Appendix 1

BURDEKIN ROW SPACING CASE STUDY

MIG GROUP - 2007

Introduction

The Mulgrave Integrated Group (MIG) was formed in June 2005 and has eleven members from 4 farming enterprises. Collectively the MIG manage approximately 1800 hectares of sugarcane in the Mulgrave area, near Clare in the Burdekin (see Figure 1).

The MIG was interested in adopting the Sugar Yield Decline Joint Venture (SYDJV) principles of reduced tillage and controlled traffic. Despite the confidence of researchers, the lack of commercial size demonstrations and generally low uptake by Burdekin farmers made MIG cautious of investing too heavily. On-farm demonstrations would provide the group with information on how to proceed.

The farmers decided to plant a trial to compare the practicalities of growing sugarcane on mound planted 1.52m singles and 2.0m dual row configurations. The trial was located on the paddock marked in Figure 1, which has a heavy cracking clay soil.

The trial consisted of 8.5 hectares of 1.52m single row and 8.9 hectares of 800mm duals on 2.0m centres in the same paddock. Q183 was planted on the 22/05/2006 (singles) and 6/06/2006 (duals) and then harvested on 10 and 11 August 2007. The trial was not replicated.

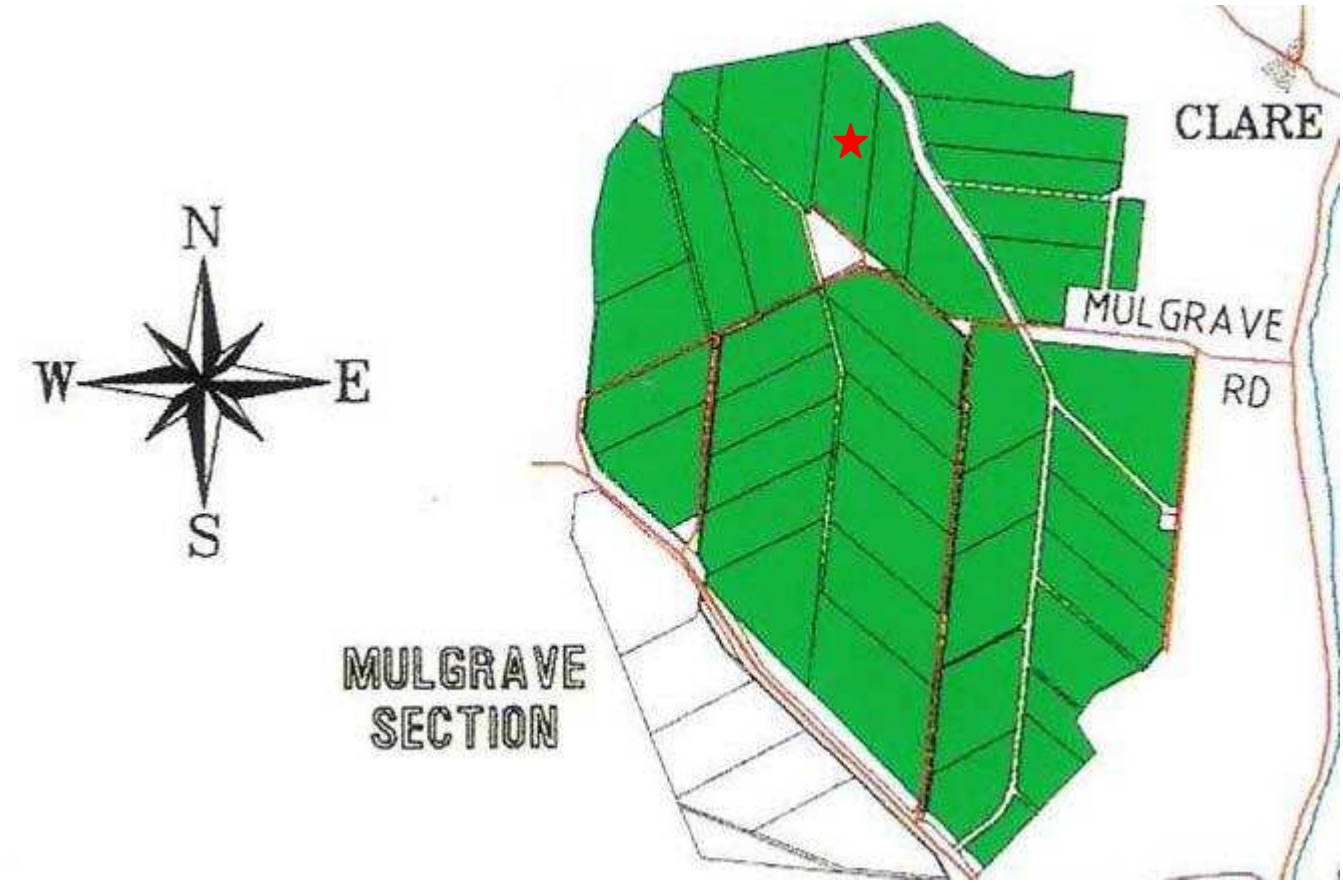

Figure 1. The Mulgrave area near Clare in the Burdekin.

Planting System

The characteristics of each system are outlined in Table 1. The conventional system is based on the old row spacing and planting system used by the MIG group in 2004. The single and twin row mound system is based on the plant cane operations used by the MIG group in their 2007 demonstration trial. In this example the planting costs are based on contractor rates. The remaining operations are completed using the growers own farm equipment.

Table 1. Characteristics of planting systems

Characteristics	Conventional System	Single Row Mound System	Twin Row Mound System
Planting width	1.52m	1.52m	2.0m (twin row at 0.8m)
Planting Method	Furrow opener whole stalk planter	Double disc opener billet planter (GPS)	Double disc opener billet planter (GPS)
Planting Rate	5 tc/ha	7 tc/ha	10 tc/ha
Land Preperation	7 x offset disc 2 x grubber 1 x hill up boards 1 x line marker	4 x offset disc 1 x mound former	4 x offset disc 1 x mound former
Controlled Traffic	No	No	Yes
Fertilizer	272kg/ha CK55 618kg/ha Urea 247kg/ha Sulphate of Ammonia	432kg/ha DAP 988kg/ha Nitra K (s)	556kg/ha DAP 988kg/ha Nitra K (s)
Weed Control	2 x chemical (crop) 1 x spring tines 1 x hill up boards	2 x Chemical (fallow) 2 x Chemical (crop)	2 x Chemical (fallow) 2 x Chemical (crop)
Insect Control	Talstar	Talstar	Talstar
Disease Control	Shirtan	Shirtan	Shirtan
Furrow Irrigation	20ML (including recycled water)	16ML (including recycled water)	16ML (including recycled water)

Economic analysis of old versus new

Economic analysis was conducted using the Farm Economic Analysis Tool (FEAT) developed by the DPI&F FutureCane initiative. FEAT is a computer based program designed specifically for cane farmers and allows grower to undertake a whole of farm economic analysis or to compare the economics of various components of a new farming system. A comparison between the costs of three different row spacings can be made by applying the current input prices to both the current and historical planting systems. The cost comparisons are provided on a per hectare basis.

The productivity of the single and twin row mound planting is based on the plant cane trial results obtained by the MIG group demonstration trial in 2007. These yield and CCS results are based on a single replication strip trial and therefore should be treated with caution because of the natural variation that may exist between treatments. The yield and CCS levels for the conventional system were assumed to be the same as the 1.52m single row mound treatment.

Given today's input costs, the conventional system would have a total growing cost of $2336/ha compared to the $2172/ha and $2328/ha with the single and twin row mound system (Table 2). These figures include tractor and irrigation labour costs at $20/hr. Irrigation labour includes the time taken to operate the irrigation system and shift

fluming/reshape banks during cultivations. Tractor labour is the time taken to undertake the tractor operations (eg. cultivation). The biggest saving in the new planting system is in land preparation costs ($265/ha → approx $132/ha), irrigation costs ($394/ha → $305/ha) and a reduction in the time spent maintaining a plant cane crop by almost 50% ($209/ha → approx $108/ha).

An increased seeding rate in the twin row system and the use of a whole stalk planter in the conventional system caused a variation in planting costs. Insecticide costs (Talstar) increased with twin row planting because of the row configuration. Fertiliser costs increased in the single and twin row mound system because of a greater amount of fertiliser applied per hectare. A greater saving would have been achieved if, 1. best management practice was adopted across all treatments, or 2. the same amount of fertiliser was applied to each treatment on a per hectare basis.

Using the assumption that the conventional system fertiliser rate was applied to all treatments, the growing costs would have been $1953/ha and $2011/ha including labour for the single row and twin row mound system respectively. This would have resulted in lower operating costs for the new planting systems, with a reduction of $383/ha and $325/ha for single and twin row mound system compared to the conventional system.

Table 2. Cost of growing plant cane per ha

	Twin Row Mound System	**Single Row Mound System**	**Conventional System**
	$/ha	$/ha	$/ha
	Variable Costs	Variable Costs	Variable Costs
Land Preparation	131	132	265
Planting & Seed	596	536	570
Fertiliser	1031	937	734
Weed Control	131	131	141
Insect Control	17	11	11
Disease Control	12	12	12
Irrigation	305	305	394
Growing Cost	2223	2064	2127
Tractor & Irrigation Labour ($20/hr)	105	108	209
Total Growing Costs (including Labour)	2328	2172	2336
Total Growing Costs (fertiliser costs held constant)	2011	1953	2336

Table 3 displays the plant cane gross margins for each system. The yield and CCS figures are based on a single replication and therefore can not be used to distinguish if there is a significant difference between treatments. The lower yield and CCS and therefore sugar yield may be related to several factors and not necessarily the row spacing, eg. high nitrogen rates in the twin row system. However the analysis does highlight the effect of yield and CCS

levels on net revenue. The twin row mound system yielded 2tc/ha and 0.7 units CCS lower than the single row mound system, resulting in $291/ha less in net revenue.

Table 3. Economic comparison of plant cane treatments in 2007

Plant Cane - 2007	Twin Row Mound System	Single Row Mound System	Conventional System
Price per tonne sugar (AUD)	260	260	260
Mean yield cane (t/ha)	146	148	148
CCS	14.3	15	15
Mean sugar yield (t/ha)	20.9	22.2	22.2
Net Revenue ($/ha)	3520	3811	3811
Growing costs ($/ha)	2223	2064	2127
Harvesting costs ($/ha)	876	888	888
Gross margin ($/ha)	421	859	796
Gross margin with labour ($/ha)	316	751	587

If we assumed that cane yield, CCS and fetiliser rate is constant across all treatments, both mound planted systems have over $325/ha higher gross margins than the conventional system (Table 4).

Table 4. Economic comparison of plant cane treatments in 2007 (assumptions)

Plant Cane - 2007	Twin Row Mound System	Single Row Mound System	Conventional System
Price per tonne sugar (AUD)	260	260	260
Mean yield cane (t/ha)	148	148	148
CCS	15	15	15
Mean sugar yield (t/ha)	22.2	22.2	22.2
Net Revenue ($/ha)	3811	3811	3811
Growing costs ($/ha)	1906	1845	2127
Harvesting costs ($/ha)	888	888	888
Gross margin ($/ha)	1017	1078	796
Gross margin with labour ($/ha)	912	970	587

Conclusion

The MIG was interested to quantify the benefits of moving from their current 1.52m row configuration to a row configuration that better matches tractors, harvesters and haulage equipment using GPS technology. There is now confidence that preformed beds will reduce input costs compared to the current system, at least for the plant crop. In particular,

significant opportunities to reduce land preparation costs and general growing costs appear to exist. All members of MIG have moved over to planting into preformed beds; however some members of MIG prefer 1.52m singles over duals on 2.0m centres. While some errors were made with the trial design, differences of at least $300/ha saving can be made by moving from the conventional system to the preformed mound system.

This report focuses on the economic results of a plant cane crop and further analysis of the following ratoons is required to provide a more accurate picture of true profitability. The economic analysis poses several questions that the group will need to consider for future plantings, these include, 1. nutrient management practices 2. replication of future trials to determine if yield and CCS variation is real 3. harvesting costs and 4. validation of irrigation savings.

This information presented in this case study is a partial analysis and does not take into consideration individual circumstances. Therefore it would not be recommended to change a farming practice or develop a plan from this case study without further consultation from a qualified person.

Prepared by:

Mark Poggio (FutureCane & SRDC), ph: (07) 4776 3907, mark.poggio@dpi.qld.gov.au
Steve Attard (CSIRO),
Paul Hatch (MIG),
Peter Fiamingo (MIG),