

SRDC Grower Group Innovation Project

Final Report

SRDC project number: GGP055

Project title: Helping Sugarcane Farmers Integrate Electronic Recording Systems into their Farming Business

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The Herbert Integrated Farming Group is not a partner, joint venturer, employee or agent of SRDC and has no authority to legally bind SRDC, in any publication of substantive details or results of this Project.

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Executive Summary

The use of timely and accurate records can improve farm profitability through the evaluation of past, current and future performance of the business. Electronic farm management records are relatively new for the sugar industry and in many cases the value of this information is yet to be successfully demonstrated to growers. This project provided growers with an opportunity to integrate electronic record keeping into existing farming businesses and evaluate the values of farm management records. The grower group consists of 15 businesses, representing a combined total area of over three thousand hectares of sugarcane farming land. Group participants had a spread of computer and record keeping skills ranging from nill to very tech savvy.

A thorough process was utilised to select an appropriate program for the duration of the project (January 2010 – December 2011). This involved a review of the most widely used ‘of-the-shelf’ record keeping products in agriculture, with emphasis on the sugarcane industry, and then narrowing down to three products of preference for the group. In order to make an informed decision, the group utilised several sources of information. This included contemporary literature on each program, demonstrations with each of the product agents, a group field study and development of a decision table to assist group members with the final selection. Final selection of the program was decided through a group vote, with Farm Works receiving the majority of votes. The group proceeded with purchasing the software and hardware and successfully implemented the electronic record keeping system into their existing cane farming business.

The grower group project delivered a strong focus on people development through improved knowledge and experience in using electronic records for farm management purposes. In many cases, the growers involved were not accustomed to keeping electronic farm management records, therefore this project provided a significant step forward from existing manual / paper based record keeping. Over the course of the project, the level of electronic record keeping increased significantly and a greater array of records are now documented by grower group participants. This project demonstrated that electronic record keeping represents the future in optimising the management of contemporary sugar farming enterprises.

Many of the group members have embraced the technology and are now looking at alternate applications within their respective business. That said producers with a lesser affinity for technology and/or complexity of the system have struggled with its application. Not all grower group members will continue to use the Farm Works program beyond the life of the project. This is largely a function of some of the co-operating producers struggling with the technology and its applicability to their specific farming operations. This reinforces the need for each grower to consider which type of record keeping system will best suit their needs before implementing a change. Only with appropriate training and support will a new district & industry norm be established. With the variety of packages available to producers, the broader industry also faces the challenge of establishing a common set of parameters that can be recorded in each district and the ability to share information between systems. Achieving consistency in this regard, would greatly enhance the ability for cross regional and industry wide assessments

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1.0 Introduction

The use of timely and accurate records of farming management can improve farm profitability through the evaluation of past, current and future performance of the business. A survey of cane growers conducted by the Department of Primary Industries & Fisheries (now the Department of Employment, Economic Development and Innovation) across the Burdekin and Herbert districts in 2006 identified the need to improve farm record keeping in the sugar industry. Apart from the benefits to farm profitability, accurate farm management records are becoming increasingly important for environmental reasons and will assist the cane industry in addressing community and regulatory concerns on issues such as fertiliser and chemical use.

The use of electronic farm management records is relatively new for the sugar industry and in many cases the value of this information is yet to be successfully demonstrated to growers. This project provided growers an opportunity to integrate electronic record keeping into existing farming businesses and evaluate the economic, environmental and social benefits of keeping and analysing farm management records.

1.1 Project Aims

The project aims were to:

- Review various electronic farm management recording systems for suitability for cane growing businesses;
- Select and implement an electronic farm management recording system using real farm data;
- Discuss and interpret farm management data to improve profitability, environmental and social outcomes;
- Enhance the suitability of an electronic recording system for the sugarcane industry in order to meet grower and regulatory requirements;
- Promote the use of farm management records in the sugar industry through media publications, training and demonstration of practical relevance;
- Establish linkages with growers in other regions to share information on farm management recording systems and;
- Improve grower knowledge of sound business management principles.

1.2 Economic Aims

The economic aims of the project were to:

- Identify areas for financial improvement within a business through an assessment of past performance and comparative analysis with other similar businesses;
- Lower input costs through the development of tailor-made fertiliser and chemical programs for each grower based on historical data and recommended best practice guidelines;
- Access real-time information to improve the timeliness of management decisions and enable a better utilization of farm resources and;
- Demonstrate that electronic records will streamline the recording and interpretation of data, saving time and money for the business.

1.3 Environmental Aims

The environmental aims of the project include:

- Improved recording of fertiliser and pesticide use (purchase, storage, application timing and rates), leading to best management practices that align with industry and regulatory requirements and;
- Improved access to past data, which will facilitate the adoption of an improved planning cycle 'plan, do, check, review'. Using this cycle, management decisions are proactive and lead to optimisation of the farming system.

1.4 Social Aims

The social aims of the project include:

- Improved adoption and capacity building within the group and industry;
- Greater interaction between growers on farm management issues;
- Increased likelihood of change through first hand participation;
- Building stronger linkages between growers and extension staff through joint participation in the project and;
- Improved ability to comprehensively plan and manage farming operations, thus reducing stress related to farm management decisions.

2.0 Methodology

The Herbert Integrated Farming Group consists of 15 business units and has approximately 3000 hectares of sugarcane farming land between them. Five group members also own farm contracting businesses that include harvesting, planting, spraying and cultivation operations which cover an additional 4000ha of farming land in the Herbert region. Group participants have a diverse range of skills in computers and record keeping. Participating growers were surveyed at the beginning and end of the project to profile business characteristics, gauge capacity building and provide feedback on farm management record keeping (Appendix D).

A steering group was formed to provide support to the grower group in meeting facilitation, report writing and communication of results to the grower group. The steering group consisted of Mark Poggio (DEEDI – Project Coordinator and Reporting), Mark Whitten (DEEDI), Lawrence Di Bella (HCPST), Michael Waring (Terrain), Adam Royle (BSES), Ash Benson (BSES), Raymond Delai (HRIC), Jeff Cantamessa (Canegrowers) and Peter Larsen (Sucrogen). The project steering group was actively involved in organising activities with the group members and administering the project budget and reporting requirements.

The project activities undertaken were:

- 1) Group field study to investigate the use of electronic business management records.
- 2) Review of current electronic farm management systems (pro's & con's).
- 3) Selection, acquisition and installation of a farm management recording system.
- 4) Training and support from the software provider.
- 5) Collection of farm management data relevant to each farming business over the project period.
- 6) Steering group meetings to facilitate the project and assist in report writing and undertake project evaluation.

- 7) Production of farm management reports from analysis of the data collected to improve farm decision making and improve profitability.
- 8) Provision of feedback to product agent on positives and negatives associated with the system and facilitate enhancements of the software to meet the cane industry and regulatory requirements.
- 9) Communication of findings to the wider industry.
- 10) Interactive demonstration of the electronic recording system.

3.0 Results and Outputs

3.1 Group Field Study

A field tour was held on the 18th and 19th of February 2010. The aim of the tour was to focus on how management records can add value to a farming business and to examine the various commercial electronic systems currently available to sugarcane farmers.

The group commenced with a visit to the Department of Environment and Resource Management (DERM) office in Townsville to discuss record keeping requirements under the Reef Protection regulations. During discussion with the DERM staff, grower group members identified the benefits of electronic records in streamlining the record keeping process and providing information for the Queensland Governments Reef Protection Regulations (Strict Requirements & Environmental Risk Management Plans (ERMP)). The group identified that some of the existing electronic record keeping systems were limited in their ability to meet the Reef Protection regulatory requirements for fertiliser and herbicide records.

Following the meeting with DERM, the group visited the Townsville Bulk Sugar Terminal. The sugar terminal staff provided an interesting insight into the use of electronic systems in other forms of business and highlighted the importance of accurate records and procedures for export sugar. The group also visited Emu Exports, a Mango farm approximately 15km south of Townsville. Although this business is not sugar industry related, it provided a good opportunity to re-enforce the importance of record keeping in all forms of business and examine record keeping methods in another agricultural industry.

Valuable information was also gained during the group's visit to sugarcane producers, Paul Willis, Dennis Pozzebon and Terry Granshaw in the Burdekin area who are using electronic record keeping for farm management purposes. Each grower provided an excellent overview about electronic record keeping based on their own experience. Local Burdekin sugarcane farmers Mark Rossato and Joseph Magatelli also joined the field tour group during the Burdekin grower visits.



Figure 1. Pozzebon's Farm – Burdekin



Figure 2. Villis's Farm – Burdekin

3.2 Review of Record Keeping Systems

A 'Decision Table' (Appendix A) was developed in March 2010 to assist the group select an electronic record keeping system to use during the project period. The criteria used in the 'Decision Table' were based on information collected during the group field tour, meetings and demonstrations held with product agents, a literature review and sugar industry expert consultation. At present there are numerous products available for electronic record keeping for the sugarcane industry and it is critical that each grower consider which system will best suit their needs. A thorough process was utilised to select an appropriate program for the duration of the project. The review included the most widely used 'of-the-shelf' record keeping products in agriculture, including the sugarcane industry, and then narrowing down to three products of preference for the group. Using the 'Decision Table' the group evaluated the three major product providers: Farm Works, Fairport and Back Paddock.



Figure 3. Farm Works Demonstration



Figure 4. PAM demonstration

3.3 Selection and Acquiring Record Keeping System

A vote was conducted by the grower group to determine which record keeping system to use during the project. The Farm Works program received the majority of votes and the group then proceeded to acquire the software. During the purchase of the software, the grower group negotiated with the software agent that the software be modified to meet Reef Protection regulation requirements. The modifications requested included the ability to record:

- 1) Total amount of active ingredient used;
- 2) Weather forecast

- 3) APVMA number
- 4) Work orders to display farm number and field number, and
- 5) Rain fast period for chemicals.

At this point in time, the software modifications have not been provided.



Figure 5. Selection of Software Meeting

3.4 Set-Up, Training and Installation

The first training session was delivered by Martin Peters (Farm Works Agent) at the Herbert River Canegrowers conference room on the 1st of June 2010 (Figure 6). The training session provided group members with a quick overview of the Farm Works program. Each grower had a laptop computer with a pre-loaded copy of the Farm Works software. Farm maps and soil maps, along with commonly used fertiliser and chemicals products, were also loaded into the Farm Works program prior to the first training session. At the end of the training session each group member received a copy of the Farm Works program and hardware accessories, including the Trimble Juno, a Personal Digital Assistant (PDA) computer for making records while in the paddock. The pre-loading of critical information assisted growers in entering data and provided relevance to their individual farm situation. A delay in running the first training session caused some farmers to have very little time to practice using the software before seasonal work commenced. Ideally, the initial set-up of equipment and first training session would have been conducted earlier and this would have allowed time for a follow up training session prior to the sugarcane season commencing. Feedback from the group indicated that the training session should have only focused on set-up of equipment and basic data entry. Many of the growers experienced difficulties in installing the software on their home computer and issues with using the PDA for making records in the paddock. Subsequent training sessions and individual farm visits by Martin Peters solved many of the initial set-up issues. Several other smaller group meetings were also held to enable growers to share ideas and solve issues with using the electronic record keeping system.



Figure 6. Set-Up & Training Session

3.5 Data Collection and Focus Meetings

The grower group identified five main stages in the collection of electronic data, these were:

- 1) Set-up of hardware and software
- 2) Training & development
- 3) Recording data
- 4) Farm management reports
- 5) Maintenance & review

Each of these stages is equal in importance and if one of the stages is not completed the value of each grower's electronic data is significantly diminished. Each stage may not occur in successive order and in some instances, several stages may occur concurrently. A list of the grower group achievements is outlined below.

- 1) Set-up of hardware and software
 - ✓ Hardware and software was functioning properly for each grower on a personal computer and/or personal digital assistant (PDA).
 - ✓ All growers initiated the program setup process; with farm maps, chemical & fertiliser products entered into the program. Approximately seven out of the fifteen growers have also entered in farm machinery items.
- 2) Training & Development
 - ✓ Three training sessions were completed with the product agent over the project period. Between 10 -14 growers participated in each training session.
 - ✓ Ongoing telephone support was provided by Martin Peter's (Farm Works Agent) to assist growers with technical issues.
 - ✓ Focus Meeting's were held to assist growers with individual needs.
 - ✓ Discussions were held with the Herbert Resource Information Centre (HRIC) to determine how farm level electronic records and the HRIC Geographic Information System (GIS) may add value to each other. Members of the grower group are also involved in a HRIC project focusing on district wide record keeping.



Figure 9. Focus Meeting



Figure 10. Adrian Chinotti displays his farm records to the grower group

- 3) Recording Data
 - ✓ Nine out of the fifteen growers are actively using the electronic record keeping system since the software was received in June 2010.
 - ✓ Six growers have indicated that they have viewed Farm Works on several occasions in order to familiarise themselves with its operation, however minimal production data was recorded. The rationale for this is expanded upon in Section 4.
 - ✓ During the project, the grower group reviewed the project strategy and decided to form small sub-groups within the larger grower group which met on a regular basis to share ideas and solve user problems. The sub-groups were based on geographic location of the growers and in addition an advanced user of the program attended each meeting.

- 4) Farm Management Reports
 - ✓ Five grower group members have collected enough data to develop a farm management report on chemical and fertiliser application.
 - ✓ Appendix B contains an example of the farm management reports developed.

- 5) Maintenance and Review
 - ✓ A software update was provided to each of the grower group members.
 - ✓ An advanced user within the group has agreed to provide training and support to other group members; this will allow local support to be provided beyond the life of the project.

3.6 Benefits, Limitations and Feedback to the Manufacturer

Information on the benefits and limitations of using electronic records and Farm Works was identified and recorded by grower group members during the project. The feedback was provided to Martin Peters (Farm Works Agent) in order to provide feedback on using the electronic record keeping system and to enable improvement in future training and software development. It has been requested that the feedback be passed to Farm Works software developers to enable a more

sugarcane friendly version. Table 1 outlines the main steps undertaken in the implementation process of the electronic recording system and the benefits and limitations experienced by the grower group.

Table 1. Electronic Record Keeping - Benefits and Limitations

System Implementation	Benefits	Limitations
Review & selection of electronic recording system by grower group members	<ul style="list-style-type: none"> • Farm Works rated quite well across the selection criteria developed by the grower group (refer to Decision Table Appendix A) • Farm Works is widely used in agriculture for keeping farm management records in sugarcane. • Farm Works is owned by Trimble, a large United States based company. Farm Works software is fully integrated with the Trimble FMX GPS system • Farm Works covers many crops and livestock. • Farm Works is competitively priced compared to other programs investigated. Off-the-shelf product and can be used for other crops / livestock. • Grower retains ownership of data collected – adds value to the business. Stand alone system, not reliant on other third party systems 	<ul style="list-style-type: none"> • Each system reviewed by the grower group had advantages and disadvantages and selection is largely dependant on individual preferences. • Although the Farm Works program was selected by the group, other programs appeared to be excellent products. • No local sales and service exists for the Farm Works product and many of the other products reviewed. • Farm Works programmers are located in the United States and therefore have limited understanding of Australian sugarcane requirements. • Farm Works is not specifically designed for the Australian sugarcane industry. • Information is not centralised across industry. The ability to share information between industry systems needs to be further investigated.
Set-up of hardware & software	<ul style="list-style-type: none"> • Farm Works agent assisted in setting up the hardware and software on grower's personal computers and/or personal digital assistants (PDA's), therefore streamlining the process. • The pre-loading of farm maps, common fertiliser and chemical products and soil maps by the Farm Works agent assisted growers in learning how to use the product. • The ability for Farm Works to be set-up on a personal computer and PDA allowed grower's to enter data either in the office or field. Software can 	<ul style="list-style-type: none"> • The initial set-up of hardware and software requires a fair amount of time. • A training session (within two weeks) following the initial set-up of hardware and software meeting would have enabled growers to use the system earlier. • The set-up of block numbers to correspond with the mill block numbers is difficult, due to the block numbers changing. Specific guidance on how to deal with this issue is required and needs to be made clear to the user. • The operation of the Farm

	<p>be placed on a windows based mobile device.</p> <ul style="list-style-type: none"> • Farm Works software updates are provided as part of a service plan. 	<p>Works on a personal computer is different to the PDA, therefore adding to the complexity of learning how to use the system. In retrospect, focusing on the personal computer software first may have been a better option.</p>
Training, Backup & Support	<ul style="list-style-type: none"> • Group training sessions allowed for greater information sharing and lowered the cost of training per individual. • Individual farm visits provided grower group members with an opportunity to receive some tailored advice. • Farm Works software comes with a standard 30 days of support (telephone & e-mail). • A 12 month support combo plan (telephone & e-mail + updates) is available for a service fee. • Service, support and training provided by Farm Works Agent was to a good standard. 	<ul style="list-style-type: none"> • Due to project timelines and hardware delays, the timing of the first training session was not ideal. A greater lead up time and additional training prior to commencement of the sugarcane season would have been preferred. • No local sales and service exists for the Farm Works product and many of the other products reviewed. • Group training sessions can be difficult to facilitate because of participants being at different stages in using the system. Group training sessions should only focus on a 2-3 topics key topics that have relevance to all participants.
Recording data	<ul style="list-style-type: none"> • Ease of retrieving information saves time. • Grower group members using the electronic recording system have found it quick and easy to record data. • Farm management reports can be developed with the click of a button. • Eliminates the need for paper based records. • Ability to interact with other systems (eg. GIS, GPS etc). • Data can be backed up easily to an external hard drive or memory stick. 	<ul style="list-style-type: none"> • The terminology used can be difficult to understand. • Farm Works and other of-the-shelf programs have a more dominant broad-acre cropping focus. • Program can be confusing to use if not used continually (seasonal use in sugarcane). • Information sheets on basic record keeping operations (chemicals & fertiliser) would be useful for the user.

On balance the Farm Works program was selected on the basis that it met the greatest number of key attributes required by the grower group members. The key attributes are outlined in the 'Decision Table' (Appendix A).

3.7 Communication and Publications

A project presentation was delivered to over 200 industry people during the SRDC Regional Workshops in Ayr, Bundaberg, Isis and Broadwater (Figure 1). Grower group members Serge Figuera and Adrian Chinnotti also completed a presentation and demonstration of the Farm Works software during the HRIC conference on the 19th of August at the Tyto Wetlands Conference Centre. Over 50 people attended the workshop. A media article was also placed in the Queensland Country Life outlining the grower group project and objectives (Appendix C).

Several inquiries have also been made from other regions (Burdekin & Mackay) looking at doing a similar project to encourage the use of electronic records.



Figure 1. Project Presentation (Serge Figuera & Mark Poggio)

4.0 Capacity Building

The project encouraged participation from all members of the business unit (e.g. business partners and family members) and provided an opportunity to integrate electronic record keeping into their existing farming businesses. The grower group project delivered a strong focus on people development through improved knowledge and experience in using electronic records for farm management purposes. In many cases, the growers involved were not accustomed to keeping electronic farm management records, therefore this project provided a significant step forward from existing manual / paper based record keeping systems. Group members were very effective at completing each of the developed work plan items and allocating activities amongst the members in order to share the project work load.

The implementation of accurate farm management records also assisted growers with the following capacity building outputs:

- Individual farmers now have the ability to accurately assess their farming system and identify areas for improvement;
- Greater communication between growers on business management and farming system practices leading to improved profitability;
- Farm advisers will have access to more accurate and detailed information on grower practices allowing for the development of tailored advice for each client;
- Provide information to the sugar industry on the effectiveness and value of electronic farm management records and;
- Build knowledge capacity on sound business management principles.
- Better positioned to address Reef Regulations (Strict Requirements and ERMP)

A survey conducted at the beginning and end of the project also provide a useful insight into the improvement in grower knowledge of farm management records over the course of the project. At the beginning of the project, all growers surveyed were using a paper based form of record keeping for their farming business. In less than two years, over 55% of the group is now using electronic record keeping on their farm (Figure 11). The level of documented records kept for farm management has also increased over the course of the project, with increases in documented records for all types surveyed (Figure 12). It is important to note that the introduction of Reef Regulation in the sugarcane industry is likely to have impacted on the level of some records kept (e.g. Chemical & Fertiliser).

Figure 11. Electronic and Paper Based Records

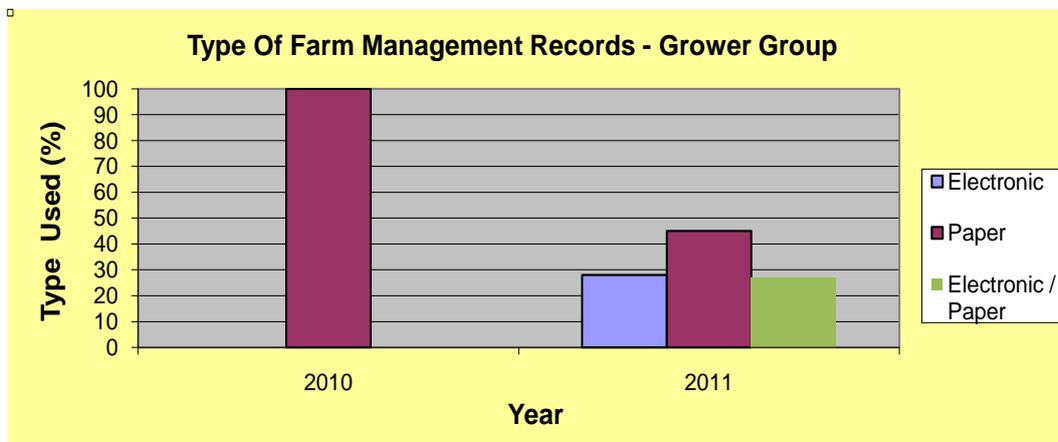
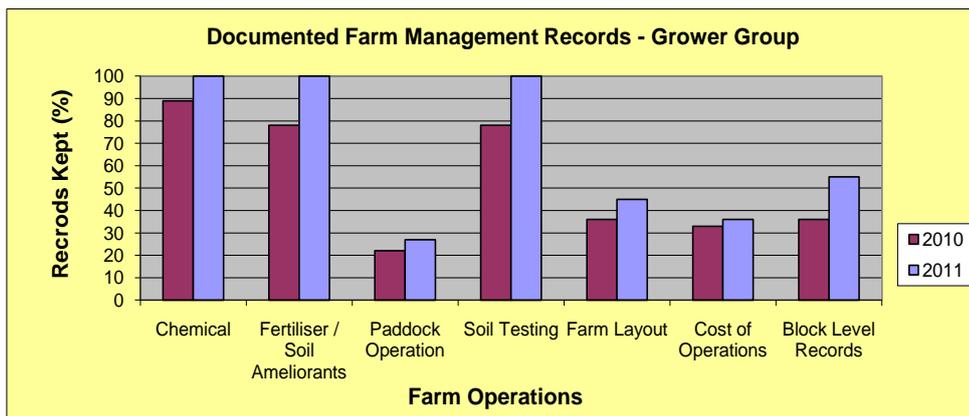


Figure 12. Documented Farm Management Records



5.0 Outcomes

The project has provided growers with an opportunity to gain a better understanding of electronic farm management records. Over the course of the project, the level of electronic record keeping has increased and a greater array of records is now documented by grower group participants. As anticipated at the beginning of the project not all grower group members are likely to continue using the Farm Works record keeping system, some may revert back to paper based records and others may investigate a different form of electronic record keeping.

One of the major issues identified by the group was the time and skills required to operate the Farm Works program. Many of the group members have a low to moderate level in computer skills and therefore a longer period of time is required to learn the skills required to operate the Farm Works program. Some grower group members have also expressed problems in using the software because of the terminology used and a more dominant focus on broad acre cropping. Although these issues can be overcome, it has made the adaptation to sugarcane farming business a little more difficult and time consuming. Despite these limitations, many of the grower group members will continue to use the Farm Works program and have initiated additional training beyond the life of this project to overcome these problems. To assist in this process, a grower group participant who is now an advanced user of Farm Works has agreed to assist other grower group participants with using the system.

Over the course of the project, grower group activities were well attended and networking between growers on farm management issues was a beneficial component of the project. The project has also sparked interest from other regions and highlighted the importance of accurate farm management records. Some of the growers involved in this project are also involved in another project being undertaken by the Herbert Resource Information Centre (HRIC). The knowledge and experience gained from this project has helped shape the HRIC project which focuses on region wide records and utilisation of GIS data, with the potential to share information between electronic recording systems. Grower group participants were also actively involved in promoting the project with presentations to over 200 growers across four different regions in the Australian sugarcane industry.

6.0 Environmental Impact

The group anticipates that the use of electronic records will improve farm management decisions, with the most immediate benefits being realised in optimising chemical and fertiliser management. It is expected that accurate and readily accessible management records will lead to environmental benefits through a more efficient use of farm inputs. Improved recording of fertiliser and pesticide use (purchase, storage, application timing, rates and block history) will encourage best management practices and align to Reef Regulation requirements, minimising the loss of agricultural pollutants (sediment, nutrient and chemicals) to sensitive downstream receiving environments. Improved access to past data will facilitate the adoption of an improved planning cycle 'plan, do, check, review'. Using this cycle, management decisions are proactive and lead to optimisation of the farming system.

8.0 Project Recommendations

Findings from this project are directly relevant to every grower in the industry and provide an insight into the issues to consider when selecting and implementing an electronic record keeping system. The key recommendations developed from this project include:

- The development of standard / industry endorsed parameters for electronic record keeping would go along way to improve functionality (irrespective of the systems and package used), whilst also ensuring better linkages and sharing of information, with specific reference to GIS spatial information layers. The myriad of products on the market are confusing for producers and ultimately have the potential to create a degree of inconsistency within districts and across the industry.
- Dedicated training and support services are required for high levels of uptake and direct functionality / applicability to individual farming systems and operations. This will obviously carry a resourcing implication for relevant service bodies and supporting organisations / partners
- The development of documented guidelines and greater transparency around operating standards for ownership and confidentiality of the data between industry stakeholders. This is especially important when considering the use of a centralised system / data repository and the sensitivities of the data in the new regulated environment.
- Continued promotion and practical demonstrations by industry stakeholders and development of structured training and support programs. Ultimately this is the future for the industry, particularly when viewed against other technological innovations occurring within the Industry (GPS, Spatial Imagery, Precision Ag etc).

APPENDIX A – ANALYSIS OF PACKAGES AND SYSTEMS AVAILABLE

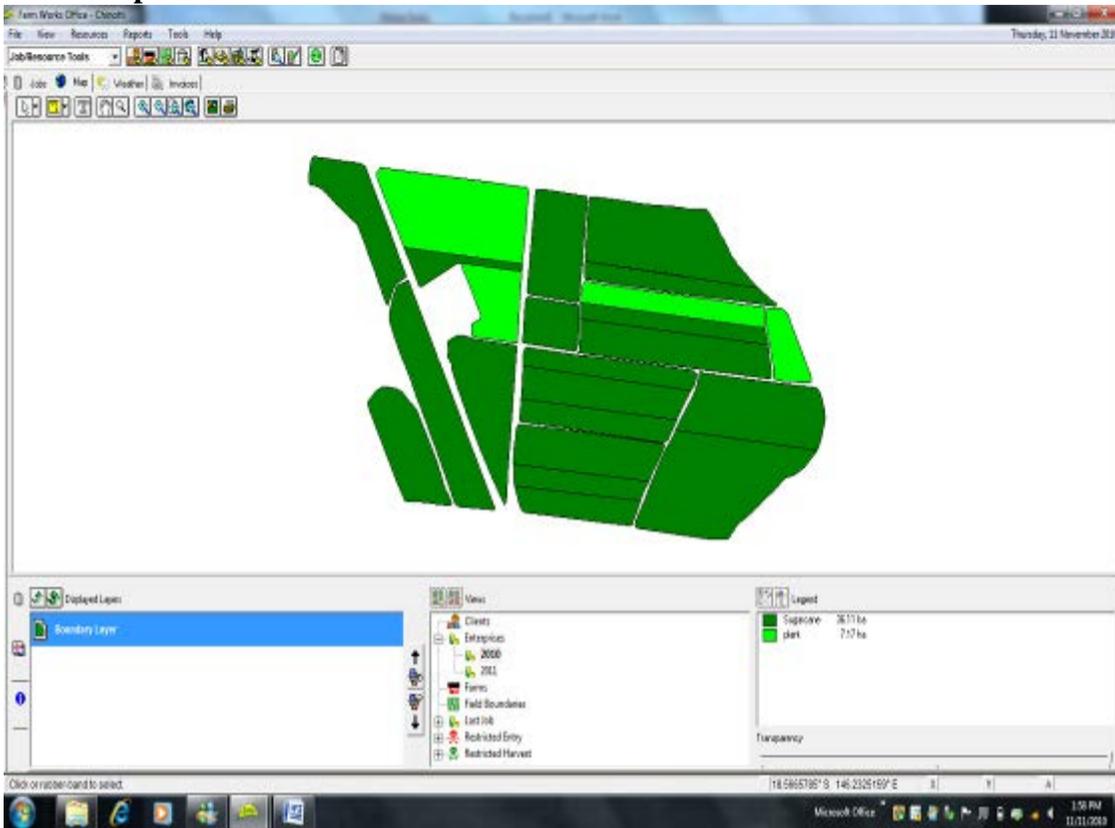
Options investigated for the recording system project (as at March 2010)

	Fairport	Farm Works	Back Paddock
Estimated cost of software	PAM QA Plus + Mapping \$1914 (standard record keeping and basic farm mapping) PAM FarmStar \$3058 (precision mapping) PocketPAM \$440 (record keeping in field) #software runs of windows	Farm Trac \$385 (standard record keeping system) Farm Site \$616 (add layers & precision mapping) Tract Mate \$385 (record keeping in field) FarmFund \$616 (financial and inventory) #software runs of windows	Manager Program - Annual fee of \$660 AgWorld (pen software) – Annual fee of \$709
Estimated cost of hardware	Home computer: Desk top PC \$1500 Possible mobile device options with GPS: iPAQ 212 \$989 Trimble Juno \$1550 Toughbook laptop \$6500 Back up system: 16GB memory stick \$60 Back up external hard drive \$150	Home computer: Desk top PC \$1500 Possible mobile device options with GPS: iPAQ 212 \$989 Trimble Juno \$1550 Toughbook laptop \$6500 Back up system: 16GB memory stick \$60 Back up external hard drive \$150	Home computer: Desk top PC \$1500 Digital Pen (Hardware) + Stationary \$625 Back up system: 16GB memory stick \$60 Back up external hard drive \$150
Licensing fees	No annual licensing fees. Fees are required if you wish to update the version of software you are using (refer to product service & support). Site licenses of PocketPAM are \$330.00 (additional mobile devices). Site licenses of the PAM software are 15% of the cost of the software (additional copies on Desk top).	No licensing fees at present. Fees are required if you wish to update the version of software you are using (refer to product service & support).	Refer to cost of software section.
Software updates & cost	Generally minor updates throughout the year. Major updates are usually done as they become available.	Generally minor updates throughout the year. Major updates are usually done annually.	Generally minor updates throughout the year. Major updates are usually done annually.
Ease of use of software	Good. User interface is well laid out and entry of records is streamlined. Reporting system is excellent.	Good. Reporting system is excellent.	Good. Reporting system is excellent. Ability to make records similar to a manual hand written recording system.
Product service and support	Main agent is based in Brisbane. Six months support service is included on purchase of software (telephone & e-mail). 12 month support service (telephone & e-mail + updates) is 10% of software cost.	Main agent is based in Victoria. All software comes with a standard 30 days of support (telephone & e-mail). 12 month support combo plan (telephone & e-mail + updates) \$360	Main agent is based in Brisbane. Telephone and e-mail support is included in the annual fee.
Compatibility with tractor GPS (auto-steer systems)	PAM is compatible with Trimble, Green Star, Autofarm and AgGuide – ability to import shape files as map layers.	Farm Works is owned by Trimble. Farm Works software is fully integrated with the Trimble FMX GPS system. The level of functionality varies with other type of Trimble GPS systems. Data can also be transferred from Green Star, Autofarm and AgGuide (limited capacity for recording using AgGuide) into the Farm Works system.	Back Paddock is compatible with Trimble, Green Star, Autofarm and AgGuide – ability to import shape files as a map layer.
Ability to integrate mapping from HRIC / HCPSL	Okay in shape file format.	Okay in shape file format.	Okay in shape file format.

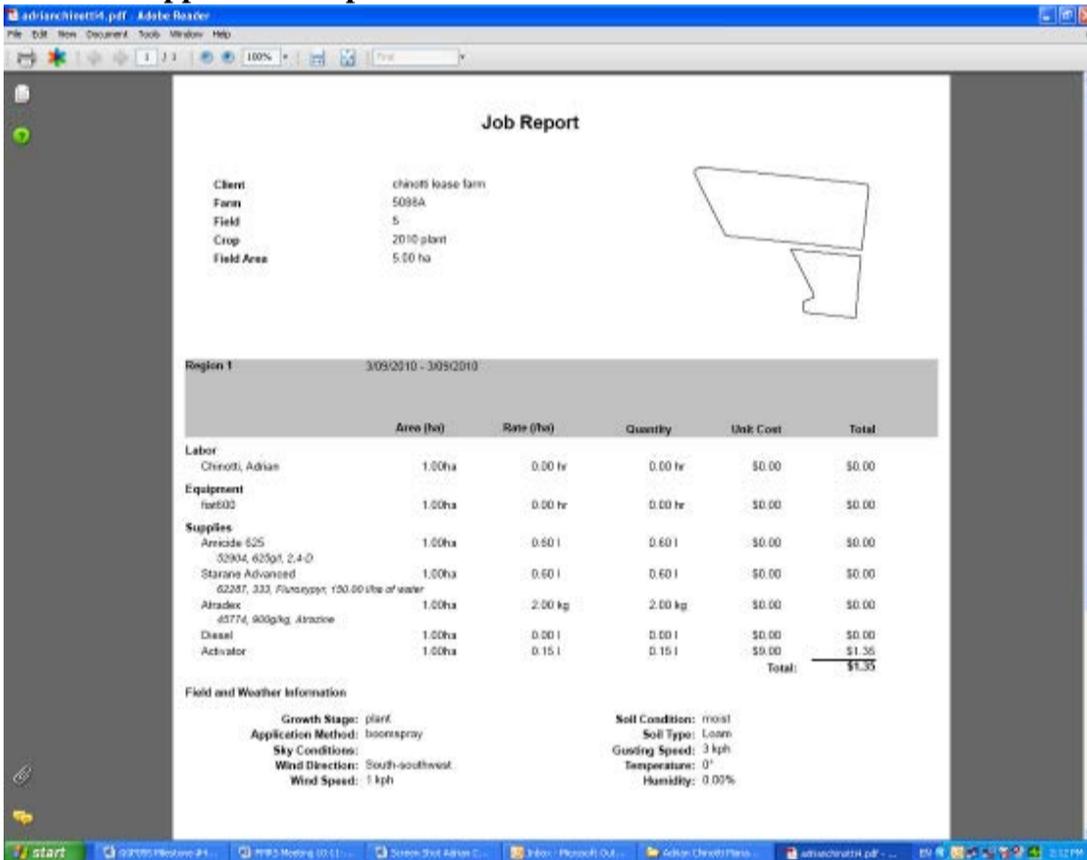
Suitability to a sugarcane farming system and legislative requirements	Generally well suited to the sugarcane farming system. System meets Reef Regulation recording requirements. Chemicals can be downloaded from internet (Infopest). PAM system also contains a chemical storage register as standard.	Generally well suited to the sugarcane farming system. Some minor changes are required to meet all the current record keeping requirements for Reef Regulation (eg. 48hr weather forecast, total amount of active ingredient used). Chemical storage register is not included in the Farm Trac version.	System requires forms to be developed to allow entry of information using the electronic Pen. Forms will be tailored to suite sugarcane farming system. At the moment the program is not able to do a crop cycle report. Back Paddock system also contains a chemical storage register as standard.
Has a capacity to include financial information	PAM comes with a detailed financial analysis as part of the PAM QA Plus + Mapping software. Financial information is based on entered machinery costs and inventory records entered in at the time of purchase. PAM is not an accounting program (not compatible with solution 6, Quicken & MYOB).	Basic gross margin information can be entered into standard Farm Trac version based on price per unit figures entered into the program. The purchase of Farm Fund\$ is required to obtain more detailed financial information based on entered machinery costs and inventory records entered in the time of purchase. Farm Fund\$ is not an accounting program (not compatible with solution 6, Quicken & MYOB). Farm Fund\$ includes a chemical storage register.	Basic gross margin information can be entered into the program. Back Paddock is not an accounting program (not compatible with solution 6, Quicken & MYOB).
Ease to back up data	Data can be backed up easily to an external hard drive or memory stick. A prompt is displayed on exiting the program to make back up of your data. Ability to transfer data to other recording system programs if the need arises.	Data can be backed up easily to an external hard drive or memory stick. A prompt is displayed on exiting the program to make back up of your data.	Data can be backed up easily to an external hard drive, memory stick or AgWorld.
Mobility of the program in the field, type of mobile device (laptop, PDA etc) and ease of use.	Software for a mobile recording system in the field is available. Software can be placed on a windows based mobile device. For example PDA, mobile phone and laptops.	Software for a mobile recording system in the field is available. Software can be placed on a windows based mobile device. For example PDA, mobile phone and laptops.	Records are kept using electronic Pen and forms or by direct entry into the program.
Ability to incorporate other crops	Covers many crops & livestock.	Covers many crops & livestock.	Covers many crops & livestock.
Current use of the software in the sugarcane industry and user feedback	PAM is a globally used system. Feedback from sugarcane users is positive (based on field tour).	Farm Works is a globally used system. Feedback from sugarcane users is positive (based on field tour).	Currently limited number of people using this system in the sugarcane industry.
Capability of the manufacturer to provide a product, updates and support in the future	Fairport is an Australian owned system (Perth) with programmers located in Australia. Fairport was established in 1988.	Farm Works is owned by Trimble, a large USA based company. FarmWorks has a large number of users across the globe and has established networks/dealers in Australia. FarmWorks programmers are located in USA.	Owned by Back Paddock. Australian owned company.
Contact details	Paul Olsen Ag IT 2-8 Serengetti Drive Munruben QLD 4125 Ph/Fax: (07) 3802 1458 Mobile: 0419 727 086 Email: paul@agit.com.au Web: www.agit.com.au	Martin Peters Farm Works PO Box 90 Meredith Victoria 3333 Australia Phone: 03 5286 1112 Mobile: 0417 823 965 E-mail: martin@farmworks.com.au Web: www.farmworks.com.au	Tom Cowrick BackPaddock Mobile 0409992407 Phone 1800557166 Email TCowrick@backpaddock.com.au

APPENDIX B – EXAMPLE OF MAPPING AND REPORTING

Farm Map



Chemical Application Report



Fertiliser Application Report

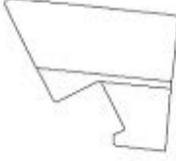
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Job Report

Client: chioroff lease farm
 Farm: 5026A
 Field: 5
 Crop: 2011 plant
 Field Area: 5.60 ha



Region 1: 2062010 - 2062010

	Area (ha)	Rate (t/ha)	Quantity	Unit Cost	Total
Labor					
Chioroff, Adrian	3.75ha	0.00 hr	0.00 hr	\$0.00	\$0.00
Equipment					
planter	3.75ha	1.00 ha	3.75 ha	\$135.00	\$506.25
internaional866	3.75ha	0.00 hr	0.00 hr	\$0.00	\$0.00
Supplies					
CR 66 S	3.75ha	344.00 kg	1.29 t	\$0.00	\$0.00
Diesel	3.75ha	0.00 l	0.00 l	\$0.00	\$0.00
				Total:	\$506.25

Field and Weather Information

Growth Stage: plant
 Application Method: baller planter
 Sky Conditions: Clear
 Wind Direction:
 Wind Speed: 0 kph

Soil Condition: Dry
 Soil Type: Loam
 Gusting Speed: 0 kph
 Temperature: 0°
 Humidity: 0.00%

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FUTURE FARMING

Herbert growers go high-tech

Electronic record-keeping boosts efficiency

HERBERT sugarcane growers are taking part in an innovative project that demonstrates the importance of record-keeping in making a farming business more efficient.

The Sugar Research and Development Corporation funded project involves 15 growers from across the Herbert. It helps farmers to move away from repetitive paper-based recording systems and adopt more efficient electronic recording systems.

A project steering committee, which includes the Department of Employment, Economic Development and Innovation (DEEDI), Herbert Cane Productivity Services Ltd (HCPSL), BSES, Sugarcorp, CaneGrowers, the Herbert Resource Information Centre (HRIC) and Terrain representatives, is steering the group.

DEEDI Agri-Science Queensland economist, Mack Poggio, who is the steering group coordinator said: "Good record-keeping is central to sound farm management."

"The use of timely and accurate records can improve farm profitability through the evaluation of past, current and future performance of the business."

"The use of a good record-keeping system will also help cane farmers comply with new regulatory requirements."

Talking about why he joined the project, Herbert cane grower Jeff Cornness said: "We've jumped to keep better records. It's always been a

big bear of the industry, because we haven't had to keep records."

"I want to use electronic recording software because it's a better way to organise records. Paper systems are messy, and it's time-consuming to go through past records. Electronic records are neat and easy to follow and eventually it will lead to more proactive, rather than reactive, decision-making."

Anthony Martin, a local grower, who is undertaking the project with his father Oratio, is another who is enthusiastic about the project.

"Before the project started, I had never used a PDA (personal digital assistant, or handheld computer)," he said.

"Now, I can be in the paddock with my spray rig, and record all my data on the spot – which makes complying with new weed regulations faster and more efficient."

The catalyst for the project began in mid 2009, when a group of Herbert-based growers identified the need to improve farm record-keeping in the sugarcane industry.

"With the help of SRDC's CaneGrow Group Innovation grant and local cane industry organisations, a group of central local growers got the project up and running," Mr Poggio said.

Since the project began in late 2009, the group has undertaken a rigorous product selection process which has involved a study group from the Bundaberg, several product demonstrations and group meetings.

Herbert grower and group member Adrian Coratti said: "The study was excellent, it allowed us to see what things other growers were doing in regards to electronic recording. There's a more size fit all sort of way great to see how they were making the software work for them. It's the same working within the group, members are spread all over the district, so you get the opportunity to see what different issues everyone has to tackle."

Having decided on a program, the group, with some technical help from FarmWorks agent Martin Peters, is also in the process of familiarising themselves with the program and getting it up and running for their farm. "Keeping it there with the project, training sessions and group meetings have continued to maintain momentum and allow vital information sharing."

Mark Whiston, Agri-Science Queensland Demonstration Farms project officer and steering group member said: "The training sessions and technical help from Martin have been critical to getting many of the members set up and driving the program in the right direction. So far, we have had one group training session. While the session helped members take some initial steps, it has really highlighted the need to have some one-on-one training, because while the program is the same, people's circumstances aren't. As a result, the next training session, in the September, will take a more personal one-on-one approach."



Oratio Martin takes his new PDA into the paddock.

As opposed to an individual implementing the system alone, the project has identified the strength in a group approach.

"For something like this the group way is the only way. It makes it more difficult if you're working alone. One of the big benefits, when we get everything up and running, is that through the experience of the group, we'll be able to help other growers who want to go down the path of electronic record keeping," Jeff Cornness said.

Anthony Martin agreed: "Working in a group is a good way of tackling it, because you're not on your own. If you're stuck with something there are

other group members who can help you out, alternatively, if they're having problems you may be able to help them out. Having that support is really important."

Mr Poggio said: "The use of electronic farm management records is relatively new for the sugar industry and in many cases the value of this information is yet to be successfully demonstrated to growers. If we can change this, it will be a huge benefit to the industry."

The project will finish in late 2011. For more information on the project, call DEEDI's Business Information Centre on 13 25 23.



MAXIMA 2

Precision Pneumatic Seed Drills



Investment in a seed drill is a key stage in any farm development. The KUHN range of precision seed drills has a wide choice of frame widths and equipment, so that users can adopt to different seeding conditions.

Its seeding component is designed for maximum comfort during operations: its ergonomic and easy to use adjustments have been particularly carefully designed.

Strong and extremely stable during work, it is the master component of MAXIMA 2 seed drills and ensures perfect seed positioning.

THE ART OF GOOD SOWING



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RCGH: The innovative Herbert group.

DEEDI's online aid for producers

QUeensland's primary producers only have to turn on their computers to access the most up-to-date information from the State Government on everything from farm irrigation to the latest sheep research.

The Department of Employment, Economic Development and Innovation's (DEEDI) website www.deedi.qld.gov.au has a range of online tools and interactive resources from which to choose, including e-newsletters, webinars, blogs and e-surveys.

DEEDI's Business and Industry Development group executive, Malcolm Lott, said the technologies had been specially designed and developed with primary producers in mind.

"DEEDI has committed to ensuring 50 percent of its services are online by 2012," he said.

"Over the past three years we have increased our capacity to deliver services online, making them more accessible particularly to our customers living in rural and remote parts of Queensland."

"This has also helped us to save an estimated \$1 million through the use of web conferencing and e-surveys, allowing us to invest in more programs."

Mr Lott said all of the programs encouraged rural and regional stakeholders to access and share important information with each other.

"We want to keep our clients up-to-date with the latest trends in farming and farm management practices in easy and convenient ways," he said.

For example, DEEDI has introduced a web-based tool, Crop Water Use (<http://cropwateruse.qld.gov.au>), which has been very popular since it was made available late last year.

"It helps users calculate the total water use of a crop based on growth variables such as location, planting dates, crop type and historical weather patterns."

Other online tools and interactive resources managed by DEEDI include:

animal breeding, marketing and business management. Visit www.leadingsheep.com.au

The Best Sheep blog provides information on the latest insect pest management issues and outbreaks affecting Queensland's grain-growing region. Visit <http://bestsheep.com.au/>

The Queensland Young Growers blog is for young vegetable farmers highlighting up-to-date research, upcoming workshops and events. Visit <http://qlygyounggrowers.wordpress.com>

The Most Profit Per Drop blog puts out highly responsive information to the cropping industry and other key stakeholders on research and extension activities. Visit <http://mostprofitperdrop.wordpress.com>

A glyphosate resistance toolkit enables growers and advisers to check the level of risk for developing glyphosate-resistant weeds on their farms

E-newsletters cover topics including plant and animal biosecurity, horticulture, forestry, field crops and fisheries. Subscribe direct at www.deedi.qld.gov.au

nqr.farmonline.com.au

APPENDIX D – PRE & POST PROJECT SURVEY RESULTS

HIFG Survey Results: Electronic Record Keeping Project

Comparison of March 2010 and December 2011 survey

Sample size 2010 = 9 Grower Group Participants
 Sample size 2011 = 11 Grower Group Participants

Figure 1. Enterprise Mix

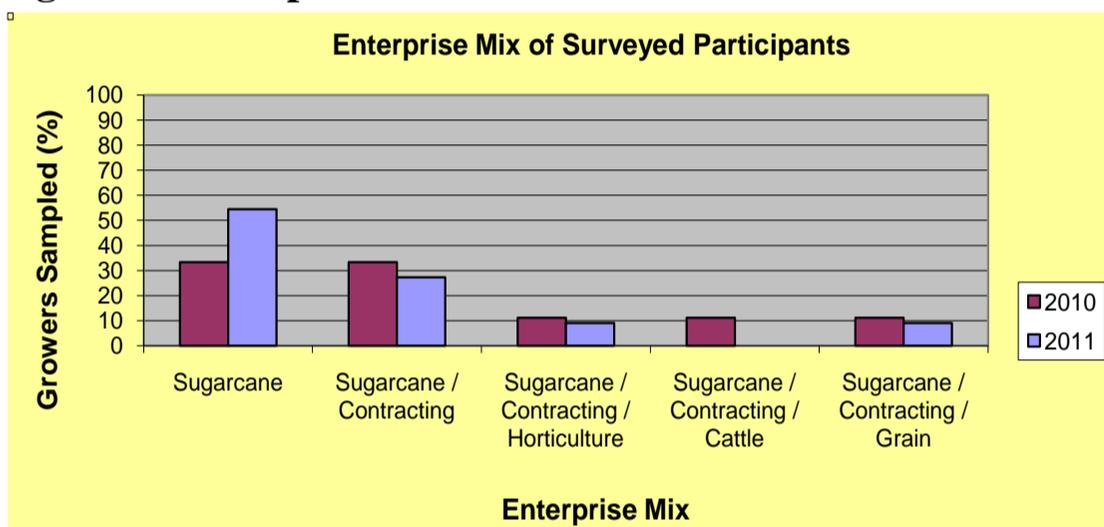


Figure 2. Farm Size

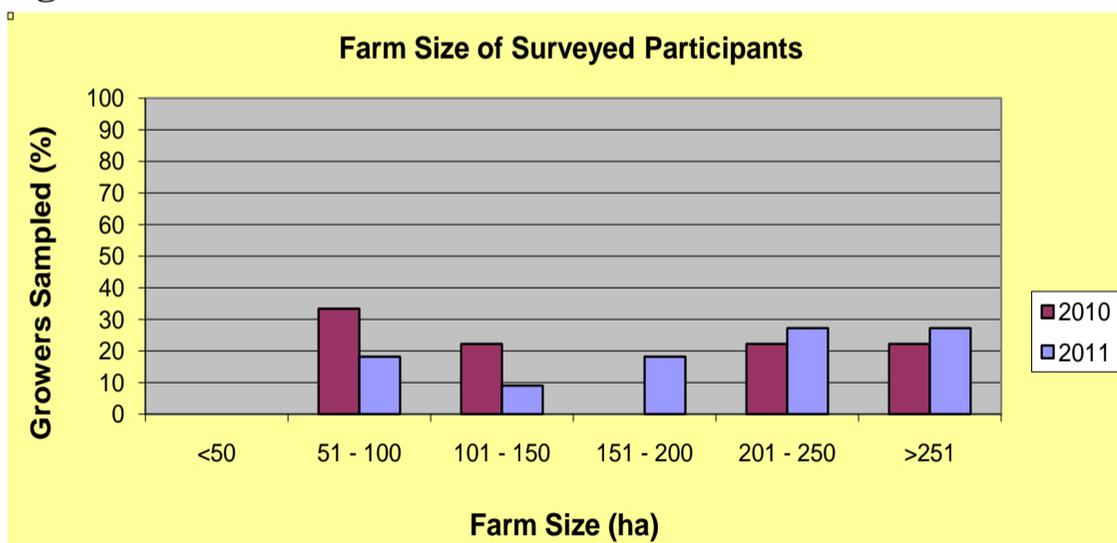


Table 1. Decision Making

Importance of information when making farm management decisions	Ranking (1 = most important)	
	2010	2011
Economic Impact	1	1
Environmental Impact	2	2
Lifestyle Impact	4	4
Farm Management Records	3	3

Figure 3. Documented Farm Management Records

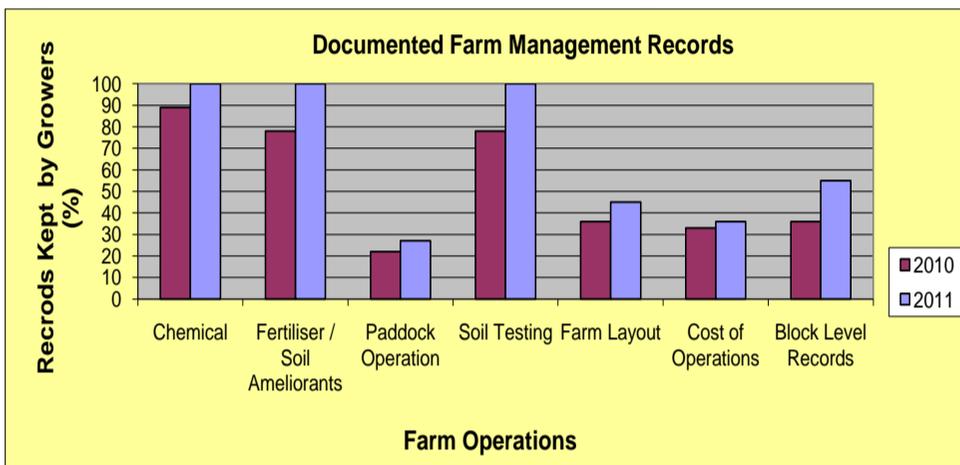


Figure 4. Electronic and Paper Based Records

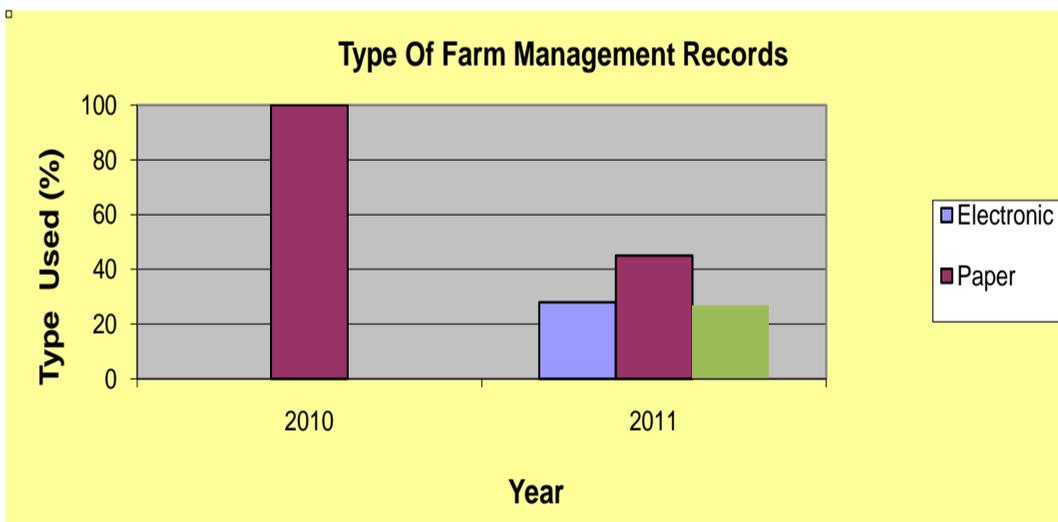


Table 2. Record Keeping Issues

What issues have you experienced in the past with keeping farm management records?	
2010	2011
<ul style="list-style-type: none"> • Time taken to keep adequate records. • Interpreting records when reviewing operations at a future date. • Records kept in various books which amount to a lot of paper work. • Difficult to keep the information together in one location. • Very labour intensive filling out records. • The need for one easy program that incorporates whole farm plan. • Farm block numbers do not remain consistent. With electronic records hopefully data will be transferred or re-aligned. Very time consuming. 	<ul style="list-style-type: none"> • Most electronic record keeping systems are not compatible with sugar industry methods. • Time constraints. • Need something to match sugarcane growing. • Difficult to get one-on-one technical support for the various electronic programs. • Time consuming. • Too much paper work in the past. Farm Works electronic recording is much easier if understood. • Had issues with the crop cycles in Farm Works for sugarcane.

Table 3. Selection Of System

What issues do you think are important when selecting an electronic farm management recording system?
<ul style="list-style-type: none"> • The ability for a system to suit individual requirements. Ease of access of data when reviewed in the future. • Simplicity, easy to use, cost effective and ability to interact with other operational systems. • Easy to use / user friendly, easy to integrate into existing computer system. • The main issue to consider is the cost of the system, both upfront and ongoing fees. The system also needs to be user friendly, simple to use and a good service agent. • Easy to use. Low ongoing costs. Needs to meet regulatory requirements. Compatible with current systems of mapping (HRIC) and GPS systems. • Easy to use, practical system and sugarcane specific. • Ease of use, cost, compatibility with GPS auto steer and variable rate systems. Must have a mobile form of software so data can easily be entered on the go. The ability to have stored data backed up on a file.

Figure 5. Perceived Computer Skill Level

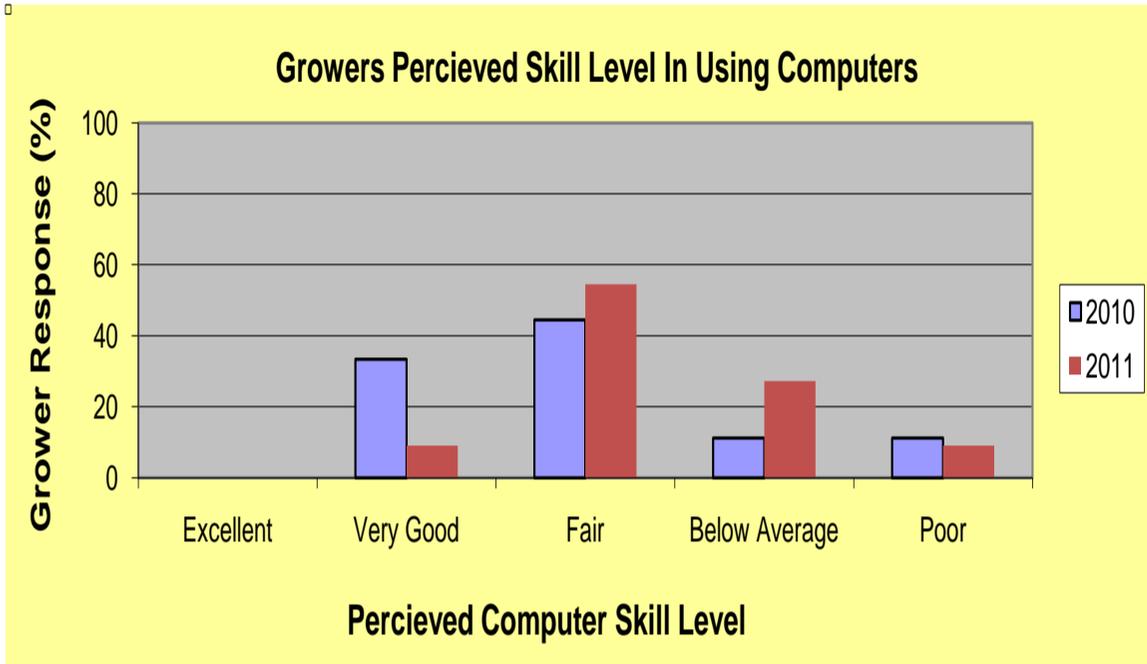


Figure 6. Rating of Farm Works Program

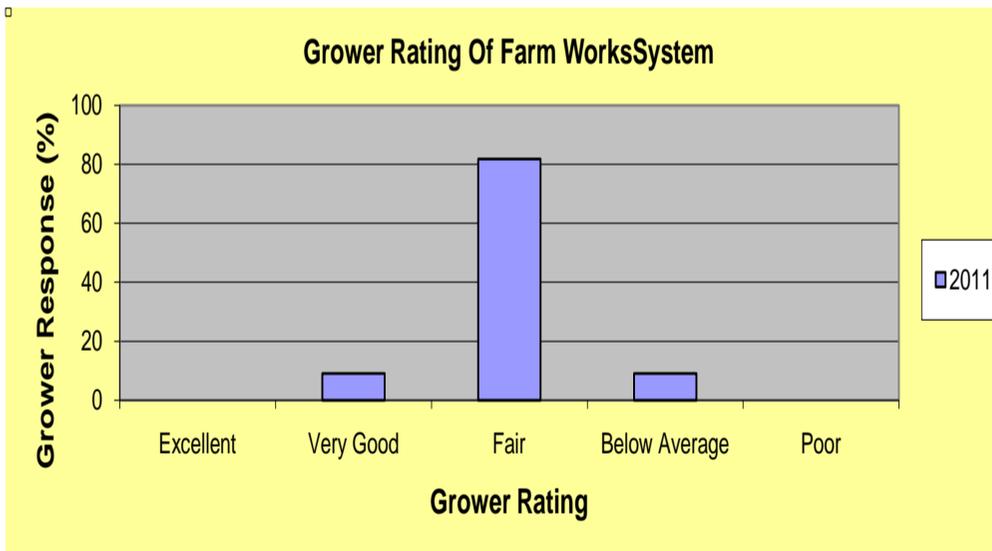


Table 4. Project Participation

What is the main reason for participating in the farm management recording system project?
<ul style="list-style-type: none">• To meet mandatory requirements and to improve farm management.• More accurate records.• To save time in record keeping.• To better my ability to keep farm management records.• To develop better record keeping reports, less paper work.• The main reason for participating: keeping regulated requirements and having somewhere easy to access records and details of farming practices.• To find an easier way to keep records and for fast retrieval of information.• We wanted to find a system that would make it easy to keep important information about our farm. The Farm Works program has potential.

Table 5. Capacity Building

How has the project improved your knowledge on farm record keeping?
<ul style="list-style-type: none">• Project has improved my knowledge of farm record keeping methods.• Yes it has improved my knowledge on record keeping. Easy to bring up reports and look at information.• My knowledge of record keeping has improved. I have tried to become more accurate with record keeping.• The project has improved my knowledge of farm record keeping.• I now have a better understanding of electronic record keeping and the issues that need to be considered.• This project has allowed me to try electronic record keeping. I found Farm Works too complicated for our needs and we will require more time to get accustomed to the system.