



2015 INDEPENDENT SOUTHERN NSW IRRIGATED CROP OPTIONS ANALYSIS

PREPARED BY



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Dear Grower

In mid-2014 SunRice commissioned Booth Associates to carry out an *Independent Southern NSW Irrigated Crop Options Analysis*. The analysis was carried out for typical irrigation farm businesses in the Murrumbidgee and Murray Valleys using realistic production costs and revenue based on a medium grain rice price (Reiziq) of \$300 per tonne; a cotton price of \$475 per bale and maize at \$300 per tonne.

The mid-2014 analysis clearly demonstrated that the rice farming system is not only competitive with other summer crop based systems, but it generates superior profit, return on capital and cashflow and balance sheet advantages for most farm businesses. Superior profit and return on capital based on the above prices is demonstrated in Table 1.

Table 1: Profit and Return on capital based on 2014 Analysis

Farm System	Murrumbidgee		Murray	
	Profit \$K	Return on Capital	Profit \$K	Return on Capital
Rice/winter crop	\$263	4.1%	\$82	3.1%
Cotton/winter crop	\$222	3.0%	\$41	1.3%
Maize/winter crop	\$130	1.8%	\$55	1.9%

Crop prices for rice and cotton have improved significantly since the mid-2014 analysis was carried out. SunRice therefore commissioned Booth Associates to carry out additional analysis on the same typical irrigation farm businesses in the Murrumbidgee and Murray Valleys using current production costs and improved prices for rice and cotton (maize and soybean prices have remained reasonably stable). A medium grain rice price (Reiziq) of \$360 per tonne and a cotton price of \$520 per bale were used.

The analysis again demonstrated that the rice farming system continues to be not only competitive with other summer crop based systems, but it generates superior profit, return on capital and cashflow and balance sheet advantages for most farm businesses.

Superior profit and return on capital from the recent analysis is demonstrated in Table 2.

Table 2: Profit and Return on capital based on 2015 Analysis

Farm System	Murrumbidgee		Murray	
	Profit \$K	Return on Capital	Profit \$K	Return on Capital
Rice/winter crop	\$385	5.9%	\$119	4.5%
Cotton/winter crop	\$331	4.5%	\$74	2.4%
Maize/winter crop	\$130	1.8%	\$55	1.9%

The conclusion I draw from the analysis over two years is that the rice farming system is clearly the first choice summer crop for our region.

We recently advised the C2014 return will be better than \$380/t. When I take into account that the rice price used in the 2015 analysis - medium grain (Reiziq) at \$360/t - has already been exceeded, the conclusion is even stronger.

Please consider the analysis in the Booth Associates *2015 Independent Southern NSW Irrigated Crop Options Analysis* and support your industry and company by making rice your major summer crop in the season ahead.

If you would like a member of the SunRice Grower Services technical team to interpret the analysis for your farm business, please contact Grower Services on 1800 654 557 or at growerservices@sunrice.com.au

Yours sincerely

A handwritten signature in black ink, appearing to read 'Rob Gordon', with a stylized initial 'R' and 'G'.

Rob Gordon
CEO
SunRice

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This independent analysis report by Booth Associates was prepared for SunRice. Booth Associates have long-standing experience across all irrigated industries, including cotton and rice, and do not favour one over the other. Booth Associates advocate best business practice and believe diversity in cropping systems is essential for Southern NSW.

Introduction

Both the 2014 and 2015 analysis investigated typical irrigation farm businesses in the Murrumbidgee and Murray Valleys with the characteristics outlined in Table 3.

Table 3: Typical Irrigation Farm Business Characteristics

	Area Cropped (ha)	General Security Entitlements (ML)	Average Allocation	Average Annual Allocation (ML)
Murrumbidgee	750	4,500	60%	2,700
Murray	500	1,200	70%	840

Crop Gross Margins

Crop gross margins are outlined in Table 4.

Table 4: Crop Gross margins

Crop	Crop Agronomics	Yield T/ha or B/ha	Price \$/T, \$/B or \$/ML	Gross Margin \$/Ha	Gross Margin \$/ML
Rice – Murrumbidgee	Medium grain sod sown	12.0	360	2,984	213
Cotton – Murrumbidgee	Roundup Ready & Bollgard	11.0	520	3,162	287
Rice – Murray	Medium grain sod sown	11.0	360	2,682	206
Cotton – Murray	Roundup Ready & Bollgard	10.0	520	2,718	272
Wheat A	After rice	6.0	250	833	416
Wheat B	Rotated with canola	6.0	250	786	196
Wheat C	After cotton	4.0	250	430	215
Canola A	After rice	3.0	475	792	396
Canola B	Rotated with wheat	3.0	475	765	191
Soybeans	Edible on beds	3.5	600	1,500	188
Maize	Grit on beds	11.0	300	1,886	189
Annual sale of allocation	Only dry wheat		50		50
Wheat – Dry		2.0	250	287	

Note: figures in bold only have changed from the 2014 report

While gross margins provide a direct comparison of per hectare and per megalitre returns possible for various crop options, they do not take into account:

- Crops grown in rotation (eg wheat using residual moisture after rice);
- Cashflow and operating funds needed;
- Overheads and unallocated costs;
- Capital investment, equipment and renewal needs;
- Strategic planning;
- Risk; and
- Lifestyle and commercial satisfaction.

Gross margins therefore need to be considered in the context of the full farm system and the whole farm budget outcome to determine and compare farm profit.

Farm Profit

To determine whole farm profit, a whole farm budget was prepared for the farming systems in Table 5.

Table 5: Farming System Details

Crop	Murrumbidgee (2,700ML)			Murray (840ML)		
	Rice System	Cotton System	Maize System	Rice System	Cotton System	Maize System
Canola – irrigated	70	-	80	22	-	24
Wheat – irrigated	100	210	115	34	70	36
Wheat – dryland	410	330	360	388	360	380
Rice	170	-	-	56	-	-
Cotton	-	210	-	-	70	-
Maize	-	-	195	-	0	60
Total	750	750	750	500	500	500

The whole farm budget outcomes in Tables 6 and Table 7 take into account the whole of business running costs including overheads, variable and unallocated costs, capital renewal and the capacity for debt servicing.

Table 6: Whole Farm Budget - Murrumbidgee

		Murrumbidgee		
		Rice System	Cotton System	Maize System
Revenue	Summer Crop Revenue	\$729K	\$1,377K	\$636K
	Winter Crop Revenue	\$454K	\$375K	\$466K
	Other Revenue	\$26K	\$28K	\$25K
	Total Revenue	\$1,210K	\$1,779K – up 47%	\$1,127K – down 7%
Expenses	Allocated Expenses	\$305K	\$765K	\$374K
	Unallocated Expenses, Staff and Overheads	\$320K	\$342K	\$331K
	Finance/ Capital Renewal	\$141K	\$281K	\$232K
	Management	\$60K	\$60K	\$60K
	Total Expenses	\$825K	\$1,448K – up 75%	\$997K – up 21%
	Profit	\$385K	\$331K – down \$54K	\$130K – down \$255K

Table 7: Whole Farm Budget - Murray

		Murray		
		Rice System	Cotton System	Maize System
Revenue	Summer Crop Revenue	\$222K	\$422K	\$198K
	Winter Crop Revenue	\$276K	\$250K	\$278K
	Other Revenue	\$16K	\$16K	\$16K
	Total Revenue	\$514K	\$688K – up 34%	\$492K – down 4%
Expenses	Allocated Expenses	\$137K	\$288K	\$165K
	Unallocated Expenses, Staff and Overheads	\$153K	\$180K	\$166K
	Finance/ Capital Renewal	\$58K	\$98K	\$58K
	Management	\$48K	\$48K	\$48K
	Total Expenses	\$396K	\$614K – up 55%	\$437K – up 10%
	Profit	\$118K	\$74K – down \$44K	\$55K – down \$63K

The analysis in Table 6 and Table 7 clearly shows that returns from cotton and maize are not as attractive as rice at the assumed farm scale. The primary differences between systems include:

The lower gross margin for rice (Table 4) is offset by reduced overall costs with full provision for whole of farm running costs;

- There is increased revenue from cotton but reduced winter crop revenue in the cotton system. This is due to very little available soil moisture after growing a cotton crop and often there are delays in sowing a winter crop after an extended period of harvesting, mulching and pupae busting after cotton harvest. Alternatively winter crops can be sown relatively quickly after rice harvest (so long as the ground is trafficable);
- The residual moisture remaining after rice can be used effectively to kick-start a winter cropping program and with well-timed spring irrigation, good yield results are achievable;
- Costs involved in the production of intensive row crops (cotton and to a lesser extent maize) are significantly higher than rice;
- Allocated and unallocated expenses are greater in cotton and maize systems as the crops are more expensive to grow;
- Overhead and management costs are the same between systems; and
- Finance and capital renewal expenses are commonly more in cotton and maize systems due to more technical row crop configurations and the need for more crop specific machinery (particularly cotton).

Cashflow Comparisons

Cashflow is more important than a simple annual profit and loss analysis. The timing of cashflow drives the timing of what can be done, both when and how. The calendar of operations and cashflow timing for rice and cotton are shown in Table 8 and Table 9.

Table 8: Rice Calendar of Operations

Rice																	
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	
Operations	Prepare Seed Bed			Plant	Grow Crop				Drain & Harvest		Paid		Prepare Seed Bed			Plant	
Cost \$/Ha	\$16			\$70	\$720				\$520		1st	Opt Early					
Cumulative cost				\$86					\$806	\$1,326		Payment	Payment				
													Prepare Seed Bed			Plant	

Note: Maize is similar to rice

Table 9: Cotton Calendar of Operations

Cotton																	
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	
Operations	Prepare Seed Bed			Plant	Grow Crop				Defoliate	Pick		Gin			Paid		
Cost \$/Ha	\$270			\$120	\$1,355				\$125	\$610		\$985					
Cumulative cost				\$390					\$1,745	\$1,870			\$2,480				
													Prepare Seed Bed			Plant	

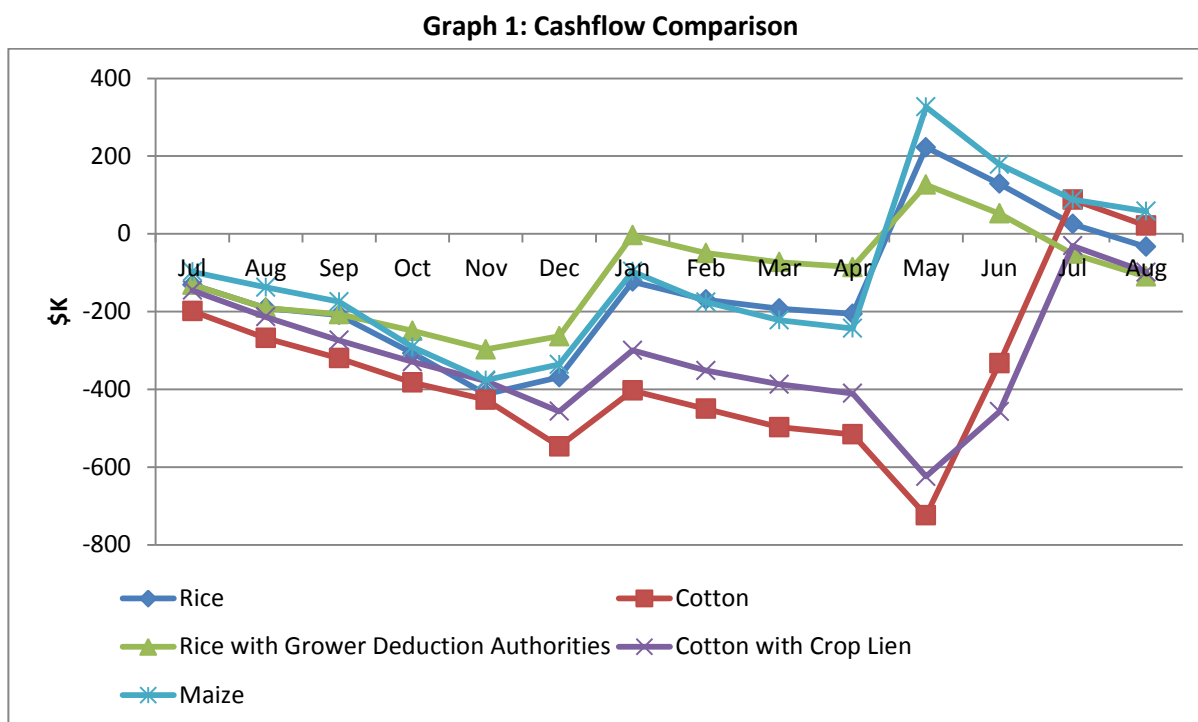
The farm profit analysis outlined in Table 6 and Table 7 was based on an assumed fixed land area and water entitlement. The resultant crop areas differ between rice and cotton (Table 5) due to the higher water use per hectare of rice.

To compare the same crop area and provide a concise comparison of cashflow between rice, cotton and maize, the cashflow for a farm business growing 170 ha of any of these three crops in rotation with winter crops was assessed. Note that this assessment differs from the farm profit analysis in Tables 6 and 7 as summer crop areas are kept constant at 170 ha to provide a direct comparison for identical crop areas. In this circumstance, the results in Table 10 are achieved.

Table 10: 170 ha Crop Comparison

	Cotton	Rice	Maize
Water required	1,870ML	2,380ML	1,700ML
Yield	11.0 B/ha	12.0 T/ha	11.0 T/ha
Gross Margin	\$537,469	\$503,618	\$320,650
Gross Margin/ML	\$287	\$213	\$189
Growing Costs	\$589,206	\$227,052	\$240,350

Graph 1 shows the cashflow impact of growing each crop over a period of 14 months to capture all costs and revenue.



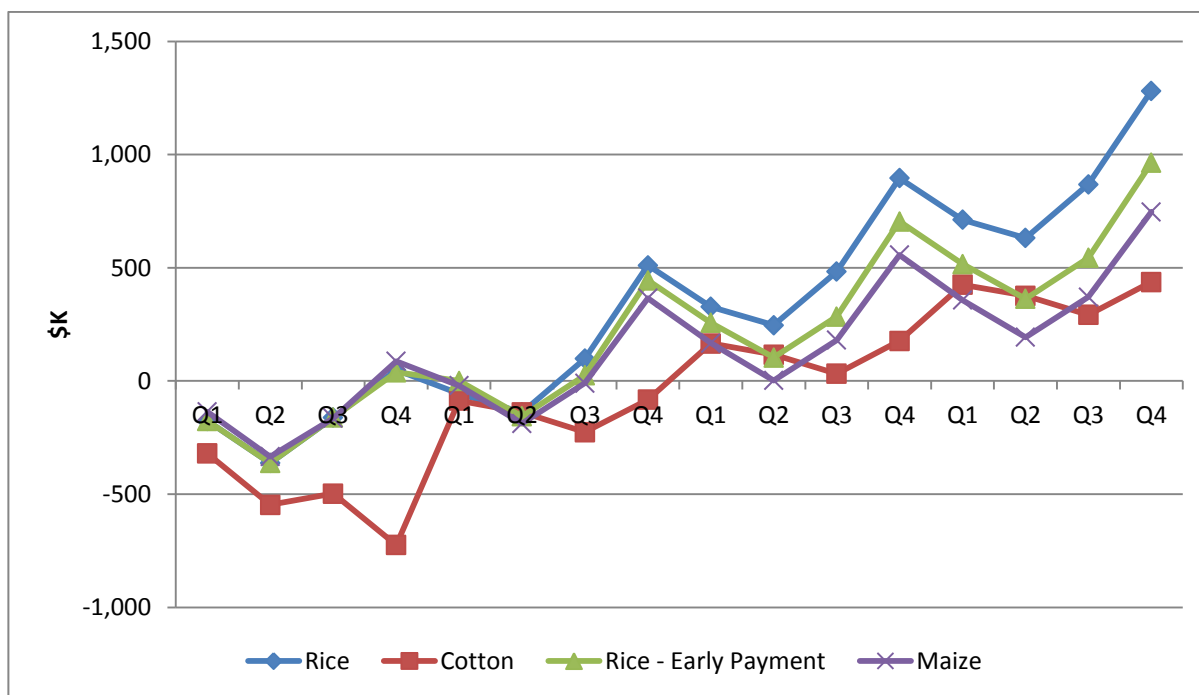
Graph 1 illustrates a full farm system in rotation with winter crop and importantly includes benchmarked allocated and unallocated costs, overhead and finance costs, together with appropriate management drawings and capital renewal costs. The growing costs of cotton are substantial and often by the time revenue from the cotton crop is realised there are already expenses incurred in planting a winter crop and preparing ground for the subsequent cotton crop.

The green line in Graph 1 represents the benefit Grower Deduction Authorities provide to reduce the cashflow burden on rice growers. The purple line represents the use of a crop lien facility to help with cotton cashflow.

Cotton income can flow in relatively quickly once the crop is ginned. Rice payments are staggered and can therefore provide some constraints to cashflow post-harvest. In particular, this can be an issue where rice areas vary significantly year-to-year, as a result of varying water allocations. There are however, early payment options available for rice. Maize payments are assumed to be 30 days post-harvest, hence the positive cashflow in Graph 1. Maize marketing can be complicated by credit risk, which is an issue across the grains industry. Prudent management of creditor risk is essential to avoid exposure to revenue loss for delivered grain.

When analysed over a four year timeframe, the 170 ha summer crop comparison of cashflow (based on quarterly apportionment) is illustrated in Graph 2.

Graph 2: Four Year Cashflow Comparison



Note that Graph 2 includes a bad summer crop year in year 2 (summer crop revenue down by 25%) to demonstrate the resilience of each crop system. The option to take early pool payments for rice is included in Graph 2.

The rice system at the assumed scale shows greater returns and resilience than maize and cotton. A poor year in the cotton system is difficult to recover from.

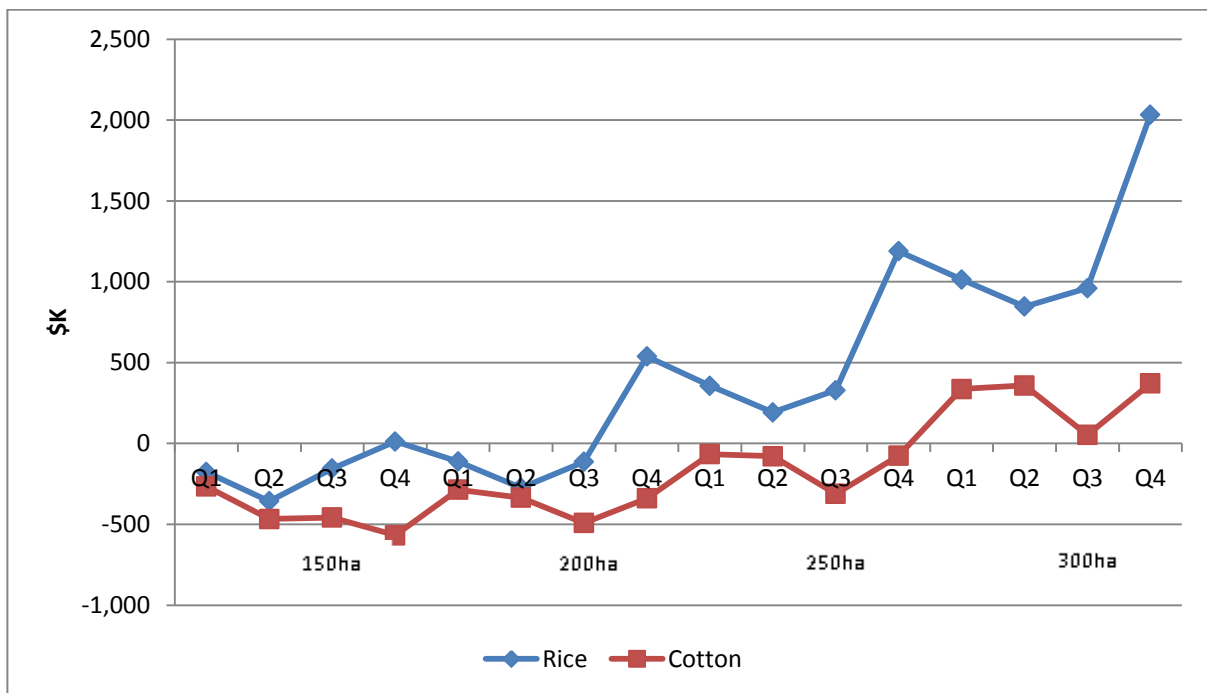
It is important to remember this is a 170 ha comparative analysis that assumes only cotton, rice or maize is grown as a summer crop. A full transition from say rice to cotton may not be practical, and initially an area of both crops may be produced. This may buffer the detrimental effects of poor seasons in one or the other crop. In the interests of reducing complexity this has not been considered in this analysis.

In situations where crop returns are suppressed due to combinations of low yield and price, and debt servicing costs are high for irrigation redevelopment and equipment finance, the businesses capacity to cope can be significantly compromised.

Cashflow and Crop Expansion

Analysis of the implications of ramping up crop area is illustrated in Graph 3.

Graph 3: Cashflow Comparison - Expanding Scale



The comparison in Graph 3 shows the impact on cashflow of expanding crop areas. In many instances the majority of profit in a year is reinvested to cover the growing costs of the expanded enterprise scale. Cotton systems only begin to show merit when grown on a greater scale.

Return on Capital and Sensitivity Analysis

A healthy farm balance sheet is critical to business success and business resilience. If equity is stressed there can be constraints on cashflow to grow a crop and the capital expenditure requirements to set up a farming system properly from the start can be inhibited.

Costs to convert from rice layout to row crop can be in the order of \$500/ha to \$1,000/ha, or greater subject to the extent of field supply and drainage requirements. Land value appreciates with irrigation development, but commonly no more than 50% of the capital expenditure associated with land development (lasering, irrigation structures, pivots, etc) goes to the balance sheet as an increase in assets.

In situations where a high quality rice layout is converted to a row crop layout there is significant sunk capital and the benefit of the irrigation redevelopment to the balance sheet may be as low as 10%. In other words, land values may only increase by a relatively small amount in such circumstances.

Plant and equipment requirements for row cropping and more specifically cotton are substantially higher than for rice systems. The specialised nature of cotton operations, especially harvest, means the equipment may be used on farm for cotton only whereas a header can harvest a range of crops including rice.

To provide a comparison of a typical balance sheet, the 750 ha Murrumbidgee and 500 ha Murray farm examples (Table 5) are used and summarised in Table 11.

Table 11: Balance Sheet Comparison

Crop	Murrumbidgee			Murray		
	Rice System	Cotton System	Maize System	Rice System	Cotton System	Maize System
Assets	\$6.50M	\$7.34M	\$7.14M	\$2.63M	\$3.08M	\$2.91M
Liabilities	\$0.45M	\$0.90M	\$0.70M	\$0.15M	\$0.28M	\$0.15M
Net Worth	\$6.05M	\$6.44M	\$6.44M	\$2.48M	\$2.80M	\$2.76M

The difference between the systems within each valley relates to the type of irrigation development and plant and equipment. When the rice, cotton and maize system returns in Tables 6 and 7 are analysed in relation to their respective balance sheet positions, the subsequent return on capital results are provided in Table 12.

Table 12: Farm System Return on Capital

Return on Capital	Rice System	Cotton System	Maize System
Murrumbidgee – 750ha	5.9%	4.5%	1.8%
Murray – 500ha	4.5%	2.4%	1.9%

Note: Figures in Table 12 are EBIT yield (Earnings Before Interest and Tax)

Sensitivity Analysis

A sensitivity analysis was undertaken to test the resilience of each crop to yield and price. The results are summarised in Tables 13 and 14.

Table 13: Sensitivity Analysis - Murrumbidgee

Rice	Cotton	Maize
10T/ha @ \$320/T = 3.1%	10 Bales/ha @ \$480/B = 1.9%	10T/ha @ \$275/T = 0.4%
12T/ha @ \$360/T = 5.9%	11 Bales/ha @ \$520/B = 4.5%	11T/ha @ \$300/T = 1.8%
13T/ha @ \$400/T = 8.2%	12 Bales/ha @ \$560/B = 7.3%	13T/ha @ \$325/T = 4.2%
12T/ha @ \$300/T = 4.1%	11.0 Bales/ha @ \$450/B = 2.3%	11T/ha @ \$275/T = 1.1%
12T/ha @ \$350/T = 5.6%	11.0 Bales/ha @ \$500/B = 3.9%	11T/ha @ \$320/T = 2.4%
12T/ha @ \$400/T = 7.2%	11.0 Bales/ha @ \$550/B = 5.4%	11T/ha @ \$350/T = 3.3%
10T/ha @ \$320/T = 3.1%	10 Bales/ha @ \$520/B = 3.1%	10T/ha @ \$300/T = 1.1%
12T/ha @ \$320/T = 4.7%	12 Bales/ha @ \$520/B = 5.9%	12T/ha @ \$300/T = 2.6%
13T/ha @ \$320/T = 5.5%	13 Bales/ha @ \$520/B = 7.4%	13T/ha @ \$300/T = 3.3%

Table 14: Sensitivity Analysis - Murray

Rice	Cotton	Maize
9 T/ha @ \$320/T = 2.3%	9 Bales/ha @ \$480/B = 0.5%	10T/ha @ \$275/T = 1.8%
11T/ha @ \$360/T = 4.5%	10 Bales/ha @ \$520/B = 2.4%	11T/ha @ \$300/T= 1.9%
12T/ha @ \$400/T = 6.3%	11 Bales/ha @ \$560/B = 4.6%	13T/ha @ \$325/T= 3.7%
11T/ha @ \$300/T = 3.1%	10 Bales/ha @ \$450/B = 0.8%	11T/ha @ \$275/T= 1.3%
11T/ha @ \$350/T = 4.3%	10 Bales/ha @ \$500/B = 2.0%	11T/ha @ \$320/T= 2.3%
11T/ha @ \$400/T = 5.4%	10 Bales/ha @ \$550/B = 3.1%	11T/ha @ \$350/T= 3.0%
10T/ha @ \$320/T = 2.9%	9 Bales/ha @ \$520/B = 1.3%	10T/ha @ \$300/T= 1.3%
12T/ha @ \$320/T = 4.2%	11 Bales/ha @ \$520/B = 3.6%	12T/ha @ \$300/T= 2.4%
13T/ha @ \$320/T = 4.9%	12 Bales/ha @ \$520/B = 4.7%	13T/ha @ \$300/T= 3.0%

- The sensitivity analysis in Tables 13 and 14 shows:
- Rice is the least sensitive crop to a reduction in yield and price, and has significant upside; and
- Cotton is the most sensitive crop to a reduction in yield and price but has solid upside in the when yield and prices are good.

Conclusion

The decision of which crop to grow should be based on best whole farm return and alignment with your:

- Skills;
- Business resources including capital and operating funds;
- Business and personal goals;
- Business strategy; and
- Preferred risk profile

Avoid making decisions based on gross margins alone, which don't provide the level of detail required to address these key business drivers.