

Project title: **Farm Management Systems for the Sugar Cane Industry, Sub-program 1: Interactive web-based material to support FMS**

Project Reference Number: FMS001

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The Farm Management System (FMS) Framework program is managed by the Sugar Research and Development Corporation (SRDC) on behalf of the Australian sugarcane industry. Funding is provided from the Natural Heritage Trust. *The Australian Government's \$3 billion Natural Heritage Trust is Australia's largest ever environmental rescue package.*



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Executive Summary:

An interactive web-based toolset was developed to support the Australian sugar industry's Farm Management System (FMS) program. Primary issues that were addressed in this sub-program included the provision of a system to increase ease of access to FMS resources, building a channel for the dissemination of new information to growers, and facilitating interactive support for customisation of industry wide requirements to local circumstances.

The toolset developed by this sub-program incorporates a database of useful information with a linked search tool plus a series of templates and guides to help cane growers to establish their own FMS. The content of this toolset and major outputs from this project can be viewed from the www.srdc.gov.au website, following the FMS links.

The framework and initial content of the toolset were developed by Agrecon in collaboration with two FMS pilot projects, in the Central and Burdekin regions, plus a range of other grower, industry and government representatives with valuable input provided by the FMS Steering Committee.

The framework was developed to enable other information types such as the indicators and auditing options still being developed under other FMS sub-programs to be readily incorporated. The linked search tool allows growers to find information relevant to their particular *region, management issue* and *information type*.

The database includes information for sugar producers on key legislation, codes of practice, best management practices, risks and other general guides. More than 300 records were created to establish the database, many with multiple region-specific versions of fact sheets including a simple overview of implications for cane growers and links for users requiring more detailed information.

An integrated guide to producing a FMS was based on the fundamental requirements of the international standard for environmental management systems, ISO14001. This includes information and templates for mapping, record keeping, self-assessment review, risk analysis, action plans, report production and monitoring as discrete but linked stages in the FMS process.

In addition to the above information that can be freely downloaded, Agrecon has also incorporated the framework and associated industry specific information within a sugarcane module under the umbrella of their broader AgrePRECISE online system. This subscription service, which will be offered free during the FMS Training sub-program to help cane growers establish their FMS, links the above information within a secure account to other databases and interactive tools. This centralised and standardised information management system will further assist growers to more rapidly establish and maintain their FMS.

This resource is expected to provide valuable and consistent information to assist Australian cane producers to establish and maintain a FMS. Its dynamic web-based format of delivery allows for continuous improvement and maintenance as the industry progresses along the path of improved environmental and economic sustainability. The structure of the database, search tool and record display format makes this system very easy to maintain by non-technical personnel via a user-friendly data base editing tool.

Agrecon has volunteered to continue to improve and add to the content of the FMS information system throughout the duration of the FMS program using feedback from the industry. In a similar vein, Agrecon is willing to maintain and add to the final list of "Indicators" being developed during sub-program FMS002 and to ensure that these are linked to relevant risk and BMP material as appropriate. It may also be appropriate to add the list of "Auditing options" being developed in sub-

program FMS004 as ongoing inputs to this FMS database, including fact sheets with links to supporting resources.

Background:

This FMS sub-program aimed to collate a range of material previously developed by the sugar industry as the basis of these information tools. Unfortunately some of this information was slow to be provided or was withheld due to copyright issues. The COMPASS self-assessment questionnaire is recommended as one option for the Initial Review. However, since it is not freely available, an alternative questionnaire was developed and provided using material developed during the Central region pilot project. Best Management Practice fact sheets being developed by the sugar industry will also improve the more generic ones provided with this program.

The primary gap to be filled by this sub-program was the development of tools to bring together a wide range of disparate material and outcomes from previous initiatives within the industry and integrate this information into a single authoritative source that is readily accessible and able to be rapidly updated as new material comes to hand. This was achieved through the provision of a sophisticated data base driven software package that enables relevant FMS related information content to be readily maintained within a structured framework by non-technical personnel.

At the beginning of the sub-program, we also saw an opportunity to satisfy aspirations of many across the industry that were seeking a whole-of-industry information system that catered for but was not captive to the requirements or particular perspective of any single organization or participant in the sugarcane value chain. In addition to developing a unique structure and populating the information framework with an initial array of content, we believe that we have achieved a significant breakthrough by linking FMS templates to a range of linked data sources and information services in a manner that satisfies the unique regional and local requirements of individual growers.

The framework and associated information system will be populated on an ongoing basis by incorporating material developed during and subsequent to this (FMS001) sub-program into a single up to date knowledge bank. The initiative that we have shown in incorporating the same material within Agrecon's online systems and linking it to data from historic records and acquisition of biophysical data from ongoing monitoring during each season has ensured that outcomes from FMS001 will continue to be widely deployed across the industry, initially through the FMS003 training and implementation sub-program. Outcomes from FMS001 provide a platform for ongoing operational implementation of FMS as an industry standard and thereby assist in facilitating the Environmental Assurance Framework recommended by the Independent Environmental Audit of the industry.

Objectives:

To compile an interactive web-based database on legislation and current best management practices and develop web-based regional natural resource management risk assessment tools and generic sugar FMS templates and guides.

Methodology:

Agrecon developed a database of FMS information and interactive web-based tools that are linked to the SRDC and CANEGROWERS web sites. Much of these materials were based on experience and feedback arising out of the Central region pilot study. In this regard, the particular contributions of Bill Boylson and collaborating growers is gratefully acknowledged. Many other industry and

government organisations have been canvassed for input and comment on the framework and information that has been brought together through the FMS001 sub-program.

The content of the online tools includes:

(i) A summary of key state and federal legislation concerning environmental protection and natural resource management in relation to sugar-cane farming in Australia. Agrecon also developed many new fact sheets providing a summary of the Act from a landholder and grower's perspective, online links to the Acts and other related information, plus contact details for responsible agencies.

(ii) A summary of key Codes of Practice affecting sugarcane producers. Agrecon has also added a fact sheet for each record including online links to the Code (where available) and contact details for the responsible organisations.

(iii) A current summary of Best Management Practices (BMP's) covering sugar-cane farming and harvesting practices that simultaneously provide economic, environmental and social benefits and that includes the management of land and soil, nutrition, water, heritage and conservation, crop production, pest and disease, infrastructure and equipment, and business. Agrecon has also added a fact sheet for most of these records, and others will be added and refined during Agrecon's ongoing involvement with the broader FMS program. This was developed from numerous sources, including sugarcane-specific information from the Sustainable Cane Growing in Queensland Code of Practice and COMPASS.

(iv) A regional risk-assessment framework including practices and procedures that can be readily applied by sugar-cane farmers and their support agencies to identify on-farm risks to productivity and sustainability as well as impacts on the wider environment. A list of demonstration risks for nutrition management was added to the database and can be accessed through the search tool. This is being replaced by an updated list of risks, based largely on LWMP assessment criteria, that have been evaluated offline. Information and fact sheets relating to susceptibility to and response protocols for a wide range of risks will continue to be developed in response to industry feedback and in parallel with the development of key indicators during the FMS002 sub-program.

(v) While not required as part of the project brief, a list of general "Guides" that did not fit under the above categories was also added to the database. These guides are presented for the most part as a simple reference within BMP fact sheets to further fact sheets to provide a more user-friendly description of how to access these resources (as opposed to a traditional, more technical reference).

(vi) Generic FMS templates and guides were developed mainly using ISO14001 EMS principles and can be adapted by individual sugar-cane farmers and their support staff to specific cane farms in Australia. The templates and guides that are provided cover all the basic information components of a customised farm specific FMS. These components include farm maps and records, a self-assessment review questionnaire, environmental policy, legal and other obligations, risk assessment, action plan summary and action plans, monitoring programs, farm operations manual and a communications strategy.

These on-line tools were demonstrated to, and feedback was sought from, more than 70 growers and approximately 120 other industry representatives, many of whom independently tested the tools online themselves and provided detailed feedback to Agrecon personnel in Mackay and Canberra.

Agrecon has prepared and delivered multiple presentations to the FMS Steering Committee, a newly formed Executive Management Committee, CANEGROWERS Board, and numerous meetings involving growers, industry and government representatives. Wherever possible, within

the constraints imposed by tight timelines and the restricted budget allocated to the project, feedback has been incorporated, system design improved and functionality increased.

Agrecon will continue to receive feedback and accumulate additional material throughout the duration of the FMS program, but will incorporate changes on a monthly basis hereafter, to ensure that financial, human and time resources are used efficiently.

In addition to the data, search functionality and information tools that comprise the FMS framework and associated on-line system, Agrecon has also incorporated the sugarcane-specific information within its generic AgrePRECISE FMS system. This will facilitate grower training during the ensuing FMS003 sub-program, more so than if this training was conducted using printed material and analogue products alone.

Additional benefits of this *on-line single entry information systems* approach include:

- The potential for growers to record their own information online, including crops other than sugar, linked to other information and useful tools relevant to their whole farm enterprise
- Enhanced interactivity using an online Initial Review questionnaire with associated links to fact sheets that assist canegrowers to answer questions and build an understanding of FMS best practice
- Online entry, storage, retrieval, review and editing of answers to the Initial Review questionnaire
- A smooth introduction and transition to grower specific Draft Risk Analysis that is tailored to the unique location, individual circumstances, applicable thresholds and Best Management Practice guidelines being developed under FMS002
- Customisation of the Draft Farm Operations Manual to the circumstances of each enterprise using a standard generic template drawing inputs from the preliminary questionnaire and supplementing these by region specific information including applicable legislation, administrative regulations, constraints and opportunities, and BMPs arising from unique local circumstances. In this regard, AgrePRECISE provides a valuable platform that links FMS documents and outcomes with:
 - historical and ongoing biophysical data;
 - locally relevant terrain, soil, hydrology and ecosystem maps;
 - access to user friendly mapping tool functionality that enables individual landholders to generate their own farm plan using modern computer based graphical techniques.
- The opportunity for individual cane-growers to incorporate additional material beyond the scope of the industry wide standard questionnaire, drawing on linked material to produce Land and Water Management Plans (FMS007 sub-program) and the potential for other improved management initiatives such as a Nutrient Management Plan.
- The potential to accommodate and incorporate linkages with a wide array of future farm mapping, property planning and enterprise specific record keeping initiatives by accommodating site specific weather forecasts, historic climate data, seasonal prognoses and production risk outcomes.

Feedback to date from growers has been very positive. We have worked very hard, spent a large amount of time travelling throughout the industry to talk with disparate groups with vested interests who feel that FMS is their turf. We have been remarkably successful in getting parties to communicate with each other, share aspirations and identify common ground around which ongoing collaboration could take place. However, it is too early to tell how successful this sub-project has been. Although the industry now has access to a robust and well integrated information system comprising an elegant framework, copious content and user friendly querying and FMS planning tools the full value will probably not be known until the training program has been completed and

the results of an independent audit through the FMS005 sub-program are available. Even then, we contend that success will ultimately depend on the degree to which FMS is seen as not just another thing to be done and forgotten, but incorporated as an operational component of ongoing management practice in pursuit of improved profitability, better environmental outcomes and production sustainability.

Outputs:

- Database of Legislation, Codes of Practice and Best Management Practices relevant to Australian sugar cane production
- Risk assessment framework incorporating an initial database of regional-specific risk factors
- Generic FMS templates for sugar cane production
- An interactive web-based interface providing growers with easy access to generic and regional FMS information (follow the FMS link from the www.srdc.gov.au website)
- Evaluation of responses from more than 70 growers who have reviewed the online tools and more than 120 industry representatives who are aware of the broader FMS program, with strategic feedback incorporated as deemed appropriate
- A sugar cane production information module has been designed and is currently being integrated within the generic AgrePRECISE system prior to the commencement of the training program (FMS sub-program FMS003)
- Potential to integrate a range of other grower-oriented initiatives such as LWMP, GPS records and tracking, precision farming applications, mill production statistics, regional NRM information exchange, customised information services and decision support tools from research and commercial providers, etc has been widely canvassed. LWMP functionality is currently being added (under the FMS007 project) and links to mills and other data providers are being actively pursued
- Improved cane grower knowledge and skills for improved farm management practices
- Provides basic skills to users giving confidence to incorporate additional data and integrate economic and environmental operations into BMP's

Intellectual Property:

New intellectual Property was created by this project in the form of software linked to a database of Legislation, Codes of Practice and Best Management Practices, plus FMS templates and instruction materials. There are also frequent references to materials developed by third parties that may have restrictions on their use. It was a requirement of the Natural Heritage Trust, who funded the program, that these outputs be made publicly available with free access.

Much of this material was created within the broader context of Agrecon's AgrePRECISE database and tools that remain the property of Agrecon. Agrecon retains a licence to use any materials developed for the Sugar FMS web site, whose copyright has been assigned to SRDC, within its AgrePRECISE system.

Expected Outcomes:

The following outcomes are expected from this project:

- Much greater adoption of FMS by cane growers due to ease of FMS development and improved understanding of the ongoing requirements
- More efficient and economic cane production
- Improved environmental sustainability and healthier communities
- Improved accountability of the sugar industry through better coordinated information exchange

- A compatible framework for an integrated whole of industry approach providing a common link for interaction of mills, harvesters and growers with industry stakeholders, government and the community
- A clear demonstration of grower and industry commitment to the sustainability of cane farming
- Greater assurances for banks and insurance companies

Future Research Needs:

It should be recognised that the broader goals of the Sugar FMS program are to support the awareness raising and initial implementation of FMS, and to this end the materials collated and developed on this program's limited budget will need to be supplemented and improved over time. Provision has been made for user feedback to be provided via the web site and Agrecon has offered to continue considering and responding to these comments as considered appropriate during the training program (FMS003). Additional material identified by the industry over time should be developed to enable growers to enhance their FMS as industry, government and community expectations demand.

Recommendations:

It is recommended that if the industry response to this new resource is positive then consideration be made for an annual financial allocation for maintaining and improving the system. This could include incorporation of outcomes from other SRDC-funded projects, with potentially even a new category added to the funding application form that asks "FMS Material – Will there be any outputs from this project that can be added to the Sugar FMS program? If yes, please describe".

List of Publications:

None