BUREAU OF SUGAR EXPERIMENT STATIONS

INDOOROOPILLY, AUSTRALIA

FINAL REPORT
SRDC PROJECT BSS238
Raising Awareness and Adoption of Sustainable Cane Growing Practices

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EXECUTIVE SUMMARY

In 1998, the Queensland sugar industry launched its *Code of Practice for Sustainable Cane Growing in Queensland* (CANEGROWERS, 1998). This important document helps growers understand how they can meet their 'duty of care' under the *Environmental Protection Act 1994* and was distributed to every canegrower shortly after its release. Grower focus groups met throughout the State a few months later to evaluate the Code and discussion highlighted that most growers felt the document contained common-sense recommendations on how to minimise risk of harm to the environment whilst still maintaining a profitable farming operation. However, further probing indicated that while growers agreed with the Code, many had not implemented the Code's recommendations on their own farms. It became obvious that a project to raise awareness and adoption of sustainable canegrowing practices, and in particular the Code of Practice, was needed.

In 1999, SRDC provided funding to conduct BSS238 *Raising Awareness and Adoption of Sustainable Cane Growing Practices*. The aim of the project was to raise awareness and adoption of sustainable canegrowing practices and, in particular, the *Code of Practice for Sustainable Cane Growing in Queensland*. More specifically, the project sought to:

- benchmark current levels of awareness and adoption of best practice recommendations contained in the Code (in Queensland) or in the New South Wales sugar industry's *Best Practice Guidelines for Acid Sulfate Soils* (Sunshine Sugar, 2000);
- develop a tool which would allow canegrowers to rank their current farming practices against the recommendations of the Code and other best practice documents and develop action plans to implement necessary changes; and
- give growers the opportunity to provide input into a review of the industry's Code of Practice.

A steering committee was established as part of this project to direct research and extension activities. This committee comprised representatives from BSES, CANEGROWERS, SRDC and EPA, as well as grower representatives from far north Queensland, central Queensland, southern Queensland and northern New South Wales.

The industry-wide benchmarking survey was undertaken in April/May 2000. The level of awareness of the Code of Practice among Queensland growers and the Best Practice Guidelines in New South Wales was encouraging. However, it was identified that further extension efforts were needed to raise the rate of possession, readership and adoption of the Code.

During 2001, a self-assessment workbook was developed which allows growers to rank their current farming practices in line with best practice recommendations. The COMPASS workbook (COMPASS stands for COMbining Profitability And Sustainability in Sugar) covers 10 different farming activities, including nutrition and fertiliser use; soil health and conservation; irrigation; drainage and acid sulfate soil management; business management; management of vegetation along creeks and rivers; planting; pest management; chemicals and dangerous goods; and harvesting. Growers are able to rank their farming practices from "1" (the best) to "4" (the worst) and identify where changes are needed to improve the sustainability of their operations. The workbook also provides

growers with space to record detailed action plans outlining how and when they will make any necessary changes.

The COMPASS workbook is delivered through a unique BSES/CANEGROWERS partnership by experienced and trained facilitators. More than 240 growers participated in COMPASS workshops in the three-month period that followed their launch in mid-February 2002. Workshops will continue indefinitely in all regions on a demand basis. Through the workshops, growers have the opportunity to discuss current best practice recommendations and provide feedback to the project's steering committee. This feedback will be collated and used in the review of the Code of Practice (currently underway).

COMPASS has been the major output of this project. However, in its development it has become obvious that much more work needs to be conducted, including the urgent review of the Code of Practice; the investigation of auditing, accreditation, EMS or certification systems for cane growers; increased environmental reporting and monitoring; and improved relations with community and government stakeholders. Like the Code, the *COMPASS Self Assessment Workbook* must be considered a living document and, as such, plans must be made to review and update its content at regular intervals. Given these unfulfilled goals and the fact that SRDC funding for this project has now come to an end, the steering committee (who have given an ongoing commitment to the initiative) are currently canvassing for alternative funding sources to continue work on this project.

1.0 INTRODUCTION

This project aimed to raise awareness and adoption of sustainable canegrowing practices in the Queensland and New South Wales sugar industries by providing canegrowers with the capacity to critically assess their farming systems, identify areas for improvement, and develop action plans.

The project built on the development of the Queensland sugar industry's *Code of Practice for Sustainable Cane Growing* (CANEGROWERS, 1998) and the New South Wales sugar industry's *Best Practice Guidelines for Acid Sulfate Soils* (Sunshine Sugar, 2000). Both of these documents provide growers with clear advice on their obligations in relation to legislation like the Queensland *Environmental Protection Act 1994*. However, they do not provide a mechanism for growers to check their compliance with best practice recommendations, nor develop plans to implement changes required. This project aimed to fill this identified gap in the process of improving cane farming practices and sugar industry sustainability.

The project was initially expected to be conducted between 1 July 1999 and 1 July 2001. However, much of the work on the project did not commence until November 1999 (with the appointment of a project officer). The project's finishing date was also delayed (with SRDC approval) until 1 May 2002 to ensure all milestones could be successfully met.

2.0 BACKGROUND

The value of our natural environment and the importance of sustaining natural resources for future generations are now well recognised and appreciated. With rising awareness and understanding of the interactions between land management and natural ecosystems, land managers are expected to minimise adverse impacts on the natural resource base and surrounding environment. This poses particular challenges for farmers, who need to find a balance between utilising natural resources like soil and water to earn a living, but at the same time, protecting these resources to ensure their future quality and availability.

This challenge is even greater for Queensland and New South Wales canegrowers, who farm a narrow coastal strip extending from Mossman in far north Queensland to Grafton in northern New South Wales. Around 6,500 sugar cane farms, the majority of which are family-run enterprises, are located adjacent to many unique ecosystems, including the Wet Tropics and Great Barrier Reef World Heritage areas. The value of these ecosystems to the Australian and international community puts canegrowers under enormous pressure to minimise any risk of environmental harm. The proximity of canegrowing regions to towns, tourism attractions, major highways and cities also increases scrutiny of the industry.

The sugar industry has established a proactive policy on environmental matters, evidenced by the commissioning of an independent environmental audit of the industry in 1995. The audit report, handed down in 1996, identified 156 recommendations, including the need for more information to be made available to growers about environmental issues (GHD, 1996).

In 1998, the industry launched its *Code of Practice for Sustainable Cane Growing in Queensland* (the Code). This document helps define how canegrowers can care for the environment whilst maintaining a profitable operation, and was developed by CANEGROWERS and BSES in consultation with stakeholders. Although compliance with the Code is voluntary, demonstrated adoption of the recommendations of the Code will be viewed as a good first line defence in the case of any legal action arising over farm activities.

In New South Wales, the sugar industry has worked with growers, community groups and government agencies to develop *Best Practice Guidelines for the Management of Acid Sulfate Soils* (Sunshine Sugar, 2000) and farm management plans. This initiative and the consultative approach adopted have ensured that cane farming can continue in harmony with the community and environment.

Growers have reacted positively to the Code of Practice, believing it is a good step and the practices it outlines are common sense. However, further probing through focus groups identified that many farmers have not adopted the recommendations or identified the need to do so on their farm. This 'failure to act' has serious consequences on two levels. Firstly, growers may be causing harm to natural resources and, secondly, the sugar industry's inability to demonstrate uptake of agreed best practice recommendations may hinder its negotiations in a range of areas, including chemical registrations and land development. Clearly, a tool was needed which would allow growers to identify what changes they may need to make to their farming practices to meet their obligations under the Code; and help the sugar industry demonstrate its commitment to improved practices and sustainability to the broader community.

3.0 OBJECTIVES

The broad aim of this project was to provide growers with the tools, advice and motivation to enhance both the profitability and sustainability of their cane farming system. The project had three key objectives:

1. benchmark current levels of awareness and adoption of the Code of Practice;
2. develop a tool for growers to review their current farming practices, identify better practices, and develop action plans to implement changes required;
3. provide a mechanism for growers to have input into the review of the Code of Practice.

A key output of the project was the development of the COMPASS program. COMPASS stands for COMbining Profitability And Sustainability in Sugar. Using a specially designed workbook as part of a one-day workshop, canegrowers can rank their current farming practices against industry guidelines, identify better practices to adopt, and develop action plans for implementation of changes required. COMPASS has been integral in allowing this project to meet its objectives, which are listed in Table 1 in more detail.

TABLE 1
BSS238 Project objectives and measures of achievement

PROJECT OBJECTIVE	Achieved	Indicator
Provide focused extension efforts that give growers the tools and motivation to:		
➢ *Better understand how their farming practices interact with the environment*	✓	▪ COMPASS
➢ *Critically evaluate their farm management practices*	✓	▪ COMPASS
➢ *Develop strategies to improve farm management for economic and ecological sustainability*	✓	▪ COMPASS
➢ *Identify their responsibilities for improved natural resource management*	✓	▪ COMPASS
➢ *Proactively prevent the need for legal action through the Environmental Protection, Water Resources and Fisheries Acts*	✓	▪ COMPASS
➢ *Develop better relations with the broader community*	?	▪ Limited impact
➢ *Utilise the Code of Practice to achieve the above objectives*	✓	▪ COMPASS
Provide growers with advice on how to apply improved practices	✓	▪ COMPASS
Benchmark current levels of awareness, adoption and perceptions of the Code of Practice among growers and industry groups and attitudes towards sustainability	✓	▪ Industry-wide benchmarking survey conducted in April 2000
Evaluate the effectiveness of the Code of Practice as an extension tool for enhanced farm sustainability	✓	▪ Industry-wide consultation
Provide a mechanism for growers to input into the review of the Code of Practice, ensuring that the ownership of the document lies with the growers	✓	▪ COMPASS grower evaluation and feedback process
Convene a technical workshop to identify key messages to incorporate into the extension package and to review the Code of Practice	✓	▪ Teleconferences deemed more effective

4.0 METHODOLOGY

4.1 Establishing a consultative group

The first step in this project was the selection and establishment of a consultative group (steering committee) to guide the project and support the project officer. This group was

selected by BSES and CANEGROWERS in consultation with industry stakeholders and initially included Dr Jennifer Marohasy (CANEGROWERS); Ms Ingrid Christiansen (BSES); Mr Robert Quirk (NSW canegrower); Mr Warren Muller (Qld EPA); Dr Robert Troedson (SRDC); Mr Peter Kaddatz (Rocky Point canegrower); Mr Keith Schmidtke (Plane Creek canegrower); and the late Mr Ray Quabba (Herbert canegrower). Ms Maryann Salvetti joined the steering committee in mid-2000 to replace the late Mr Ray Quabba following his unexpected death. Mr Gavin McMahon (BSES) joined the steering committee upon the resignation of Ms Ingrid Christiansen in January 2001. Mr Warren Muller resigned from the steering committee for work reasons in December 2001. In April 2002, the committee expanded to include Mr Lindsay Delzoppo (Qld EPA), Mr John Cameron (ASMC) and Professor Robert Lawn (CRC Sugar). A project officer (Ms Christina O'Grady) was appointed by BSES in November 1999. Ms O'Grady was located at Mackay BSES and remained with the project until her resignation in mid-2000. Ms Melissa Azzopardi replaced her in October 2000 and oversaw the project with supervision from Mr Trevor Willcox (BSES Mackay) until its completion in May 2002. CRC Sugar now employs Ms Azzopardi until 30 June 2003. CRC is continuing to support this project by funding 25% of Ms Azzopardi's time for COMPASS and Code of Practice activities.

4.2 Benchmarking grower awareness

4.2.1 The survey

The steering committee and project officer first sought to ascertain what levels of awareness and adoption there were for the Code of Practice (in Queensland) and the Best Practice Guidelines for Acid Sulfate Soils (in New South Wales). In April/May 2000, a survey of all cane farmers in Queensland and New South Wales was carried out to benchmark these levels of awareness and adoption (Appendix 1).

4.2.2 Survey design

A survey questionnaire was developed in collaboration with steering committee members, BSES extension staff and members of CRC Sugar. Topics covered by the survey questions included awareness and opinion of the Code of Practice/Acid Sulfate Soil Guidelines; nutrition; water management; soil management chemical use and storage; waste management; farm layout; record keeping; and the environment.

The survey contained 26 questions, most of which were closed questions with a set range of answers available to respondents. Two of the questions were open-ended requiring respondents to compose their own answer. The questionnaire was designed to achieve the best possible response rate and was pilot-tested at Mackay prior to printing.

4.2.3 Distribution

On the recommendation of the steering committee, a prize draw was created to encourage growers to return the survey. In return for providing the prizes, donating companies received promotion of their business through the placement of company logos on the survey form and cover letter. The survey was distributed to growers with assistance from Cane Protection and Productivity Boards and was widely promoted.

4.2.4 Survey response

The survey was completed and returned by 15.5% of growers, with respondents from all mill areas. This is regarded as a good response rate for a mail-out survey (Christiansen *et al,* 2001). A detailed explanation of the survey distribution, response rates and representativeness of respondents is provided in the full survey report (O'Grady and Christiansen, 2000). A thorough investigation of the patterns of response indicates that the results can be taken to be representative of the industry.

4.2.5 Survey results

4.2.5.1 Awareness of Code of Practice and NSW ASS Guidelines

There is a good level of awareness of the Code of Practice among Queensland canegrowers, with an average of 79% of growers aware of the Code. The percentage of growers who indicated that they have a copy of the Code was not as high (62%), despite every grower having been sent a copy in 1998. There is good support for the Code among those who have a copy of it; 89% completely or partially agree with the recommendations and only 7% had not read it. Two-thirds of all growers consider a code to be of benefit to the industry. Overall, 2% of growers do not agree at all with the recommendations of the Code, and 8% don't consider it at all useful for farm management or to understand how to minimise risk of environmental harm. However, only a small percentage of growers (less than 20%) consider a code to be a restriction, which supports the view that Australian cane farmers support guidelines for best practice farming.

In NSW, there was even more widespread support for environmental guidelines, with 95% of growers considering it important for the industry to have best practice guidelines. Two-thirds of growers believed that the sugar industry should develop these guidelines independently, while the remainder considered that they should be developed in collaboration with government agencies. Ninety-five per cent of grower respondents from New South Wales were aware of the Best Practice Guidelines for Acid Sulfate Soils.

4.2.5.2 Factors influencing decision making

Questions were asked of all growers about which factors were taken into consideration when making decisions on fertiliser usage and irrigation. In both cases, past experience and knowledge of the block (ie the grower's own knowledge) were strong drivers in these decisions. Advice from extension officers or suppliers also ranked highly in fertiliser use decisions. Soil tests were indicated to be used by many growers for fertiliser decision-making, though there was no indication of how often these soils tests were carried out.

Fertilisers were usually applied below the soil surface by three-quarters of growers, with responses varying from 98% in the Burdekin to 60% in the Central district. Subsurface application is predominantly beside the stool (more than 80%). Surface application is generally banded over the stool or beside the stool, the popularity of each varying between districts. Seventeen per cent of those using surface application broadcast fertiliser. Three

per cent apply fertiliser in the inter-row, a practice no longer recommended due to high rates of loss.

There is a strong correlation between the use of tailwater dams, retention basins and artificial lagoons and irrigation. Overall about one-quarter of farms have these structures to trap surplus water from all or part of their land. These are most prevalent in the Burdekin and Southern districts (almost 50% of farms) and, to a lesser degree, the Central district (one-third of farms). Many comments were recorded that these structures were not used because the farm was not irrigated.

Laser grading for farm drainage in acid sulfate soils (ASS) areas can be beneficial because deeper drains, which have a higher risk of ASS disturbance, can be avoided or filled in. Laser grading is considered beneficial by a large proportion (78%) of NSW growers. About a quarter of farms have 75% or more of their total farm area laser graded, 10% will grade more than half their farm, and a third will grade at least 25% of the farm area. Less than 5% do not intend to laser grade. As a result of laser grading, drains on a quarter of sugar cane farms in NSW have been made shallower.

Approximately 74% of growers have reduced tillage in the past 10 years. The greatest reductions in tillage over this period were in the Central and Burdekin regions. Over 80% of growers maintain headlands by slashing, with less than 10% grading or cultivating headlands. Farm management plans are held by 62% of growers - the majority of these indicating that they do use them for decision making.

The safe and careful use, handling and storage of agricultural chemicals and disposal of containers are important from both safety and environmental perspective. Questions were asked about chemical storage, chemical application, attendance at a farm chemical course and whether containers were triple-rinsed after use. Overall, there was a reasonably good rate of adoption of many recommended practices. However, there are some issues of concern, particularly relating to personal safety.

4.2.5.3 Perceived environmental issues

Growers were asked which issues they considered to be of concern in their local area, whether any of these issues affected their farm, and if they required assistance dealing with these issues. Many highlighted noxious weeds as a concern. Sixty-nine per cent of growers considered that some of these environmental issues affected their farm, but few identified the particular issues of concern to them. Some issues covered in the Code (particularly those relating to natural ecosystems) were not addressed in the survey due to the large variation in growers' existing situations. Specific practices; for example, revegetation, may not be relevant on some farms due to existing retained vegetation. To include these issues, growers were asked to identify which environmental issues were of concern in their local area and whether these were an issue on their farm. This provides an attitudinal, rather than practical response.

For more detailed survey results, please refer to the full survey report (O'Grady and Christiansen, 2000).

4.2.6 Dissemination of survey results

A full survey report was prepared for the industry in October 2000 (Appendix 1). The project officer also prepared and distributed a summary brochure outlining key survey findings. Survey findings were presented and discussed at a variety of industry forums, including ASSCT in 2001 (Christiansen *et al*, 2001).

4.2.7 Survey conclusions

The survey provided a considerable wealth of information about how canegrowers view environmental issues and industry self-regulation, and about their farm management practices. The responses about farming practices, particularly at a district level, provided valuable information for extension staff and funding agencies in planning future extension activities, and for the industry in benchmarking its current performance.

The level of awareness of the Code of Practice among Queensland growers and the Best Practice Guidelines in New South Wales was encouraging. However, it was identified that further extension efforts were needed to raise the rate of possession, readership and adoption of the Code.

4.3 Raising awareness and adoption

4.3.1 The workbook

The survey provided invaluable insight into the rate at which the sugar industry was adopting more sustainable farming methods and areas that require special attention. The information obtained from the survey also assisted in the next stage of this project – the development of a practical self-assessment workbook for canegrowers, building on the content of the *Code of Practice for Sustainable Cane Growing* and other identified Best Management and Best Practice guidelines. This workbook (COMPASS) is the major output of this project and enables growers to better understand and be recognised, for their management practices in line with the Code of Practice.

4.3.2 Development process

Following the benchmarking survey, the project's steering committee and project officer set about designing a self-assessment process to assist growers in reviewing their farming practices. It was essential that this process be simple to complete and offer both financial and environmental outcomes. The tool developed to meet these objectives needed to be practical in helping growers to identify their obligations towards the environment, and provide them with a vehicle to help make further improvements to their farming practices.

As part of this task, the committee reviewed the management systems used by other rural industries to gauge their suitability for adaptation to the sugar industry. These included: the Australian cotton industry's *Best Management Practices Manual* (Williams and Williams, 2000), which is based on the United States *Farm*A*Syst* model (*Farm*A*Syst*, 2000); *Freshcare* (2000); *Cattlecare* (1999); and the *Linking Environment And Farming*

(LEAF) Audit (2001). The success of similar types of evaluation and assessment programs already used in the sugar industry was also considered. These included the Department of Primary Industries' *Futureprofit* program (1999), and the current *Farmsafe On-Farm Safety Checklist* (2001). The committee also considered the merit of internationally recognised management systems like ISO14001 and Quality Assurance.

The project officer conducted extensive one-on-one consultation with around 30 individual growers as part of this selection and review process. Draft workbook pages based on the major systems currently in use were prepared for grower comment. These draft pages included a simple 'yes/no' tick box style approach, a process where growers were required to write down in their own words exactly what they do on their farm in response to different questions, and a system which offered growers the choice of three or four rankings to choose from for each category. Most growers (>20) involved in the trials preferred the draft page that offered the option of selecting a ranking which best matched current practices. The yes/no approach was not considered to have provided enough of an idea of where they currently sit in relation to the Code (and how far they have to go or have already come). Literacy skills within the industry were also a consideration that ruled out the draft page that required growers to provide lengthy written responses.

A self-assessment system similar to that used by the Australian cotton industry's *Best Management Practices Manual* (Williams and Williams, 2000) - but with a much wider focus across all farming activities - was eventually selected for use by the project's steering committee. The committee felt that definitions, descriptions and important information should be included in fact boxes on each page of the workbook.

4.3.2.1 Engaging technical assistance

The committee established 10 working parties to cover a wide range of farming activities. These working parties comprised one steering committee member, the project officer, industry experts, grower representatives, and where possible, representatives from relevant government agencies or regulatory bodies. The farming activities covered by the working parties and the completed workbook included nutrition and fertiliser use; soil health and conservation; irrigation best management; drainage; business management; pest management; management of vegetation along creeks and rivers; planting; chemicals and dangerous goods; and harvesting.

The role of each working party was to identify the issues that needed to be covered by each section of the workbook, and to seek industry agreement on what is current best practice. For the purposes of the workbook, the steering committee identified the "best possible" practice as Ranking 1, the "minimum acceptable" practice as Ranking 2, the "just below acceptable" practice as Ranking 3, and "unacceptable" practice as Ranking 4. A decision was made early in the process to set the standard for Ranking 1 as high as realistically possible to give all growers something to work towards and "reward" those growers who are going above and beyond what they are required to through peer recognition. Much of the individual working parties' discussions took place as part of regular teleconferences.

The initial draft of the COMPASS workbook was developed and circulated to all members of the working parties to ensure that the standards applied in one section were

not higher than those used in another. Following this, the workbook was trialed with growers in each canegrowing region in Queensland.

4.3.2.2 Grower trials

Trials of the draft workbook were held with canegrowers in Mareeba, Gordonvale, Sarina, Rocky Point and northern New South Wales in March 2001. Around 8-15 growers attended each trial session, which lasted about four hours. Local BSES extension officers, steering committee members, and the project officer invited selected growers to take part in the trials, and aimed to ensure both male and female growers of all demographic, social, cultural, political and educational backgrounds were represented.

There were a number of changes made as a result of the grower trials. These changes included adding listings of key contacts or other references to consult for more information; a paragraph explaining growers' "duty of care"; sections on the use and storage of mill mud and dunder; improving the section relating to acid sulfate soil; adding insurance protection to the business section; incorporating the recommendations of the new *Managing Riparian Lands in the Sugar Industry* guidelines (Lovett and Price, 2001); developing new recommendations on trash management and trash fires in consultation with industry representatives and Rural Fires; and including raw sugar quality in the harvesting section. The ranking calculation process was also simplified.

4.3.2.3 Naming the workbook

A statewide competition was conducted in mid-2001 to encourage canegrowers to come up with a name for the new environmental management workbook. This initiative also helped raise the profile of the new program. While no single entry was deemed suitable by the judging panel, the theme common in many of the entries was one of setting future directions. As a result, the name COMPASS was created. COMPASS, which stands for "COMbining Profitability And Sustainability in Sugar", reflects the direction-setting aims of the program. BSES graphic artist Annette Vandermaat designed the logo with input from the steering committee.

4.3.2.4 Industry support

The grower trials verified that the style and content of the workbook was on track. Prominent north Queensland cartoonist Harry Bruce was engaged to draw cartoons to illustrate the workbook. Bruce's cartoons were also used to illustrate the Code of Practice and the steering committee hoped their inclusion in the COMPASS Workbook would help growers realise the link between the two documents.

The workbook was then circulated widely throughout the sugar industry to stakeholders including BSES, Cane Protection and Productivity Boards, sugar-milling companies, Australian Sugar Milling Council, Cooperative Research Centre for Sustainable Sugar Production, Fertilizer Industry Federation of Australia, and relevant government departments for comment. As expected, a number of positive changes were made to the technical content of the workbook as a direct result of this consultative process.

The workbook was then presented to the industry's representative bodies for endorsement and support. In recognition of the irrigation best management practices contained in the workbook, the Queensland sugar industry's Rural Water Use Efficiency Initiative contributed $15,000 towards the printing costs of the workbook. Both Queensland CANEGROWERS and the New South Wales Cane Growers Association endorsed the document. The Queensland Environmental Protection Agency has also formally indicated its support for the COMPASS workbook. Queensland Primary Industries Minister Henry Palaszczuk launched the workbook in Brisbane in late November 2001.

4.3.3 Delivering the COMPASS program to growers

Delivery of the workbook to Queensland and New South Wales canegrowers began in February 2002. The early grower trials identified that the *COMPASS Self Assessment Workbook* (Azzopardi, 2001) was a powerful tool to foster group discussion among growers. The nature of the workbook is such that it covers a number of different topics in a very general manner. Where growers disagree with a recommendation of the workbook, facilitated discussion is encouraged to allow growers to identify best practice for their geographical area and also allow growers to learn from one another. A process is in place to ensure feedback from this activity is channeled back to the project's steering committee to ensure required changes can be included in the next version of the workbook.

The workbook is delivered to small groups of growers as a one-day workshop through a unique BSES/CANEGROWERS partnership. In this partnership, CANEGROWERS offices provide the administrative support for the workshops (registrations, catering, room hire etc), while trained BSES facilitators with extensive in-field experience deliver the workshops. While both organisations have worked together to deliver industry workshops before, the arrangements made for the COMPASS workshops are different because:

- CANEGROWERS and BSES have both established policies at a board level to support the joint-delivery of the program;
- CANEGROWERS and BSES have established a policy to share the financial proceeds from the workshops; and
- CANEGROWERS and BSES have taken joint ownership over the program for their members and established a policy to provide the workshop to those growers who are not financial members of either organisation.

Funding support has been received from FARMBIS to assist with the delivery of the program and growers are encouraged to attend with their family members. The cost of attending the workshop is $55 per farming enterprise (after FARMBIS subsidy and for up to three people from the same farming enterprise).

Facilitators receive a comprehensive folder containing all the information required to conduct the workshop (CD-ROM, reference materials, workbook copies etc). Facilitators must also undergo a one-day training session. To date, 14 extension officers have completed the COMPASS facilitator-training course (2 CPPB, 2 DPI and 10 BSES). In addition, every regional CANEGROWERS office has received an information package that explains the workshop and their responsibilities as part of the COMPASS partnership.

The workshops provide growers with the time, motivation and focus to assess their current farming practices and develop action plans to help prioritise tasks. The workshops also provide growers with the opportunity to learn more about sustainable canegrowing techniques, discuss best practice issues with a local extension officer, and pursue nationally recognised competency qualifications if they choose (RUA AG3321SCA: *Apply Sustainable Sugar Cane Production Practices*, Australian National Training Authority, 2000). Most importantly, the workshop provides growers with a written record documenting their current farming practices, and their future intentions to address areas of concern. Growers are not required to reveal their ranking to fellow participants and are encouraged to take an honest approach to the self-assessment process.

On completion of the workshop, every grower is required to complete a Grower Attendance Form (which records their attendance details and is sent to CANEGROWERS Brisbane) and a Feedback Form (this provides them with the opportunity to anonymously provide feedback and their rankings, which is sent to the project officer Melissa Azzopardi at Mackay BSES). Every grower who attends the workshops receives a Certificate of Attendance, signed by the chair of CANEGROWERS (Qld) or the Cane Growers Association (NSW). These certificates are individually numbered.

4.3.4 Ongoing support for COMPASS

A COMPASS forum was held in Brisbane in April 2002. This forum, which attracted a range of government and agribusiness representatives, aimed to make external stakeholders more aware of the value of COMPASS to the sugar industry, and sought funding and in-kind support for the continued development of the COMPASS program and related activities. Negotiations with interested parties are continuing.

4.4 Review of the Code

The final component of this project was to provide growers with an avenue to have input into a review of the current Code of Practice. The need for a review of the Code has become increasingly obvious in the past two years through the development of COMPASS. Many of the recommendations made in the Code have now changed or been improved, and new information now exists on topics not previously covered (eg the relationship between dissolved oxygen and cane juices left behind in fields after harvesting). As part of the COMPASS workshops, growers are encouraged to discuss aspects of best practice recommendations and have the opportunity to feed their comments back to industry through the COMPASS feedback forms. A process to undertake a review of the Code is being established and should be endorsed by the steering committee in mid-2002. This process will include consultation with a wide range of stakeholders, including Queensland and New South Wales EPA. This review is expected to result in a new version of the document some time in 2003.

5.0 RESULTS

Discussion on the results of this project will focus on the feedback and grower performance at the initial COMPASS workshops, and the project's overall success in achieving its outcomes. Results from the benchmarking survey have already been published and presented in the full survey report (O'Grady and Christiansen, 2000).

5.1 COMPASS workshops

5.1.1 Attendance rates

The first COMPASS workshop was held in mid-February 2002. In the three-month period that followed (up to mid May 2002), 18 workshops were held, with at least one workshop in every sugar growing area of Queensland, as well as one in NSW. In total, more than 240 growers have attended a COMPASS workshop to the period ending 31 May 2002 (Appendix 1). Further workshops are expected to commence in late October following the end of the harvesting season. The steering committee is hopeful of reaching the 500-grower mark by the end of 2002 – an achievement that will see COMPASS delivered to roughly 10% of the industry.

Attendance rates varied between areas and participant numbers were largely dependent on the following factors:

- the commitment of the local COMPASS facilitator and CANEGROWERS office towards the COMPASS initiative;
- the interest of local growers in environmental issues, or the environmental pressure local growers experience;
- the level of publicity given to the workshops through local media, and also at forums (eg CANEGROWERS AGMs etc).

5.1.2 Grower results

The COMPASS Feedback Form asks growers to provide their individual ranking for each of the 10 sections of the workbook (from Ranking 1 – the best, to Ranking 4 – the worst). Growers are also asked to calculate their overall ranking.

Appendix 2 contains pie charts based on the results of the first participants to attend the COMPASS workshops (241 growers at 18 workshops). When analysing these results, it is important to remember that the growers who attended the initial workshops are likely to be the "better" growers in their district. Therefore, it would be unrealistic to expect the proportion of Rankings 1 and 2 to stay as high as they are currently illustrated.

Generally, the vast majority of growers are receiving Ranking 2 in most areas. Overall, growers are ranking very well in the COMPASS workbook sections relating to harvesting, planting, nutrition and fertiliser use. Areas where growers are not performing as well include soil health and conservation, drainage, business management (record-keeping), chemicals and dangerous goods, and management of vegetation along creeks and rivers.

5.1.3 Grower feedback

More than 75% of growers who have taken part in the COMPASS workshops so far said they would recommend the activity to a neighbour. Sixty-five per cent of participants have indicated they would be willing to attend a follow-up workshop in 12 months time.

Growers were also given the opportunity to provide written comments on any aspects of the course that were most useful, least useful or difficult to understand. The overwhelming majority of these comments were positive. A database of participant results and feedback is being maintained by BSES to ensure necessary changes will be integrated in future updates of the workbook.

These results do not assist in evaluating changes in awareness or adoption of the Code of Practice. However, the COMPASS workshops do help raise awareness of the Code, and subsequent COMPASS workshops and the data collected will allow this evaluation to be completed.

6.0 DISCUSSION

6.1 Positive outcomes

This project has produced a number of important outcomes for the sugar industry. Through the development and extension of COMPASS, the industry has been able to highlight the importance of environmental management to growers and industry advisors. More importantly, the industry has been able to attract a great deal of public, agribusiness and government attention to its environmental efforts through media articles, launches and forums. While public and government opinion on the COMPASS program varies enormously, the fact remains that stakeholders are aware of the initiative and have an opinion on it! COMPASS has also become a pivotal part of important industry initiatives, including BSES's Prosper Program and CANEGROWERS's Environmental Management Strategy. Its inclusion at this strategic level will ensure its longevity and on-going support. The current steering committee has also made a commitment to continue guiding the delivery and improvement of COMPASS and will play an important role in the review of the Code. The committee has also recognised the need to involve other stakeholder representatives in their discussions, and has broadened its membership to include a representative from ASMC and CRC Sugar. Discussions are ongoing about the need to include a community or environmental representative on the committee. A communication plan has also been developed to ensure stakeholders at all levels remain up-to-date on COMPASS activities and improvements.

6.2 Inability to measure changes

While COMPASS can help growers become more aware of best practice recommendations and the relationship between sustainability and profitability, help the industry improve its environmental image, and provide an avenue for growers to have direct input into the formation of best practice recommendations, it does not provide a mechanism to measure on-the-ground changes in farming practices. It is difficult to assess at this point in time whether COMPASS actually motivates growers to change, or whether there is a need for stronger motivational tools. COMPASS helps growers identify areas for

improvement and make plans to change; but it does not help them take the next step in actually implementing changes. In its current state, COMPASS cannot provide growers with a dollar value of what the costs of implementing necessary changes are in comparison with expected benefits; nor can it guarantee them that certain changes in practices will ever "pay-off" financially. For example, those practices that are designed to protect growers in the case of legal action arising – like keeping good chemical records - might never be needed as a defence argument.

The real challenge ahead lies in helping growers realize the importance in implementing changes to their farming practices and, more specifically, helping them implement those changes on the ground. Achieving this will require efforts on two fronts. Firstly, the link between the adoption of improved practices and improved profitability needs to be made stronger. In particular, growers need some way of evaluating the cost of adopting an improved practice versus the expected return they can expect. Secondly, growers need assistance with the "how to" aspects of their COMPASS Action Plans. This assistance will include both financial and technical support. The recent announcement by the Federal Government of $25 million in cash rebates for primary producers who have developed Environmental Management Systems for their properties may be one possible avenue for the steering committee to investigate.

7.0 ASSESSMENT

The impact of this project (and in particular COMPASS) on the Australian sugar industry is substantial. More importantly, a support framework has been established by BSES and CANEGROWERS to ensure COMPASS will continue to develop and have impact well into the future. No similar type of self-assessment management program exists in overseas sugar cane industries and, with time and further development, COMPASS may well be perceived as a world leader in this area.

SRDC contributed just over $210,000 in cash to this project, with a further $100,000 received in-kind from industry partners. Given the benefits delivered to date and the potential benefits still to be realised, this project represents outstanding value for money and a return on investment that will continue to be realised for many years to come. The information gathered as part of the industry-wide benchmarking survey and the development of the COMPASS workbook has great value and is now recognised as important intellectual property.

8.0 PROJECT TECHNOLOGY

Two approaches used in this project merit discussion and evaluation as possible models for other industry projects. The first is the establishment and use of a steering committee. This project would not have been as effective without its steering committee. The committee, which comprises key representatives from industry and government organizations, was essential in encouraging and attracting:

- industry support and interest in the benchmarking survey;
- technical input into the development of guidelines for the COMPASS workbook;
- growers to trial draft self-assessment workbooks;

- key bodies to endorse and support the COMPASS workbook;
- Public, government and agribusiness interest in on-going support for the COMPASS initiative; and
- Grower attendance at COMPASS workshops to date.

The careful selection of steering committee members, the ability of those members to balance their values, beliefs and individual organisation's objectives with "bigger picture" issues, and their good-natured commitment has been essential in achieving all this project's outcomes.

The second approach that merits evaluation has been the development of a partnership between BSES and CANEGROWERS to deliver COMPASS. This unique arrangement ensures that both BSES and CANEGROWERS have ownership over COMPASS and a responsibility to ensure its longevity. The delivery arrangements also ensure that both parties receive a financial return for each COMPASS workshop conducted. One BSES extension officer in each sugar-growing region has been allocated the sole responsibility of delivering the COMPASS workshops. This in turn has encouraged each of these facilitators to take ownership over the program, and a positive sense of competition and inclusion has emerged between BSES COMPASS facilitators. The development of detailed notes for facilitators and regional CANEGROWERS offices was essential in making the COMPASS delivery process simple and effective for all concerned.

9.0 RECOMMENDATIONS

There is great potential to further expand and build on the achievements of this project through investment in the following areas:

- the development of a Environmental Management System framework for the Australian sugar industry, in which COMPASS in an integrated feature;
- benchmarking the Australian sugar industry's environmental performance against international competitors, other Australian primary industries, and community expectations;
- establishing demonstrations farms;
- developing and implementing an environmental performance strategy;
- challenging public and industry perceptions of the sustainability of the Australian sugar industry;
- achieving stakeholder endorsement for recommendations made in the revised *Code of Practice for Sustainable Cane Growing*;
- adoption of agreed practices by the majority of growers through the delivery of a competency based training program given due regard to regional differences and/or the provision of incentive funds to assist with implementation costs;
- development and implementation of a system of biennial reporting on industry environmental performance against agreed targets; and
- investigation of certification systems for the sugar industry with potential incentives for the adoption of best management practices.

Some of these activities can be considered more important to the short-term survival of the industry than others, but at the very minimum, the sugar industry needs to be prepared to allocate funds on a regular basis for the continual update and improvement of the *COMPASS Self Assessment Workbook* and workshops to ensure they remain current and effective.

10.0 PUBLICATIONS

Numerous publications have arisen from this project. The major publications are listed below. In addition, there were also a significant number of articles in industry journals, regional newspapers, and stakeholder newsletters. An electronic update of the project was sent to interested parties several times during the project period.

Azzopardi, M. (2001). COMPASS: A Self-Assessment Workbook. Bureau of Sugar Experiment Stations, Brisbane.

Azzopardi, M. (2001) COMPASS Self-Assessment Workshop – Facilitator's Notes. Bureau of Sugar Experiment Stations, Mackay.

Azzopardi, M., Marohasy, J. and Muller, W. (2001) The COMPASS Workbook: Assisting the Queensland and New South Wales Sugar industry to move in the right direction. Proceedings of the EMS in Agriculture Conference, Ballina, NSW. November 2001 (in preparation).

Azzopardi, M., Salvetti, M., Kaddatz, P., Schmidtke, K. and Quirk, R. (2002) COMPASS: Helping Queensland and New South Wales' cane growers move in the right direction. Proc. Aust. Soc. Sugar Cane Technol., 24: 304-310.

Bureau of Sugar Experiment Stations (2000) Cane growing and sustainability: A survey of Australian cane growers. Survey Summary. BSES Mackay.

Christiansen, I.H., O'Grady, C.M. and Azzopardi, M.J. (2001). Environmental Management and Cane Growing: A survey of farm practices. Proc. Aust. Soc. Sugar Cane Technol., 23:236-245.

O'Grady, C. and Christiansen, I. (2000). Canegrowing and sustainability – A survey of Australian cane growers with particular reference to the Code of Practice for Sustainable Cane Growing in Queensland. BSES Project Report PR00004, BSES Indooroopilly.

11.0 ACKNOWLEDGEMENTS

In addition to the significant financial contribution made by SRDC towards this project, the project officer would like to acknowledge the following individuals and organisations.

- The steering committee members (former and current)

- Ingrid Christiansen (formerly BSES now CRC Cotton, NSW) who devised the original concept for this project
- Former project officer Christina O'Grady who carried out much of the early survey work
- Cartoonist Harry Bruce
- BSES staff including Steve Irwin and Annette Vandermaat
- CANEGROWERS staff including Jim Kirchner, Diana Dawson and Bill Kerr
- RWUEI for their financial support of printing costs
- FARMBIS who are currently subsidising the cost of the COMPASS Workshops
- The input received from the many industry personnel and growers who helped develop and improve the workbook
- COMPASS facilitators who are assisting with the delivery of the workbook to growers

12.0 REFERENCES

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Cattlecare (1999). Cattlecare National On Farm Quality Assurance Manual, Version 1. AUS-MEAT Ltd, Brisbane.

Christiansen, I.H., O'Grady, C.M. and Azzopardi, M.J. (2001). Environmental management and canegrowing: A survey of farm practices. Proc. Aust. Soc. Sugar Cane Technol., 23: 236–245.

Farm*A*Syst (2000). *Farm*A*Syst/Home*A*Syst*. [Online] University of Wisconsin, USA. Available at: http://www.uwex.edu/farmasyst

Farmsafe Queensland (2001). Farmsafe On-Farm Safety Checklist. Farmsafe: Brisbane. (In preparation).

Freshcare Limited (2000). Freshcare: The On-Farm Food Safety Program for Fresh Produce Department of Primary Industries/New South Wales Agriculture, Brisbane.

Futureprofit (1999). Department of Primary Industries Futureprofit workshops. Queensland Government, Brisbane.

GHD (1996). Environmental Audit of the Queensland Cane Growing Industry. Gutteridge, Haskins and Davey Pty Ltd, Brisbane.

Linking Environment and Farming (2001). LEAF Audit. National Agricultural Centre, Warwickshire, Great Britain.

Lovett, S. and Price, P. (2001). Managing Riparian Lands in the Sugar Industry: A guide to principles and practices. Sugar Research and Development Corporation/Land

and Water Australia, Brisbane.

O'Grady, C. and Christiansen, I. (2000). Canegrowing and sustainability – A survey of Australian cane growers with particular reference to the Code of Practice for Sustainable Cane Growing in Queensland. BSES Project Report PR00004, BSES, Indooroopilly.

Sunshine Sugar (2002) Best Practice Guidelines for Acid Sulfate Soils. Broadwater Sugar Mill, New South Wales.

Williams, A. and Williams, J. (2000). Australian Cotton Industry Best Management Practices Manual. Cotton Research and Development Corporation, Australian Cotton Industry, Narrabri.

APPENDIX 1

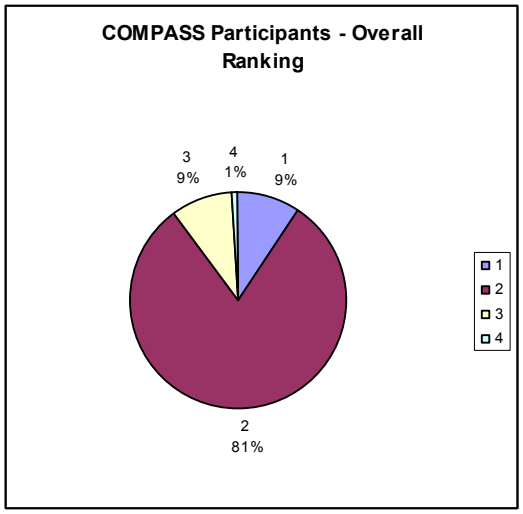
A survey of Australian cane growers with particular reference to the Code of Practice for Sustainable Cane Growing in Queensland

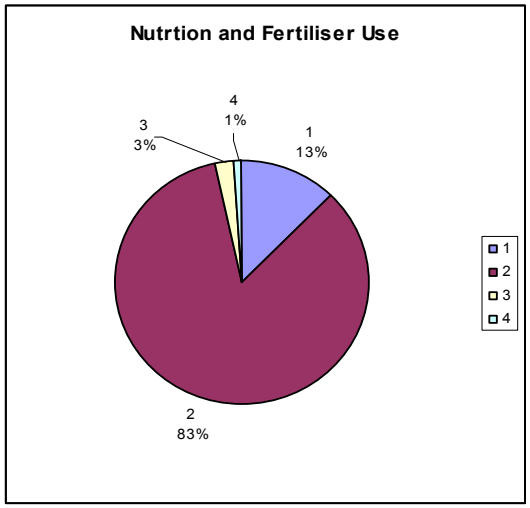
APPENDIX 2 **Growers who attended a COMPASS workshop between 12 February 2002 and 31 May 2002**

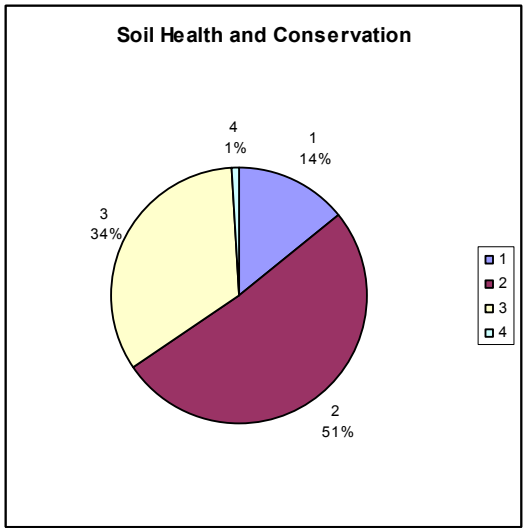
Location of workshop	Number of workshops	Total number of participants
Herbert River	3	50
Burdekin	3	29
Bundaberg	1	15
Tully	2	27
Mossman	1	13
Mulgrave	1	8
Condong	1	13
Mackay	1	13
Isis	1	21
Innisfail	1	12
Maryborough	1	16
Babinda	1	19
Rocky Point	1	5
TOTAL	**18**	**241**

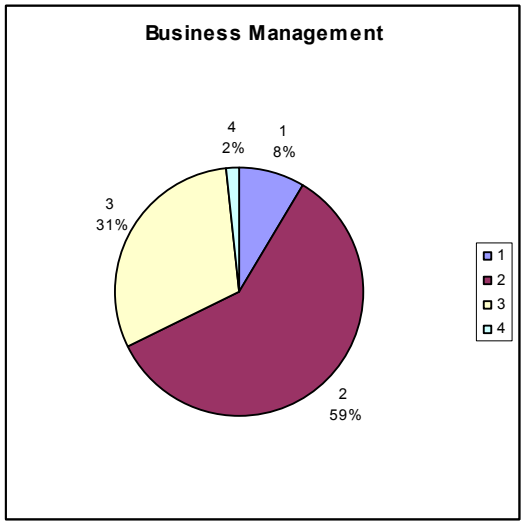
APPENDIX 3

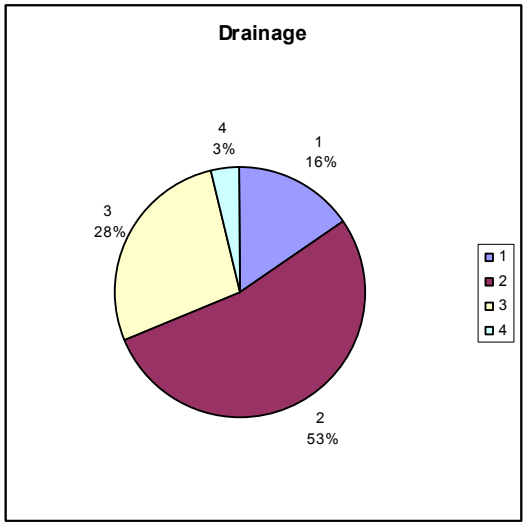
Results of initial 241 growers to participate in COMPASS Workshops between 12 February 2002 and 31 May 2002.

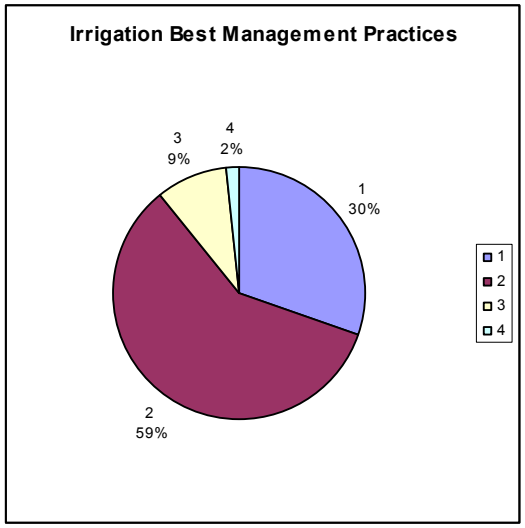

COMPASS Participants - Overall Ranking
3 9%
4 1%
1 9%
2 81%
1
2
3
4

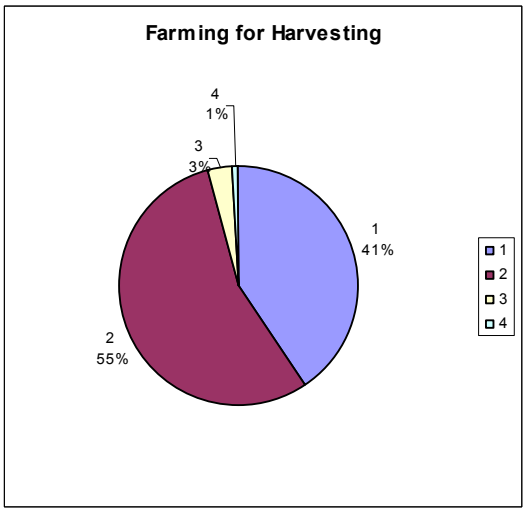

Nutrtion and Fertiliser Use
4 1%
3 3%
1 13%
2 83%
1
2
3
4

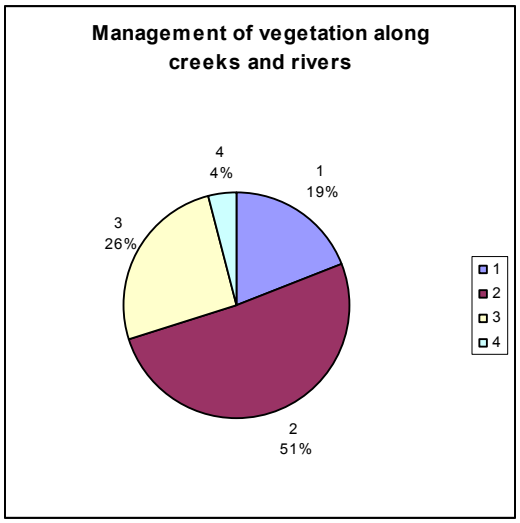

Soil Health and Conservation
4 1%
1 14%
3 34%
2 51%
1
2
3
4

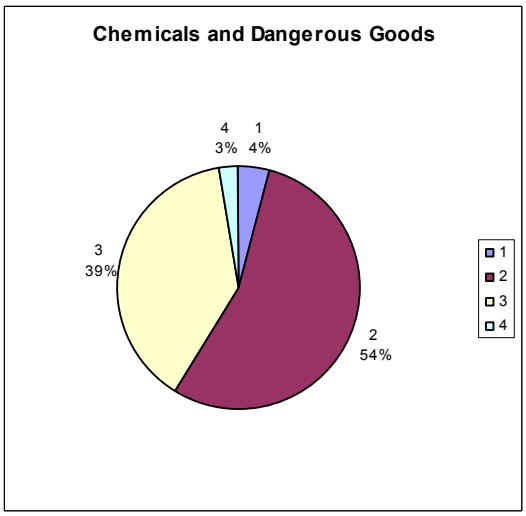

Business Management
4 2%
1 8%
3 31%
2 59%
1
2
3
4

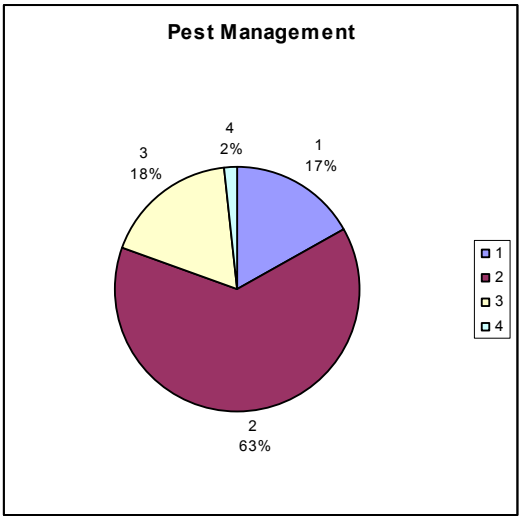

Drainage
4 3%
1 16%
3 28%
2 53%
1
2
3
4

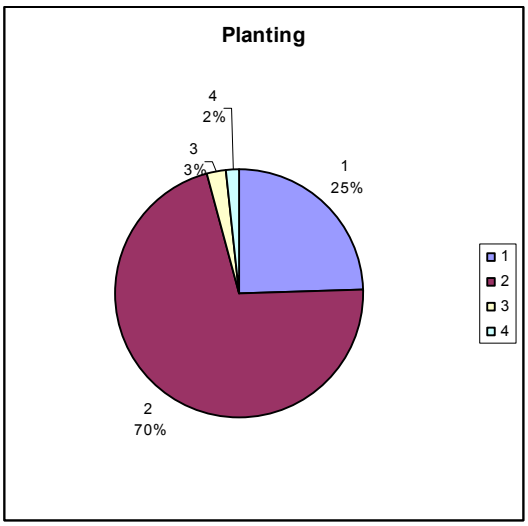

Irrigation Best Management Practices
3 9%
4 2%
1 30%
2 59%
1
2
3
4

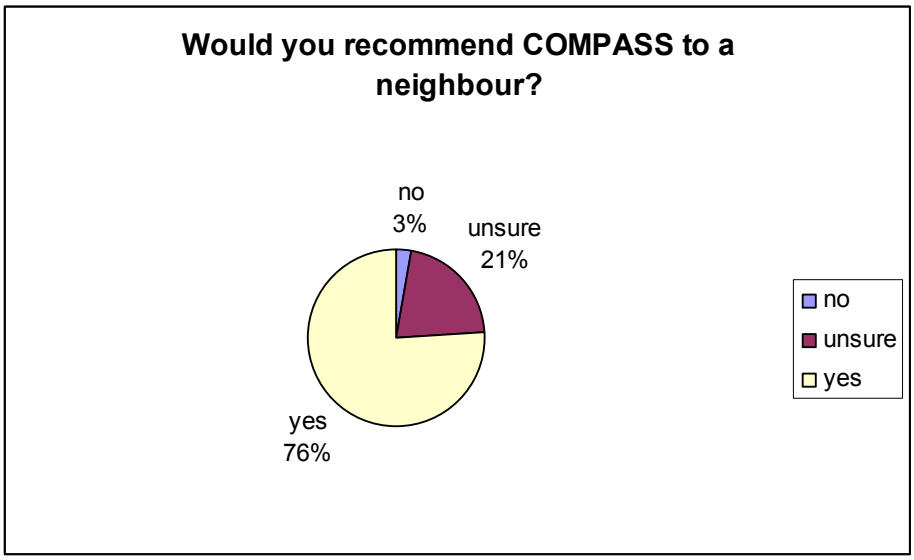

Farming for Harvesting
4
1%
3
3%
1
41%
2
55%
1
2
3
4

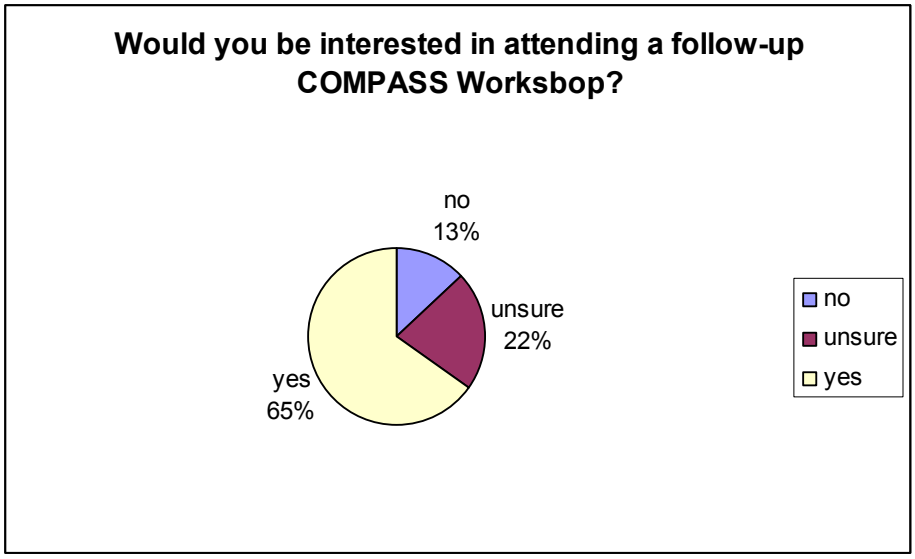

Management of vegetation along creeks and rivers
4
4%
1
19%
3
26%
2
51%
1
2
3
4


Chemicals and Dangerous Goods
4
3%
1
4%
3
39%
2
54%
1
2
3
4


Pest Management
4
2%
1
17%
3
18%
2
63%
1
2
3
4


Planting
4
2%
3
3%
1
25%
2
70%
1
2
3
4


Would you recommend COMPASS to a neighbour?
no 3%
unsure 21%
yes 76%
no
unsure
yes


Would you be interested in attending a follow-up COMPASS Worksbop?
no 13%
unsure 22%
yes 65%
no
unsure
yes