

**BUREAU OF SUGAR EXPERIMENT STATIONS**

**QUEENSLAND, AUSTRALIA**

**FINAL REPORT**

**SRDC PROJECT BS109S**

**CONSTRAINTS TO THE ADOPTION  
OF GREEN CANE TRASH BLANKETING  
IN CENTRAL AND SOUTHERN DISTRICTS  
SD96005**

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**BSES Publication  
SRDC Final Report SD96005**

**July 1996**

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## 1.0 SUMMARY

Ten focus group meetings were held with sugarcane growers from Proserpine to the New South Wales border to discuss their experiences with green cane trash blanketing (GCTB). The meetings were conducted by the Rural Extension Centre, UQ-Gatton in conjunction with the BSES. The meetings were held between 1 and 3 February 1994, and each was attended by 8 to 16 growers. An additional four focus groups were convened by BSES for representatives of the mills and harvesting contractors in Mackay and Bundaberg. Results across all groups were reasonably consistent.

1. Most growers had tried GCTB. Opinions were therefore based on personal experience, and not on second hand information. They were consequently firmly held.
2. The reported level of adoption of GCTB in each district and the use of GCTB amongst the growers attending the focus groups dropped from north to south. This was related to declining temperatures, and changes in rainfall distribution. The more northerly focus groups recognised the risk of poor ratoons, but there was a general sense that this risk will be minimised by practical farmers refining the agronomic management of GCTB. Moving south, with cooler climatic conditions and the perception of a greater chance of rain at harvest, GCTB was viewed as less suitable. The two most southerly groups (at Nambour and Rocky Point) were generally of the opinion that GCTB was only suitable for the undulating or very light soils in their areas, and would never be acceptable on the heavier, flat, or poorly drained paddocks.
3. The green cane trash blanket, rather than harvesting green, was perceived to be the main problem with the GCTB system. The key issue was the risk of poor ratooning, especially on poorly drained soils when cool wet weather followed harvesting. If the stool remained wet under a heavy trash blanket, it may rot, causing depressed yields, and/or a shortened cycle of ratoons. At best, affected crops grow slowly and weakly, usually resulting in lower yields. Several participants at both Nambour and Rocky Point proposed promoting harvesting green, then collecting and using the trash for other purposes (profitable if possible). Some growers at Rocky Point are already adopting this strategy. There were comments that both SRDC and BSES are very focused on sugar production and are not very interested in exploring systems which include other commercial by-products at the farm level.
4. Growers observed that members of the wider community talk incorrectly about GCTB as though it is only a change to one part of cane production - harvesting. GCTB changes the whole farming system. Many farmers had first tried GCTB when they decided to harvest green at short notice (for example, when faced with wet weather during harvest). They had not been prepared for later problems, and therefore formed a poor impression of GCTB. Those who regularly used GCTB commented that preparation at the initial planting stage (ensuring good drainage and maintaining excellent weed control) was important for successfully using the practice.

5. The effect of GCTB on yield was debated, although many reported reduced yield with GCTB. The only yield and profit increases consistently attributed to GCTB occurred in dry seasons on lighter soils, where irrigation is unavailable or limited. This was perceived to be due to extra moisture infiltration and retention under the trash blanket. In all other circumstances, effects on both yield and profit were debated. Some participants were convinced that if burning were banned, the resulting yield reductions would “*send some farmers broke*”.
6. GCTB generally increased the costs of harvesting and slowed down the rate of harvest. On the other hand, labour costs are reduced, as are fuel costs for cultivation. There is debate over the possibility of savings on weed control.
7. A possible rise in CCS with green harvesting has been promoted but few farmers were convinced that this occurred. It did not appear to be a significant factor influencing the use or non-use of GCTB.
8. Other significant problems with GCTB were:
  - difficulty and uncertainty with fertiliser placement (particularly nitrogenous) through the trash blanket,
  - variation between varieties in their response to GCTB (some varieties appear to more vigorously ratoon following harvest, and are more tolerant of the trash blanket conditions),
  - difficulties with flood irrigation, due to low slopes and potential for waterlogging,
  - the risk of trash fires, and the fact that existing machinery or harvesting schedules did not lend themselves to GCTB. (There were several references to the New South Wales bushfires which occurred in the week prior to the grower focus group meetings. This event may have affected the relative importance of trash fires and the frequency with which this problem was mentioned).
9. There was general agreement that GCTB protects sloping land from erosion, reduces inconvenience associated with burning, and is more acceptable to the community.
10. Although the focus groups showed a range of concern, there was a perception amongst all sectors of the industry of community pressure to stop burning cane. Some groups conceded that burning is likely to be banned in the future. There was frustration and resentment among many growers at pressure to adopt a technology which they have trialed and believe is unsuitable. Future research and extension approaches must address both the technical problems with the existing system, and the negative attitudes which currently exist. The participants felt this required urgent attention to ensure that sugar producers are able to adopt other strategies without facing major disruption or major losses.
11. Other groups expressed indignation that the community might attempt to impose rules on them. Some individuals believed that BSES and QDPI press releases on the benefits of GCTB had contributed to the pressure to ban burning, by

highlighting the issue and implying that a suitable alternative was available. They believed that this should be resisted, both by lobbying, and by informing the wider community that green cane trash blanketing is not an acceptable option for many cane producers in southern Queensland. A sense of frustration was expressed that cane producers who did not adopt GCTB were portrayed as slow or recalcitrant, when GCTB had been tried and shown to be unsuitable for many areas.

12. Participants in all sectors of the industry felt there was insufficient economic information to properly evaluate GCTB. This meant that most discussion was generally based on limited observation of different aspects of the production system. There was no clear direction for economic decisions due to the apparent inconsistency, and the lack of any integration, of existing information. It was felt necessary to determine if green cane harvesting and GCTB were actually beneficial for the industry. If so, with better data, and information, the industry would be in a better position to encourage and support GCTB systems.
13. Green cane harvesting was felt to be an excellent management tool for the industry in wet conditions, allowing flexibility for growers, and access to a better level of cane supply for mills. This allowed continuity of cane supply resulting in easier scheduling of operations. In contrast were the increased costs associated with higher levels of extraneous matter. It was felt that extraneous matter will become more significant in the future if the level of green cane increases. The need to determine the maximum acceptable levels of extraneous matter, including dirt was an important issue. The industry should fully support the current efforts of BSES into reducing harvester losses, and reducing extraneous matter in the cane supply. In addition, there needs to be a continuing focus on making growers aware of correct drill profiles and consistent row spacing.
14. The risk of poor ratooning and reduced yields under a trash blanket limited the suitability of existing GCTB methods. The need to avoid burning is real, and requires further research and development. The key research, development and information issues included:
  - varieties suited to GCTB;
  - alternatives for handling trash after green harvest at different times of the season (to reduce the risk of poor ratooning);
  - systems for fertiliser application through and under the trash blanket, (there appeared to be a lack of understanding and confidence regarding the existing information on fertiliser placement. BSES needs to focus on this area for future extension activities);
  - methods to reduce the risks of waterlogging, particularly under flood irrigation;
  - economic evaluation of the various methods of production for all sectors of the industry;
  - management systems for GCTB on heavier, and less suitable soil types.
  - systems to minimise trash fire risks.

## **2.0 BACKGROUND**

GCTB is widely used at Ingham and areas further north. The adoption of GCTB in central and southern districts has not proceeded as expected. Between 1989 and 1993, the area of GCTB had reduced in southern districts, and increased only marginally in central Queensland. In 1991, only 13% of the central and 15% of the southern district crop was harvested green. There was initial interest in some districts, eg; Isis and Bingera areas cut 44% and 37% of the crop green respectively. However, this early interest was not sustained and many growers reverted to burning cane.

The low acceptance of GCTB in central and southern Queensland occurred despite considerable extension efforts by BSES, QDPI, and Landcare committees. This indicated the existence of barriers to adoption of GCTB in these districts.

## **3.0 OBJECTIVES**

- Conduct ten focus groups comprising canegrowers who are current, former and non-users of GCTB
- Identify perceived barriers to adoption and key issues requiring further research
- Use the findings as a basis for planned extension programs to overcome barriers, and promote the major motivational aspects of GCTB.

## **4.0 INTRODUCTORY TECHNICAL INFORMATION**

The principle reasons for adopting GCTB include: reduced erosion losses; avoidance of the risk of cane loss after burning; harvest operations can commence earlier after rain, thereby shortening the harvest period; environmental issues associated with smoke and ash fall-out from cane fires are averted, thus reducing conflicts with urban communities; increased yields under dry conditions; reduced growing costs; control of grass weeds; improved soil structure; and higher soil organic matter levels.

The focus group technique is commonly used by many market research organisations to gain an understanding of their clients' relationships with products and issues. The aim of the focus groups held during this project was to obtain industry experience, attitudes and perceptions of GCTB in the sugar production areas from Proserpine south to the New South Wales border.

## **5.0 RESEARCH METHODOLOGY**

In association with the Rural Extension Centre, ten researchers with prior training in the focus group method conducted a series of group meetings. The researchers were paired so that each were of different backgrounds, and did not have previous experience with the issue of GCTB in the region in which they conducted the focus groups. Each pair conducted two focus group meetings between 1 - 3 February 1994, alternating in the roles of discussion moderator and recorder. The discussion at each meeting was tape recorded.

Participants were selected with the assistance of BSES extension officers. The participants received a letter of invitation from the Rural Extension Centre and/or were personally contacted by the local BSES extension officer. Eight meetings involved a range of producers including some who had not used GCTB, some who had used GCTB previously but no longer used the practice, and some who regularly used the practice. At least one harvesting contractor was present at each meeting. At the remaining two meetings (one each in Mackay and Bundaberg), the participants were non-users of GCTB. These groups were selected as a comparative check to ensure the opinions of growers who did not use GCTB were not being unduly influenced in the mixed focus groups. The meetings consisted of 8 - 16 growers, and generally lasted 1.5 - 2 hours.

Separate meetings for representatives of each of the milling and harvesting sectors were held in Mackay and Bundaberg. Participant contact methods, and meeting processes were similar to the grower meetings.

The questioning routes used in the meetings is attached (Appendix I).

## **6.0 RESULTS AND DISCUSSION**

All focus groups produced lively and willing discussion. The moderators reported a high degree of interest in sharing experiences and perceptions about GCTB. Many participants remained to continue their discussions after the formal meetings had concluded.

The conclusions from the focus groups were remarkably consistent. The two grower groups which predominantly non-users of green cane trash blanketing more strongly expressed reservations about GCTB. However, they identified the same problems as those identified in the other grower groups which included people not using GCTB, people who had previously used GCTB but were no longer doing so, and people who used GCTB regularly.

### **6.1 Individual Grower Meetings**

The following summarise discussion from each of the individual meetings attended by growers. Quotations from the discussion are shown in *italics* in this report.

### 6.1.1 Proserpine

#### Specific factors related to this focus group

All producers at the meeting had some experience with GCTB, and were aware of positives and negatives relating to the practice. The comment was made by a participant that those present at the meeting were all innovative farmers in the district and may not represent the average views. Participants knew each other and avoided making statements which might be seen as putting down others' opinions.

#### Summary

GCTB was generally seen as a significant advantage on the lighter, better drained soils particularly in drier years. Heavier, poorly drained soils were generally considered inappropriate for GCTB. This was because of concerns about water logging, and cool wet conditions inhibiting ratoon growth. A major concern was that the difference in suitability of sites was not recognised sufficiently and that growers would be forced into 100% GCTB by the community, regardless of the agronomic practicalities. Increased harvesting costs were hindering wider uptake, and fertiliser application was seen as a major practical difficulty.

#### Results

##### Question 1. What are your thoughts about green cane trash blanketing in this area?

There was strong agreement between participants that some areas within the region were suitable, while others were unsuitable for GCTB. Growers felt they were aware of their particular farm conditions and had sufficient information about GCTB and experience to know which practice was best for their farm situations.

*BSES has done extensive work on GCTB and if we as growers don't know what we can do and can't do by now, where the hell have we been?*

*What concerns me is ... we (the industry) promote it (GCTB) too much as a one across the line fix. I cannot green trash blanket all my farm and if we lose the ... option of using those matches . . .that's what concerns me.*

It was evident that the growers carried out extensive trials on their farms to determine applicability and test variations in management practices to optimise benefits. They strongly rejected any implication that they were backward because of less than 100% adoption of GCTB.

There was a strong agreement that planning and preparation were essential if GCTB was to be successful in a farming operation. Opportunistic use of the practice because of rain was cited as the reason for many apparent failures. Necessary preparation included starting from planting (rather than ratoons) with attention to drainage, grass control, area selection, and fire breaks.



**Question 2. What factors influence your decision to use or not to use green cane trash blanketing? & Question 3. What are the main difficulties, if any, with green cane trash blanketing on your farm?**

### **Advantages**

**Soil Type:** GCTB was unanimously seen as advantageous on lighter soils, particularly in drier years where irrigation was limited, because of its effect on retaining soil moisture. A grower with limited irrigation reported that GCTB cut his water needs by half.

**Soil Structure/Stability:** GCTB was described by growers having used the practice for a number of years as significantly improving soil structure - *softer and easier to work*. A major advantage raised was that of avoiding soil erosion - keeping soil in place particularly in sandy country.

**Weed Control:** Trash blankets were recognised by most as suppressing weeds in general and reducing the number of sprays/cultivation needed. A crop of 95 t/ha was proposed as necessary for beneficial cover.

**Harvesting:** A major advantage highlighted by all was the flexibility with harvesting during wet conditions: *if you burn you are committed to cutting*. The practice was also noted as helping to keep a continuous flow of cane to the mills under wet conditions. Reduced time, labour, and personal stress in relation to burning were raised as major advantages.

### **Disadvantages**

**Soil type:** The fear expressed by some growers was that of possible losses in a cooler, wetter year in the heavier soils - or worse, two wet years in a row. The comment was made with much agreement that if we could better predict the weather, growers would have more confidence in using GCTB. GCTB was seen by most to inhibit growth of ratoons, particularly in cool, wet, poorly drained conditions on heavy soils (some experienced stools rotting under these conditions). There was some comment that although ratoon emergence was slower, in many cases the crop caught up later in the growing cycle.

**Varieties:** There was a general feeling that the lack of suitable varieties was a major limitation against wider use of GCTB. Some varieties were named as being particularly problematic in wet, cool conditions. Q96 was an example given. Varietal factors were also considered to affect losses at harvesting and the amount of 'dirt' in bins. Q136 was cited as having a greater loss.

**Irrigation:** Difficulties with flood irrigation and GCTB were described. A travelling irrigator was seen as being much more suited to GCTB than flood irrigation. For flood irrigation to be successful with GCTB, good drainage (laser levelling) was reported to be needed as well as high drills.

**Flooding:** Trash blankets were suggested to be a problem during floods. The trash was often moved and blocked up waterways. It was suggested shredded trash was less likely to move. Better machines were needed to mulch the blanket into black soils.

**Fertiliser Application:** Fertiliser application was considered by most to be a major difficulty. A specific problem described was that of nitrogen placement with flood irrigation, and the loss of N due to water logging.

**Weeds:** Specific grasses and vines were described as being a greater problem by some with GCTB. Couch grass for example was not suppressed by GCTB. Guinea grass was also described as a real problem under GCTB. In general, grasses were noted to be a problem on the row ends. Spot spraying was described by some as being adequate to control these problems.

**Rats:** There was a range of opinion on the impact of GCTB on the rat population. Some saw it as increasing the problem, while others suggested that the rats just congregated under the trash.

**Insects:** Army worms were also described as being a greater problem with GCTB as they liked to get under the blanket. There were varying views on the benefits or necessity of spraying. Grasshoppers were also raised as a potentially greater problem with GCTB.

**Harvesting:** A number of disadvantages were highlighted with harvesting. These included the increased cost charged by contractors (20 cents to the usual \$1 extra per tonne), a number of contractors initially reluctant to cut green, losses of cane during harvesting, and the longer time needed to cut cane green (a problem for large Co-operatives, or if there was 150 tonnes per hectare). Increased trash in bins was also raised as a concern. Losses were suggested to be a result of inadequate extractors and worse with large tonnages. Shredding (seen as a better option for the trash blanket) required a greater machine capacity and some machines could not cope. Older harvesters were seen by some as inadequate for GCTB. It was generally agreed that there were problems with harvesting green cane that is lying down. It was perceived to be easier to harvest if burnt. GCTB was also thought by some to affect the amount of floc in the product with some varieties.

A general point raised was that *if you cut green and the mills had a problem, they will stop you first.*

### **Other points**

**Preparation:** It was suggested that the higher the stool, the better it will grow under GCTB. Raking trash away from drills was suggested as a way of avoiding the disadvantage of cooler weather under trash, and increasing the number of stalks under GCTB. Pre-watering was described as giving a better response from ratoons.

**Fertiliser application:** There was some discussion on alternative approaches to fertiliser application. This ranged from fertilising as soon as possible after harvesting (before rain), to pre-watering, with fertiliser included, prior to harvest. Direct application to the stool

was also raised as advantageous. If application with a coulter was too difficult, broadcasting or aerial application was suggested as alternatives. The point was made that growers were still learning, and trying alternative application methods. These included developing and adapting machinery for the purpose.

**Fire:** The issue of fire hazards with GCTB was a significant and general concern.

*There's two sides to this. No-one can argue about the dangers of trash making fires especially when crushing is finished and everyone has gone to the beach ..flash lightning and so on.... that's a real fire risk. But also by not burning you get away from all the other fire risks back during the crushing .. when you can still have hot weather, big winds.. (and) people have to burn.*

**Community:** There was some concern expressed that the general community (through environmental lobby groups) would force an inappropriate no-burn policy onto cane farmers (examples given from England). An opinion was expressed that the industry was unnecessarily fuelling these moves by promoting GCTB on radio (farmer magazines were considered to be more appropriate in this case). The comparative environmental damage of smoke as compared to rotting trash was discussed.

**Question 4. On your farm, how do you see green cane trash blanketing in relation to yield?**

There were no hard figures to support yield differences. There was a general perception that yields were better in dry years in the lighter soils. This advantage was suggested as being reduced or even reversed on the heavier soils particularly in cool wet years. CCS gains of 0.3 to 0.5 of a unit were attributed to GCTB in one case. It was pointed out that the need to burn poorer, lodged, cane could have biased this apparent advantage.

**Question 5. How do you think that green cane trash blanketing affects profit?**

Again, no hard figures were given to demonstrate the impact of GCTB on profit. There was a general recognition that profit took in all factors including reduced growing costs, increased harvesting costs and losses, and yield. Cost advantages were given as reduced cultivation, spraying, irrigation, and labour (overtime) costs. Extra costs included more expensive equipment and increased harvesting costs. Wet or dry years were considered to impact on profits, however it was proposed that recent seasons put GCTB well ahead.

**Question 6. Are there any research or information issues about green cane trash blanketing which should be addressed?**

Further research suggestions centred around varieties and machinery. Better varieties were suggested as being needed in relation to ratooning under GCTB and reducing losses during harvesting. Harvesting efficiency and equipment to better incorporate trash into soils were the machinery issues.

It was also suggested that research into GCTB on the flatter, heavier soils was needed. It would have a dual purpose in that it firstly would improve management methods for these

areas, and secondly would demonstrate the inappropriateness of the practice under these conditions. The issue of gas emissions from rotting trash was also raised in this context.

There was some support for extension programs aimed at farmers whose land suited the practice but who were not using it. Demonstrating that the industry was using the practice where agronomically feasible was considered to be a good counter to environmentalists.

### **6.1.2 Mackay (Group 1)**

#### **Specific factors related to this group**

All participants were growers from the Mackay region. Although they came from different districts they all seemed to know each other quite well. Most of the producers at the meeting were using GCTB. A small number had experimented with it but were looking at going into it further.

#### **Summary**

The main reasons why the practice was being used were the advantages associated with soil moisture retention on the lighter soils in the better drained areas. Soil conservation and reduced cultivation costs/management demand were other reasons strongly promoted. Fertiliser application was considered to be a significant issue, however, many growers had appeared to successfully get around the difficulties. The need for good drainage was also highlighted. There was a strong feeling that it was inappropriate to use the practice in some areas and growers needed to maintain the right to choose if and where they used GCTB. A general feeling of unhappiness was shown towards the non farming community because of this. There was a suggestion that growers should attempt to use GCTB as this would provide valuable information to support/not support the use of GCTB in all areas. Varieties and reducing losses at harvesting were the main suggestions for further RD&E.

#### **Results**

##### **Question 1. What are your thoughts about green cane trash blanketing in this area?**

In general the participants felt that GCTB would not be successful in all parts of the district, although some of the growers already farmed 100 per cent GCTB. Many growers on the lighter soil types already used GCTB whereas those on the heavier and wetter soils (eg. Victoria Plains) perceived problems with GCTB. Another point was that blocks which were to be cut green should be carefully selected. Those growers who presently use GCTB considered it to be an excellent cultural practice. One participant felt that GCTB must be persevered with over a long period of time, and not just for one year. One grower suggested GCTB is not likely to work well in a wet year. Although there were some disadvantages associated with GCTB, these could be overcome by changing management practices.

*It's not as broadly used as once thought to be. Victoria Plains will never cut it all green.*

*It's the way to go, we cut 100 per cent green.*

*I've been doing it (GCTB) since 1987, I now think we are on the right track.*

*A farmer is responsible and will try to do things. They are not idiots as the media makes them out to be.*

**Question 2. What factors influence your decision to use or not to use green cane trash blanketing?**

Advantages and disadvantages were explained. Even those who were farming 100 per cent GCTB had found some disadvantages with the practice. These growers consistently raised methods they introduced into their farming practices to overcome these problems. Growers considered GCTB to be a suitable practice, otherwise they would have returned to burning.

**Advantages**

Some participants found that GCTB has produced a dramatic reduction in farming workloads. The grower no longer has to burn and cultivate every block on their farm, which has resulted in a decrease in work pressure. Growers suggested increases in production have been experienced on the lighter and drier soils of the district through the increase in moisture retention due to GCTB. Some growers found the build up of trash has led to an increase in worm activity, leading to soil structure improvements. Improvement in soil structure had increased water penetration and reduced soil compaction. Some growers found GCTB useful in reducing soil erosion.

One grower found that cutting green cane in wet conditions had no effect on yield, although it did delay the ratooning time. Some participants suggested that by time of harvest the crop would catch up. It was observed that although cutting green cane slows down the harvester, it resulted in less stool damage from shattering. Community concerns were another issue brought forward. The perception is if less growers burn the community will be happier.

*Great, as it (GCTB) takes pressure off the farmer.*

*On my lighter country I get results.*

*Trash holds the moisture, when I burnt, some stools died but it doesn't happen as much now.*

*GCTB is similar to a vege patch, that is, you throw lawn clippings on it.*

*We must be seen to be doing something to quieten the community. If we try GCTB we will have information to say I can do it (GCTB) here but not there.*

## **Disadvantages**

The increase in cane loss was considered to be a disadvantage to GCTB. A few participants thought the mill sometimes discriminated against growers with GCTB by milling any burnt cane first to reduce its deterioration. Some participants expressed their concern with the increase in fire danger under GCTB.

The difficulties of wetting beneath the trash when flood irrigating was also discussed. If conditions were too wet the crop suffered, this was observed by one grower when his travelling irrigator broke down. Some growers found ratoons did not germinate under wet conditions. Under GCTB some participants suggested there is a greater problem with vines, couch grass and Guinea grass. Some participants suggested an increase in armyworm, grasshoppers and rat activity. It was suggested these problems could also occur in burnt cane situations as well. Another disadvantage were difficulties with fertiliser placement on GCTB.

*In a wet year the soil went sour.*

*Under GCTB I found a weed I had never seen before.*

### **Question 3. What are the main difficulties, if any, with green cane trash blanketing on your farm?**

Most participants found trash fire problems to be a difficulty. One participant was concerned with the amount of fuel which is present in government reserves. A few participants said the difficulties they had with GCTB were obvious, until they improved both surface and sub-surface drainage. Heavy soil types were discussed again.

*You must have good surface and sub-surface drainage, then you will get results.*

*I've laser levelled and I can't run water on top of water, that is I can't drain my place any better.*

*I had problems on my glue pot soils.*

*If we are all prepared to try green cane, we must be allowed to retain the right to burn.*

### **Question 4. On your farm, how do you see green cane trash blanketing in relation to yield?**

Most participants found their yields had improved under GCTB, especially in the dry years. Some participants have found that when a crop was cut at the end of the season under wet conditions the crop did not recover well. One participant thinks that although you may grow more, you must take into consideration the losses incurred from harvesting.

*I've trialed half my blocks and compared yields and GCTB has always won.*

*In a drier year you get better yields under GCTB, but that depends on irrigation.*

*When a 'canie' estimates a green block he would take 10% off because the harvester throws that out.*

*You must decide for yourself if you should cut green, we have grown greater t/ac by going to GCTB.*

**Question 5. How do you think that green cane trash blanketing affects profit?**

A number of participants suggested GCTB led to higher CCS, which led to a greater profit. It was obvious there were reservations from some participants towards this comment. All participants agreed there were increases in harvesting costs under GCTB. Some growers suggested this extra cost was outweighed if a higher CCS was produced. Other savings included less fuel consumption through reduced cultivation, less herbicide use, and one man being able to farm greater areas without the need for other casual or permanent employment. Two participants actually found that harvesting labour costs were considerably reduced using GCTB. Workers are no longer being paid at time and a half to burn. One participant showed concern with these points and asked why everyone isn't farming using GCTB? Some participants once again put forward the points that maybe the profits are not carried on due to factors such as soil type.

*We charge 70 cents more per/tonne to cut green cane, but you save that if you get a higher CCS.*

*The extra cost of cutting green cane costs less than getting people to come and burn in the afternoon at time and a half.*

*You may use more Round-up in some places but you don't have to spray in other places because of a good trash blanket.*

*Where is the saving if you get charged an extra \$1/tonne to cut it?*

*There is a misconception if you go to GCTB you lose 4-5 t/ac because of harvesting but you (BSES extension) should be saying we (farmers) will make 4-5 t/ac more because of GCTB.*

**Question 6. Are there any research or information issues about green cane trash blanketing which should be addressed?**

Participants saw the need for further research regarding GCTB. Key issues were varieties better suited to GCTB, fertiliser type and placement, and cane loss. Some participants suggested enough work was being carried out on cane loss.

Some participants found that the extension messages associated with GCTB were inconsistent, and unclear.

As there was a strong perception that heavy, poorly drained soils were not suited to GCTB, specific work is needed to explore this in terms of alternative agronomic practices

and yield. Climate forecasting tools may also assist confidence with using the practice in marginal areas.

The compounding costs and benefits associated with the practice at all stages of growing and harvesting lend themselves to 'what-if' financial models. These could be extremely useful in decision-making.

Growers in the area are trialing their own adaptations according to their own specific conditions. It was obvious that other growers are interested in discussing such practices and learning from peers. Discussion groups to provide this opportunity would not only assist practices in relation to GCTB, but also assist the use of other management practices pertinent to the cane industry.

### **6.1.3 Mackay (Group 2)**

#### **Specific factors related to this group**

All participants were growers from the Mackay region. This meeting convened growers who were predominantly using burnt cane production methods. Most had tried GCTB and experienced poor results, and were well aware of the limitations of the system. All participants engaged in constructive discussion and were eager to hear of the experiences of others.

#### **Summary**

Discussion focused mainly on the negative aspects of GCTB. There was a strong perception that adopting GCTB required additional investment and production costs. Major drawbacks were the costs of new machinery against a questionable increase in profitability. The group agreed that GCTB had a place under particular conditions (soil type, topography, dryland, newer harvesting equipment) and felt a profit could be made. However, participants felt the 'right sort of country' was necessary for successful results from GCTB, and that growers on low slopes, and/or, heavy soils were unable to grow cane under GCTB.

The group agreed that GCTB had significant advantages in the areas of soil conservation, moisture retention and harvesting. There was a feeling that GCTB gives growers some management advantages, which did not always result in an improved crop yield.

Other major obstacles to adoption were the harvesters' capability of cutting green, the harvester operator's skill in reducing cane loss, and the machinery investment required for GCTB. Overall, the group felt there was no significant advantage in yield between GCTB and burnt except in a dryland situation. The increased costs, and cane loss, when harvesting green were felt to negate yield gains for many growers. Fire hazard and wet weather were also identified as obstacles to GCTB.

There was concern that GCTB would be imposed on 100% of caneland. GCTB may be less profitable for the majority of producers which was seen as detrimental to the industry.



There was concern that their livelihood would be threatened and the group believed that most canefarmers would be ruined.

## Results

### Question 1. What are your thoughts about green cane trash blanketing in this area?

Many limitations were identified to the growing of GCTB. In particular, the type of country suitable to utilise GCTB techniques was perceived to be sandy or light textured soils, and undulating or sloping country, with good surface drainage. Land levelled to remove any localised depressions may be necessary.

The group believed GCTB does have its place in the industry although it was not suited to everybody. Dryland growers would gain greater advantage than irrigated growers. There was some concern about changing farming methods to successfully implement GCTB; ie., fertilising differently, increased dependence on chemicals, expense of buying new machinery, and, if GCTB wasn't working, the machinery inflexibility to return to burnt cane methods. All agreed that a lot more could be learnt about GCTB.

Legislation and the imposition of GCTB on the cane industry was the greatest concern of the entire discussion. Concern was that *the environmental movement* could force growers to 100% GCTB, as had happened in Florida. DPI was criticised for a survey identifying class 1 and 2 (agricultural) land as good land, some of which is known by growers to be poor quality. As part of the Government, DPI was perceived to have no powers to protect the cane industry. A survey using group meeting techniques was conducted by a consultant in 1993 for the Australian Conservation Council. The group had serious concerns about the report which they felt did not portray the group discussions accurately or fairly.

*Green cane has its places. Its not for everybody.*

*Better for dryland; GCTB is a benefit on the slopes.*

*GCTB has to be on well drained country. Land levelling is very important.*

*There are a lot more things to learn.*

*Don't want environmental movement causing 100% GCTB. If GCTB was made compulsory it would put many growers out of business.*

*BSES should protect growers to ensure GCTB is applied to caneland that is suitable.*

*It'd be a disaster to the whole community (town and country people) if GCTB forced on growers.*

*(The consultant) said the growers economic argument against GCTB was irrelevant.*

**Question 2. What factors influence your decision to use or not to use green cane trash blanketing?**

**Advantages**

The advantages of GCTB depend on the block of land and its slope. GCTB gave advantages of reducing soil erosion and conserving soil moisture. Most of the other advantages related to harvesting. Harvesting green eliminates the problem of deterioration in the quality of burnt cane left standing in the paddock after rain. Removing the job of burning was seen as one of the major labour saving advantages of GCTB.

*Definitely stops soil erosion.*

*Advantage in GCTB depends on the block.*

*Trash certainly conserves moisture.*

*Best in sloping land.*

*Can select a paddock that can be cut after rain.*

*Don't have hassle of organising couple of blocks for a couple of hours to burn - also having to notify all your neighbours.*

*GCTB gives you a lot of fishing time.*

*Burnt needs to be harvested - caught two times last year.*

**Disadvantages**

Participants felt that soils with a clay base within 50 cm of the surface stay waterlogged, resulting in reduced cane growth, and are therefore unsuitable for GCTB. This may also cause rotting of the stool. Heavy rain can float the trash blanket off the paddock where it can build up in creeks or block culverts and wash out approaches.

The risk of trash fires was seen as a major problem of GCTB, as was the need to acquire different farming implements. Harvesters need to be in good order and big enough to handle green cane harvesting. Operator error was seen as a major cause of harvesting losses of green cane. Areas unsuitable for green harvesting include rough country with rocks, where lack of visibility could cause harvester damage and/or accidents. This had implications for causing trash fires as well as operator safety.

Other issues included additional chemicals required for weed control, potential for more problems with rats, and doubt about improved fertility with GCTB.

*A clay base with GCTB stays waterlogged. Waterlogging may rot stool.*

*Fire won't stop in trash blanket.*

*During heavy rain, trash blocks culverts and builds up in creek banks.*

*Can't put the match in any more - wrong gear set up for GCTB.*

*Fertilising in trash is done with expensive new gear.*

*Kidding yourself if you think fertility builds up.*

*What turns me off most is the amount of cane left in the paddock. You need the machine to do it and they need to be in good order.*

*Go GCTB got to go chemicals.*

**Question 3. What are the main difficulties, if any, with green cane trash blanketing on your farm?**

In addition to previous points, placement of fertiliser, not being able to cultivate the soil following harvest, and small weeds in the trash blanket were also seen as problems. Armyworms and rats were felt to be favoured by GCTB.

It was argued bin weights to the mill drop with GCTB increasing the cost for the harvester. This cost was felt to ultimately be passed on to the grower. The mills had not complained about reduced bin weights.

*Armyworms set cane back.*

*When ratoons are 50 cm high is the worst you; loose yield - sets it back.*

*I lost 60-70% cane down due to rats.*

*Temperature a problem with excess moisture.*

*Loss bin weight - to mills.*

*Rain can be deadly.*

*Tried to keep cutting after rain - paddock can't be flooded any more due to ruts. Will have to re-laser level paddock after ploughout.*

*Can't bust it up (soil);*

**Question 4. On your farm, how do you see green cane trash blanketing in relation to yield?**

A reduction in yield of GCTB areas had been experienced by members of the group. Losses during harvest due to incorrect toppler and basecutter settings was seen as a major contributing factor to these losses. Conflicting comments were made in relation to CCS.

One grower related experiences of increases in the range of 0.3 to 0.5 of a unit of CCS, and another, a loss of 0.3 units. This was reinforced by another comment of trials done by one grower saying: *I have had good results and bad results.*

It was noted that in a dryland situation GCTB is likely to give increased yield. Irrigation can negate this difference.

*Drop down in crop tonnage.*

*Make some money due to reduced costs.*

*Turned off most by the amount of cane left in paddock.*

*Harvesters drop their topper - loose cane, and cut high on stool - trash covers mistakes.*

*You can pick up the difference between trash and no trash. If you have water it makes a big difference.*

*CCS up 0.3 of a unit even up to 0.5 a unit.*

*A lot of up and down CCS - 15 bins GCTB 14.2 CCS: same block - 14 t burnt 14.5 CCS.*

#### **Question 5. How do you think that green cane trash blanketing affects profit?**

With the expense of changing equipment it is critical that GCTB is successful. GCTB reduces production costs but there is often an associated drop in production. There is an increase in chemical use and costs, and fertiliser placement requires new machinery that can deal with the trash blanket. Overall there appears to be a willingness to apply GCTB.

*A problem if we change over to GCTB and then it fails.*

*GCTB could be a good thing for farmers to reduce costs.*

*Make some money due to drop in costs (also drop in production).*

*Neighbour has been GCTB for 10 years - last 3 years he has incorporated the trash , looks better and increased the costs a lot.*

*Equipment for GCTB is out there but at a cost;*

*Chemical costs increase.*

#### **Question 6. Are there any research or information issues about green cane trash blanketing which should be addressed?**

Growers in this group agreed that they *wanted trials done. More effort* needs to be put into *the economic aspects of GCTB.* Trials need to be *throughout the district, over 5 years and side by side* with traditional methods.

The group believe that *there is a better future in GCTB* but *don't know* if they would get a *yield improvement*. They want *proof it works* as they are all *in it to make a quid - livelihood*.

*Look at other farming areas getting success in GCTB - want proof it works for us.*

*Want trials done.*

*Watching BSES trials to show response.*  
*In it to make a quid.*

*Want and need more trials on incorporating trash.*

*More effort in economic aspects of GCTB.*

*Do trials throughout district - over 5 years and must be side by side.*

*Believe there is a better future in GCTB.*

#### **6.1.4 Sarina**

##### **Specific factors related to this group**

All participants were growers from the Plane Creek mill area. All had used GCTB at some stage.

##### **Summary**

The group generally felt GCTB was a useful management practice for the area. It was acknowledged GCTB required a major change in farming practice to realise the potential benefits. Some growers felt in conjunction with improvements in other practices production would be increased as a result of GCTB. There was no consistent yield response to GCTB, with growers reporting both good and bad results. These were greatly influenced by soil types, seasonal conditions, varieties, and availability of irrigation. Most of the difficulties and poor results were related to soil types, topography and risk of fires. The best results were obtained on well drained, lighter soils. GCTB on heavy soils was more likely to produce lower yields and more management problems than on lighter soils.

There was a range of opinions expressed on other issues such as weeds, fertiliser application, and harvesting. These were not necessarily seen as advantages or disadvantages, rather areas of farm practice requiring change to improve the acceptance and performance of crops under GCTB. Growers were keen to support the development of cane varieties more suitable to GCTB, and improved harvesting machinery.

**Question 1. What are your thoughts about green cane trash blanketing GCTB in this area?**

Members of this group had all used GCTB at some time, with some growing 100% of their cane under GCTB. The practice was not considered to be suitable for all soil types. In particular, medium to heavy clay 'gluepot' soils were unsuitable. Extra research and development was considered necessary for sites with poor drainage (both surface and internal) before GCTB could be successfully adopted.

GCTB required a different approach to farming practices, particularly in relation to weed control, fertiliser placement, operation and set-up of harvesting machinery, and irrigation management. It was felt that the benefits of adopting GCTB may take some years to become fully apparent in some situations. Weather conditions following harvest and soil types can have a major influence on the success of GCTB in any one year.

*Must persevere for a full crop cycle for full benefits.*

*Must have patience in cold and wet weather following harvesting - not always a disaster.*

*GCTB gives you a lot more time but you have to redesign your farming system.*

*Soil types important - every paddock is different and will produce different results.*

*Seasonal conditions highlight drainage problems. Must eliminate any areas where water lies.*

**Question 2. What factors influence your decision to use GCTB?**

The advantages of GCTB identified by group members included less work, reduced fuel costs, reduced erosion, and improved yields, particularly in drier years and on lighter soils. Harvesting green cane improved the flexibility of the harvesting operation. Green cane harvesting did not necessarily mean GCTB, as some farmers subsequently burnt the trash. Some farmers had experienced better sugar CCS in GCTB cane, but some had conflicting experiences.

Environmental considerations were an issue in terms of health and safety of farm workers and smoke inhalation. Reduction in soot fall out (*black rain*) from fires over urban areas was also mentioned as an advantage of GCTB. The increased use of herbicides sometimes associated with GCTB, was felt to be a concern from an environmental perspective.

As discussed previously, the adoption of GCTB required a change to many farming practices. This was seen as both an advantage and a disadvantage. These management issues were being addressed by individual farmers in different ways, and were a major part of the on-going development of GCTB farming.

Many of the problems with harvesting green cane will be overcome as improved machinery and farming practices are developed. It will take many years to replace existing

machines, with better (and expensive) machines as they become available. Participants felt that existing machines were basically modified burnt cane harvesters.

Growers were aware of the potential problems with pests, but did not seem to be overly concerned. The concept of possible natural biological control of army worms was discussed. Growers were clearly aware of, and concerned about, possible environmental effects of herbicides and insecticides. They were keen to minimise the use of these chemicals.

*Water running out of trash blanketed areas after heavy rain is clean.*

*One block of cane worked using traditional methods performed well until it encountered dry weather. A comparable GCTB block which appeared to perform poorly under the wetter conditions actually cut 10t/ac more cane.*

*Must persevere for full crop cycle - problems can be overcome.*

*Keeping right on top of weeds in plant cane and first ratoon will greatly reduce future problems.*

*Has increased yield. Big benefits on white sandy soils with limited irrigation.*

*Definitely long term yield decline where burnt.*

### **Question 3. What are the main difficulties of GCTB on your farm?**

The major disadvantages included soil type and drainage, problems with ratoon growth in wet and cold soil conditions following harvesting, the need to develop alternative fertiliser application and weed control strategies, and problems with harvesting machinery and operation.

Risk of fires in trash blanketed areas was also a major concern. Fire was of particular concern in areas where cane was burnt adjacent to GCTB areas and also along roads. Farmers have developed management practices to reduce the risk of spread of trash fires but this risk will continue to be a problem into the foreseeable future.

The cost of harvesting by contractors was quoted at up to 80c/t dearer than burnt cane, and concerns were expressed about the amount of cane sometimes left in the paddock following harvesting. Some existing varieties of cane were more suitable for GCTB than others under some conditions. For example Q124 was generally better than Q135.

Discussion on soil compaction was inconclusive. Some growers felt GCTB reduced compaction, whereas others reported an increase in compaction.

*Cane won't grow in wet ground.*

*Definitely still need weed control with GCTB.*

*Q135 can take twice as long to harvest green.*

*Increased weed and vine problems may be a result of increased soil moisture levels with GCTB.*

*Badly lodged crops could present big harvesting problems.*

*Big problems with fires when neighbours burn.*

#### **Question 4. How do you see GCTB in relation to yield ?**

The group experienced a range in yield response under GCTB. In comparing GCTB to burnt cane production, both increases and decreases in CCS and tonnage were discussed. Soil types and post harvest weather conditions had a major effect on yield. In dry years GCTB generally enhanced yield on all soil types, with larger responses on 'white' soils with limited irrigation available.

*Q124 has consistently higher sugar cut green but not Q135.*

*GCTB cane is 0.25 unit higher sugar.*

*In dry weather cut 10 t/ac more on GCTB area.*

*If you cut in dry weather and then irrigate improved yield with GCTB.*

*Sometimes increased yield, sometimes not.*

*Its better in dry years but I don 't think much difference in wet years.*

#### **Question 5. How do you think GCTB affects profit?**

Most of the experiences reflected improved profitability. Costs were generally reduced as a result of reduced ground workings and fuel costs. There was some experience of increased herbicide costs. Harvesting was generally quoted as being more expensive. As soil types and drainage were considered to be important factors likely to affect yield, they also affected financial outcomes. GCTB on suitable soil types was considered to be more profitable in most years by the majority of farmers present. The benefit was generally related to reduced costs rather than increased production. There was generally more time for other pursuits, both on and off farm, where GCTB was adopted.

*If soil is right and drainage is right GCTB should be more profitable on many areas of the farm.*

*It halved the fuel bill on the farm.*

*There's a debate whether weed control is cheaper when using GCTB. You can stand a yield decline and still be more profitable.*



**Question 6. Can you clarify green cane trash blanketing in relation to specific issues (if necessary) ?**

Harvesting of green cane or burnt was seen to have potential advantages, even if trash was subsequently incorporated. These included improved flexibility at harvest time to react to wet weather. It removed the need to burn and allowed moving to drier blocks. This flexibility also allowed moving to higher CCS blocks of cane if areas being harvested were low. Green harvesting had the major advantage of eliminating the time needed to burn.

Disadvantages of green cane harvesting were generally associated with cane losses during harvesting, slower operation of machinery, and needing suitable harvesters. Cane loss was associated with operators trying to maintain high operating speeds, lifting the base cutters, and lowering the topper on the harvester. Cleaning was also a problem, and cane was blown out with the trash. Some machines handled green cane better than others. Excess trash in cane sent to the mill was a problem with harvesting green cane in some instances, but not when cane was in short supply due to weather conditions.

Army worms were mentioned as a potential problem with GCTB. The experience of others suggested that GCTB may actually reduce the risk of serious army worm damage. Early attacks by army worms, which do occur, allow a build up of natural predators, thus reducing the risk of a build up in army worm populations which would have a more serious effect on older cane.

Rats were also mentioned as a potential problem but the experience of this group suggested that if weed control was adequate, rats weren't likely to be any more serious with GCTB.

*GCTB improves flexibility by not having to burn.*

*Burning costs 1 day a week, at a time of day when I should be setting up irrigation.*

*It allows flexibility of not having to continue to cut cane which is not testing for sugar.*

*Fires from burnt cane areas can be a big problem to GCTB areas.*

*Could have big problems green harvesting badly lodged crops.*

*Cut slow to get clean cane.*

*Cut to suit wind to reduce the risk of fires for harvesters and haul outs.*

*Army worms do prefer GCTB areas. Haven 't had bad attack of army worms in big cane since started using GCTB.*

*Army worms aren't a big problem as predators build up to control them.*

**Question 7. Are there any research or information issues about green cane trash blanketing which should be addressed?**

Development of varieties of cane more suitable for GCTB in this area was suggested as a high priority for R&D. Varieties must have the capability to handle cold wet soils following harvest and be suitable for green harvesting. A variety of suited to cold and wet soil conditions would extend areas suitable for GCTB.

The development of harvesters capable of handling green cane and possibly other operations at the time of harvesting was another high priority.

Concerns were expressed during the meeting regarding weed control, fertiliser placement, fires and other agronomic issues related to GCTB. Based on the experiences related by this group these issues were being *sorted out by farmers*.

*We need varieties more suitable to GCTB.*

*Poor ratooning in heavy soils -we need a variety with some of the characteristics of Pindar.*

*The industry needs harvesters built for green cane harvesting with better cleaning gear.*

*We need a harvester that can place fertiliser and pre emergent herbicide "under the blanket" while harvesting.*

### **6.1.5 Bundaberg (Group 1)**

#### **Specific factors related to this group**

The group was predominantly non-users of GCTB from the Bundaberg region.

#### **Summary**

The participants found the current limitations with GCTB were too great for widespread adoption in the region. They had tried GCTB, and their attitude was based on reasonable consideration of their experiences. They found it less productive, more costly, and a less profitable way of producing cane than conventional burnt cane production. They would adopt GCTB if it had equal profitability to their traditional methods. They were not convinced that CCS increased with GCTB and criticised BSES over emphasising this alleged benefit.

The group seemed well informed and most had travelled throughout the industry. They strongly emphasised the different conditions between North Queensland and the Bundaberg districts. They felt that the North Queensland experience with GCTB was not comparable to the Bundaberg district because of soil type differences, and the lower yields and higher temperatures of North Queensland.

The entire group had very strong concerns over the risk of trash fires. Three had first hand experience of trash fires and it was felt that crop insurance was not sufficient to protect them from the possible losses that could result from a trash blanket fire in the district.

They felt that the problems with GCTB were not widely understood by the community and that too much emphasis on GCTB was coming from the industry leadership, the BSES and the DPI. They were concerned with the broader community's perception of burning cane from both a community and an environmental perspective

There was an overall belief that research and provision of information on GCTB should continue. However, because of limited funding, allocation for research should be placed in the perspective of other priority issues affecting conventional production methods.

## Results

### Question 1. What are your thoughts about green cane trash blanketing in this area?

There was an overall feeling that GCTB hadn't been adopted to a significant extent in the Bundaberg district, and this was related to differences in soil type. Growers felt that GCTB had a role on some farms in the Bundaberg district but not in their own individual situations. There was an overall belief that yields were less with GCTB, and soil type was a key issue for all growers. The concern over the fire hazard dangers of trash blanketing was a major concern. There was also concern expressed that concentrating on GCTB was 'playing into the hands of environmentalists' and government. They felt demands would be placed on them from environmentalists, governments and the Bundaberg community with respect to traditional firing of cane.

*It (GCTB) has potential in the district as far as soil types are concerned. . . the concept of GCTB has a lot to offer farmers with certain situations like well drained soils...sandier soils.*

*I tried it on different soil types too. Sand and fluffy red soil. Variety might come into it. But we just went downhill, so we had to pull out of it. Now we're back up to 100 t/ha.*

*Well I can sum it up in one sentence. Been there, done it and it don't work on my soil; I tried it (GCTB) over about five years and I just dropped down from about 100 t/ha down to about 70 t/ha.*

*Last year, blocks side by side that were cut green, same age ratoons or same age plant cuttings...they were crops that were cutting around the 50 t/acre mark or better...the residues that were left on the ground were almost knee deep. The biggest trouble with that is that where we burnt, the cane was up and ratooned in about ten days. . .where it was trash blanketed I didn't see any shoots for nearly two months. So I lost as far as I am concerned I lost at least two months growth through the prime part of the season which is October through November and through to early December. So naturally the following crop was quite a bit less.*

*Our farm production this year averaged 116 t/ha over the whole of our harvested area and that was a drought year. There is no way that trash blanketing can improve that sort of production.*

*With GCTB there is less tonnage at the end ...In the first year I lost 12 percent of production. In the second year the production figure dropped back 64 percent;*

*The fire hazard worries me dramatically...at least with cane fire its over and done with in about 10 minutes.*

*If you get a government person, they will grab onto these sorts of details, coming along and say "Right..trash blanket. " You're going to break half of Bundaberg!*

**Question 2. What factors influence your decision to use or not to use green cane trash blanketing?**

There was little mention of any advantages that may exist with using GCTB. The participants listed a range of disadvantages that they found with the GCTB method, which were the basis of their reluctance to adopt the practice. The major emphasis seemed to relate to lower yield together with higher costs of GCTB, which they equated with lower profitability. Soil compaction was another major problem with GCTB. Other disadvantages were risk of trash fires, increase in soil borne pathogens, inefficient harvesting, and irrigation difficulties.

*I'm dreading because one day its going to happen that we will be 70 to 80 percent trash blanketed here and somebody's harvester will catch on fire at 2 o'clock in the afternoon and 30 knot nor-wester blowing.*

*Soil borne problems and poor root syndrome problems...I feel that under my conditions trash blanketing under my conditions makes them worse.*

*Cost of harvesting is a lot more...use to take 1 L/t to cut burnt cane and 2.5 L/t to cut green.*

*(With GCTB you have) compaction ... you have got more run-off, lack of stool and growers don 't want to invest in different fertiliser application gear.*

*Compaction is brought about by the higher soil moisture (under GCTB).*

*Not economical at this stage to cut and trash blanket. Some people might like working for workings sake. But I like to work for dollars for myself.*

*Part of the problem would be too big a volume of trash for our environment or conditions.*

*If I go to full trash blanketing I will have to go to winch irrigation. I've tried to incorporate and I just can 't get the water through (with current flood irrigation).*

*The reason we went away from it (GCTB) was water infiltration was our biggest problem. We've got heavy black soils and alluvial soils. We could not get water from winch irrigation through trash and surface sealing.*

**Question 3. What are the main difficulties, if any, with green cane trash blanketing on your farm?**

As a whole, the group again emphasised the lower yields they experienced with GCTB compared to conventional burnt cane, and were unconvinced of any CCS advantage. There were differing opinions and criticism of the reported advantages of CCS increases with GCTB. There is a belief that the promoters of GCTB are incorrectly claiming an increase in CCS. They felt that at best there is no effect on CCS, with many experiencing reduced CCS.

*I found it the same (CCS levels between burnt cane and GCTB cane).*

*We had slight increases (in CCS) with cutting green but I mean it still didn't compensate much for our per hectare tonnage (which was lower with GCTB).*

*There is very few who can claim increases in CCS. . . over a whole block. I don 't think it is achievable.*

*Each time I did a trial it (the CCS level) was half a unit less cut green.*

**Question 4. On your farm, how do you see green cane trash blanketing in relation to yield and profitability?**

The profitability of GCTB was felt to be much less than that from traditional cane production. This was due to lower yields and the perception costs were greater growing cane with a trash blanket. A range of costs were identified as higher under GCTB, including irrigation, fertiliser, harvesting, weed control, and insect control. There was also a concern that GCTB would result in a lowering of sugar quality.

*You're up for a dollar a tonne extra to harvest (GCTB cane).*

*You're up for about 3 to 5 percent (harvest) losses extra (compared with those from traditional cane).*

*You always whack a heap more urea on or something like that just so you know you've still got the crop next year if it (GCTB) doesn't work.*

*There would be extra costs (with weed control). Its very difficult to control couch (in GCTB). . . it really loves a trash blanket.*

*Armyworm control is a real problem in our area. I've had armyworm outbreaks quite severely the times I have trash blanketed.*

*A cost that is very real to the industry and yet it's a bit of a hidden one is sugar quality. With Q141 and CP51, a couple of the larger varieties, if they're cut green there's a real chance of getting sugar quality down, which will affect the price we will get for our sugar. . . a mealy bug gets in there and his secretions are acid and it stays there unless burnt. The heat of the fire actually gets rid of it. It affects the individual grower.*

*I still maintain the trash blanket requires more water.*

**Question 5. Can you clarify green cane trash blanketing in relation to specific issues (if necessary)**

Several issues arose. Concern over being forced to GCTB through community pressure, environmentalists and government legislation was again emphasised. The community's negative perception of traditional cane production would threaten their livelihood. Criticism was also levelled at the leadership of the cane industry for promoting GCTB which could contribute to enforcement of GCTB.

Apart from lowering profitability they felt that GCTB was in itself a hazard to the environment and the wider community. Issues included road safety and the need to use pesticides. The group was keen that traditional cane production was seen to be environmentally responsible, and a clearer message on the industry's beliefs about the possible role of GCTB in southern Queensland was required.

*Molly Robson. (Minister for Environment) said "Why don't you all go to trash blanket". That's the perception everyone's got. We've got to get that through to our leaders, that trash blanket is not recognised (as being unprofitable).*

*The public perception is very poor with regards to trash blanketing. Their perception is the same way...that we should be doing it.*

*Environmentalists will go on about fires will take all the oxygen if you burn. Even if you burn, by growing cane it still gives the atmosphere, the environment, a plus as far as oxygen is concerned.*

*Another effect of trash blanketing is that you don't get an uniform crop which we always aim at now . . . you've got all your weed troubles on end. Its a lot hairier farm by the time you finish. . . it looks a bloody mess.*

*If we can incorporate the benefits of green cane trash blanketing and the benefits of normal cultivation then we'd be right;*

**Question 6. Are there any research or information issues about green cane trash blanketing which should be addressed?**

There was a strong call for economic evidence that GCTB is more profitable than traditional production methods. The group felt that GCTB research in northern districts was not applicable to their situation and even questioned its benefits in the north. Such research was not a high priority for them. Although further research on GCTB in their

district was desirable it should not be given priority over other issues concerning conventional cane production.

*Profitability - that's the one. That's the only one! Its really a profitability decision.*

*Some research should be persevered with in case we get this no burn business put on us.*

*Terrific amount of research has been done into trash blanketing. DPI has done some...BSES has done a lot and they're of the view that canegrowers take. But I would hope and I know that BSES would always be keeping an eye on (it), so we will be getting sufficient research. As new technology develops it might alter our whole (attitude).*

*There should be ongoing research into it (GCTB), but I wouldn't say we'll be saturated with research funds. I think, like everything else it needs some continuation of research into it but I don't think it needs to be gone overboard..*

*I don't think there was ever enough research done in the northern areas when they went into trash blanketing. They saw an increase in production immediately but it came in about the same time as the advent of good weedicides.*

### **6.1.6 Bundaberg (Group 2)**

#### **Specific factors related to this group**

This group was a mixture of farmers who are green cane trash blanket (GCTB) users, farmers who had tried it but did not adopt the technology, and one farmer who had just tried it for the first time during the previous season.

#### **Summary**

Participants felt that all cane farmers understand that GCTB is a whole farm production system. This means that you should prepare for it prior to planting right through until you plough out the last ratoon. It is not a system you suddenly drop into during a wet harvest and then change back when the ground dries out. Growers need to persevere to gain the understanding, and benefits.

The group was interested in addressing the management, technical issues, and difficulties of GCTB. The specific issues of importance included:

- fertiliser application & placement, liquid versus solid fertiliser, variability of effect, and what happens to the fertiliser once applied, with particular emphasis on nitrogenous fertilisers.
- soil compaction, how to minimise it, what effect does it have on ratoons, do some soils compensate for compaction over time, do earthworms have any impact, how to, and benefits of mechanical correction.
- stool damage/bruising including correct cutting depth / height, covering with soil and the effect of being driven on by harvesters and transporters.

- harvest group/harvest contractor/harvester operation, management and education. With big groups eg > 60 bins per day, it is critical to maintain operational care in the paddock such as preventing driving on stools and turning in the paddock instead of on the headlands, speed of operation, setting up the harvester correctly for cutting height, extraction of trash, and operator understanding / attitude to on-farm issues of cane loss, trash extraction, compaction and stool damage.

There was a strong awareness of the negative community attitudes on environmental issues associated with burning cane, and the lack of understanding of the difficulty of applying GCTB regionally. It was felt that both the cane growers and the community had to understand and change, and move towards the optimal position of as much GCTB as possible (a suggested 60%), a total ban on the burning of tops, and community understanding, acceptance and support for this. The community needs to understand that the conventional burnt cane system has changed significantly, and that GCTB can not be used by all farmers.

GCTB was exceptionally effective at controlling soil erosion on sloping ground especially if the centres had been ripped. It was noted that ripping the centres increased the infiltration rate but crop benefit was not obvious. The CCS benefit was highly variable and not consistent, but concluded a probable advantage across the whole farm per season of 0.2 of a unit to GCTB. The best results were 0.5 of a unit sometimes, and reductions at other times, particularly early in the season and in lodged cane.

The increased incidence of frost damage was not a particular issue. All participants had experienced or observed it in their district but believed it to be highly variable over time and place. Frost had been observed to burn off the ratoons but did not kill them even after three frostings. Similarly, army worms were not an issue, being highly variable in incidence and effect. It was just another crop management task. Neither grass nor broadleaf weeds are considered to be a problem, rather another crop management task.

GCTB is not for every grower in the district, but a lot more growers should be doing it. It's a problem of understanding and application. Supporters of GCTB in the group were quite adamant that they were better off socially (no burning), labour wise (less work), cost wise (reduced purchased inputs) and profit wise (the same or slight increase). But they did have to change their farm management, eg; the harvest operation was now critical because under GCTB there isn't the opportunity to redress problems arising from shoddy harvest practices.

### **Question 1. What are your thoughts about green cane trash blanketing in this area?**

The growers in this group had an open and positive attitude towards GCTB. There did not appear to be concern with the concept of GCTB as such, but rather more concern with the crop management or techniques required to implement GCTB successfully. It was stated that GCTB is not for every farm in the district but that a lot more farmers should be growing cane (profitably) using this system. GCTB was described as a whole farm production system, with subsequent events dependant on previous events. If the farmer



does not get the production events in order and carried out correctly then there is every chance that the system will break down, probably very quickly.

The dominant issue was that of harvest management. Good harvest practices are essential for successful GCTB production. Important considerations included cutting depth, setting the harvester up correctly to balance cane loss with trash extraction, turning on headlands instead of in field, and not running along stools. There was a high correlation between successful GCTB and owner harvesters, farmer contractor harvesters and small group harvesters. Contract harvesters who don't farm and big harvesting groups always resulted in poor performance under GCTB for members of this group.

It was critical to set up the plant crop correctly, especially hilling up the stools, overcoming fertilising problems.

The point was made (and is inherent in many of the group's comments) that apart from the technical problems, it's an individual matter, and farmers need to make the effort over an extended period of time to understand and come to grips with the GCTB production system.

*Well its a very personal thing, the more personal its done the better it is...more people could probably go to it but they have just got to have a better understanding of it and be willing to adapt.*

*I think its a specialist approach to a particular cane cultivating position were you harvest your own cane.*

*Our very first block we cut this year we cut green, ratooned well and done very well we are very happy with them in fact the work load is being reduced to almost nothing we did it because we wanted to try it so far very pleased with it.*

*I tried it and I think fairly successfully on light soil.*

*Been at it for six years. . everything cut green. I feel that the last crop was the first full successful crop under trash.*

**Question 2. What factors influence your decision to use or not to use green cane trash blanketing?**

Most of the growers in this group started green cane harvesting as the direct result of wet weather at harvest time. This allowed harvesting without the risk of losses of burnt cane in wet paddocks. Overall, it appears not to have been a carefully planned decision.

Two members commenced GCTB deliberately with the specific aim of improving light soil country and another made a conscious decision to change over to GCTB to improve his irrigation effectiveness on a particular soil type. A minority said that it was the fact that they would not have to burn cane prior to harvest that influenced them significantly.

Another point worth noting is that when the growers did change over they usually changed the whole farm over at once. It was not a staged process. Apparently there weren't any expectations of yield and profit increases. Also it does not appear that the different management practices required were well thought through, but were a matter of learning on the go. This would have made it difficult to adopt the GCTB system easily and successfully. The growers who abandoned GCTB had done so primarily because of significant yield reduction, and the difficulty of sorting out the problems inherent in any new production system.

*Socially I found that it was a better practice... Sunday evenings and that I did not need to worry about burning cane.*

*Flexibility of being able to move from one block to another.*

*Soil erosion, the use of diesel in conventional till was a lot more expensive, able to hang on to our tractors longer.*

*Initially I guess we started I think 88 or 89 was a fairly wet year. . .so that we did not have to contend with burnt cane and wet ground worrying about getting a burnt crop off.*

*My main reason was water retention.*

*Unless we try we don't know.....save soil erosion...some of these soils there's no humus going in and that trash decomposes continually into the soil must do something.*

*We looked at it originally for a lot of marginal country we wanted to build up that country by putting the trash back into the soil.*

**Question 3. On your farm, how do you see green cane trash blanketing in relation to yield?**

Yield had to be measured over time, due to the variation between years. All agreed that probably the yield under GCTB production was down compared to the burnt cane system. There was a need to plan the adoption of the GCTB system to minimise yield loss from waterlogging, pests and diseases. Overall, the size of any yield reduction should not be significant.

*Its not much good just taking the yield over one year.*

*In my case I can 't compare because we went from burnt cane to green cane.*

*I had been on a trip up north and there was general comment that your first year would be a down year.*

*We've been six years at it. Last year we had a record crop.*

*Yield is probably down a little bit on burnt cane.*

*A quick graph of our overall production in five year groups went back twenty years....the average for five years... very little difference....green cane cycle still on the same level for five years as per the previous five years and the previous five years before that.*

**Question 4. How do you think that green cane trash blanketing affects profit?**

Profit increases across the district due to adopting GCTB are unlikely. One grower on marginal land was adamant that GCTB had increased his profit margin significantly. Another said that growing costs including depreciation were down significantly but the harvesting costs went up significantly. However, the group as a whole were non committal about the profitability or otherwise of GCTB.

Expenditure patterns will change with GCTB. Harvesting costs may increase even over the already higher green cane contract rate. Depreciation costs should plummet. Fertiliser expenditure will likely stay the same or rise slightly. Growers could plan for a decline in profit from the first ratoon when they adopt GCTB, but over time whole farm profitability should be the same for GCTB as for the conventional system.

*We found in the longer term the net was getting lesser.*

*I still maintain that net return is somewhat the same.*

*Depending on how your management is you can really get down to spending very little.*

*Well in our case its been a big improvement in our profit margin.*

*We don 't put a value on our time.*

**Question 5. Can you clarify green cane trash blanketing in relation to specific issues (if necessary)**

**(a) CCS**

The group said that they were always told that CCS under GCTB was better. Their experience is that it is highly variable changing between seasons, within seasons, and within blocks of cane.

*The one thing that has improved on our place is the sugar. CCS has gone up the last three years, been over 15.*

*At the start of the season I tend to wonder if we are at a disadvantage cutting green; Most times it seems to come back 1/2 a unit better green than it has burnt, but I wouldn't treat that as being anything to go by.*

*The majority of years you usually expect a 1/2 unit higher CCS for green cane. We were always told that.*

*No such pattern that if you cut green you are going to get higher sugar.*

*Not much in it basically probably up maybe 0.2 of a unit over all if you average the whole year out.*

**(b) Ratooning**

Again the experience is variable with one grower saying that in five consecutive years he had not experienced any problems ratooning his crops. However the more common experience was that across all varieties cut early in the crushing, ratooning was definitely slower. Wet weather at this time exacerbated the problem. Two growers stated that management of the plant crop, and attention to the harvesting operation, especially cutting height, were critical to ratoon regrowth. Frost was a highly variable event and while it certainly burnt off the ratoon there was no experience within this group of it actually killing the crop, even under repeated frosting.

*All varieties will ratoon slower early under trash blanket.*

*Wet and cold is not a good recipe for good ratoons.*

*The other thing with ratoons. . . it must be harvested at the right depth. . the harvester driver has to be spot on.... otherwise she'll show up.*

*Shape of the stool is a major factor too. If you happen to have a crop of plant cane that hasn't been filled in adequately and cut green.... there's a lot of loose trash impregnated soil over the stool.*

**(c) Weeds, Pests and Diseases**

Incidence of a range of weeds, pests and diseases was highly variable from year to year, and were not felt to be a major issue. The critical aspect was again attention to detail, eg; look in the trash for army worms, don't wait for the disaster to happen.

*We do find we get a lot less dieback in trash blanket than we do in conventional. Nearly every shoot that comes through trash is a goer. Good sound solid sticks.*

*The patches in the block that sort of a bit of a dip and holds water very poor under trash blanket.*

*Heavy blanket of trash you will get minimal grass.*

*I have to admit the broadleafs come into it.*

*Just keep your eye on it.*

*Got to get in there and physically have a look.*

*I think that we got less trouble from cane grubs.*

**(d) Soil types and drainage**

Most soil types were farmed by the group members. Results with GCTB have varied on both light marginal soils and heavy soils. Drainage was felt to be very important. All

participants were adamant that GCTB worked best on free draining soils, but this did not preclude its use on soils with drainage problems. All that it meant was that the farmer had another issue to contend with in his adoption of the GCTB system.

**(e) Lifestyle.**

Two or three members of the group claimed that they were better off socially, with the biggest benefit being not having to burn cane and any labour saving running second.

**(f) Community Concerns**

Although not strongly expressed, the full range of community issues were mentioned, including:

- smoke and ash from cane fires
- devastation of a trash fire
- road safety declines when trash lies on the road
- rural residential people get angry when cane trash blows into their yard
- rural residential kids already light up cane paddocks so what will happen with trash farming

The point was made that the urban community depends on the sugar industry economically and there was potential for a negative impact on urban people if the industry is hindered in any way. The adoption of GCTB should not be compulsory, and farmers should always retain the option of burning, eg; lodged crops.

*Up against a road there is a heck of a lot of trash ends up on the road.*

*If it was bought in compulsory that you couldn't burn cane then I think a lot of people involved in the industry would become not involved in it because after a period of time it would become uneconomic.*

*Must retain that right to burn if and when its needed..*

**Question 6. Are there any research or information issues about green cane trash blanketing which should be addressed?**

Varieties were considered to have scope for improvement under GCTB, with the main emphasis on free trashing and heavy billets to reduce harvester losses. Overall it was felt to be more important to develop varieties for soil types and time of harvest than GCTB.

Most felt that there were potentially significant gains through improved fertiliser management. Another important area was how to deal with compaction without losing the benefits of the trash blanket.

### 6.1.7 Childers

#### Summary

Many issues influenced thoughts and attitudes to GCTB. The main factors influencing its success were felt to be soil types, temperature, machinery and varieties of cane. Most participants held the opinion that yield is generally decreased under GCTB, although some were unsure, believing it is largely dependant on rainfall and irrigation. Growers were keen to obtain hard data to resolve questions on yield and profitability.

Difficulties with cultivation machinery and the risk of fire were the main obstacles to be overcome. Many growers see an improved lifestyle as a major benefit of GCTB, and Landcare concerns do influence decisions to apply GCTB. Local on-farm research was identified as an aid to supply local data, and many felt that suitable cane varieties and improvements in machinery operations would resolve some of the major problems.

#### **Question 1. What are your thoughts about green cane trash blanketing in this area?**

Most growers in the Childers area have experience with GCTB, which strongly influenced attitudes to GCTB. Most participants found it difficult to draw conclusions about the benefits relative to 'burnt cane' harvesting. There was some agreement on the major issues associated with GCTB, however there was some diversity of opinions when relating the technology to individual circumstances. There were factors significantly influencing decisions to use GCTB, including soil types, temperature, cane variety, machinery and its operation, lifestyle, and meeting community concerns. Perceptions of the degree of risk associated with the use of GCTB played a significant part in decision-making.

The GCTB farming system is complex and decisions on one issue have implications for other components of the system. Participants felt that further R&D should be conducted in a systems context preferably 'on-farm'. Research on separate components of the system may result in this research requiring major adaptations to suit local situations.

*There is the perception that we are slow adopters, however, although only about 30% of this area is under GCTB, 90% of farmers have tried it.*

*It is difficult to compare GCTB with burning cane because between applying the two different practices on a block various other practices have changed, this means that the yields and profitability cannot be compared across the practices.*

*Everyone uses different harvesting methods for different reasons, no two people will agree.*

*If we could trash blanket tomorrow we would.*

## **Question 2. What factors influence your decision to use or not to use green cane trash blanketing?**

The following factors were major influences on decisions to use GCTB:

- soil types and their ability to drain
- cool environmental temperatures
- cane varieties.
- available farm machinery and factors affecting its operation

### **a) Soil-types**

The participants identified three major soil types in the Childers area:

- Good red soils
- Good forest soils (sandy)
- Rubbish white soils (sandy)

GCTB was felt to work well on the red soils, which are generally on sloping ground. They have good drainage and GCTB stabilises them well. GCTB was felt to be more difficult to apply on some of the poorly draining duplex soils (with sandy topsoils) in the district.

*If a cane block is not well drained the stools can 'rot-out'. This problem is worse in gullies;*

*We tried GCTB on lighter sandy soils in 1988/89, it was a wet year and we lost a huge amount of crop, we lost 15 tonnes/acre across the whole farm.*

### **b) Temperature**

Cold winters, particularly cold wet winters, resulted in poor ratooning under trash. Some growers found it sometimes necessary to burn the trash to encourage ratooning. One participant had to ploughout cane which had failed to ratoon under trash.

*'Early-cut' blocks (cane cut before September) may fail. Maybe the traditional harvesting season should be different for trash and burnt. The 'burnt' season starts in July and ends at Xmas. 'Green ' harvesting could start in August and continue after Xmas;*

*If we were to have a good frost on ratoons, trash blanketing could kill the whole crop. This would change everyone's attitudes to GCTB.*

### **c) Cane varieties**

Varieties differed in relation to harvesting, ratooning, and growing under GCTB. Some varieties were felt to be as easy to harvest green, as when burnt. Better varieties for GCTB generally had a thicker stalk with the trash being easily removed

### **d) Machinery and its operation**

The right stool profile (for drainage) and the right width (*to ensure that harvesters and haul-outs don 't ride on the stools*) were important factors in using GCTB. The need for careful operation of the harvester was identified also as important. Some growers were had experienced poor results in the past from GCTB, due to less suitable machinery being available at the time.

*You need higher stool profile with sandy soils.*

*If you plant a variety of cane which grows well and which is easy to cut green, the contractor can drive harvesting machinery faster. This may result in stools being torn out of the ground. This happens because the operator can't see the stools under the trash.*

*People remember bad experiences for a long time. You need to persevere to get it right and reap the benefits. When I first tried it I was quoted \$7. 44/tonne for harvesting green and \$5. 00/tonne for harvesting burnt.*

*If we could trash-blanket successfully tomorrow we would, we need improvements in cultivation machinery.*

*The incorporation of trash into the ground could help overcome the effect of cool and wet conditions.*

### **Advantages**

The biggest benefit was water retention, which was felt to be greatly reduced if irrigation was available.

The costs of cultivation, spraying and fertilising operations are reduced, with the biggest saving in mechanical equipment. GCTB significantly reduces weed control operations. It reduces the risks of burnt cane losses during wet weather.

### **Disadvantages**

The main disadvantages were the requirement for different machinery for green and burnt harvesting.

Under GCTB there was an increasing use of chemical weed control.

### **Question 3. What are the main difficulties, if any, with green cane trash blanketing on your farm?**

The main difficulties were associated with machinery operations, particularly fertilising. The risk of trash fires was a major concern.

Yields were not increased under GCTB because of the difficulty applying fertiliser through the trash. There was no problem when fertiliser was applied to trash blankets and 'watered in' by rain or irrigation. Storm rains may wash off fertiliser. Fertiliser may be applied by using coulters to cut through trash. Coulters were used on all three soil types, although it was more difficult to apply fertiliser on red soils than it is on sandy soils. The retained moisture makes red soils bind with coulters so that they get jammed.

Green and burnt harvesting systems were not compatible because of the risk of trash fires.

### **Question 4. On your farm, how do you see green cane trash blanketing in relation to yield?**

Most growers agreed that yield is reduced under GCTB, however this depends on the amount of rain or irrigation.



On a district basis decreased yields could threaten the viability of a sugar mill and therefore also the viability of a district's growers. There was a need for continuing research to generate local information on yield under different management methods.

*There are no increases in yield but the benefits of reduced erosion and time saving more than compensate for the lack improved yield.*

*The season influences the benefit of GCTB, if the season is dry there is a big benefit, if the season is wet the benefit is negligible.*

*On-farm research is needed to get hard data.*

#### **Question 5. How do you think that green cane trash blanketing affects profit?**

There was no agreement on whether GCTB was more or less profitable.

*Most growers agree that yield is reduced, but you save lots of labour therefore you can do more yourself, and the enterprise is more profitable.*

*GCTB reduces machinery operations (eg cultivating), you can fertilise and spray in one pass, therefore the enterprise is more profitable.*

*Contractors charge more for fertilising green than they do for burnt cane.*

#### **Question 6. Can you clarify green cane trash blanketing in relation to specific issues (if necessary)?**

##### **Lifestyle**

It was commented that a property in the district employs 4 men for 11/2 hours per night for 100 nights in a crushing season to do burning. This amounts to 600 man-hours of labour. This time commitment was considered by one participant to be unacceptable in terms of life-style although he still preferred to burn cane. The time spent burning is exacerbated if you live far from cane fields. Time saving is perceived to be a benefit of GCTB.

*GCTB reduces labour requirements therefore can do more yourself therefore the enterprise is more profitable.*

*If you employ 2-3 men in your operation, GCTB can reduced the pressure of ensuring correct timing of operations like weed control.*

##### **Erosion**

GCTB reduces erosion particularly on steep slopes.

*The greatest benefit of GCTB is landcare.*

##### **Pests**

The participants were concerned about the amount of damage inflicted by army worms under GCTB. There was also some discussion about trash and cane grub damage.

*Army worms reduced ratooning so that after six weeks you could hardly see the shoots they were that small. Burning improved the situation.*

*Are cane grubs worse under trash? Most cane growers don't know.*

**Question 7. Are there any research or information issues about green cane trash blanketing which should be addressed?**

Importantly growers were concerned that the GCTB technique should be developed to anticipate community pressure to stop burning.

Research areas were identified as:

- Cane varieties suited to GCTB
- Soil-types and their influence on the success of GCTB
- Cultivating and harvesting machinery and operations
- How to overcome the influence of cold weather on ratooning, and crop development under GCTB
- Incorporation of trash in the soil and its influence on drainage and soil temperature.
- Machinery to accomplish incorporation needs to be developed
- Soil compaction associated with GCTB, and effect on water infiltration.
- The benefits and costs of GCTB.
- The effect of GCTB on sugar quality

*We don 't have enough hard data on whole of production economics.*

### **6.1.8 Maryborough**

#### **Summary**

Growers had many different opinions, but agreed that the issues influencing the adoption of GCTB are interrelated. The main factors to influence the success and adoption of GCTB were variety, temperature, machinery and soil type. Soil type was often mentioned as a major factor influencing use of GCTB, possibly because it was perceived as non-controversial. Other factors pointed to style of farming practice which is much more personal, and perhaps more difficult to explain.

Community concerns were perceived to be a future problem. The majority of growers at this meeting did not want to grow green cane and public awareness campaigns were requested to assist them to continue this way. The sentiment that individual growers must have the right to burn was quite strong.

Mill policy in the Maryborough area did influence cane being cut on Fridays to be burnt. Some growers mentioned that changing implements for burnt and GCTB management was an impediment, and this had a small influence on grower's overall decisions on GCTB. Time saved from using green was important to some participants.

Future research is needed into varieties suited to GCTB, to cooler climate and to the harvesting machinery. All growers agreed that although harvest costs are higher for green cane, the overall profitability was unclear. A thorough cost/benefit analysis was identified as necessary to clarify profitability issues.

**Question 1. What are your thoughts about green cane trash blanketing in this area?**

The participants thought issues involved in (GCTB) are complex, and felt it was important to consider it in the context of the whole farm system. The numerous issues are interrelated, and decisions about one aspect is influenced by other factors. The key factors include variety of cane grown, threat of fire, soil type and availability of irrigation. The group was divided on the effect of GCTB on yield and on profit. Some thought the increased costs were more than balanced by the increased benefits/savings, others did not.

**Question 2. What factors influence your decision to use or not to use green cane trash blanketing?**

Key factors included variety of cane grown, attitude to risk of trash fires, soil type, and availability of irrigation. The suitability of harvesters, and weather at harvest time were also important.

**Variety of cane grown**

The dominant opinion was that variety of cane was the biggest influence of all. Yield of some varieties, such as Q110, dropped under trash. Some varieties were easier to cut green than others.

*Its easier to cut green up north because you seem to get more trash in the cooler climate.*

*Varieties that are more tolerant to frost have tighter trash - that means more trash from the length of cane).*

*Q141 might be an exception, but it is particularly good green and its frost resistant too.*

**Attitude to fire**

Trash on the ground posed a serious fire hazard. Accidental fires in the hottest part of day would be uncontrollable. Damage to infrastructure, adjoining cane crops and safety of people were discussed. Ratoon crops do not always recover. Green cane in strips, not all the farm, was suggested as one way of handling the fire risk.

*GCTB is a fire hazard with trash on the ground.. just as terrifying as the NSW fires: impossible to control.*

**Soil type**

All seemed to agree that some soil types were better suited to green cane. Clay 'sub-soil' was mentioned as a problem. One participant said he ripped up the centre to help let the sun in (also to catch water and let fertiliser in).

*On sandy forest soil, you can get too much rain. The ground goes sour because it is not well drained.*

### **Availability of irrigation**

In unirrigated cane, moisture retention under trash produced more cane. One grower said that less water was needed under trash to grow the same crop. Some participants with irrigation did not need to use green cane.

*We are not irrigated...when it rains, full trash will catch all the water. On well drained soil, this is a plus.*

### **Type of harvester used**

Some types of harvesters, particularly older machines, could not cut green cane. All seemed to agree harvesting costs increased with green cane, with increased fuel and maintenance. Some noted harvesters had difficulty to handle rougher ground under trash. Not all participants agreed that ground had to be rougher under trash - the right stool profile could help.

Other advantages and disadvantages of GCTB mentioned were

### **Advantages**

- moisture retention; if irrigation is available this is not as significant
- less risk at harvest time of losing some crop
- erosion control - a big advantage for one participant
- easier to work ground (related to soil structural improvement over time under GCTB: differences of opinion on this point)
- CCS increases - *some years 1/2 unit more, but not all years.*

### **Disadvantages**

- more risk for some people
- fire hazard
- too wet on some soil types, *soil went sour*
- armyworms
- increased cost of harvesting
- must have access to harvester which can harvest green - *some not designed to harvest green.*
- harder to work ground (differences of opinion on this point)
- shorter growing season under trash - *trash blanket means lower temperatures; the cane grows slower. This is more of a problem in the cooler climate here.*
- must get the drill profile right during plant crop..... *really only get one go at it (the profile) if you minimum till with all green cane. If you get it right the first year, it is right for the rest of the years.*

**Question 3. What are the main difficulties, if any, with green cane trash blanketing on your farm?**

Other difficulties mentioned were:

**Mill Policy**

Mills accepted burnt cane in preference to green on Fridays and individuals could lose their allocated tonnes for that day if they had green.

*.....so they (the mill) don't have to pay overtime.*

**Difficulty with both green and burnt**

Changing implements, particularly to apply fertiliser, to work with green, and then burnt is awkward. One grower cut cane green then burnt it to overcome this problem.

*Now I wanted to leave a bit of green cane. We have different people doing different jobs - it is too much of a hassle to change implements to fertilise the green cane - so they burnt the trash.*

**Question 4. On your farm, how do you see green cane trash blanketing in relation to yield?**

There was a difference of opinion on the effect of GCTB on yield, depending on variety and soil type. Several agreed that yield seemed to drop under trash after the first year. One grower ripped up the centre of the rows on his areas of GCTB, otherwise yield dropped.

*We trash blanketed for 2 years and went backwards - 8 tons/ha over the whole farm.*

**Question 5. How do you think that green cane trash blanketing affects profit?**

The predominant feeling was that GCTB was more profitable on lighter soils. Some seemed to feel that costs saved from irrigation and chemicals more than compensated for increased costs of harvesting under full trash.

*It costs more to harvest that's for sure, but the benefits on our country with full trash - our cost saving on working, mechanical and irrigation far outweigh costs.*

**Question 6. Can you clarify green cane trash blanketing in relation to specific issues (if necessary)?**

**Community concerns**

The group agreed that urban people were concerned about soot from cane fires in swimming pools, vegetable gardens, washing, lawns, roofs, on cars in car yards and in homes causing asthma. Trash blowing onto lawns was mentioned but people did not seem to complain about this. A few growers felt that if they're were unable to burn they would be out of business.

*It is not profitable to keep going with green cane;*

*This will be the biggest problem we have got in years to come. They think they can tell farmers how they can farm.*

*No matter what we think, the greenies are getting more power. If they think a bloke should not burn, that will be it.*

### **Lifestyle**

Green cane gave some people more flexibility, and less labour demand.

*With all green, I get home 2-3 hours earlier. Green suits me, burning is a hassle.*

### **Question 7. Are there any research or information issues about green cane trash blanketing which should be addressed?**

More research into developing new varieties to overcome difficulties with GCTB was a priority. Varieties suitable for frost areas and less trash were also discussed. A change in available varieties might encourage some growers to change to GCTB.

Other factors, such as drainage etc, were seen as farmers' problems, however, there seemed to be different levels of understanding. Further information sharing on topical issues would be useful.

Improving harvester performance and operation to prevent cane loss was also important.

Public awareness information campaigns were requested to inform the community of the danger of fire with trash on the ground, and difficulties with GCTB on some soil.

*Varieties are the main thing that requires research.*

*A trash fire in the middle of the day is totally out of control. No matter how much water you put on it, it just keeps burning underneath.*

*River type of soil will never be suitable for green cane.*

*Some people will never cut green cause the country does not lend itself to it.*

## **6.1.9 Nambour**

### **Summary**

Most growers have tried GCTB and had bad results, except on hillside/sandy slopes. The general consensus was that GCTB was not suitable for most of the Nambour area and that opportunities for viable alternative uses or management of the trash needed to be explored.

**Question 1. What are your thoughts about green cane trash blanketing in this area?**

Whilst growers acknowledged that GCTB worked on hillsides due to the better drainage, it was generally held that GCTB was not suitable for much of the Nambour region due to the cooler climate and the high rainfall/wetter conditions. The group strongly emphasised the high risk of losing stands and/or reducing the number of ratoons resulting from cool wet conditions after GCTB.

The attitude to GCTB was predominantly negative. It was agreed that GCTB was not viable during the period from July to September.

*I think there's a place for it in our area on a limited scale, on certain varieties, in certain places.*

*...cutting cane early in the year, even under dry conditions, the cane can be very slow to ratoon because the temperature remains quite cool and the ground temperature is very cold.*

**Question 2. What factors influence your decision to use or not to use green cane trash blanketing?**

The decision to harvest green is often made only when burning is undesirable because of the threat of rain. In many instances the GCTB is either burnt, bailed or incorporated following (green cane) harvest.

**Advantages**

The majority of the positive comments regarding GCTB related to the avoidance of the negative aspects of burning rather than any benefits of retaining a trash blanket.

- No burning costs;
- Improvement of some environmental problems;
- Avoids the risk of having rain after burning cane;
- Better flexibility, ie; can harvest any paddock at any time.

Erosion control received general support but the benefits of weed control as a result of GCTB were debated.

**Disadvantages**

The cool wet conditions make GCTB unsuitable in much of the district. The Nambour area is predominantly undulating and GCTB is seen to be suitable only on the hillsides/sandy slopes. The majority of harvesters in the Nambour area are older machines which are not suited to green cane harvesting. The group agreed that harvester performance in green cane is also affected by varieties and individual crop yields. The general feeling was that the problems associated with green cane harvesting were not insurmountable, but alternatives to trash blanketing needed to be considered.

There was a perception that cultivation was required to *sweeten the ground up* and to reduce compaction following harvest. It was also mentioned that fewer ratoons would be

possible as the shape of the bed deteriorated due to an inability to properly reform the beds each year.

Other disadvantages mentioned were armyworms, a shortage of appropriate equipment in the area; wastage of cane at harvest ie. leaving billets in the paddock with the trash; and too much trash going to the mill.

**Question 3. What are the main difficulties, if any, with green cane trash blanketing on your farm?**

Most of the difficulties related to losing ratoons/early growth due to the cold wet conditions under GCTB. Growers were aware of the success of GCTB in the North, but perceived that the cane in their area has more trash than the cane in the North. Growers also felt that the varieties used in the North were better suited to harvesting green.

*We've got a very high frequency of rainfall here, possibly the highest in the State in the harvesting season. ...in a year like this if you put a trash blanket on the paddock it'd just never dry out...*

**Question 4. On your farm, how do you see green cane trash blanketing in relation to yield?**

Growers generally agreed that comparable or even slightly better yields could be obtained with GCTB in dry seasons but emphasised the devastating effects on yield of GCTB in wetter seasons.

**Question 5. How do you think that green cane trash blanketing affects profit?**

Growers did not acknowledge savings from any agronomic benefits of GCTB, but focused on the risk of crop/profit losses resulting from GCTB in wetter seasons.

*The crop coming up, there is absolutely no doubt that growers are going to be worse off on blocks that they cut green and left trash on than if they'd cut it burnt. There's absolutely no doubt about that. The evidence is out there now.... They 're not going to grow a crop. What they've saved in the cost of cultivation they're going to lose in reduced crop. Instead of getting 30t to the acre or 40t to the acre, they're only going to get 25.*

**Question 6. Can you clarify green cane trash blanketing in relation to specific issues (if necessary)?**

**Soil Types and Drainage**

The issue of soil types and drainage was seen to be closely associated with topography. GCTB was seen to be more suited to the hill sides and sloping country where there are sandy soils and better drainage.

**Lifestyle**

It was generally acknowledged GCTB involved less work than burnt cane systems.



### **Community Concerns**

There is a real concern amongst these producers, who believe that GCTB is not appropriate for the majority of the district, that community pressure will result in a banning of cane fires. There is a perception that growers in the Nambour area are under added pressure to harvest green because the practice has been adopted in other areas.

*We've got 60 odd thousand people in the district verses 140 (cane growers) ... that's about what it comes down to.*

*The general public keep wanting to know why we 're not cutting green.*

### **Question 7. Are there any research or information issues about green cane trash blanketing which should be addressed?**

There was a suggestion that perhaps more trials should be done on GCTB in the area. However, growers gave the impression that they felt that they knew enough about GCTB already from their own experiences.

Research/information issues mentioned were:

- weed control eg. Giant Sedge;
- suitable varieties for green cane harvesting;
- fertiliser application;
- alternative uses and management of trash.

#### **6.1.10 Rocky point**

##### **Summary**

The growers agreed the GCTB is not suitable to all conditions in the Rocky Point region. The benefits of GCTB on sandy soil and on salt affected land were acknowledged. However, growers focused on the high risk of early growth and ratoon loss in cold wet conditions.

### **Question 1. What are your thoughts about green cane trash blanketing in this area?**

The attitude towards GCTB was strongly negative although growers did concede that in certain circumstances it was beneficial, such as on well drained sandy soils. Most growers indicated that they would prefer to find alternative uses for some, or all, of the trash, rather than use all of it in GCTB. The majority of growers perceive that ultimately they will be forced to harvest green and, based on this perceived inevitability, many have tried to make the system work on their farm.

*It's got its place on different grounds, on the sandier soils ... I don't believe in leaving dollars on the ground. I prefer to turn the trash into dollars rather than leave it lying on the ground.*

*I think we 're going to be forced into banning of burning and I think we've really got to look at doing this experimental work ourselves.*

*We've had major problems in heavy soil. We've tried it extensively . . . and we 're losing crop . . . So, we've basically gone back to working our ground.*

**Question 2. What factors influence your decision to use or not to use green cane trash blanketing?**

Widespread crop and ratoon losses, and poor early growth in cold wet conditions have convinced most growers that GCTB is unsuited to most of this region.

**Advantages**

Most growers had difficulty identifying advantages with GCTB. Some growers noted the following:

- avoids the hassles of burning;
- improves well drained sandy soils;
- improves salt effected soil;
- some growers noted improvements in soil condition, including increased earthworms.

**Disadvantages**

Growers readily volunteered disadvantages, including the following:

- early growth and plant losses due to water logging and cold conditions;
- growers claimed frost problems were aggravated by trash blanketing;
- risk of trash blankets being washed off site causing problems with neighbours and going into water ways;
- problems with fertiliser application;
- soil compaction increased with GCTB;
- respiratory complaints associated with green cane harvesting;
- increased armyworms with GCTB.
- increased grass problems, such as Giant Paspalum.

**Question 3. On your farm, how do you see green cane trash blanketing in relation to yield?**

There was considerable debate about whether GCTB increased or decreased yields. Many growers claimed yields actually declined while others claimed increases. There was active discussion as to whether yield differences were in fact directly related to the season rather than to the effects GCTB.

**Question 4. How do you think that green cane trash blanketing affects profit?**

Most growers felt that GCTB decreased profits through loss of ratoons, decreased yields and increased harvesting costs. Growers indicated there was some motivation for green cane harvesting in the potential to increase profits by selling the trash rather than GCTB.

**Question 5. Can you clarify green cane trash blanketing in relation to specific issues (if necessary)?**

**Varieties**

There was vigorous debate over which varieties were better suited to green cane harvesting and GCTB.

**Harvesting**

Most harvesters in the district are older and not well suited to green cane harvesting. As a result harvesting costs and problems with green cane harvesting are increased. It was also noted that the varieties used and the local cane characteristics made much of the district's cane difficult to harvest green.

**Ratoons**

Most growers agreed that GCTB reduced the number of ratoons.

**Pests**

As noted earlier, some growers claimed increased armyworm problems and grass prevalence.

**Soil types & drainage**

The group agreed that GCTB was not appropriate on heavy soils and that good drainage was essential. The group stressed the need for laser levelling with GCTB, but acknowledged that this is also desirable with burnt cane systems.

**Lifestyle**

Growers noted that green cane harvesting saved work especially in relation to avoiding the difficulties associated with burning.

**Community Concerns**

The growers perceived that many in the wider community and in the industry do not fully appreciate the problems associated with the practice of green cane harvesting and GCTB in their district. A strong degree of frustration was noted among growers with the community's lack of understanding of the problems associated with green cane harvesting and GCTB in their area.

*Because they know that some cane is being cut green, they can't accept that it all can't be cut green.*

**Question 6. Are there any research or information issues about green cane trash blanketing which should be addressed?**

Most growers have observed the negative consequences of GCTB and don't see any point in seeking information on a practice which they see as unsuitable in the majority of the area. However, against this perceived backdrop of inevitability ie. they feel they'll be forced to do it eventually, growers want to know how to make it work.

The growers who have had success with GCTB and who have areas that are better suited to the technique expressed a desire for information on fertiliser application, overcoming drainage problems and reducing harvester losses.

A desire for information on the best suited varieties for green cane harvesting and GCTB in that area was also noted.

## **6.2 Milling representative meetings**

The following summarises discussion from the two meetings attended by representatives of the milling sector. One was held in Mackay, and the other in Bundaberg.

Quotations from the discussions are shown in *italics*.

### **6.2.1 Bundaberg**

#### **Specific factors related to this focus group**

Participants included a mill manager, an assistant manager, a production superintendent, chief cane inspectors, and a chief chemist.

#### **Summary**

The participants felt that although many growers had tried GCTB, they were not confident with, and did not understand, the system. The group was aware of the production constraints of GCTB, particularly soil types, drainage, and wet weather. It was observed that many growers had harvested green in the past, and subsequently raked and burnt the trash. Bad experiences after wet weather in southern areas, particularly Maryborough in the previous season, may result in a static or reduced amount of GCTB over the short term. It was acknowledged that this would be highly dependant on seasonal conditions.

Information available to growers and millers on green cane was felt to be inconclusive and poorly integrated, thereby causing difficulties for decision-making on matters associated with production and processing. An important area was the need to evaluate economic analyses of GCTB from both the milling and growing sectors. The returns and overall profitability from a green cane system may warrant investment to support its adoption, or in contrast, it may have significant costs for the local industry. This information was deemed necessary for industry planning.

Green cane harvesting was felt to be an excellent management tool for the industry in wet conditions, allowing flexibility for growers, and access to a better level of cane supply for

mills. This allowed continuity of cane supply resulting in easier scheduling of operations. In contrast were the increased costs associated with higher levels of extraneous matter. It was felt that extraneous matter will be a more important issue in the future if the level of green cane increases. Mills will require a larger bin fleet with increased transport costs. As mills are geared for a set throughput tonnage, the lower bin weights with green cane will also lower milling efficiency and increase costs.

There was a strong need to determine the maximum acceptable levels of extraneous matter, including dirt. This needs to be carried out with the cooperation of each of the growing, milling, and harvesting sectors of the industry to ensure consistent input and effective dissemination of information.

Other key issues were related to quality, particularly floc, colour and dextran. As floc insensitive markets were reducing, it was an issue requiring more attention in the future, preferably on a whole of industry scale. The participants felt that the apparent relationship between floc and green cane was confounded by the increased harvesting of green cane in weather.

**Question 1. What are your thoughts on green cane trash blanketing from a milling perspective ?**

The participants felt there was a greater potential for green cane than was being used in the region. The great majority of growers had harvested green at some stage, and many growers were still trialing it. However, many growers were felt to harvest green only as a convenience, and were observed burning trash after harvesting green, therefore inflating the estimated amount of cane grown under GCTB. It was acknowledged that field conditions placed significant limitations on the use of GCTB. Some very poor results were felt to be the result of harvesting green in the cool conditions experienced in the early part of the season.

The availability of green cane was extremely important to milling through-put and the continuing operation of the mill, ensuring minimal down time during wet conditions. Green cane allows the mill to crush longer, and commence sooner after wet periods.

It was stressed that in some areas comparing seasonal trends in CCS for burnt and green cane can be misleading, due to many growers harvesting green during, or soon after, wet weather. Any differences in CCS between green and burnt cane over different years was also felt to be greatly influenced by seasonal effects. It was felt that varieties were important in determining differences in CCS between green and burnt harvested cane. An example was given from the Isis area, where both milling and trial results indicated that Q141 and Q146 (both accounting for over 30% of the mill area crop) had a higher CCS when cut burnt in the previous season.

*Last year a lot of people got caught trying to harvest paddocks that had trash and the water just wouldn't allow them, especially on some soil types.*

*Any paddocks that had been cut green at the end of the season had been an absolute disaster.*

*There is an apparent decline in the percentage of green cane harvesting. We had more a few years ago, but growers have gone off it. Then again some growers have been green cane harvesting for 4-5 years and getting the best figures they have ever had.*

*Those who have trialed blocks especially on the heavier volcanic soils have had disastrous ratoons.*

*Farmers don't want to pay the extra dollar a ton to cut green, especially when the CCS is similar.*

*I can't see it increasing in Millaquin much more than it has over the last few years.*

*From the milling point of view, you are interested in the maximum availability of cane.*

**Question 2. What are the main economic issues associated with green cane harvesting from the milling perspective?**

The participants felt that there was no definitive information to properly evaluate GCTB from the milling perspective. This meant that most discussion on green cane was generally based on limited observation of different aspects of the production system. There was no clear direction for economic decisions due to the apparent inconsistency, and the lack of any integration, of existing information.

Any economic advantage for growers seems to be most evident in dry years. In seasons with heavier rainfall, there was likely to be a disadvantage. This was especially the case on the heavier volcanic soils.

In some areas, green cane increased further way from the coast under the influence of drier conditions. This resulted in greater transport costs due to lower bin weights. The impact of this on regional efficiency was increased when placed in the context of areas which relied on road transport with long distances.

The increased cost of \$1.00-\$1.30 per tonne to harvest green was felt to have an impact on growers overall, due to the tendency for many to cut green in wet conditions, and then negate any potential benefits by burning the trash.

Extraneous matter, particularly dirt, was felt to have a large impact on milling. Very high levels, were resulting in mill breakdowns. Although one of the benefits of green cane was the continuity of cane supply in wet conditions, it was stressed that the mills don't want harvesting to occur in very wet conditions due to the increased intake of mud and dirt. A general push to lower extraneous matter levels would make GCTB more desirable to the mills through an overall increased CCS of crushed cane. It was also recognised that any means of monitoring EM% as part of a program to reduce it, would incur a cost for the industry as a whole. There would have to be reasonably substantial improvements in EM% to justify the costs. There is no effective penalty system currently in place to drive improvements as part of an overall program. One of the important strategies to improve EM% was identified as topping lower, which would ultimately incur a penalty for the harvesting sector.

*Green cane goes up as you go away from the coast, and costs more overall to transport.*

*In drought years, you can see an advantage with green cane, but I don't know about other years.*

*We don't want harvesting in real wet conditions due to mud and dirt.*

*Topping lower would be good for the mill, more sugar, but the losers would be the harvesters.*

### **Question 3. What are the main advantages and disadvantages of green cane trash blanketing from the milling perspective ?**

Discussion on the advantages/disadvantages of GCTB from both the growing and milling perspective are covered in other questions also.

#### **Advantages**

- No loss of cane to growers if there is a sudden stop to milling due to large breakdown, a strike, or due to wet weather.
- Under chopper harvesting green cane reduces bacteria infection and deterioration of cane.
- There may be an increase in CCS, but this was not certain.
- Reduced dextran in the sugar.

#### **Disadvantages**

- The added transport costs due to lower bin weights
- The increased levels of extraneous matter. In burnt the average EM% was estimated at 7%, in green it was 10%. The 3% increase resulted in an extra 30,000 tonnes to transport and crush for a mill area. There was the added impact of poorer sugar recovery, and the difficulty for the 'back end' of the mill.
- The increased EM increased the amount of bagasse produced, with the added difficulty of handling, and removing it.

*During a strike blokes had burnt cane deteriorating, but those who cut green were OK. Its the same for breakdowns and rain.*

*Extraneous matter is the big thing. Mills not only have to transport and crush the stuff, but they also have to handle it in the back end, its hard on the overall efficiency all around.*

### **Question 4. How does green cane trash blanketing influence industry profitability ?**

An important issue for milling is the density of throughput at the mouth of the milling train. The milling train is set to handle a certain throughput, and variation in material density due to extraneous matter, causes tipping, milling and overall efficiency problems.

There is also increased fibre, and increased loss of sugar through the milling train. As a result, the mill requires a strong back end to handle the impurities.

As discussed previously, the effect of increased extraneous matter on lower bin weights caused increased costs, with no gain. This is worse when there is a lot of road transport, and when cane is having to be transferred.

The quality issues were felt likely to have more of an impact in the future. Not all green cane received at the mill has excessively high EM%, and a comment was made that this must be addressed at the harvester level. The benefits of lower dextran levels probably assists overall industry profitability. Floc was strongly felt to become an increasingly important issue and to be linked to green cane. It was recognised that although floc levels were influenced greatly by seasonal conditions, the relationship with green cane and different varieties need to be clarified.

The participants felt that many growers experienced a decrease in production under GCTB. This was linked to soil types, seasonal conditions and irrigation. When this was coupled to the higher harvesting costs, there was a strong feeling GCTB was less profitable overall.

An important discussion point related to the need for determining if green cane harvesting and GCTB were actually beneficial for the mill. If so, with better data/information, the mills would be in a better position to encourage and support GCTB systems.

*For a road transport system, trashy cane creates a bigger problem. When it is distributed unevenly, it is difficult to handle and transfer.*

*Milling is density at the mill mouth; lower density drops sugar.*

*Its very hard to quantify, we need better information.*

*Unless the decreased costs of production, apart from harvesting, also maintains productivity, I cant see more people using it.*

### **Question 5. What other issues are important with green cane trash blanketing ?**

The ability of harvesters to handle green crops was important. In some cases, very large crops, especially any that have been stood over were unable to be harvested green. Overall the large majority of harvesters in the area were able to handle most green crops, and the small number that were currently unable to, would be phased out over the next few years.

As discussed earlier, an important issue linked to the profitability of the milling process was floc. As green cane appeared to be linked to higher floc levels, there was a concern about the impact on lower quality sugar, and increased milling costs. Although it was again stressed that floc was not a clear issue, and that varieties and seasonal conditions played an important role, the questions was raised: *who should pay for it ?* There was a concern that millers were bearing the burden and increased costs due to high floc levels. As floc insensitive markets are declining, discussions suggested a future penalty



introduced for high flocc cane. It was recognised that this would have a detrimental effect on the acceptance of green cane harvesting.

The labour saving factor of green cane was discussed, particularly the benefit of not having to burn. Some felt that this was attractive to many people, particularly those with small farms, more elderly growers, or those with a periodic difficulty getting assistance. With green cane harvesting, they need not employ people to assist burn and were able to subsequently burn the trash. This point led to the added difficulties with trash fires, and their worse smoke impact on surrounding areas. Although the flexibility of green cane harvesting was seen as beneficial, burning the trash was seen as a negative step for the industry and should be avoided if possible.

The participants felt the increased level of community interest in environmental issues was important, and was driving much of the discussion and support for GCTB. There was a concern that if the technology was found eventually to be unsuccessful, returning to conventional systems would be very difficult due to the environmental context. An example was given of the largest grower in one mill area having returned from full GCTB to burnt production after poor results and the losses from trash blanket fires. It was felt the environmental pressure from urban and residential areas will increase in future, and will overtake any industry debate on productivity issues. As a result it was felt necessary to develop appropriate data to determine the best production methods for the industry, and be in a position to justify the position to others.

The benefits of GCTB for soil conservation was well accepted. However, it was felt that QDPI was placing too much emphasis on GCTB from this perspective alone, without enough information on the productivity and management of GCTB. To assist growers make informed decisions, it was felt that BSES should develop appropriate information, or the end result may be a forced change to GCTB.

*It is something we have to be careful of, if you have an alternative practice, you need to be able to change back if necessary.*

*There is more of an environmental push for green cane now.*

*To date we haven't seen any data to argue or justify industry practices, we need that.; This is an important issue, when the environment issue takes off we need to be able to quantify the overall effect to be able to argue the best for the industry.*

*The push from DPI is a bit of a worry, they are pushing green cane for soil conservation without all the facts.*

#### **Question 6. What are the research or information needs for green cane trash blanketing?**

It was felt there was an overall lack of understanding and confidence with GCTB among growers. There was some discussion on the need to determine the place for GCTB, its suitability across the region, and suitable soil types.

There was a general feeling that previous research had not adequately dealt with green cane harvesting and GCTB. There appeared to be conflicting information coming from BSES. An increasing number of growers who had been cutting green, had recently returned to burnt methods due to declining productivity. However, BSES was still supporting GCTB, but not clearly justifying why it should be an overall improvement. It was again stressed that there was not enough information on GCTB to clearly define its place in the industry. There was a query as to whether there had been enough work previously done, or whether that which had been done was acceptable, due to the large amount of conflicting information.

Further field trials in the region were felt necessary in order to clarify the suitability of GCTB. The timing and placement of fertilisers under GCTB was an area which required further attention, particularly with consideration for any relationships with soil types.

There needed to be more emphasis placed on setting up harvesters properly to reduce cane losses, and reduce extraneous matter for the mills. There was felt to be a large amount of existing information which needs to be more widely distributed.

*Good results and bad results, why hasn't there been enough research into it already?  
Unless results are proven in the field, we all lose. We need to be able to increase yields.*

*Is it situation specific?*

*The industry doesn't have enough good information, I don't know whether enough is being done, or whether is just not substantial enough.*

## **6.2.2 Mackay**

### **Specific**

Participants included Chief cane inspectors, mill chemists, and production engineers.

### **Summary**

The participants felt it was important to determine the real costs associated with cutting green across all sectors of the industry. There was strong support for rationalising and restructuring the harvesting process to remove the major impediments related to harvesting costs and inefficiencies. This would entail developing larger groups to support more contractors with machines capable of cutting green.

The main benefits of green cane are related to access to paddocks and throughput of cane in wet conditions. This allows easier management of milling operations and the logistics of bin allocation over the length of the crushing season. Green cane harvesting also reduces the difficulties of removing large quantities of burnt cane from the field in wet weather.

The main concerns with GCTB are the increased costs of processing green cane due to the higher levels of extraneous matter, and the relationship between green cane and floc.

It was stressed that although the extraneous matter in green cane often appears high, the dirt levels in burnt cane are often worse. This is exacerbated in wet conditions. It was felt that acceptable levels of extraneous matter should be clearly set.

A clear research need was the development of models to determine the economic efficiency of green versus burnt cane harvesting and processing systems. This should encompass production, harvesting, transport and processing.

**Question 1. What are your thoughts on green cane trash blanketing from a milling perspective?**

Although there were some disadvantages evidenced by the slow adoption of GCTB, it was felt that a steady increase in GCTB in the future would be beneficial to the local industry.

The lack of harvesting machines in the region suitable for cutting green was identified as a major impediment to an increase in GCTB. It was felt that upgrading the harvester fleet would have a large impact on the amount of cane cut green.

It was observed that there was a core group of growers who have made the system a success. Many of these growers have persevered with harvesting green for a number of years, and strived to make the system work. They have experimented with different methods of handling the trash, including mulching and incorporation at different times of the year.

It was felt that attitudes to GCTB were different between mill areas. In Marian, growers have increased the amount of green cane in response to the dry conditions, valuing the moisture conservation. In other mill areas it was observed that many growers have cut only a small area green to finish off their bin allotment, or when there was a possibility of wet weather.

*A lot of growers say they have trialed it, but all they have done is really only dabbled in it to finish off a rake, or in wet conditions.*

*At the moment the only real increase is due to growers cutting in wet weather.*

*There's too many Mizzies around, newer and bigger capacity machines will see an increase in green cane.*

**Question 2. What are the main economic issues associated with green cane harvesting from the milling perspective?**

The participants emphasised that the most important issue related to quantifying the costs or benefits to the industry of green cane trash blanketing. It was strongly felt that the industry should evaluate the effect of green cane on productivity and profitability across the whole region.

Harvesting cane green was felt to assist milling efficiency and management of bin allocation over the length of the crushing season. This was achieved through ensuring access to cane, and consistency of milling throughput in wet conditions. It also reduced the pressure on mills to rapidly process large quantities of burnt cane after wet weather or milling problems.

Green cane also provides fresher cane with reduced levels of dextran, but increases extraneous matter, in the form of trash, and floc levels. Extraneous matter and floc levels were presumed to have a significant economic effect on the harvesting, transport and milling processes. The inability of many machines to harvest and clean green cane well was highlighted as being the major contributor to extraneous matter in the form of trash in the bin. Significant discussion was generated on the benefits of consistent milling throughput, and lower dextran levels, as opposed to the costs of increased levels of extraneous matter and possible need for removing floc. The high levels of trash lead to chokes in the milling system, and reduces the amount of sugar recovered through impurities and adsorption to the trash.

Floc levels change during the season. Floc is generally higher in the start of the season and reduces during the season. Cutting green during the early part of the season tended to increase the overall levels of floc. Some of the floc problem was understood to be varietal. Floc levels appear to be greatly increased after rain.

It was noted that some areas are not suited for cutting green, and any regulatory efforts to impose green cane trash blanketing would result in a decrease in productivity. These areas include heavier soil types, and stony areas. However, it was acknowledged there was greater area suited for GCTB than is currently being implemented. Many growers would suffer a production loss if they suddenly switched to green cane. This would have an impact on the profitability of the industry as a whole. Growers tend to fail with green cane if the only change they make is not to burn. The participants noted that levelling and drainage are extremely important, as are changes to fertilising practice.

*If the whole mill area was to adopt green cane, would there be as much production from the same area under burnt cane ?*

*The money isn't there to run the industry on gut feeling any more. We've got to be accurate in what we do. We need accurate models, costing, forecasting, whole of industry models.*

*Mills need to undertake cost analysis comparisons of green and burnt cane. For example, in burnt cane there is less wear on the milling train, but dextran must be dealt with.*

*Is there higher profitability for the industry as whole to off-set handling the increased trash levels ?*

*Do mills accept trash as a trade-off for receiving green cane ?*

*The industry has to define what is acceptable extraneous matter, and what is acceptable levels of the various types of extraneous matter to maximise industry profitability.*

*The increase of trash in bins has very little weight and is not of great consequence. In burnt you get more tops and dirt, which are milling problems. However, the greatest impact from green cane harvesting is floc.*

*Dextran is low at the start and higher at the end of the season. By burning up to approximately the middle of the season when temperatures which affect ratooning are lower, and then cut green later in the crushing, ratoon emergence, floc, and dextran levels should be improved.*

**Question 3. What are the main advantages and disadvantages of green cane trash blanketing from the milling perspective ?**

High levels of extraneous matter in green cane causes significant problems in the mill. The participants felt that older varieties were more difficult to clean with the available machinery. Most newer varieties are cleaned more easily by the modern harvesters. Some varieties such as Q136, are very hard to clean, even with a new machine.

There is a need for bigger groups to support contractors with newer machines that are able to cut larger crops of green cane, reduce cane loss and provide cleaner cane. This entails looking at the entire Mackay transport system, and rationalising the number and size of sidings. It was felt that this ultimately would result in a more efficient, and profitable production system. It was emphasised that harvesting contractors should be included in any planning process for rationalising harvesting and transport systems.

It was acknowledged that there was a limit to the desirable size of groups. Increased group sizes can cause an increase in extraneous matter with green cane. Smaller groups are able to send in very clean cane. Larger groups on over 70 bins per day are unable to take the time to send in cane of similar quality.

There is a great deal of variation in the extraneous matter percentage of green cane. In dry seasons, the quality of the cane coming in to the mill is generally good. In wetter periods, it is sometimes hard to pick the difference between the green and burnt cane due to poor burns and poor harvester operation. The appearance of green harvested bins is often worse than the level of extraneous matter they contain. Due to the lower weights of bins there are increased transport costs and the need for more bins and loco power.

It was noted that harvesters are able to top a lot better in green cane. When a crop is cut green there is a reduction in the amount of tops and dirt, but an increase in the amount of trash. The opposite of this applies to burnt cane. Continuous sampling for extraneous matter over a whole crushing season at North Eton found very little difference between green cane and burnt cane.

**Advantages**

- Harvesting flexibility allows growers to chase, and obtain higher CCS
- Once cane is burnt it is a potential loss. Millers are not under pressure to get off the burnt cane after wet weather.

- Green cane offers excellent flexibility in harvesting and scheduling of transport operations.
- Cane quality in regard to dextran is much improved in green cane.

### **Disadvantages**

- Bin weights and increased transport costs.
- A decrease in productivity on unsuitable soils
- The CCS advantage will be lost as soon as harvesters begin putting tops into bins.
- Higher cane loss during harvesting. In some cases there is not much difference in terms of sugar yields between green and burnt cane when losses are accounted for.

*The green often looks very bad, but the burnt is often as bad.*

*The quality of green cane has a hell of a lot of variation in terms of extraneous matter. Some green cane that comes in is really, really clean. It is as good as the best burnt cane. On the other hand some that comes in appears to be half trash,....you wonder what is this going to do to (to the mill) when it goes through ?*

*Bins often look very high in trash, but the actual level of extraneous matter is generally very small.*

*There is not a great deal of weight in trash. But in the burnt cane, the relatively heavy cabbage ends of the tops are often sent in, which cause milling problems.*

*A lot of older machines are not set up for green cane harvesting, and send in some horribly dirty cane.*

### **Question 4. How does green cane trash blanketing influence industry profitability ?**

It was felt that this was difficult to determine due to the lack of information comparing green and burnt production and processing. The higher harvesting losses in green cane have greatly impeded its acceptance. As discussed in previous points, the upgrading of machinery has improved this situation. Further successful improvement in this area has resulted from the harvester loss project of BSES.

It was felt the introduction of continuous crushing has added financial pressure to harvesting operations in general. This has been exacerbated by green cane harvesting. In order to properly clean green cane, the harvesting process is slower, resulting in longer hours in the paddock, and greater expense of harvesting operations. There is potential for harvesting contractors to reduce overtime payments by moving to sub-contracting their haul-out operators.

The premium of between \$0.70 -\$1.00 for harvesting green may be justified in some of the older machines, but was felt unlikely to be justified in the newer machines. The premium acts as a real deterrent to many growers. The only justification is the added wear, and the extra hard facing required. Some contractors have said their maintenance costs for cutting green are increased by 15-18% over burnt cane.

*There has been a price premium established for green cane per tonne, but this has not been underpinned by any analysis.*

*Most of the guys in our area on soils suitable for green cane have said they are in the paddock for 10-12 hours now. With an overtime component of 2-4 hours, slowing the process down further reduces their income. What they will do is cut some green and some burnt, to try and reduce the time they are in the paddock.*

**Question 5. What other issues are important with green cane trash blanketing ?**

The participants were concerned at how the industry had approached GCTB in the recent past. They felt that the industry needs to be careful how green cane harvesting information is published. It should be addressed as an alternative system, rather than a replacement for burnt cane.

From a milling perspective, regional production and throughput of cane are the key issues. These should be the dominant factors to influence decisions on GCTB. Air quality and asthma issues are becoming more important for urban communities. If environmental pressures result in green cane harvesting being imposed upon the industry, it will likely result in reduced productivity in many areas.

It was felt that the cane fires in general will ultimately be regulated. Burning of cane prior to harvest will probably be allowed by regulators for longer than burning of trash.

*Every stick of cane that comes into the mill is important.*

*The productivity aspect is the overall concern.*

**Question 6. What are the research or information needs for green cane trash blanketing?**

The most important need was to determine the impacts of GCTB on the profitability of the industry as a whole. This would evaluate GCTB on an economic basis, and be valuable information for influencing growers to adopt the system. Determining some key parameters such as defining an acceptable level of extraneous matter was also considered important.

Associated with the economic analyses was the need to determine the most suitable group sizes. Increasing the group sizes will create sufficient support for harvesting contractors to continue upgrading their machinery, and allow easier management for mill transport logistics. The experiences of northern mills, particularly CSR, was felt to be of value in this regard.

*Farmers need a system to tell them whether if they cut green or burnt, what will be the dollar return for them.*

*Growers attitudes have got to change. The benefits in dollar terms have to be sold to growers as a package.*

*Millers, growers, and harvesters (contractors) have to get together, and go down a path together.*

*We need to put a limit on the amount of trash going into the mill of about 5%. Below this the mill will still crush at the same rate.*

*From the canie's point of view, it is the group sizes that are important. Mackay has a traditional small group syndrome. The North went through this problem, CSR was instrumental. Maybe we should find out what they did.*

### **6.3 Harvesting contractor meetings**

The following summarises discussion from the two meetings attended by representatives of the harvest contracting sector. Similar to the milling meetings, one was held in Mackay, and the other in Bundaberg.

Quotations from the discussions are shown in *italics*.

#### **6.3.1 Bundaberg**

##### **Specific factors related to this focus group**

Participants included full-time harvesting contractors, and growers who also contract harvested.

##### **Summary**

Most of the discussions related to the effect on machinery efficiency and increased costs when harvesting green. Most participants felt that their operating costs were increased in green cane. The group felt the only productivity gains from GCTB were to be obtained in dryland situations, in dry years. The increased use and availability of irrigation had reduced the viability of GCTB for many growers. The overall feeling was that GCTB resulted in less production and profitability for the industry.

There was real concern that ultimately the industry would be forced into adopting GCTB, at a real cost to profitability. This was the result of poor information and understanding by the general community on the suitability and limitations of GCTB in the region.

##### **Question 1. What are your thoughts on green cane trash blanketing from a harvesting perspective?**

There was concern that GCTB was mainly an environmental issue being supported strongly by interests outside the industry. It was felt that it was only a matter of time before GCTB would be regulated as mandatory for the industry. Although some growers were very successful with GCTB, the majority had poor results. The poor acceptance of



GCTB within the region indicated it would be a major setback for regional productivity. One participant had previously cut 70% green and was now only 10%. It was observed that the majority of growers who had previously cut green had returned to burnt systems. The majority of GCTB was now felt to be carried out by newer growers.

It was emphasised the industry had not argued the case against GCTB very well, and that the general community did not understand the production problems and limitations associated with the practice.

There was a concern that harvesting green slows the machine down significantly. The estimated reduction was around 20-25%, although this was influenced by the size of the crop. The machines were slowest in the largest crops, however, there was no difference in crops less than 50 tonnes per hectare. It was perceived there was inequitable machinery capability and efficiency when cutting both burnt and green crops. The participants felt it was necessary to be able to harvest green, which resulted in the power and engineering of the machines being under utilised in burnt crops. Conversely, they felt the machines were generally inadequate in larger green crops.

The major benefit of green cane was the ability for the harvesting group to start earlier in the wet. Visibility, and staying on the row in green crops was sometimes difficult. As a result, there was a concern that a lot of cane was being left behind in the trash. In some cases, growers had been asked to burn to improve visibility for the operators, and reduce losses.

Most participants felt that fuel and running costs were more in green cane. One participant had kept accurate records in recent years, and felt the differences were minimal, however, he acknowledged this may have been influenced by the smaller crops during this time. Overall, it was felt that green cane was harder to cut, with more throughput in the machine, but without any increase in profit.

Trash fires were a major concern, particularly because harvesters can start fires as well as catch fire themselves. It was acknowledged that the newer harvesters were less of a fire hazard than older models.

There was a concern that the mills wanted very clean cane, but the growers wanted no harvester losses. The contractors were also concerned about losses because it was cane they had cut and were not being paid for. Green cane increased the difficulties with cane loss, and the contractors felt they were caught in the middle.

*Who's pushing it?*

*From the government there will be a time limit when we have to go green.*

*Its an exciting experience when you're on the harvester when it catches alight. You've got to get the machine off the block, loose cane drops off and lights up the trash.. up she goes.*

*If all Bundy went trash blankets, fire could wipe out a large percentage of the district;  
Cutting green slows you down.*

*The bigger the crop, the slower the speed when cutting green.*

*We find it good to get the group moving in the wet.*

**Question 2. What are the main advantages and disadvantages of green cane trash blanketing from the harvesting perspective ?**

Most of the discussion focussed on the disadvantages, which were covered in the previous section.

**Advantages**

- It was perceived that the main benefit from GCTB was for the mills and not contractors.
- Ability to harvest in wet conditions, start harvesting earlier after rain, and prevent losses in burnt cane.

**Disadvantages**

- Harvesting losses were important, not only from the perspective of cane lost, but reducing losses also caused a perceived increase in the wear on machinery components.
- Trash fires
- Health problems were felt to be a concern in green cane. Employees appeared to have more respiratory problems, particularly in some varieties. There was some discussion about the liability for any long term effects in green cane.
- There was a perception that the trend to green cane resulted in an increase in chemical use for weed control

**Question 3. What are the main difficulties associated with green cane harvesting from the harvesting contractor perspective?**

Most of the discussion focussed on the difficulties associated with machinery operation. There was a lot more wear on the machinery in green cane. The durability of some of the components was felt to be greatly reduced, particularly linked to increases in hydraulic pressure when harvesting green. The overall reduction in efficiency of the harvesting operation was a major problem. This resulted in a lower daily bin output, and had ramifications for haul out operations, especially over long distances.

It was felt that most contractors didn't know the true costs of harvesting. Although harvesting green was slower, it was difficult to determine the difference in running costs. Any comparisons were generally confounded by different conditions, such as crop size, and ground conditions. One of the important considerations was the drill shape, and the condition of the interrow. Uneven and compacted interrows slewed the harvesters around and resulted in the pick-up of more dirt. This was often the case in GCTB paddocks cut in wet conditions. If drills were narrow, the situation was worse. Many growers who had seriously adopted GCTB had gradually moved out to larger row spacings, but not all were interested in assisting the harvesting process.

The benefits of dual row pineapple planting were discussed. Some participants felt that it was likely the industry would move towards dual row systems to overcome problems with compaction under GCTB in the future, in conjunction with the development of dual row harvesters.

*It all comes back to costs, you get 320 t per day in green and 400 in burnt.*

*I'd sooner forgo the \$1.00 than cut green.*

*Something that helps us will help the farmer also.*

*Contractors are getting bigger by buying others out.*

*I believe it (pineapple planting) is the way it'll end up. There's less compaction, wheels fit the interspace, its ideal for trickle, and you use less tape per acre..its cheaper.*

#### **Question 4. How does green cane trash blanketing influence industry productivity and the public perception of the industry ?**

##### **Productivity**

The participants felt that although productivity should be evaluated on an individual farm basis, it would be reduced under GCTB over the region. The only consistent gain observed was on unirrigated farms in dry seasons. This overall benefit was reduced with the trend to greater reliance on irrigation. One participant felt that there would be a large regional loss if all growers adopted GCTB.

##### **Public perception**

There was concern that insufficient information had been made available to the wider community on the difficulties for the industry with GCTB. The environmental aspect of GCTB perceived to be promoted by the community was being carried out in an ill-informed manner. The group believed that most of the negative impact was perception only, related more to inconvenience such as ash on washing and in pools, than health or soil conservation issues.

With the trend to longer harvesting hours to complete bin allocations under green cane, there was concern that noise would be an increasing problem. This was also the case with trash in residential areas, and on roads.

*I don't think you get more productivity with green cane. Only dryland crops grow better due to moisture content.*

*Now because of irrigation, there is not as much benefit.*

*Some Isis farmers cut green cane for many years. Their production dropped to 2000 tonnes. They burnt and it increased to 3000, and then 3,500 tonnes the year after; There would be an enormous loss if everyone went green, to the district and individually.*

*The general public don't have a clue what they are talking about, we need to do more PR in the local media.*

**Question 5. How do you think GCTB affects industry profitability ?**

For harvesting contractors, there was a tendency to increase contract size in order to justify investment in the equipment necessary for harvesting green. This investment was not always matched by improved returns. Due to the slower harvesting of green cane, contractors were often paying overtime in order to get through their bin allocations.

The added intake of extraneous matter, particularly dirt, was felt to reduce industry profitability. The impact on lower bin weights and increased harvester losses were important factors for profitability. It was felt that millers and growers need to look more closely at the overall issue.

There was unanimous agreement that floc, being associated with green cane, was an important issue for the whole industry. However, the participants felt it was basically a mill processing responsibility.

**Question 6. What are the research or information needs for green cane trash blanketing?**

There was a strong discussion on developing varieties suitable for GCTB in the climatic conditions of the region. They particularly stressed the need for a variety able to ratoon in cool and wet conditions.

There was a need to ensure harvester technology improved to handle harvesting green in large and lodged crops. Basecutter technology was an area that particularly need attention.

Another suggestion regarded the industry looking at the real costs of cleaning cane in the paddock. There was some discussion that the most economically effective, and efficient, method may be sending all material for cleaning and separation at the mill, especially if there were some alternative use available for the trash.

It was stressed that growers need to be encouraged to manage their farms properly for green cane harvesting, especially in regard to adequate hilling up, drill profile, and consistently wider row spacing.

An area of interest was the health of harvesting workers in green cane. There was concern that greater airborne particulate matter in green cane may have an impact on worker health.

*We want a variety that's straight, able to stand up in strong winds, and come away when its wet and cold.*

*The mill should take all of it, make paper from the trash.*

### **6.3.2 Mackay**

#### **Specific factors related to this focus group**

Participants included full-time harvesting contractors, and growers who also contract harvested.

#### **Summary**

The group strongly felt it was necessary to determine the real costs of harvesting green cane and GCTB for themselves, and the rest of the industry.

They were concerned that a lot of growers who purchased harvesters may be receiving poor investment advice. They believed that this was not an efficient approach for most growers, and that more information should be available on the costs (including opportunity costs) of harvesting for themselves.

There was a need for further research into harvester design for better cleaning systems for green cane. The group also felt it was important for growers to continue receiving information on row spacing, drill shape, and the importance of the plant cane phase for GCTB.

Significant discussion occurred on the need for rationalising group sizes to underpin investment in new machinery suitable for GCTB. The smaller groups sizes were supporting the continued use of older, small machines which were acting as an impediment to GCTB in the region.

#### **Question 1. What are your thoughts on green cane trash blanketing from a harvesting perspective?**

All participants felt that GCTB was a good tool for the industry, allowing growers flexibility in harvesting their farm. They were not committed to cut a burnt block, and able to cut any block on the farm when the contractor was there. More growers required the flexibility and option of harvesting some blocks green during the season, and required contractors to have the ability to harvest green. This created a difficulty for most contractors because they were unsure of the costs of cutting green. There was additional concern that nobody in the industry knew the real costs of harvesting green.

There was an overall feeling that only some growers gain an increase in productivity from GCTB. The majority of participants had observed and experienced the limitations of GCTB, particularly in regard to soil type. They felt that growers needed to be better informed on the soils to be used for GCTB. The time of year and prevailing temperature conditions were felt to be important also. All growers needed to have more information on how to manage the trash and crop in wetter conditions. Another issue mentioned was trash fires, and the need for harvester care.

Most participants felt that current machines were not adequate for cutting large crops green. There was some discussion on the suitability of varieties, and the group felt the

northern varieties had looser trash and were superior for GCTB. Most of the participants felt that local varieties were not as suitable for GCTB, and the machines and operators were receiving a lot of the blame for harvesting losses, poor ratooning, and lower yields.

The correct drill shape and standard wider rows were important for cutting green. A lot of emphasis was placed on getting it right during the plant cane phase. This improved harvester performance, and reduced stool shattering.

*Its a good management tool for growers. They don't have to cut a burnt block and can chase CCS.*

*A loss of production for the farmer is a loss of production for contractors. BSES should be telling growers what soils are suitable.*

*Our varieties aren't suitable, the contractors and machines get the blame.*

*The time of year its cut is important.*

*What are the costs to cut green, can anyone tell me, no one knows.*

## **Question 2. What are the main advantages and disadvantages of green cane trash blanketing from the harvesting perspective ?**

### **Advantages**

- Flexibility in block selection for harvesting
- Better cane quality and reduced dextran levels
- No waiting around to burn, and reduced working day length
- Allows contractors to more easily maintain grower quota
- Green cane is cleaner to harvest than burnt

### **Disadvantages**

- The need for nearly all contractors to have capability for harvesting green
- Flocculation
- Lower bin weights
- Armyworms
- It is essential to get drill profile right in plant cane, otherwise it is difficult to harvest for the whole crop cycle
- Harvesting loss
- Extraneous matter

## **Question 3. What are the main difficulties associated with green cane harvesting from the harvesting contractor perspective?**

The group was concerned about the relationship between harvester losses, extraneous matter and green cane harvesting. They believed they suffered lost income, as they received no returns for cane they had cut and was lost in the paddock. On the other hand, if they tried to minimise losses, they often ended up with very low bin weights, which

incurred increased handling costs. They felt that there needed to be a compromise or optimum level of extraneous matter which was equitable for all sectors of the industry.

Some varieties were easier to cut green, whereas others appeared to have higher losses and performed poorly under GCTB. Examples given were Q124 as a good variety for GCTB, and Q136 as a poor variety to harvest green. The importance of drill shape, height, and row spacing were again discussed.

*How much extraneous matter is OK ?*

*Farmers trial green cane but don't make the necessary changes to make it work. They need to make the hill profile good in plant cane. Hill profile is very important.*

*Its useless cutting 136 till 10 (am), when the dew's dried off.*

#### **Question 4. How does green cane trash blanketing influence productivity and the public perception of the industry ?**

##### **Industry productivity**

Most of the participants felt that this was a difficult question to answer. They believed that some growers would benefit from GCTB, but others had a lot of problems. New management problems such as armyworms, and the increase in vines were unquantified in terms of their effect on production.

Some participants felt there were a lot of hidden costs with cutting green, and specified fuel, time and hydraulic pumps. Again the issue was raised concerning the lack of information on the costs of cutting green and GCTB. It was stressed that this was important information for the group and the industry as whole.

The issues of extraneous matter and the relationship with cane loss emerged again. The group felt that this was an important factor in green cane harvesting, influencing the productivity, and profitability of the whole industry. They strongly felt that an acceptable level of extraneous matter, which minimised cane loss had to be determined.

##### **Public perception**

There was only minor discussion on this issue. The main point related to the general community not understanding the issues associated with GCTB, and only focussing on the perceived positive factors.

*There are new pests, armyworms, rats etc. that we don't know the effect of;  
Vines are another problem to consider.*

*You also have to look at extraneous matter again. You need to weigh it up versus cane loss, and come up with a reasonable level for everyone.*

**Question 5. How do you think GCTB affects industry profitability ?**

Most of the discussion was focussed on profitability from the contracting perspective. Green cane was slower to harvest. The size of the crop, degree of lodging, and ground conditions influenced the rate of harvesting. Slower harvesting resulted in losses to the contractor, due to longer days and overtime. Most participants felt that the extra \$1.00 per tonne for cutting green cane was only a rough estimate of the real costs. It was basically based on the machine throughput being greater due to the extra trash, and the slower rate of harvesting. However, cutting green was not as profitable for contractors overall, although it was again acknowledged that no data was available to base this on.

In contrast, one participant felt that it was difficult to justify the incremental increase for harvesting green. He cut approximately 50,000 tonnes, and if he cut it all green, he did not believe that it would cost him an extra \$50,000 to cut and cart over the season. He acknowledged that the necessary capital investment was high, but as long as the machinery was of a high standard, the operating costs could be similar.

There was a lot of discussion on rationalisation of harvesting groups. This centred on making groups larger to justify the investment in better harvesting and haul out machinery, increasing siding capacity, and more flexibility from the mill. Overall, rationalising groups and better machinery would allow an increase in the amount of green cane in the region. There was strong concern that many growers were receiving poor financial advice, over capitalising, and buying harvesters. The opinion was that this was an inefficient way for many growers to manage the farm, and have their cane cut. Another point was the prevalence of a lot of small and older machines unable to cut green. It was felt that many farmers using these would be able to pool their resources into an effective group, and benefit from GCTB on some of their farms.

*I want to know the extra costs of cutting green cane.*

*The extra dollar is just a guesstimate.*

*The biggest problem is that you're slowing down. Costs are based on 20% more trash on the cane, and therefore 20% more moving through the machine.*

**Question 6. What are the research or information needs for green cane trash blanketing?**

Varieties suitable for GCTB needed to be developed. Varieties had to ratoon well under GCTB, be free trashing, and not be prone to losses during the cleaning process.

There needed to be an economic analysis to determine the real costs and benefits of GCTB to the industry, and provide an economic benchmark for comparative purposes.

There needed to be more work on developing improved harvester performance, particularly the cleaning systems, and possibly looking at opportunities for dual row configurations. It was felt that there was little information on optimum transport systems, and this needed further development.



The group emphasised that growers should receive consistent information on drill profiles and row spacing in order to improve harvester performance.

*We need to know what it costs us and the industry to cut green.*

*BSES needs to set a standard row and hill profile; they really need to do something about it now.*

## **7.0 IMPLICATIONS AND RECOMMENDATIONS**

The results of the focus group discussions suggest that all sectors of the industry cane producers from Proserpine south are well informed about GCTB. The majority of growers appear to have tried the practice. Continuing to extend the practice in the existing manner is unlikely to rapidly increase adoption of GCTB by those not currently using the practice, and may increase the frustration and resentment of producers who have tried the practice without success.

Participants responded well to the opportunity for group discussion, suggesting that group approaches to extension and data collection techniques such as focus groups are well suited to the industry.

### **7.1 Future Research**

The risk of poor ratooning and reduced yields under a trash blanket limits the suitability of existing GCTB methods. The need to improve sustainability and avoid burning is real, and requires further research and development. This should include consideration of alternative and innovative approaches, such as harvesting green and removing the bulk of the trash for other purposes, as well as the possibility of agronomic adjustments to GCTB such as manipulation of trash, and alternative irrigation strategies.

Future research needs to clearly analyse and document the costs and benefits of alternative production methods, both in terms of yield and profit, and effects on soil based parameters. This needs to include all sectors of the industry. Promising approaches will need to be demonstrated on-farm at a commercial scale, taking note of adjustments required in the overall farming system. While this approach may be relatively expensive, it will be necessary to overcome the existing negative views of the appropriateness of current GCTB practices.

The industry should fully support the current efforts of BSES into reducing harvester losses, and reducing extraneous matter in the cane supply. This was an extremely important issue for the entire industry. In addition, there needs to be a continuing focus on making growers aware of correct drill profiles and consistent row spacing.

To support growers who have adopted GCTB (particularly in the northern areas of this study), the following issues require further research and/or development:

- varieties suited to GCTB;
- alternatives for handling trash after green harvest at different times of the season (to reduce the risk of poor ratooning);
- systems for fertiliser application through and under the trash blanket (the existing information needs to be extended in a consistent manner to overcome current misunderstanding, and targeted specifically for growers using GCTB);
- methods to reduce the risks of waterlogging, particularly under flood irrigation;
- economic evaluation of the various methods of production;
- systems to minimise trash fire risks.

In addition to the above, there is the need to research and develop management systems for GCTB on heavier, and less suitable soil types. This will assist growers who have previously had poor experiences with GCTB, as well as those who have already adopted the system.

## **7.2 Difficulties**

Managing large numbers for focus group meetings can be difficult. At a couple of the meetings, larger than expected attendance (probably due to wet weather) meant it was difficult for all participants to have adequate input.

The selection of meeting location is also important. One noisy location limited the quality of the tape recording of the discussion. Transcription and analyses of group meetings is a laborious process. The process requires good sound recording and transcription equipment. The time necessary for compiling a summary report for each two hour meeting is influenced by the quality of the recording and notes.

## **8.0 INTELLECTUAL PROPERTY**

No intellectual property of commercial significance arose from this project.

## **9.0 TECHNOLOGY TRANSFER**

Television and radio interviews were given on the outcomes of the project. These were broadcast across the regions addressed by the project.

The project outcomes were presented to a meeting of all BSES extension officers in 1995. In addition, draft copies of meeting summaries have been circulated. Outcomes have been used subsequently as the basis for promoting GCTB with growers in central and southern regions.

Outcomes of the project have been used for a number articles in a rural newspaper popular with growers in the central region. They have also been used as the basis for a handout developed for CANEGROWERS organisation, discussing the advantages and disadvantages

of GCTB. This has been distributed to all growers in the Mackay region, as well as schools, community groups, and other regional centres.

A poster paper was accepted, and a presentation on the project was made to delegates to the *International Symposium on Environmental Agriculture: Towards 2000* at the Gold Coast in June 1994.

A presentation of the key project outcomes was made to a planning group for sub-program 2.2 of the CRC for Sustainable Sugar Production in 1995.

## **10.0 ACKNOWLEDGMENTS**

Thanks are extended to all growers, milling representatives, and harvesting contractors who participated in this project.

I would also like to acknowledge the efforts and assistance of Dr. Beth Woods, Director of the Rural Extension Centre; Dr. Jeff Coutts, REC; Mike Whereat, UQ-Gatton; Richard Clark, John Daniels, Graham Harris, Peter Smith, Ann Messenger; DPI; Dana Kelly, Dept. Lands; Salvo Vitelli, Tony Blatch, Hayden Darveniza, BSES.

## **11.0 LIST OF PUBLICATIONS ARISING FROM THIS PROJECT**

Poster-paper:

Norrish, S. and Woods, E.J.; Constraints to the adoption of green cane trash blankets in central and southern districts of the Qld sugar industry. *Proc. International Symposium Environmental Agriculture. Towards 2000.* Gold Coast June 1994.

## **12.0 APPENDIX : QUESTIONING ROUTES**

### **GROWERS**

Question 1. What are your thoughts about green cane trash blanketing in this area?

Question 2. What factors influence your decision to use or not to use green cane trash blanketing?

Question 3. What are the main difficulties, if any, with green cane trash blanketing on your farm?

Question 4. On your farm, how do you see green cane trash blanketing in relation to yield?

Question 5. How do you think that green cane trash blanketing affects profit?

Question 6. Can you clarify green cane trash blanketing in relation to specific issues (if necessary)

- the harvesting operation
- ratooning
- pests
- soil types and drainage
- lifestyle
- community concerns

Question 7. Are there any research or information issues about green cane trash blanketing which should be addressed?

### **MILLING REPRESENTATIVES**

Question 1. What are your thoughts on green cane trash blanketing from a milling perspective?

Question 2. What are the main economic issues associated with green cane harvesting from the milling perspective?

Question 3. What are the main advantages and disadvantages of green cane trash blanketing from the milling perspective ?

Question 4. How does green cane trash blanketing influence industry profitability ?

Question 5. What other issues are important with green cane trash blanketing ?

Question 6. What are the research or information needs for green cane trash blanketing?

**HARVESTING CONTRACTORS**

Question 1. What are your thoughts on green cane trash blanketing from a harvesting perspective?

Question 2. What are the main advantages and disadvantages of green cane trash blanketing from the harvesting perspective ?

Question 3. What are the main difficulties associated with green cane harvesting from the harvesting contractor perspective?

Question 4. How does green cane trash blanketing influence:

- industry productivity;
- harvesting efficiency;
- the public perception of the industry.

Question 5. How do you think GCTB affects industry profitability ?

Question 6. What are the research or information needs for green cane trash blanketing?