BSES Limited

FINAL REPORT – SRDC PROJECT BSS282

FARMING SYSTEMS TOUR FOR THE HERBERT SUGAR INDUSTRY

by

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SD05016

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SUMMARY

The 'Enhanced Farming Systems Tour' to Sarina and Emerald was aimed at building the capacity for change, learning and innovation through the investigation of several enhanced farming systems in the Sarina and Emerald districts. The study tour participants investigated minimal-tillage equipment, controlled traffic, crop rotation and harvesting. The enhanced farming system has potential to improve environmental, economic and social benefits for the Herbert sugarcane industry. The study tour was an industry-wide approach with participants from CSR, QMCHA, CANEGROWERS, HCPSL, BSES and growers.

Sarina and Emerald currently use minimum-tillage practices, controlled traffic and crop rotations on a commercial basis in a dryland situation and has particular relevance to the Herbert sugar industry. The study tour was conducted over a 6-day period, 4-9 April 2005.

The use of disc-opener planters, controlled traffic and legume crops as an integrated system is a viable option for the Herbert sugarcane industry. The growers visited during the study tour reported a reduction in farming costs (fuel, labour, capital), whilst still maintaining yield and CCS. The initial cost of changing to controlled traffic (dual row) and disc-opener planters is small/moderate and will depend on the growers existing machinery set-up, whether modifications are outsourced or completed on-farm using existing materials and labour.

GPS technology was also investigated by the study tour group. GPS can provide several benefits to the sugarcane industry, but the capital cost is quite high and may slow immediate adoption under the conventional farming business structure.

Alternative crops, such as kenaf and hemp, may have potential as a cash crop in rotation with sugarcane. Barriers to commercialization on a large scale include the establishment of secure market, localised processing plants and the need for further research, development and extension.

A survey was conducted before and after the study tour to determine the adoption rate of major findings and to gain participant feedback. Following the study tour, the proportion of study tour participants that used disc-opener planters increased from 0% to 64% and the use of pre-formed mounds increased from 13% to 43%.

1.0 BACKGROUND

In late 2004, the Herbert industry identified that a study tour would provide valuable knowledge and information to stimulate the adoption of enhanced farming systems. Local industry stakeholders at productivity forums and R&D forums (industry-wide approach) strongly supported a study tour to investigate farming-system practices in Sarina and Emerald. Sarina and Emerald currently use minimum-tillage practices, controlled traffic and crop rotations on a commercial basis in a dryland situation and would have particular relevance in drier parts of the Herbert.

Participants displayed a willingness to participate in a 6-day study tour; this was demonstrated by Herbert growers participating in a 7-day study tour to Northern New South Wales in March 2004. The duration of the study tour was planned to provide sufficient time to investigate the enhanced farming systems in detail, allowing for considerable social interaction among industry stakeholders and increasing the prospects of adoption.

2.0 OBJECTIVES

The 'Enhanced Farming Systems Tour' to Sarina and Emerald aimed to build capacity for change, learning and innovation through the investigation of several management practices that will provide major environmental, economic and social benefits for the industry. The study tour was an industry-wide approach with participants from CSR Sugar, QMCHA, CANEGROWERS, HCPSL, BSES and individual growers.

The study tour provided first-hand knowledge, understanding and enhancement in:

- broadening industry knowledge by engendering spirit and demonstrating the way;
- networking to develop new industry contacts;
- developing a shared vision through challenging current farming systems and empowering others;
- displaying superior farm-management techniques and their benefits;
- preparing areas for plant crops using strategic, minimum tillage or zero tillage;
- controlled-traffic zones and retaining a trash blanket;
- investigation of dryland farming systems for other crops in the Emerald area.

3.0 ITINEARY AND PARTICIPANTS

Date	Time	Details
Monday 4 April 2005	7:00am 2:30pm 5:30pm	Depart Ingham from BSES Herbert Station (22 seater bus) Mackay BSES (Chris Aylward) – Werner Farming Arrive Sarina Beach Motel

Tuesday 5 April 2005	8:00am 8:30am 6:00pm	Depart Sarina Beach Motel Sarina Farm Visits - Bryan & Karen Baker's - Keith & Beth Schmidtke's - Jim, Doug & Alan Pederson - Serg Berardi's - Rodney Pratt's Arrive Sarina Beach Motel
Wednesday 6 April 2005	7:45 10:30am 2:00pm 5:00pm	Depart Sarina Beach Motel and travel to Emerald Rod & Phil Otto's farm at Clermont Gary & Max Gersbach's farm at Capella Arrive Emerald, Motel 707
Thursday 7 April 2005	8:00am 8:30am 5:00pm 7:00pm	Depart Motel 707 DPI&F - Zero & minimum tillage - Controlled traffic and precision agriculture - Residue management Arrive Motel 707 Dinner with Pat Magee from Beta Crop Seed
Friday 8 April 2005	7:30am 1:00pm 5:30pm 8:00am 8:30am 3:00pm	Depart Emerald Motel 707 and travel to Mackay & Burdekin Visit Gerry Deguara Arrive in Burdekin, Ayrline Motel Depart Burdekin, Ayrline Motel Visit Rapisarda farming Arrive in Ingham

Figure 1 Study tour participants. Back left to right: David Robino, Joe Girgenti, Robert Bonassi, Sergio Fighera, Paul Coppo, Alan Pace, Felix Roveglia, Michael Waring, Jeff Cantamessa, Robert Durso, Victor Reinaudo, Joe Cervellin, Norm Reid. Front left to right: Frank White, Lawrence Di Bella, Mark Poggio, Silvio Cervellin.

4.0 STUDY TOUR SUMMARY

4.1 Mackay

The Mackay sugar industry covers an area of approximately 78 000 ha with a mixture of irrigated and dryland sugarcane farming. Approximately 70% of the area is irrigated, with most areas having less than 1 ML/ha. Soil types are predominantly solodic and soloth.

Chris Aylward, John Turner and Joe Muscat (all from BSES) organized the Mackay section of the study tour on behalf of the study tour participants.

4.1.1 BSES Mackay - legume planter

Planting legumes (especially soybeans) through trash and achieving successful germination and establishment can be difficult to achieve. The study group investigated methods to achieve improved germination and establishment of legumes through a trash blanket.

Chris Aylward (BSES Mackay) discussed the 6-row disc-opener legume planter that was recently purchased and their past experiences (Figure 2).

Figure 2 Disc-opener legume planter at BSES Mackay

The planter was made by Austil and costs between $15 000-16 000. The legume planter can plant seed through a green-cane trash-blanket with minimal soil disturbance. This system has several advantages over conventional legume planters. Some of the benefits include:

- reduced cultivation;
- improved timeliness of operation;

- retention of the trash blanket;
- lower weed pressure and;
- lower operational costs.

400 ha of legumes (soybeans and cowpeas) have been planted in Mackay and surrounding areas. Some possible limitations that growers should be aware of before direct drilling legumes include:

- pH of soil (low pH will cause poor legume growth);
- depth control at planting is critical (varying trash layer can be an issue);
- effective weed management (mainly broadleaf weeds) and;
- the type of legume planter (disc versus tine).

These factors are critical to ensure a successful legume crop is in your fallow. Effective volunteer control is also important to ensure that the block is disease free for the next plant-cane crop.

4.1.2 Werner Farming - industrial hemp and kenaf

Several growers in the Mackay region are assessing the feasibility of a fibre industry in rotation with sugarcane. The two crops currently being investigated are industrial hemp and kenaf. Trials have been established at Werner Farming in Septimus and Muscat Farming in Oakenden. The trial results have been promising, with yields for industrial hemp of 7.48-9.13 tonnes of dry matter per hectare and for kenaf of 9.24-13.7 tonnes of dry matter per hectare. The fibre crops also have the added benefits of being a break crop used in rotation with sugarcane. The study tour delegation investigated a crop of kenaf at Werner's farm, the crop had been growing for 90 days and was 2 m high (Figure 3).

Figure 3 Dennis Werner discussing the characteristics of kenaf

Growers involved in the fibre industry project highlighted the need for a local processing plant in order to minimize transportation costs and improve profitability.

4.2 Sarina

The Sarina sugarcane growing area is very similar to the Herbert River district in terms of environmental conditions and the large variation in soil types. Sarina is predominantly dryland farming, with soil types varying from sands, black earth and grey clay. The Sarina sugar industry covers an area of approximately 18 000 ha. The Sarina area is quite advanced in progress towards a fully integrated farming system involving controlled-traffic, use of double disc-opener cane planters and incorporation of break crops. Currently, there is about 1000 ha planted each year using double disc-opener planters on a preformed mound.

Robert Sluggett (BSES) organized the Sarina section of the study tour on behalf of the study-tour participants.

4.2.1 Bryan and Karen Baker

The area of sugarcane production under controlled traffic farming system has been growing strongly in the Sarina district over the last 4-5 years.

The Bakers currently plant at 1.8 m dual row using a whole-stalk double-disc-opener planter on a preformed mound. The system involves preforming a mound in December/January, planting legumes into the fallow mounds, managing the legume crop (spray-out), and then directly planting cane through the dead legume crop the following year. Some of the short-term benefits reported from Baker's farm include improved crop management and reduced costs of operation. It is also believed that the reduced cultivation and legume crop rotation will provide long-term improvements to soil health and productivity.

Some of the key issues discussed included:

- Modification of machinery;
- Bed forming and need for uniform bed height;
- Legume crop management;
- Double-disc-opener planters.

Machinery modifications include the mound former, spray equipment, fertilizing equipment and disc-opener planter. Baker's have also modified a whole-stalk cutter to enable them to harvest dual-row cane for plants (Figure 4).

Figure 4 Modified whole-stalk cutter and disc-opener planter

Existing farm tractors were set to 1.8 m wheel width to ensure that controlled traffic was achieved. Most of these modifications are small/moderate in terms of cost and time required to make the changes. The total cost to convert to a controlled-traffic system ranges from $16 500 to $45 000. The initial cost will depend on the grower's existing machinery set-up, and whether modifications are outsourced or completed on-farm using existing materials and labour.

Bed forming is an important part of the process and a uniform bed height that suits the harvesting equipment is essential. Uneven beds result in uneven depth of planting and difficulties have been experienced with trying to cover plants, particularly where soybean residue is present. Most farmers now have a bed height of 125-250 mm. Bakers currently use a mouldboard mound-former and find that they are capable of handling some trash residue during bed formation (Figure 5).

Figure 5 Mouldboard mound-former

The Bakers have progressively lowered the height of their mounds over the past few years because of dry conditions. This year they are have decided to plant on flat ground because of the limited soil moisture.

Soybeans are grown in the fallow, usually between December and May, depending on environmental conditions. Because of the recent dry conditions, Bakers are considering an early spray-out or mulching of the soybeans before the crop dries out the available soil moisture. Roundup® Powermax plus Hammer® is currently used to spray-out the soybeans in the fallow.

Bakers are very happy with the results produced from the disc-opener planter and will continue to use this system in the future.

4.2.2 Keith and Beth Schmidtke

Schmidtke's sugarcane farming operation is based on the concept of billet planting 1.8 m dual row into preformed mounds. The main subjects discussed by the group during the visit to Schmidke's were:

- HBM billet planter modifications;
- Harvester modifications;
- Bed former;
- Peanuts.

Schmidtkes currently plant their cane into preformed mounds using a HBM billet planter fitted with double-disc openers. The HBM planter has a single feed mechanism that is then split into two rows. Producing an even feed is critical to ensure a successful and consistent germination along the row and to prevent choke-ups from occurring between the discs. The angle between the discs on a billet planter is 30-40º on average, compared to a whole-stalk planter at 15°.

Harvester modifications were discussed in detail by the study group. Some of the main modifications for dual-row harvesting included the removal of the floating shoes, elevator extension, lifting of the extractors to reduce cane loss, and the fixing of the first top roller. Harvester modifications vary from group to group, but the elevator extension is an essential component for harvesting dual rows. Instead of using an elevator extension, some harvesting groups have opted to use a flipper roller or metal slide. Figure 6 shows the harvester front used to harvest dual-row cane; the floating shoes have been removed to suit the wider mound profile.

Figure 6 Modified front for harvesting dual-row cane

A tunnel bed-former is used to form flat top mounds before the wet season. Some of the benefits of the tunnel bed-former include a uniform bed height and ease of operation. A disadvantage of the tunnel bed-former is that trash residue can cause problems with the flow of soil through the tunnel. When using the tunnel bed-former it is necessary to ensure adequate soil tilth and breakdown of residue before forming the mound. Flat-top mounds appear to have better water infiltration on some soil types compared to the well rounded profile.

Schmidtkes also grow peanuts as a crop rotation with sugarcane. Peanuts provide an opportunity to make some additional income as a break crop and to improve soil health for the following cane crop. Some of the key points to consider with peanuts include:

- Strong nitrogen-fixation capacity;
- Relatively expensive to grow;
- Specialized harvesting machinery;
- Easy to direct drill, but considerable soil disturbance during harvest;
- Irrigation and light-textured soils are generally required;
- Quality and food safety are extremely important.

4.2.3 Pederson Family

The study tour visited the Pederson's family farm to investigate various aspects of their farming operations. Like Schmidtkes, the Pedersons have also adopted the enhanced farming system and currently plant 1.8 m dual row into a preformed mound using a double-disc-opener Moller billet planter. The main topics discussed during the visit were:

- Moller planter modifications and press wheel design;
- Ripping;
- Soybean spay-out.

Pedersons directly drill through soybean stubble on a preformed mound using a Moller billet planter (Figure 7).

Figure 7 Double-disc-opener Moller billet planter

The Moller billet planter has a split-feeding mechanism that allows for a more even feed at higher planting speeds (7-8 km/h). The press-wheel configuration on billet planters varies from grower to grower, with the number of press wheels ranging from one to three. Some growers place the press wheels close to the discs to prevent the throw-out of soil and others use a toe-out configuration to prevent leaving a 'V' shape, which may be prone to hard setting after heavy rain on some soils.

The preformed mounds are ripped after they are formed using a curved-shaped ripper leg (Figure 8). Pedersons have found that ripping the mound before the wet season assists with moisture infiltration.

Figure 8 Curved ripper legs

Soybeans are a common fallow crop in Sarina, with many growers using the crop for green manure or grain.

A soybean spray-out trial was investigated at Pederson's farm. The aim of the trial was to demonstrate the effectiveness of Hammer® as a tank mix partner with glyphosate for soybean spay-out. The tank mixture of these products provided effective control of soybeans in the fallow. Centro was also present in the trial block, but the treatments did not adequately control this weed. Growers have also found that a tank mixture of Starane® and 2,4-D is very effective for soybean spray-out and for managing other broadleaf weeds such as centro.

The study tour group also investigated a Soybean grain crop at Berardi's farm.

4.2.4 Soil mapping and variable-rate nutrition application

Kylie Cauchi and Robert Sluggett discussed the use of soil maps and variable-rate fertilizing equipment to tailor a nutritional program for a grower. The soil maps are developed using a Veris 3100 machine that measures soil electrical conductivity and plots the readings with a global positioning system. Figure 9 shows BSES Senior Extension Officer Robert Sluggett disusing the maps produced by the Veris 3100 machine.

Figure 9 Robert Sluggett discussing the Veris 3100

Electrical conductivity measurements allow the grower to determine precisely where changes in soil type occur within a block. Soil samples are then taken for each of the different soil types and a nutritional program is developed using this information. Trials are currently investigating the use of variable-rate fertilizer applicators using GPS-controlled Biodunder machinery. The program is part of a precision-agriculture program and will enable the grower to develop a tailor-made nutritional program instead of the blanket application of nutrients across blocks.

4.3 Emerald and surrounding areas

Farming enterprises in Emerald and surrounding areas currently use minimum-tillage practices, controlled traffic and crop rotations on a commercial basis in a dryland situation (Figure 10).

Figure 10 Dryland sorghum crop near Emerald

The farming system used in these areas is aimed primarily at managing the seasonal variation associated with dryland farming and to maximise productivity and profitability. The sugar industry has adopted many of these concepts from broad-acre farms and it has particular relevant to the Herbert because of our dryland farming situation and variation in environmental conditions. Many of the concepts, including disc-opener planters, GPS, crop rotations and controlled traffic, have been used on the commercial basis in these areas for 10-15 years. Moisture conservation is a very important issue in these regions, because of the low annual rainfall.

Ann Sullivan (DPI&F Emerald) assisted in organising the Emerald section of the study tour on behalf of the study tour participants. The study tour group visited several properties near Clermont, Capella and Emerald. The crops investigated included sorghum, maize, sunflower, cotton, mungbean, and chickpea (Figure 11).

Most of the farming systems are based on controlled traffic and the use of minimum tillage in order to reduce the costs of production, preserve soil moisture and reduce the negative effects of compaction on crop yield. Adequate soil moisture is needed to ensure the survival of crops and to maximise production. Several of the growers have noticed that other farmers using conventional tillage have not had successful crops over the last 3-4 years because of very little moisture available for the plant after cultivation.

Figure 11 Cotton and sorghum crops in Emerald

GPS guidance is used for planting, fertilizing, spraying and harvesting to minimize overlap of operations, reduce compaction and for ease of operation (Figure 12).

Figure 12 GPS-guided John Deer sprayer

Reducing compaction and maintaining crop residue improve water infiltration and soil fertility. Crops are direct-drilled into the previous crop stubble using disc opener or tined seed planters. Tined seed planters are not effective at planting through a heavy crop residue.

The possibility of nutrient stratification in a zero-tillage situation was discussed by the study tour delegates. Nutrient stratification can occur in a zero tillage system because of no cultivation and uneven distribution of nutrients through the soil profile. To date, growers in the Emerald area have not noticed any effects of nutrient stratification in their crops. Growers stated that the machinery and labour required to manage the farming area has dramatically reduced since changing to a minimum-tillage farming system.

4.4 North Eton

Deguara's farm is situated in North Eton, approximately 15 km north of Mackay. The farming system adopted at Deguara's consists of twin rows at 0.8 m on 2.0 m bed profiles. The main topics discussed during the visit include:

- Row configuration;
- Harvesting;
- GPS.

Deguaras believe that twin row swill allow for a more effective use of cultivation, easier weed control and improved productivity. Various trials have been established at Deguara's, with initial trials set up on a high-density system. In order to harvest the twin row effectively, the harvester has been significantly modified with four base cutters fitted, widening of the front, and widening of the tracks (Figure 13). It is planned that GPS units will be fitted to the harvester and haul-outs this year.

Figure 13 Jerry Deguara discussing harvester modifications

4.5 Burdekin

Rapisarda's farm is situated near Clare, approximately 20 km from Ayr. Rapisarda's farming operation is a unique system because it integrates small crops in rotation with sugarcane. Evan Shannon guided the study tour delegates around the farm and showed us the current farming-system practices including irrigation. The study tour participants also investigated a trial where cane was direct-drill planted into a sprayed-out ratoon crop (Figure 14).

Figure 14 Direct-drill planting through a spray-out ratoon cane crop

5.0 MAJOR LEARNING OUTCOMES

The major learning outcomes from the study tour were:

- Preparing areas for plant crops using strategic, minimum tillage or zero tillage is a viable option for the Herbert sugar industry;
- Growers undertaking the enhanced farming system have noticed a reduction in farming costs (fuel, labour, capital), whilst still maintaining yield and CCS;
- Disc-opener billet planters are planting cane on a commercial basis and have proven to be very successful;
- The initial cost of changing to controlled traffic (dual row) and disc-opener planters is small/moderate;
- The major modifications for dual-row harvesting include an elevator extension and removal of floating shoes to suite the wider mound profile;
- Several advantages exist with the use of disc-opener legume planters, but there are some limitations that must be considered before planting;
- Controlled traffic, minimal tillage and rotational crops are beneficial for soil health, productivity and the environment;
- Farmers in Emerald have been using minimal tillage and controlled traffic in a dryland situation for a number of years and have observed a reduction in farm costs, improved soil health and enhanced moisture conservation;
- Farmers in Emerald have not yet noticed nutrient stratification effects from continued use of zero tillage;
- GPS technology can provide benefits to the farmer through reduced field compaction, auto-steer, precision tillage and spraying, yield mapping and variable-rate nutritional program;
- Kenaf and hemp may have potential as cash-positive rotational crops in the sugarcane industry. Barriers to commercialization on a large scale include the establishment of secure market, localised processing plants and adequate funding for R,D&E.

Increased adoption of improved farming systems on a regional basis will lead to:

- Improved soil health and fertility;
- Reduced sediment, nutrient and chemical loss from cane lands;
- Diversification of the income stream through the use of rotational crops;
- Lengthening the window of opportunity for planting (timeliness of operation);
- Potential to move the yearly crop cycle forward through earlier planting;
- Minimising the effect of adverse climate conditions through preformed mounds and control-traffic system;
- Reduction in adverse effects of disease through crop rotation;
- Reduction in farm input costs and increased marginal revenue.

6.0 COMMUNICATION OF FINDINGS

The following activities have been undertaken to communicate the findings of the project to industry stakeholders:

- PowerPoint presentation developed by contributions from tour participants and project committee (Appendix 3);
- Presentations given to 26 productivity forum groups;
- BSES Limited Quarterly Newsletter article;
- Newspaper articles in *Herbert River Express*;
- ABC radio interview;
- Forum for tour participants to determine level of adoption six months after study tour completion;
- Final Report distributed to industry stakeholders.

7.0 ADOPTION OF FINDINGS BY PARTICIPANTS

A survey was conducted at the start of the study tour to gauge the participant's current farming practices (Appendix 1). Six months after the study tour a follow-up forum and final survey was conducted to determine the adoption rate of the study tour findings and participant feedback (Appendix 2). The major findings adopted by the study tour participants are shown in Figures 15 and 16.

Figure 15 shows that the proportion of study tour participants that used preformed mounds increased from 13% to 43% following the study tour.

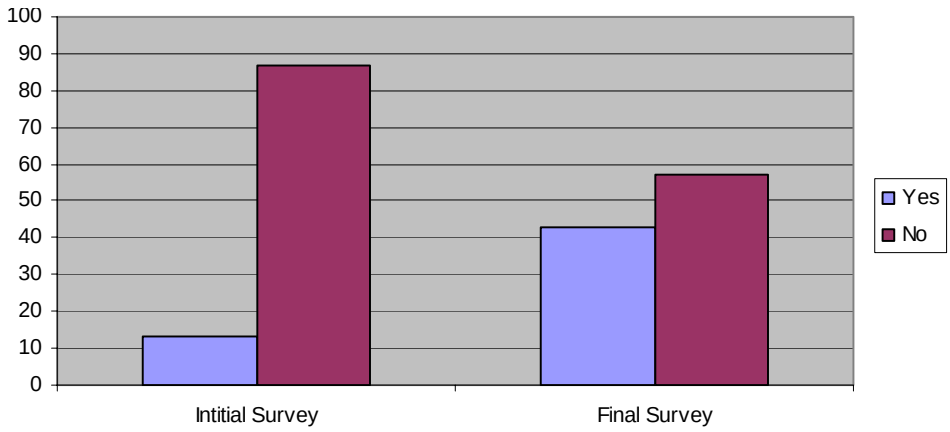


Figure 15 Use of pre-formed mounds before and after the study tour

Figure 16 shows that the proportion of study tour participants that used disc-opener planters increased from 0% to 64% following the study tour. Growers felt that the study tour was a catalyst in changing and re-enforcing their decision to adopt pre-formed mounds and double disc-opener planting.

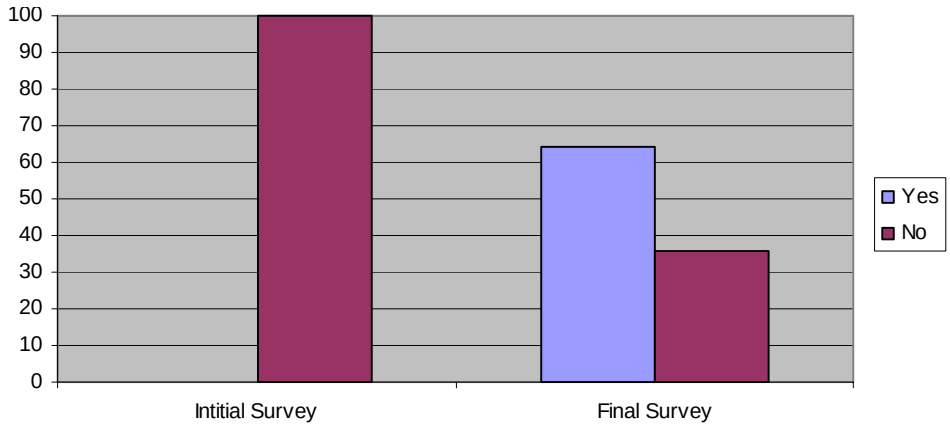


Figure 16 Use of disc-opener planters before and after the study tour

8.0 RECOMMENDATIONS

Recommendations developed from the study tour were:

- Establish commercial demonstration plots using a disc-opener billet planter on preformed mounds in the Herbert region with demonstration plots situated on different soil types (sands to heavy clay);
- Undertake further trial work to determine the interaction between varieties and row spacing;
- Develop economic analysis of farming systems and provide these to industry;
- Inform harvesting contractors on harvesting issues related to the enhanced farming systems and potential economic benefits;

- Inform industry on GPS technology (types of systems available, advantages and disadvantages) and investigate industry-wide GPS program;
- Monitor productivity data from growers (Sarina) using the enhanced farming systems and compared against the average productivity for the region;
- Investigate farming business structures in order to increase the adoption of new technologies (out sourcing, co-operatives, partnerships etc).
- Have the study group meet again to discuss their progress and issues that they have encountered and ways in which they addressed these issues.

APPENDIX 1 – Pre-tour survey

INTRODUCTION

15 growers were surveyed at the beginning of the study tour. The survey is part of the project milestones and is required in order to receive the travel and learning grant from SRDC. The survey will also help us to gauge grower uptake of enhanced farming systems, determine the correct allocation of research resources and have a greater understanding of grower opinions.

CURRENT FARMING PRACTICES

Which form of fallow do you use on the majority of your farm?

	Percentage
Bare/sprayed out	50
Legume	38.5
Grassed	11.5
Don't fallow – plough out and replant	0

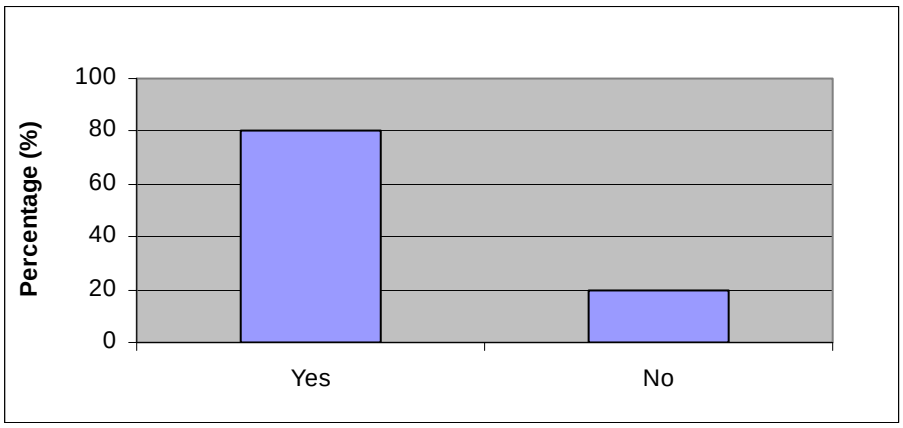
What tillage practice is the majority of your farm under?

	Percentage
Strategic tillage	7
Zero tillage	0
Less than 8 passes	93
More than 8 passes	0

Do you adjust nitrogen rates after a legume crop in your fallow?

	Percentage
Yes	60
No	40

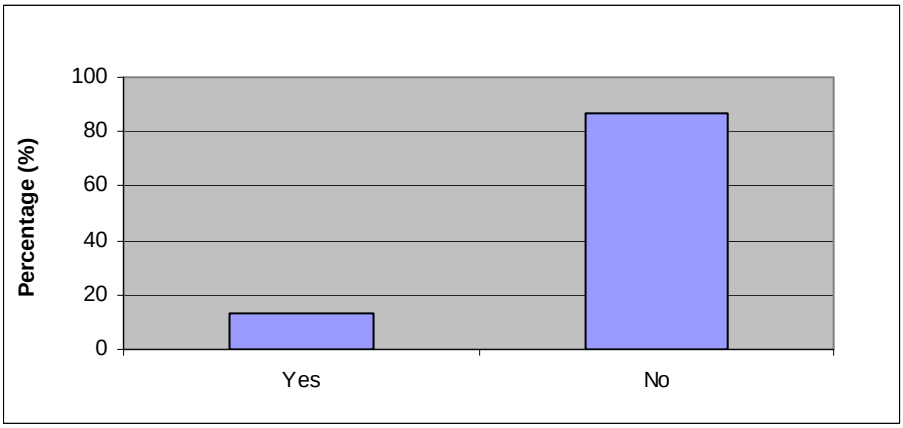
Do you believe soybeans are a suitable legume crop for your area? If not, please explain why.



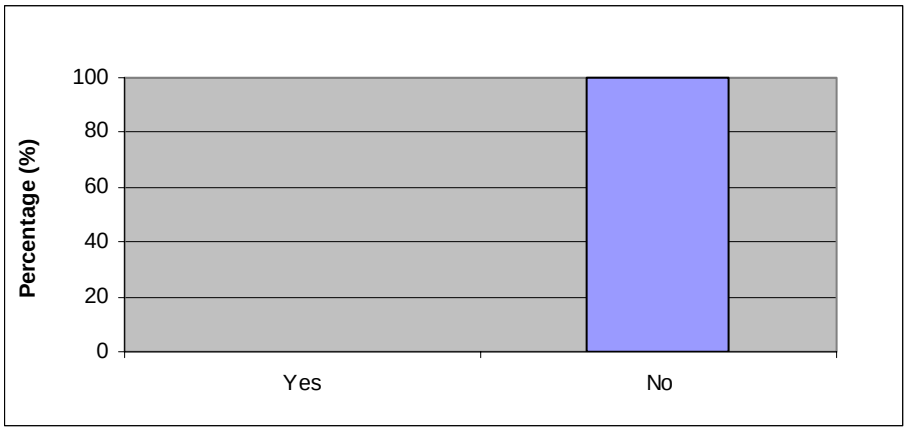
Comments:

- Weather conditions, too hot or too much rain;
- Will use soybeans when strategic tillage is trialled and equipment is available;
- Waterlogging and nematodes;
- Could be too dry;
- May only be suitable in some places.

Do you use pre-formed mounds?

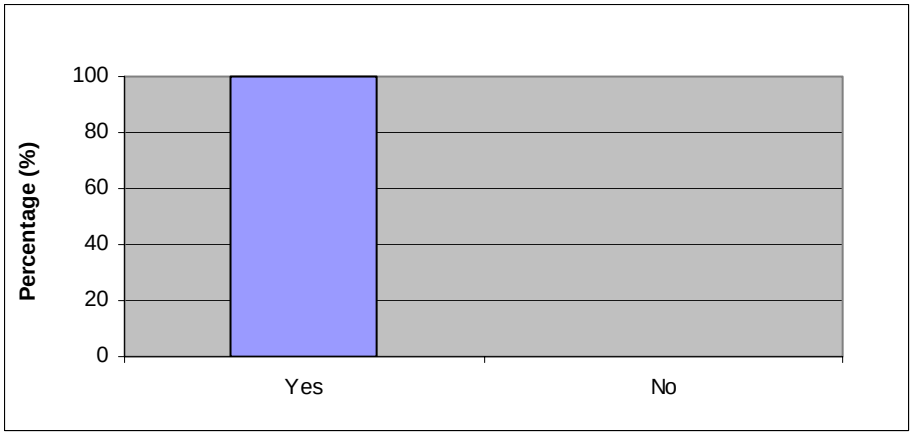


Do you or have you used double-disc-opener planting?

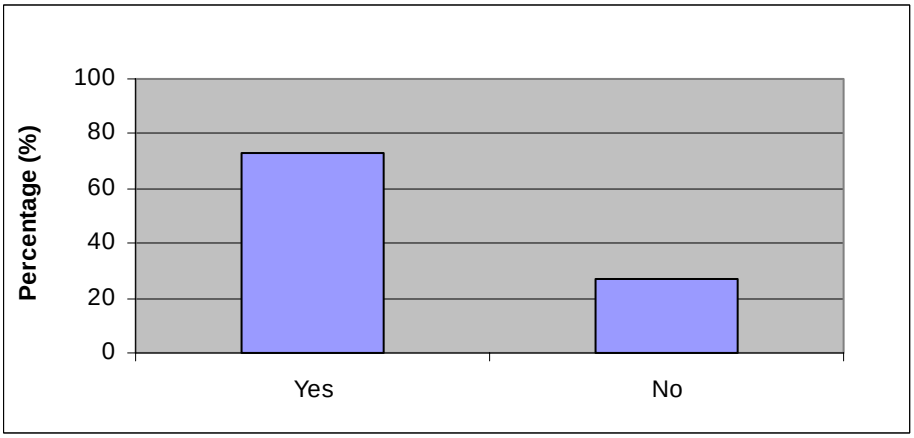


THE FUTURE

Do you believe that a controlled traffic system is a viable option for the sugar industry?



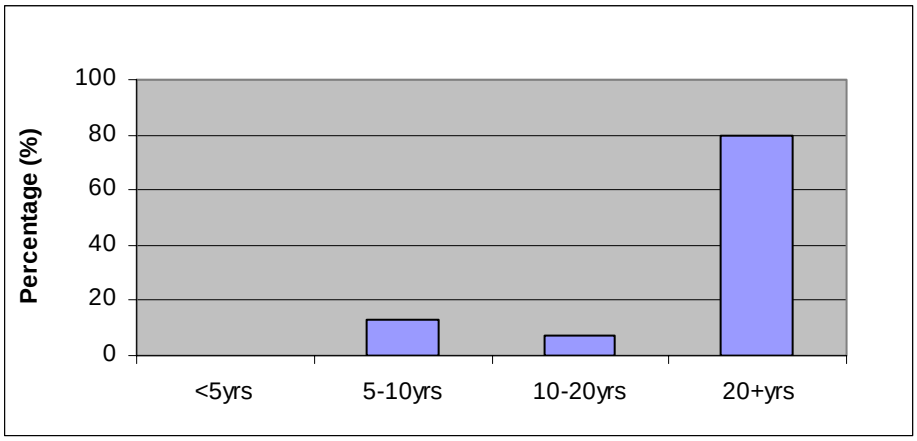
Would you consider using GPS technology on your farm? If not, please explain why and what are the limitations.



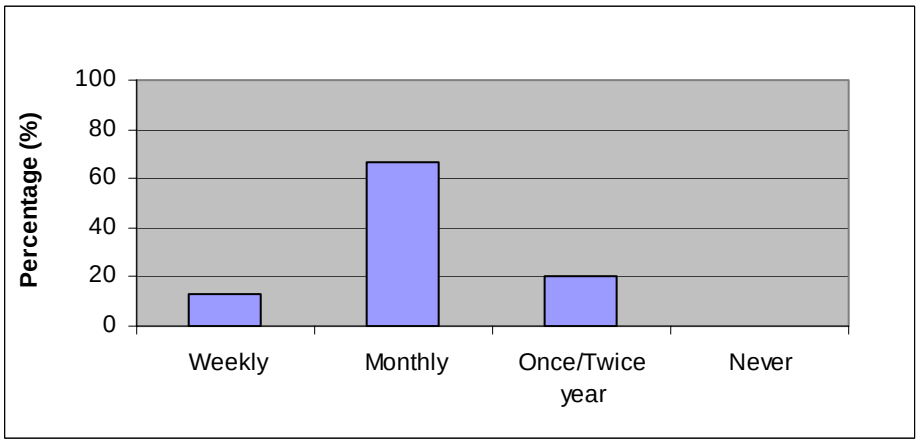
Comments:

- Drills are too short;
- Too expensive;
- Very costly, not a viable option at present because of the cost of set up;
- Not feasible;
- Paddock size too small.

How long have you been in the sugar industry (farming)?



How often (on approximate average) do you have contact with your local RD&E officers?



CONCLUSION

The results collected from this survey will enable us to set a benchmark with this study tour group. Our aim is to re-evaluate the group in six months time and determine what impact the study tour has had on farm management and farming system practices. I would like to thank the participants for their valuable contribution to the survey.

APPENDIX 2 – Post-tour survey

INTRODUCTION

15 growers were surveyed 6 months after the study tour. The survey is part of the project milestones and is required in order to receive the travel and learning grant from SRDC. The survey will also help us to gauge grower uptake of enhanced farming systems, determine the correct allocation of research resources and have a greater understanding of grower opinions.

CURRENT PRACTICES

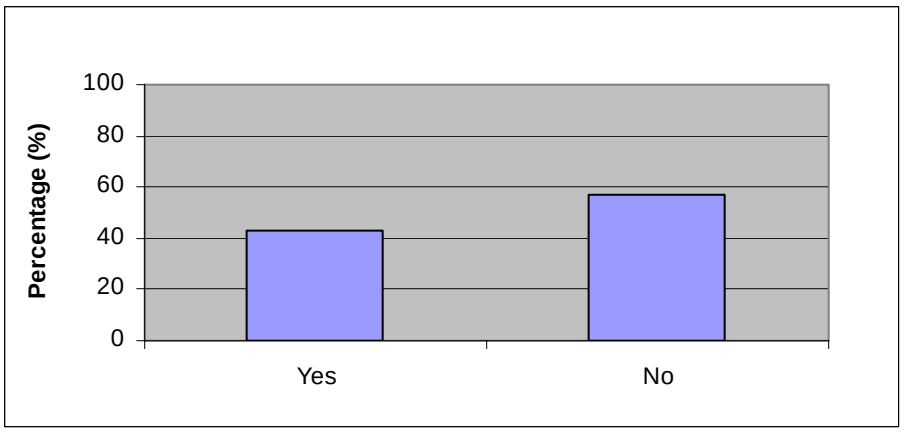
Which form of fallow do you use on the majority of your farm?

	Percentage
Bare/sprayed out	53
Legume	41
Grassed	6
Don't fallow – plough out and replant	0

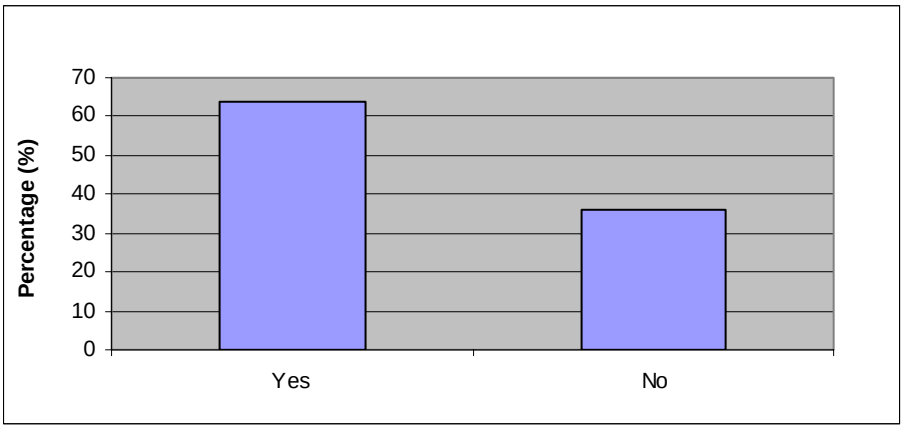
What tillage practice is the majority of your farm under?

	Percentage
Strategic tillage	12
Zero tillage	6
Less than 8 passes	76
More than 8 passes	6

Do you use pre-formed mounds?

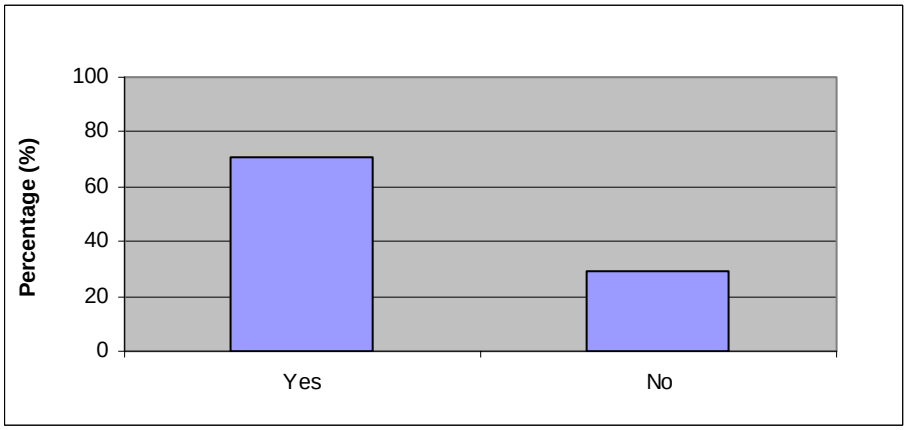


Do you or have you used double-disc-opener planting?



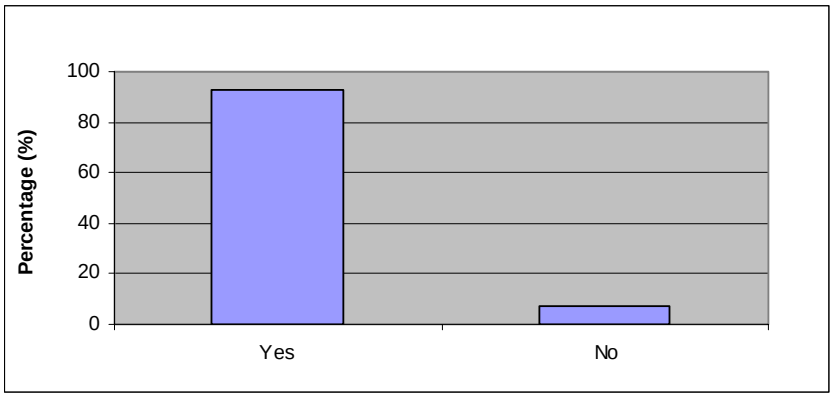
THE FUTURE

Would you consider using GPS technology on your farm? If yes, please specify an approximate time (eg, next year, 2 years time)



For those participants planning to use GSP technology, the time-frame for adoption ranged from currently doing to 6years time.

Are you planning to use pre-formed mounds and disc-opener planters in the future? If yes, please specify an approximate time (eg. next year, 2 years time)



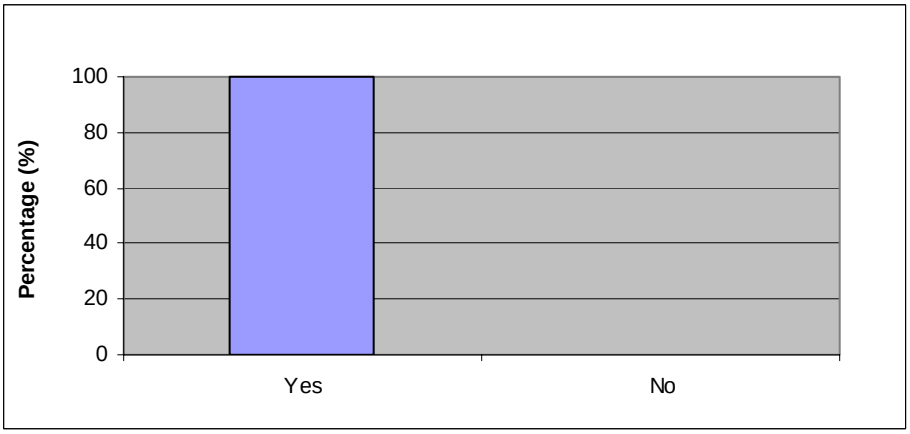
The time-frame for adoption ranged from currently doing to five years time, with the majority answering between one to two years.

STUDY TOUR GENERAL

What is your opinion on the cost of the study tour?

	Percentage
Too expensive	0
Average price	14
Quite cheap	86

Do you feel that the study tour was well organized and at the correct time during the year? If not, please suggest improvements for future study tours.



CONCLUSION

I would like to thank the participants for their valuable contribution to the survey.

APPENDIX 3 - Post-tour presentation

SARINA & EMERALD STUDY TOUR

April 2005

Australian Government
Sugar Research and Development Corporation

SRDC TRAVEL GRANT FUNDED

BSES HCPSL QMCHA CANEGROWERS CSR Sugar

TOUR OVERVIEW

- 4TH – 9TH April 2005
- 17 people (2500km travelled)
- Mackay, Sarina, Emerald and Burdekin
- Aim was to investigate minimum tillage & zero tillage farming systems, controlled traffic (GPS), rotational crops and future benefits and limitations of these farming systems for all industry sectors

MACKAY

- Mackay BSES Soybean planter (Single Disc)
  - Worked well, seed depth, limitations in trash

MACKAY CONTINUED

Dennis Werner – Kenaf trial

Easy to grow

Minimal amount of water needed

No processing plant in Sarina therefore cost of transportation is high

No restrictive regulations (Vs Hemp)

Yields in 2004 – 9.24 tonnes dry matter/ha

92 days to maturity

SARINA

Brian Baker – New Farming System

1.8m dual row pre-formed mounds

3 years planting with dual row double disc opener

Rotation with Soybeans, however they can dry soil profile with a failed wet season

Designed plant cutter for dual row system

Maintained productivity

SARINA CONTINUED

Keith Schmidtke

- minimum tillage
- controlled traffic
- dual row billet planter with double disc opener
- harvester modifications
- peanuts

SARINA CONTINUED




SARINA CONTINUED

Jim and Alan Pedersen

1.8m dual row

Dual row double disc opener billet planter

Single disc legume planter

- problems in wet clay soils
- plants legumes on a pre-formed mound


SARINA CONTINUED




SARINA CONTINUED

Veris 3100 Machine

- Measures & Maps Electrical Conductivity
- GPS, Controlled Bio-Dunder applications with variable control on rate

PHIL & JANELLI OTTO (Clermont)

HOMELEIGH

EMERALD




EMERALD




MACKAY & BURDEKIN