cane WHS management Current practices promoted by the industry	**Aspirational cane WHS management** Innovative practices that require further validation
Planning and record keeping: 1. Generic WH&S Policies 2. Written risk management procedures 3. Basic written warnings and policies 4. Provides relevant safe equipment 5. Basic record keeping 6. Basic review of policies and procedures 7. Basic written inductions 8. Feed back 9. Emergency procedures (First Aid) 10. Sign off on induction, etc. by employee/s	Planning and record keeping: 1. Formal Inductions 2. Training in risk management/assessment 3. Hazard Identification 4. Formal policies/procedures 5. Follow up and review of policies and procedures 6. Detailed record keeping 7. Detailed knowledge of WH&S Policies 8. Detailed emergency procedures 9. As for point 10 'B' class

Table 8 Business/financial management practices for cane classified in the ABCD framework

Dated cane business/financial management Practices that are superseded or unacceptable	**Conventional cane business/financial management** Farming practices that meet minimum expectations
Description: 1. Ensure all financial information is provided to an accountant for compilation 2. No formal budgets are written 3. No formal business plans are written 4. Marketing is left to the Mill and Queensland Sugar Limited (QSL) Financial records: 1. Invoices and receipts kept together 2. Fuel dockets kept separately 3. Wages documented 4. Basic financial analysis from bank statements 5. Discuss with Bank Manager when necessary Budgets: 1. Basic opportunity analysis 2. Basic Gross Margin (GM) cost analysis Business plans: 1. Basic planning 2. No succession planning or benchmarking Marketing: 1. No marketing strategy – left to the mill and/or QSL	Description: 1. BAS completed quarterly then (maybe) checked by an accountant 2. Budgets and economic analysis completed 3. Skills training identified and hand written paddock journals 4. Awareness of mill pricing system, minimal usage Financial records: 1. Recording payments/receipts in a computerised cashbook 2. Books of prime entry 3. Quarterly entry of data (BAS; fuel rebate) 4. Financial analysis completed & discuss with accountant Budgets: 1. Annual operational and capital budgets developed 2. Year on year comparison 3. Economic analysis of whole farm gross margin 4. Annual farm budget compared to actuals 5. Basic machinery costs analysed 6. Opportunity cost analysis when necessary Business plans: 1. No formal annual strategic plan 2. No succession planning 3. Basic benchmarking - accountant developed using their client base Marketing: 1. No formal marketing strategy – left to the mill and/or QSL

Best practices cane business/financial management Current practices promoted by the industry	**Aspirational cane business/financial management** Innovative practices that require further validation
Description: 1. BAS completed quarterly on computer system 2. Budgets and cost centre analysis completed monthly 3. Strategic business planning undertaken and computerised 4. Formal marketing strategy Financial records: 1. Detailed monthly entries into computerised recording system using basic cost centres (MYOB etc) 2. Monthly reporting and financial analysis 3. Update machinery and other asset values plus liabilities to develop actual statement of position annually 4. As C class Budgets: 1. As C class 2. All budgets computerised living documents personally developed and reviewed 3. monthly Cost centre specific budgeting 4. Detailed machinery costing computerised and analysed at least annually Business plans: 1. Strategic business planning training and plan developed 2. Succession planning training and plan written 3. Benchmarking 4. Skills training plan (FEAT etc) 5. Land and water management plan completed (with water quality information continuously updated) 6. Economic analysis 7. Paddock journals computerised and added into nutrient; soil and chemical management plans Marketing: 1. Utilisation of mill (or other) pricing system	Description: 1. Record changes to asset values annually 2. Detailed ratio analysis 3. Management plans updated regularly 4. Economic analysis of spatial/paddock gross margins 5. Marketing own product Financial records: 1. Detailed entry using comprehensive cost centres to assist analysis 2. Monthly computerised entry and reports 3. Development and analysis of changes in statement of position at least annually 4. Financial and performance analysis discussed with competent business advisor/consultant (this maybe your accountant) Budgets: 1. As per B 2. Detailed ratio analysis (e.g. use of FEAT or similar tool 3. Benchmarking/accountants group and proactive farmer group 4. Cost centre analysis 5. Monthly budget comparison to cost centres. Various partial budgets for economic analysis Business plans: 1. As per B 2. Detailed succession plan regularly updated and implemented 3. Strategic plan and risk analysis updated annually 4. Land & water management plan updated quarterly 5. Skills training regularly for management and staff 6. Economic analysis of spatial/paddock gross margins 7. Sensitivity analysis (risk) Marketing: 1. Futures / hedging

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Appendix one

2021 Participants

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