



Home grown feed costs for dairy farmers

South East Queensland 2015



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This publication has been compiled by Ray Murphy and Ross Warren of Animal Science, Department of Agriculture and Fisheries.

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Introduction

The Queensland Department of Agriculture and Fisheries has compiled this collection of home grown feed costs, as part of the C4 Milk project, to assist dairy farmers in feed budgeting and assist in the modelling of Queensland dairy systems.

All the following costings are available in Excel format from www.dairyinfo.biz (go to “Technical Information” and then “Farm Business Management”). With these spreadsheets you can add your own data and calculate your own costing of feeds.

These costings have been developed after speaking to dairy farmers across south east Queensland to determine typical management practices for different crops and pastures. Inputs prices have been sourced from local rural merchandising outlets.

Machinery

Machinery costs are an estimation of fuel, oil, repairs and maintenance for machines typically used on dairy farms in south east Queensland. The cost of operating labour and the cost of owning this machinery are not included.

Irrigation

\$100/ML is assumed as the cost of irrigation and includes the cost of pumping and water. This cost varies on farm from \$50 to \$150 / ML depending on the efficiency of irrigation systems used.

Perennial crops and pastures

For perennial crops and pastures, the cost of establishment is averaged over the life of the crop or pasture. For instance, if the cost of establishing lucerne is \$800/ha and its life is 4 years, then \$200 (\$800/4years) is added to the annual cost of Lucerne. Perennial pastures such as kikuyu have been allocated a life of 10 years. In reality, if maintained, these pastures have a much longer life.

Feed utilisation

Feed production estimations, made as kilograms of dry mater per hectare (kg DM/ha), are achievable with good crop and pasture management. Default utilisation percentages of 70% for grazing and 100% for hay and silage have been used. Feed utilisation (kg DM/ha), which equals feed production multiplied by the feed utilisation percentage is the critical factor that you must be confident in. While silage and hay have high utilisation percentages when being made, you must remember that they may suffer significant wastage during storage and feeding.

Cost of feed

The cost of feed (\$/kg DM) is calculated by dividing the total annual costs by the feed utilisation (kg DM/ha). This result can be multiplied by 1,000 to show the cost of feed in \$/t DM. For instance \$0.09/kg equals \$90/t DM.

Risk

Tables at the bottom of each page show the effect changes in DM utilisation, irrigation costs and the quantity of irrigation used have on the cost of feed. In all cases changes in feed utilisation make a larger change to feed cost than irrigation cost or the quantity of irrigation.

Summary of costs

Annuals <small>(click on link for more detail)</small>	Water Supply	Crop Use	Irrigation ML/ha	Cost \$/ha	Production kgDM/ha	Utilisation %	Utilisation kgDM/ha	Cost \$/kgDM
Barley	Irrigated	Silage	3.0	\$1,587	11,500	100%	11,500	\$0.14
Barley	Dryland	Grazed	0.0	\$505	7,000	70%	4,900	\$0.10
Barley	Dryland	Silage	0.0	\$857	7,000	100%	7,000	\$0.12
Brassica	Irrigated	Grazed	3.0	\$759	13,000	70%	9,100	\$0.08
Chickory, Plantain & Clover	Irrigated	Grazed	10.0	\$1,778	17,000	70%	11,900	\$0.15
Fodderbeet (Autumn plant)	Irrigated	Grazed	3.0	\$1,352	14,500	90%	13,050	\$0.10
Fodderbeet (Late winter pla	Irrigated	Grazed	3.0	\$1,352	30,000	90%	27,000	\$0.05
Lab Lab	Dryland	Grazed	0.0	\$437	8,000	70%	5,600	\$0.08
Lab Lab	Dryland	Grazed	0.0	\$352	8,000	70%	5,600	\$0.06
Lab Lab	Irrigated	Grazed	3.0	\$762	10,000	70%	7,000	\$0.11
Lab Lab	Irrigated	Silage	3.0	\$1,404	10,000	100%	10,000	\$0.14
Maize	Irrigated	Silage	4.0	\$3,206	17,000	100%	17,000	\$0.19
Maize	Irrigated	Earlage	4.0	\$2,320	9,500	100%	9,500	\$0.24
Maize	Irrigated	Snaplage	4.0	\$2,470	7,000	100%	7,000	\$0.35
Millet	Irrigated	Grazed	3.0	\$939	15,000	70%	10,500	\$0.09
Oats	Dryland	Grazed	0.0	\$594	10,000	70%	7,000	\$0.08
Oats & vetch	Dryland	Grazed	5.0	\$674	9,000	70%	6,300	\$0.11
Pea - field	Irrigated	Hay	3.0	\$984	5,000	100%	5,000	\$0.20
Ryegrass (annual)	Irrigated	Grazed	6.0	\$1,514	20,000	70%	14,000	\$0.11
Sorghum - forage	Irrigated	Grazed	2.5	\$1,021	17,000	70%	11,900	\$0.09
Sorghum - forage	Irrigated	Silage	2.5	\$2,089	17,000	100%	17,000	\$0.12
Sorghum - forage	Dryland	Grazed	0.0	\$449	8,300	70%	5,810	\$0.08
Sorghum - forage	Dryland	Silage	0.0	\$1,051	8,300	100%	8,300	\$0.13
Sorghum - grain variety	Irrigated	Silage	2.0	\$1,355	13,000	100%	13,000	\$0.10
Sorghum - grain variety	Irrigated	Headlage	2.0	\$927	7,000	100%	7,000	\$0.13
Soybean	Irrigated	Silage	2.0	\$1,100	7,000	100%	7,000	\$0.16
Triticale	Irrigated	Silage	3.0	\$1,657	12,250	100%	12,250	\$0.14
Turnip	Irrigated	Grazed	3.0	\$701	11,000	70%	7,700	\$0.09
Perennials <small>(click on link for more detail)</small>	Water Supply	Crop Use	Irrigation ML/ha	Cost \$/ha	Production kgDM/ha	Utilisation %	Utilisation kgDM/ha	Cost \$/kgDM
Bisset grass	Irrigated	Grazed	3.0	\$649	10,000	70%	7,000	\$0.09
Fescue	Irrigated	Grazed	7.0	\$1,380	14,000	70%	9,800	\$0.14
Gatton panic	Irrigated	Grazed	4.0	\$1,035	23,000	70%	16,100	\$0.06
Kikuyu	Irrigated	Grazed	4.0	\$1,101	25,000	70%	17,500	\$0.06
Lucerne	Irrigated	Grazed	7.0	\$1,180	18,000	70%	12,600	\$0.09
Lucerne	Irrigated	Hay	7.0	\$2,706	20,000	100%	20,000	\$0.14
Prarie grass	Irrigated	Grazed	7.0	\$1,465	20,000	70%	14,000	\$0.10
Rhodes grass	Irrigated	Grazed	4.0	\$1,064	20,000	70%	14,000	\$0.08

Barley – Irrigated and cut for silage

Assumptions								Barley		
Machinery costs per ha include Fuel, oil, repairs and maintenance								Irrigated		
Irrigation costs								Silage		
				\$100	/ML					
Operation			Month	Machinery \$/ha	Inputs			Total \$/ha		
					Units/ha	Unit	\$/unit	\$/ha		
Offset discs			May	24.73				0.00	24.73	
Spray - Roundup			May	5.43	3	L	\$8.80	26.40	31.83	
Power harrows			May	36.32				0.00	36.32	
Planting and seed using a combine			June	15.70	80	kg	\$1.70	136.00	151.70	
Fertiliser, DAP (with above)					125	kg	\$0.89	111.25	111.25	
Fertiliser, CK88 (with above)					250	kg	\$0.69	172.50	172.50	
Harvest & ensile			Sep	→				0.00	0.00	
					33	t (wet)	\$23.00	759.00	759.00	
								0.00	0.00	
								0.00	0.00	
								0.00	0.00	
								0.00	0.00	
								0.00	0.00	
								0.00	0.00	
Irrigation			Various		3.0	ML	\$100.00	300.00	300.00	
Total annual cost (maintenance and establishment)								1,587.33		
Feed production and utilisation										
Feed produced (kgDM/ha)								11,500		
Feed utilisation (kgDM/ha)								11,500		
Utilisation %								100%		
Cost of feed (\$/kgDM)								\$0.14		
Risk assessment										
Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM			
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low	
DM utilised (kg/ha)	13,800	11,500	9,200	0.12	0.14	0.17	-17%	0%	25%	
Irrigation cost (\$/M)	\$120	\$100	\$80	0.14	0.14	0.13	4%	0%	-4%	
Irrigation use (ML/ha)	3.6	3.0	2.4	0.14	0.14	0.13	4%	0%	-4%	
<i>Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level</i>										
Cost per kg DM at varying amounts of utilisation and irrigation use										
		Dry mater utilisation (kg/ha)								
		6,900	9,200	11,500	13,800	16,100				
Irrigation		1.8	0.21	0.16	0.13	0.11	0.09			
use		2.4	0.22	0.17	0.13	0.11	0.09			
(ML/ha)		3.0	0.23	0.17	0.14	0.12	0.10			
		3.6	0.24	0.18	0.14	0.12	0.10			
		4.2	0.25	0.19	0.15	0.12	0.11			

Barley – Dryland and grazed

Assumptions								Barley	
Machinery costs include Fuel, oil, repairs and maintenance								Dryland	
Rain events dictate fertiliser and grazing intervals								Grazed	
Irrigation costs								\$0 /ML	
Operation	Month	Machinery \$/ha	Inputs				Total \$/ha		
			Units/ha	Unit	\$/unit	\$/ha			
Offset discs	Mar	24.73				0.00	24.73		
Spray - Roundup		5.43	3	L	\$8.80	26.40	31.83		
Planting and seed using a combine	Apr	15.70	65	kg	\$1.70	110.50	126.20		
Fertiliser, DAP (with above)			125	kg	\$0.89	110.88	110.88		
Fertiliser, Urea using spreader	Jun	5.41	100	kg	\$0.65	65.00	70.41		
Fertiliser, Urea using spreader	Aug	5.41	100	kg	\$0.65	65.00	70.41		
Fertiliser, Urea using spreader	Sep	5.41	100	kg	\$0.65	65.00	70.41		
						0.00	0.00		
						0.00	0.00		
						0.00	0.00		
						0.00	0.00		
						0.00	0.00		
						0.00	0.00		
						0.00	0.00		
						0.00	0.00		
						0.00	0.00		
Irrigation	Various		0.0	ML	\$0.00	0.00	0.00		
Total annual cost (maintenance and establishment)							504.87		
Feed production and utilisation									
Feed produced (kgDM/ha)							7,000		
Feed utilisation (kgDM/ha)							4,900		
Utilisation %							70%		
Cost of feed (\$/kgDM)							\$0.10		
Risk assessment									
Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM		
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low
DM utilised (kg/ha)	5,880	4,900	3,920	0.09	0.10	0.13	-17%	0%	25%
Irrigation cost (\$/M)	\$0	\$0	\$0	0.10	0.10	0.10	0%	0%	0%
Irrigation use (ML/ha)	0.0	0.0	0.0	0.10	0.10	0.10	0%	0%	0%
<i>Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level</i>									
Cost per kg DM at varying amounts of utilisation and irrigation use									
		Dry mater utilisation (kg/ha)							
		2,940	3,920	4,900	5,880	6,860			
	0.0	0.17	0.13	0.10	0.09	0.07			
Irrigation	0.0	0.17	0.13	0.10	0.09	0.07			
use	0.0	0.17	0.13	0.10	0.09	0.07			
(ML/ha)	0.0	0.17	0.13	0.10	0.09	0.07			
	0.0	0.17	0.13	0.10	0.09	0.07			

Barley – Dryland and cut for silage

Assumptions								Barley	
Machinery costs per ha include Fuel, oil, repairs and maintenance								Dryland	
Irrigation costs								Silage	
				\$0	/ML				
Operation			Month	Machinery	Inputs			Total	
				\$/ha	Units/ha	Unit	\$/unit	\$/ha	\$/ha
Offset discs			May	24.73				0.00	24.73
Spray - Roundup			May	5.43	3	L	\$8.80	26.40	31.83
Planting and seed using a combine			Apr	15.70	65	kg	\$1.70	110.50	126.20
Fertiliser, DAP (with above)					125	kg	\$0.89	110.88	110.88
Fertiliser, CK88 (with above)					150	kg	\$0.69	103.50	103.50
								0.00	0.00
								0.00	0.00
Harvest & ensile			Sep	→	20	t (wet)	\$23.00	460.00	460.00
								0.00	0.00
								0.00	0.00
								0.00	0.00
								0.00	0.00
								0.00	0.00
								0.00	0.00
Irrigation			Various		0.0	ML	\$0.00	0.00	0.00
Total annual cost (maintenance and establishment)								857.14	
Feed production and utilisation									
Feed produced (kgDM/ha)								7,000	
Feed utilisation (kgDM/ha)								7,000	
Utilisation %								100%	
Cost of feed (\$/kgDM)								\$0.12	
Risk assessment									
Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM		
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low
DM utilised (kg/ha)	8,400	7,000	5,600	0.10	0.12	0.15	-17%	0%	25%
Irrigation cost (\$/M)	\$0	\$0	\$0	0.12	0.12	0.12	0%	0%	0%
Irrigation use (ML/ha)	0.0	0.0	0.0	0.12	0.12	0.12	0%	0%	0%
<i>Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level</i>									
Cost per kg DM at varying amounts of utilisation and irrigation use									
		Dry mater utilisation (kg/ha)							
		4,200	5,600	7,000	8,400	9,800			
	0.0	0.20	0.15	0.12	0.10	0.09			
Irrigation	0.0	0.20	0.15	0.12	0.10	0.09			
use	0.0	0.20	0.15	0.12	0.10	0.09			
(ML/ha)	0.0	0.20	0.15	0.12	0.10	0.09			
	0.0	0.20	0.15	0.12	0.10	0.09			

Bisset grass - Irrigated and grazed

Assumptions								Bisset grass	
Machinery costs include Fuel, oil, repairs and maintenance								Irrigated	
Life of the crop (years)								10	
Irrigation costs								\$100 /ML	
Note: Bare seed used, coated seed is about 80% coating and 20% seed!								Grazed	
Establishment			Month	Machinery	Inputs				Total
				\$/ha	Units/ha	Unit	\$/unit	\$/ha	\$/ha
Offset discs			Sept	24.73				0.00	24.73
Spray - Roundup			Sept	5.43	3.0	L	8.80	26.40	31.83
Power harrows			Sept	36.32				0.00	36.32
Seed with a spreader			Oct	5.41	5.0	kg	21.00	105.00	110.41
Roller			Oct	5.42				0.00	5.42
Fertiliser, CK88 using spreader			Oct	5.41	200.0	kg	0.69	138.00	143.41
								0.00	0.00
								0.00	0.00
Irrigation			Various		3.0	ML	100.00	300.00	300.00
Total establishment cost								652.12	
Establishment cost averaged over the life of the crop								65.21	
Annual maintenance			Month	Machinery	Inputs				Total
				\$/ha	Units/ha	Unit	\$/unit	\$/ha	\$/ha
Fertiliser, CK88 using spreader			Jan	5.41	200.0	kg	0.69	138.00	143.41
Fertiliser, Urea using spreader			Feb	5.41	100.0	kg	0.65	65.00	70.41
Fertiliser, Urea using spreader			Mar	5.41	100.0	kg	0.65	65.00	70.41
								0.00	0.00
								0.00	0.00
Irrigation			Various		3.0	ML	100.00	300.00	300.00
Total annual maintenance cost								584.23	
Total annual cost (maintenance and establishment)								649.44	
Feed production and utilisation									
Feed produced (kgDM/ha)								10,000	
Feed utilisation (kgDM/ha)								7,000	
Utilisation %								70%	
Cost of feed (\$/kgDM)								\$0.09	
Risk assessment									
Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM		
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low
DM utilised (kg/ha)	25,000	7,000	17,500	0.03	0.09	0.04	-72%	0%	-60%
Irrigation cost (\$/M)	\$130	\$100	\$60	0.11	0.09	0.07	15%	0%	-20%
Irrigation use (ML/ha)	10.0	3.0	5.0	0.19	0.09	0.12	108%	0%	31%
Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level									
Cost per kg DM at varying amounts of utilisation and irrigation use									
		Dry mater utilisation (kg/ha)							
		4,200	5,600	7,000	8,400	9,800			
	1.8	0.13	0.09	0.08	0.06	0.05			
Irrigation	2.4	0.14	0.11	0.08	0.07	0.06			
use	3.0	0.15	0.12	0.09	0.08	0.07			
(ML/ha)	3.6	0.17	0.13	0.10	0.08	0.07			
	4.2	0.18	0.14	0.11	0.09	0.08			

Brassica - Irrigated and grazed

Assumptions								Brassica
Machinery costs include Fuel, oil, repairs and maintenance								Irrigated
Irrigation costs								Grazed
			\$100	/ML				

Operation	Month	Machinery \$/ha	Inputs				Total \$/ha
			Units/ha	Unit	\$/unit	\$/ha	
Spray - Roundup	Feb	5.43	3	L	\$8.80	26.40	31.83
Offset discs		24.73				0.00	24.73
Planting and seed using a spreader	Feb	5.41	4	kg	\$15.00	60.00	65.41
Fertiliser, DAP (with above)			125	kg	\$0.89	110.88	110.88
Drag harrows	Feb	5.42				0.00	5.42
Fertiliser, Urea using spreader	Mar	5.41	100	kg	\$0.65	65.00	70.41
Fertiliser, Urea using spreader	Apr	5.41	100	kg	\$0.65	65.00	70.41
Fertiliser, Urea using spreader	May	5.41	100	kg	\$0.65	65.00	70.41
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
Irrigation	Various		3.0	ML	\$100.00	300.00	300.00
Total annual cost (maintenance and establishment)							749.50

Feed production and utilisation							
Feed produced (kgDM/ha)							13,000
Feed utilisation (kgDM/ha)							9,100
					Utilisation %	70%	

Cost of feed (\$/kgDM)							\$0.08
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Risk assessment

Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM		
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low
DM utilised (kg/ha)	10,920	9,100	7,280	0.07	0.08	0.10	-17%	0%	25%
Irrigation cost (\$/M)	\$120	\$100	\$80	0.09	0.08	0.08	8%	0%	-8%
Irrigation use (ML/ha)	3.6	3.0	2.4	0.09	0.08	0.08	8%	0%	-8%

Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level

Cost per kg DM at varying amounts of utilisation and irrigation use

		Dry mater yield (kg/ha)				
		5,460	7,280	9,100	10,920	12,740
	1.8	0.12	0.09	0.07	0.06	0.05
Irrigation	2.4	0.13	0.09	0.08	0.06	0.05
use	3.0	0.14	0.10	0.08	0.07	0.06
(ML/ha)	3.6	0.15	0.11	0.09	0.07	0.06
	4.2	0.16	0.12	0.10	0.08	0.07

Chicory, Plantain & Clover - Irrigated and grazed

Assumptions						Chicory, Plantain & Clover					
Machinery costs include Fuel, oil, repairs and maintenance										Irrigated	
Chicory, Plantain, clover direct drilled into kikuyu after mulching										Grazed	
Irrigation costs						\$100	/ML				
Operation	Month	Machinery \$/ha	Inputs			Total \$/ha					
			Units/ha	Unit	\$/unit		\$/ha				
Mulching of Kikuyu	Mar	21.34				0.00	21.34				
Planting with a direct drill	Apr	32.59				0.00	32.59				
Seed Chicory (with above)			4	kg	\$16.50	66.00	66.00				
Seed Plantain (with above)			4	kg	\$16.50	66.00	66.00				
Seed Clover (with above)			5	kg	\$7.00	35.00	35.00				
Fertiliser, DAP (with above)			125	kg	\$0.89	110.88	110.88				
Fertiliser, CK88 using spreader	May	5.41	100	kg	\$0.69	69.00	74.41				
Fertiliser, CK88 using spreader	Jun	5.41	100	kg	\$0.69	69.00	74.41				
Fertiliser, CK88 using spreader	Jul	5.41	100	kg	\$0.69	69.00	74.41				
Fertiliser, CK88 using spreader	Aug	5.41	100	kg	\$0.69	69.00	74.41				
Fertiliser, CK88 using spreader	Sep	5.41	100	kg	\$0.69	69.00	74.41				
Fertiliser, CK88 using spreader	Nov	5.41	100	kg	\$0.69	69.00	74.41				
						0.00	0.00				
						0.00	0.00				
						0.00	0.00				
						0.00	0.00				
Irrigation	Various		10.0	ML	\$100.00	1,000.00	1,000.00				
Total annual cost (maintenance and establishment)										1,778.27	
Feed production and utilisation											
Feed produced (kgDM/ha)										17,000	
Feed utilisation (kgDM/ha)						Utilisation %	70%			11,900	
Cost of feed (\$/kgDM)										\$0.15	
Risk assessment											
Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM				
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low		
DM utilised (kg/ha)	14,280	11,900	9,520	0.12	0.15	0.19	-17%	0%	25%		
Irrigation cost (\$/M)	\$120	\$100	\$80	0.17	0.15	0.13	11%	0%	-11%		
Irrigation use (ML/ha)	12.0	10.0	8.0	0.17	0.15	0.13	11%	0%	-11%		
<i>Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level</i>											
Cost per kg DM at varying amounts of utilisation and irrigation use											
		Dry mater utilisation (kg/ha)									
		7,140	9,520	11,900	14,280	16,660					
	6.0	0.19	0.14	0.12	0.10	0.08					
Irrigation	8.0	0.22	0.17	0.13	0.11	0.09					
use	10.0	0.25	0.19	0.15	0.12	0.11					
(ML/ha)	12.0	0.28	0.21	0.17	0.14	0.12					
	14.0	0.31	0.23	0.18	0.15	0.13					

Fescue - Irrigated and grazed

Assumptions								Fescue	
Machinery costs include Fuel, oil, repairs and maintenance								Irrigated	
Life of the crop (years)								10	
Irrigation costs								\$100 /ML	
Fertiliser applied during establishment is recorded in the annual maintenance section as fertiliser applied in March								Grazed	
Year 1		Month	Machinery \$/ha	Inputs				Total \$/ha	
				Units/ha	Unit	\$/unit	\$/ha		
Offset discs		Mar	24.73				0.00	24.73	
Spray - Roundup		Mar	5.43	3	L	8.80	26.40	31.83	
Power harrows		Mar	36.32				0.00	36.32	
Planting and seed with a combine		Mar	5.41	15	kg	12.00	180.00	185.41	
Roller			5.42				0.00	5.42	
Irrigation		Various		0.0	ML	100.00	0.00	0.00	
Total establishment cost								283.71	
Establishment cost averaged over the life of the crop								28.37	
Annual maintenance		Month	Machinery \$/ha	Inputs				Total \$/ha	
				Units/ha	Unit	\$/unit	\$/ha		
Fertiliser, CK88 using spreader		Mar	5.41	200	kg	0.69	138.00	143.41	
Fertiliser, Urea using spreader		May	5.41	100	kg	0.65	65.00	70.41	
Fertiliser, Urea using spreader		Jun	5.41	100	kg	0.65	65.00	70.41	
Fertiliser, Urea using spreader		Jul	5.41	100	kg	0.65	65.00	70.41	
Fertiliser, Greentop K using spreader		Aug	5.41	150	kg	0.72	108.00	113.41	
Fertiliser, Greentop K using spreader		Sept	5.41	150	kg	0.72	108.00	113.41	
Fertiliser, Urea using spreader		Oct	5.41	100	kg	0.65	65.00	70.41	
							0.00	0.00	
							0.00	0.00	
Irrigation		Various		7.0	ML	100.00	700.00	700.00	
Total annual maintenance cost								1,351.87	
Total annual cost (maintenance and establishment)								1,380.24	
Feed production and utilisation									
Feed produced (kgDM/ha)								14,000	
Feed utilisation (kgDM/ha)								Utilisation % 70% 9,800	
Cost of feed (\$/kgDM)								\$0.14	
Risk assessment									
Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM		
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low
DM utilised (kg/ha)	25,000	9,800	17,500	0.06	0.14	0.08	-61%	0%	-44%
Irrigation cost (\$/M)	\$130	\$100	\$60	0.16	0.14	0.11	15%	0%	-20%
Irrigation use (ML/ha)	10.0	7.0	5.0	0.17	0.14	0.12	22%	0%	-14%
<i>Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level</i>									
Cost per kg DM at varying amounts of utilisation and irrigation use									
		Dry mater utilisation (kg/ha)							
		5,880	7,840	9,800	11,760	13,720			
	4.2	0.19	0.14	0.11	0.09	0.08			
Irrigation	5.6	0.21	0.16	0.13	0.11	0.09			
use	7.0	0.23	0.18	0.14	0.12	0.10			
(ML/ha)	8.4	0.26	0.19	0.16	0.13	0.11			
	9.8	0.28	0.21	0.17	0.14	0.12			

Fodderbeet (autumn plant) - Irrigated and grazed

Assumptions						Fodderbeet (Autumn plant)				
Machinery costs include Fuel, oil, repairs and maintenance										Irrigated
Irrigation costs						\$100	/ML			Grazed
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Operation	Month	Machinery \$/ha	Inputs				Total \$/ha			
			Units/ha	Unit	\$/unit	\$/ha				
Spray - Roundup	Mar	5.43	3	L	\$8.80	26.40	31.83			
Fertiliser, animal manure using spreader	Mar	12.89	6	m3	\$19.00	114.00	126.89			
Offset discs	Mar	24.73				0.00	24.73			
Power harrow	Mar	36.32				0.00	36.32			
Planting and seed using direct drill	Apr	32.59	4	kg	\$15.00	60.00	92.59			
Fertiliser, DAP (with above)			200	kg	\$0.89	177.40	177.40			
Fertiliser, MOP (with above)			150	kg	\$0.76	114.00	114.00			
Fertiliser, MgO (with above)			75	kg	\$1.33	99.75	99.75			
Spray - Fertiliser, Boron	Apr	5.43	5	kg	\$3.10	15.50	20.93			
Roller	Apr	5.42				0.00	5.42			
Spray - Pyramin	Apr	5.43	1.6	kg	\$94.60	151.36	156.79			
Spray - Trammat	Apr	5.43	1.6	L	\$100.00	160.00	165.43			
						0.00	0.00			
						0.00	0.00			
						0.00	0.00			
						0.00	0.00			
Irrigation	Various		3.0	ML	\$100.00	300.00	300.00			
Total annual cost (maintenance and establishment)									1,352.08	
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Feed production and utilisation										
Feed produced (kgDM/ha)										14,500
Feed utilisation (kgDM/ha)						Utilisation %	90%			13,050
<hr/>										
Cost of feed (\$/kgDM)										\$0.10
<hr/>										
Risk assessment										
Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM			
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low	
DM utilised (kg/ha)	15,660	13,050	10,440	0.09	0.10	0.13	-17%	0%	25%	
Irrigation cost (\$/M)	\$120	\$100	\$80	0.11	0.10	0.10	4%	0%	-4%	
Irrigation use (ML/ha)	3.6	3.0	2.4	0.11	0.10	0.10	4%	0%	-4%	
<i>Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level</i>										
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Cost per kg DM at varying amounts of utilisation and irrigation use										
		Dry mater utilisation (kg/ha)								
		7,830	10,440	13,050	15,660	18,270				
	1.8	0.16	0.12	0.09	0.08	0.07				
Irrigation	2.4	0.17	0.12	0.10	0.08	0.07				
use	3.0	0.17	0.13	0.10	0.09	0.07				
(ML/ha)	3.6	0.18	0.14	0.11	0.09	0.08				
	4.2	0.19	0.14	0.11	0.09	0.08				

Fodderbeet (late winter plant) - Irrigated and grazed

Assumptions				Fodderbeet (Winter plant)					
Machinery costs include Fuel, oil, repairs and maintenance				Irrigated					
				Grazed					
Irrigation costs		\$100	/ML						
Operation	Month	Machinery \$/ha	Inputs				Total \$/ha		
			Units/ha	Unit	\$/unit	\$/ha			
Spray - Roundup	Aug	5.43	3	L	\$8.80	26.40	31.83		
Fertiliser, animal manure using spreader	Aug	12.89	6	m3	\$19.00	114.00	126.89		
Offset discs	Aug	24.73				0.00	24.73		
Power harrow	Aug	36.32				0.00	36.32		
Planting and seed using direct drill	Aug	32.59	4	kg	\$15.00	60.00	92.59		
Fertiliser, DAP (with above)			200	kg	\$0.89	177.40	177.40		
Fertiliser, MOP (with above)			150	kg	\$0.76	114.00	114.00		
Fertiliser, MgO (with above)			75	kg	\$1.33	99.75	99.75		
Spray - Fertiliser, Boron	Aug	5.43	5	kg	\$3.10	15.50	20.93		
Roller	Aug	5.42				0.00	5.42		
Spray - Pyramin	Aug	5.43	1.6	kg	\$94.60	151.36	156.79		
Spray - Trammat	Aug	5.43	1.6	L	\$100.00	160.00	165.43		
						0.00	0.00		
						0.00	0.00		
						0.00	0.00		
						0.00	0.00		
Irrigation	Various		3.0	ML	\$100.00	300.00	300.00		
Total annual cost (maintenance and establishment)							1,352.08		
Feed production and utilisation									
Feed produced (kgDM/ha)							30,000		
Feed utilisation (kgDM/ha)							27,000		
Utilisation %							90%		
Cost of feed (\$/kgDM)							\$0.05		
Risk assessment									
Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM		
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low
DM utilised (kg/ha)	32,400	27,000	21,600	0.04	0.05	0.06	-17%	0%	25%
Irrigation cost (\$/M)	\$120	\$100	\$80	0.05	0.05	0.05	4%	0%	-4%
Irrigation use (ML/ha)	3.6	3.0	2.4	0.05	0.05	0.05	4%	0%	-4%
<i>Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level</i>									
Cost per kg DM at varying amounts of utilisation and irrigation use									
		Dry mater utilisation (kg/ha)							
		16,200	21,600	27,000	32,400	37,800			
	1.8	0.08	0.06	0.05	0.04	0.03			
Irrigation	2.4	0.08	0.06	0.05	0.04	0.03			
use	3.0	0.08	0.06	0.05	0.04	0.04			
(ML/ha)	3.6	0.09	0.07	0.05	0.04	0.04			
	4.2	0.09	0.07	0.05	0.05	0.04			

Gatton panic - Irrigated and grazed

Assumptions							Gatton panic		
Machinery costs include Fuel, oil, repairs and maintenance							Irrigated		
Life of the crop (years)							10		
Irrigation costs							\$100 /ML		
							Grazed		
Establishment			Month	Machinery	Inputs				Total
				\$/ha	Units/ha	Unit	\$/unit	\$/ha	\$/ha
Offset discs			Oct	24.73				0.00	24.73
Spray - Roundup			Oct	5.43	3.0	L	8.80	26.40	31.83
Power harrows			Oct	36.32				0.00	36.32
Seed with a spreader			Oct	5.41	5.0	kg	19.50	97.50	102.91
Roller			Oct	5.42				0.00	5.42
Fertiliser, CK88 using spreader			Oct	5.41	200.0	kg	0.69	138.00	143.41
								0.00	0.00
								0.00	0.00
Irrigation			Various		3.0	ML	100.00	300.00	300.00
Total establishment cost									644.62
Establishment cost averaged over the life of the crop									64.46
Annual maintenance			Month	Machinery	Inputs				Total
				\$/ha	Units/ha	Unit	\$/unit	\$/ha	\$/ha
Fertiliser, CK88 using spreader			Oct	5.41	200.0	kg	0.69	138.00	143.41
Fertiliser, Urea using spreader			Nov	5.41	100.0	kg	0.65	65.00	70.41
Fertiliser, Urea using spreader			Dec	5.41	100.0	kg	0.65	65.00	70.41
Fertiliser, Greentop K using spreader			Jan	5.41	150.0	kg	0.72	108.00	113.41
Fertiliser, Urea using spreader			Feb	5.41	100.0	kg	0.65	65.00	70.41
Fertiliser, Urea using spreader			Mar	5.41	150.0	kg	0.65	97.50	102.91
								0.00	0.00
Irrigation			Various		4.0	ML	100.00	400.00	400.00
Total annual maintenance cost									970.96
Total annual cost (maintenance and establishment)									1,035.42
Feed production and utilisation									
Feed produced (kgDM/ha)									23,000
Feed utilisation (kgDM/ha)							Utilisation %	70%	16,100
Cost of feed (\$/kgDM)									\$0.06
Risk assessment									
Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM		
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low
DM utilised (kg/ha)	25,000	16,100	17,500	0.04	0.06	0.06	-36%	0%	-8%
Irrigation cost (\$/M)	\$130	\$100	\$60	0.07	0.06	0.05	12%	0%	-17%
Irrigation use (ML/ha)	10.0	4.0	5.0	0.10	0.06	0.07	58%	0%	10%
<i>Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level</i>									
Cost per kg DM at varying amounts of utilisation and irrigation use									
		Dry mater utilisation (kg/ha)							
		9,660	12,880	16,100	19,320	22,540			
	2.4	0.09	0.07	0.05	0.05	0.04			
Irrigation	3.2	0.10	0.07	0.06	0.05	0.04			
use	4.0	0.11	0.08	0.06	0.05	0.05			
(ML/ha)	4.8	0.12	0.09	0.07	0.06	0.05			
	5.6	0.12	0.09	0.07	0.06	0.05			

Kikuyu - Irrigated and grazed

Assumptions								Kikuyu		
Machinery costs include Fuel, oil, repairs and maintenance								Irrigated		
Life of the crop (years)								10		
Irrigation costs								\$100 /ML		
Establishment										
		Month	Machinery \$/ha	Inputs				Total \$/ha		
				Units/ha	Unit	\$/unit	\$/ha			
Offset discs		Mar	24.73				0.00	24.73		
Spray - Roundup		Mar	5.43	3.0	L	8.80	26.40	31.83		
Power harrows		Mar	36.32				0.00	36.32		
Seed with a spreader		Mar	5.41	5.0	kg	42.00	210.00	215.41		
Roller		Mar	5.42				0.00	5.42		
Fertiliser, CK88 using spreader		May	5.41	200.0	kg	0.69	138.00	143.41		
Fertiliser, Greentop K using spreader		May	5.41	150.0	kg	0.72	108.00	113.41		
Fertiliser, Urea using spreader		Jun	5.41	100.0	kg	0.65	65.00	70.41		
Fertiliser, Urea using spreader		Jul	5.41	100.0	kg	0.65	65.00	70.41		
Fertiliser, Urea using spreader		Aug	5.41	100.0	kg	0.65	65.00	70.41		
Fertiliser, Greentop K using spreader		Sept	5.41	150.0	kg	0.72	108.00	113.41		
Irrigation		Various		3.0	ML	100.00	300.00	300.00		
Total establishment cost								1,195.17		
Establishment cost averaged over the life of the crop								119.52		
Annual maintenance										
		Month	Machinery \$/ha	Inputs				Total \$/ha		
				Units/ha	Unit	\$/unit	\$/ha			
Fertiliser, CK88 using spreader		Oct	5.41	200.0	kg	0.69	138.00	143.41		
Fertiliser, Urea using spreader		Nov	5.41	100.0	kg	0.65	65.00	70.41		
Fertiliser, Urea using spreader		Dec	5.41	100.0	kg	0.65	65.00	70.41		
Fertiliser, Greentop K using spreader		Jan	5.41	150.0	kg	0.72	108.00	113.41		
Fertiliser, Urea using spreader		Feb	5.41	100.0	kg	0.65	65.00	70.41		
Fertiliser, Urea using spreader		Mar	5.41	150.0	kg	0.72	108.00	113.41		
Irrigation		Various		4.0	ML	100.00	400.00	400.00		
Total annual maintenance cost								981.46		
Total annual cost (maintenance and establishment)								1,100.98		
Feed production and utilisation										
Feed produced (kgDM/ha)								25,000		
Feed utilisation (kgDM/ha)								Utilisation % 70% 17,500		
Cost of feed (\$/kgDM)								\$0.06		
Risk assessment										
Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM			
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low	
DM utilised (kg/ha)	25,000	17,500	17,500	0.04	0.06	0.06	-30%	0%	0%	
Irrigation cost (\$/M)	\$130	\$100	\$60	0.07	0.06	0.05	12%	0%	-16%	
Irrigation use (ML/ha)	10.0	4.0	5.0	0.10	0.06	0.07	54%	0%	9%	
<i>Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level</i>										
Cost per kg DM at varying amounts of utilisation and irrigation use										
		Dry mater utilisation (kg/ha)								
		10,500	14,000	17,500	21,000	24,500				
	2.4	0.09	0.07	0.05	0.04	0.04				
Irrigation	3.2	0.10	0.07	0.06	0.05	0.04				
use	4.0	0.10	0.08	0.06	0.05	0.04				
(ML/ha)	4.8	0.11	0.08	0.07	0.06	0.05				
	5.6	0.12	0.09	0.07	0.06	0.05				

Lab Lab - Dryland and grazed

Assumptions								Lab Lab		
Machinery costs include Fuel, oil, repairs and maintenance								Dryland		
Irrigation costs								Grazed		
			\$0	/ML						
Operation	Month	Machinery	Inputs				Total			
			Units/ha	Unit	\$/unit	\$/ha				
Offset discs	Nov	24.73				0.00	24.73			
Spray - Roundup	Nov	5.43	3	L	\$8.80	26.40	31.83			
Power harrows	Nov	36.32				0.00	36.32			
Planting and seed using a combine	Nov	15.70	25	kg	\$3.20	80.00	95.70			
Fertiliser, CK88 (with above)			100	kg	\$0.69	69.00	69.00			
Fertiliser, DAP using spreader	Feb	5.41	100	kg	\$0.89	89.00	94.41			
						0.00	0.00			
						0.00	0.00			
						0.00	0.00			
						0.00	0.00			
						0.00	0.00			
						0.00	0.00			
						0.00	0.00			
						0.00	0.00			
Irrigation	Various		0.0	ML	\$0.00	0.00	0.00			
Total annual cost (maintenance and establishment)								351.99		
Feed production and utilisation										
Feed produced (kgDM/ha)								8,000		
Feed utilisation (kgDM/ha)								5,600		
Utilisation %								70%		
Cost of feed (\$/kgDM)								\$0.06		
Risk assessment										
Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM			
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low	
DM utilised (kg/ha)	6,720	5,600	4,480	0.05	0.06	0.08	-17%	0%	25%	
Irrigation cost (\$/M)	\$0	\$0	\$0	0.06	0.06	0.06	0%	0%	0%	
Irrigation use (ML/ha)	0.0	0.0	0.0	0.06	0.06	0.06	0%	0%	0%	
<i>Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level</i>										
Cost per kg DM at varying amounts of utilisation and irrigation use										
		Dry mater utilisation (kg/ha)								
		3,360	4,480	5,600	6,720	7,840				
	0.0	0.10	0.08	0.06	0.05	0.04				
Irrigation	0.0	0.10	0.08	0.06	0.05	0.04				
use	0.0	0.10	0.08	0.06	0.05	0.04				
(ML/ha)	0.0	0.10	0.08	0.06	0.05	0.04				
	0.0	0.10	0.08	0.06	0.05	0.04				

Lab Lab - Irrigated and grazed

Assumptions								Lab Lab		
Machinery costs include Fuel, oil, repairs and maintenance								Irrigated		
Irrigation costs								Grazed		
			\$100	/ML						
Operation	Month	Machinery	Inputs				Total			
			Units/ha	Unit	\$/unit	\$/ha				
Offset discs	Nov	24.73				0.00	24.73			
Spray - Roundup	Nov	5.43	3	L	\$8.80	26.40	31.83			
Power harrows	Nov	36.32				0.00	36.32			
Planting and seed using a combine	Nov	15.70	30	kg	\$3.20	96.00	111.70			
Fertiliser, CK88 (with above)			100	kg	\$0.69	69.00	69.00			
Fertiliser, DAP using spreader	Jan	5.41	100	kg	\$0.89	89.00	94.41			
Fertiliser, DAP using spreader	Feb	5.41	100	kg	\$0.89	89.00	94.41			
						0.00	0.00			
						0.00	0.00			
						0.00	0.00			
						0.00	0.00			
						0.00	0.00			
						0.00	0.00			
						0.00	0.00			
						0.00	0.00			
Irrigation	Various		3.0	ML	\$100.00	300.00	300.00			
Total annual cost (maintenance and establishment)								762.40		
Feed production and utilisation										
Feed produced (kgDM/ha)								10,000		
Feed utilisation (kgDM/ha)								7,000		
Utilisation %								70%		
Cost of feed (\$/kgDM)								\$0.11		
Risk assessment										
Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM			
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low	
DM utilised (kg/ha)	8,400	7,000	5,600	0.09	0.11	0.14	-17%	0%	25%	
Irrigation cost (\$/M)	\$120	\$100	\$80	0.12	0.11	0.10	8%	0%	-8%	
Irrigation use (ML/ha)	3.6	3.0	2.4	0.12	0.11	0.10	8%	0%	-8%	
<i>Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level</i>										
Cost per kg DM at varying amounts of utilisation and irrigation use										
		Dry mater utilisation (kg/ha)								
		4,200	5,600	7,000	8,400	9,800				
	1.8	0.15	0.11	0.09	0.08	0.07				
Irrigation	2.4	0.17	0.13	0.10	0.08	0.07				
use	3.0	0.18	0.14	0.11	0.09	0.08				
(ML/ha)	3.6	0.20	0.15	0.12	0.10	0.08				
	4.2	0.21	0.16	0.13	0.11	0.09				

Lab Lab - Irrigated and cut for silage

Assumptions								Lab Lab	
Machinery costs include Fuel, oil, repairs and maintenance								Irrigated	
Irrigation costs								Silage	
			\$100	/ML					
Operation	Month	Machinery \$/ha	Inputs				Total \$/ha		
			Units/ha	Unit	\$/unit	\$/ha			
Offset discs	Nov	24.73				0.00	24.73		
Spray - Roundup	Nov	5.43	3	L	\$8.80	26.40	31.83		
Power harrows	Nov	36.32				0.00	36.32		
Planting and seed using a combine	Nov	15.70	30	kg	\$3.20	96.00	111.70		
Fertiliser, CK88 (with above)			200	kg	\$0.69	138.00	138.00		
Fertiliser, DAP using spreader	Dec	5.41	100	kg	\$0.89	89.00	94.41		
						0.00	0.00		
						0.00	0.00		
						0.00	0.00		
Harvest & ensile	Feb	→	29	t (wet)	\$23.00	667.00	667.00		
						0.00	0.00		
						0.00	0.00		
						0.00	0.00		
						0.00	0.00		
						0.00	0.00		
Irrigation	Various		3.0	ML	\$100.00	300.00	300.00		
Total annual cost (maintenance and establishment)								1,403.99	
Feed production and utilisation									
Feed produced (kgDM/ha)								10,000	
Feed utilisation (kgDM/ha)								10,000	
Utilisation %								100%	
Cost of feed (\$/kgDM)								\$0.14	
Risk assessment									
Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM		
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low
DM utilised (kg/ha)	12,000	10,000	8,000	0.12	0.14	0.18	-17%	0%	25%
Irrigation cost (\$/M)	\$120	\$100	\$80	0.15	0.14	0.13	4%	0%	-4%
Irrigation use (ML/ha)	3.6	3.0	2.4	0.15	0.14	0.13	4%	0%	-4%
<i>Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level</i>									
Cost per kg DM at varying amounts of utilisation and irrigation use									
		Dry mater utilisation (kg/ha)							
		6,000	8,000	10,000	12,000	14,000			
	1.8	0.21	0.16	0.13	0.11	0.09			
Irrigation	2.4	0.22	0.17	0.13	0.11	0.10			
use	3.0	0.23	0.18	0.14	0.12	0.10			
(ML/ha)	3.6	0.24	0.18	0.15	0.12	0.10			
	4.2	0.25	0.19	0.15	0.13	0.11			

Lucerne - Irrigated and cut for hay

Assumptions									Lucerne	
Machinery costs include Fuel, oil, repairs and maintenance									Irrigated	
Life of the crop (years)									4	
Irrigation costs									\$100 /ML	
Hay										
Establishment				Machinery	Inputs				Total	
			Month	\$/ha	Units/ha	Unit	\$/unit	\$/ha	\$/ha	
Spray - Roundup			Mar	5.43	3.0	L	8.80	26.40	31.83	
Offset			April	24.73				0.00	24.73	
Power harrow			April	36.32				0.00	36.32	
Spray - Broadstrike			April	5.43	0.05	kg	60.00	3.00	8.43	
Planting and seed using a combine			April	15.70	20.0	kg	10.00	200.00	215.70	
	Fertiliser, Sulfate of Potash (with above)				100	kg	1.40	140.00	140.00	
	Fertiliser, Super (with above)				200	kg	0.54	108.00	108.00	
Spreader - Gypsum			April	12.89	1000	kg	0.20	200.00	212.89	
Roller			April	5.42				0.00	5.42	
Irrigation			Various		1.0	ML	100.00	100.00	100.00	
Total establishment cost									883.32	
Establishment cost averaged over the life of the crop									220.83	
Annual maintenance				Machinery	Inputs				Total	
			Month	\$/ha	Units/ha	Unit	\$/unit	\$/ha	\$/ha	
Fertiliser, Super using spreader			April	5.41	200	kg	0.54	108.00	113.41	
Fertiliser, Sulphate of Potash using spreader			Aug	5.41	100	kg	1.40	140.00	145.41	
Spray - Herbicide mix			Dec	5.43				0.00	5.43	
	Liase				2.0	L	4.00	8.00	8.00	
	Spinnaker				0.14	kg	32.85	4.60	4.60	
	L1700				0.2	L	8.53	1.71	1.71	
	Buttress				1.7	L	21.01	35.72	35.72	
	Hasten				1.0	L	8.09	8.09	8.09	
Spray - Insecticide (Lorsban)			Feb	5.43	0.7	L	11.00	7.70	13.13	
Cut, bale, cart (contractor)				→	58.0	Rd bale	\$25.00	1,450.00	1,450.00	
Irrigation (various times)					7.0	ML	100.00	700.00	700.00	
Total annual maintenance cost									2,485.49	
Total annual cost (maintenance and establishment)									2,706.32	
Feed production and utilisation										
Feed produced (kgDM/ha)									20,000	
Feed utilisation (kgDM/ha)									Utilisation % 100% 20,000	
Cost of feed (\$/kgDM)									\$0.14	
Risk assessment										
Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM			
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low	
DM utilised (kg/ha)	25,000	20,000	17,500	0.11	0.14	0.15	-20%	0%	14%	
Irrigation cost (\$/M)	\$130	\$100	\$60	0.15	0.14	0.12	8%	0%	-11%	
Irrigation use (ML/ha)	10.0	7.0	5.0	0.15	0.14	0.13	11%	0%	-7%	
<i>Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level</i>										
Cost per kg DM at varying amounts of utilisation and irrigation use										
		Dry mater utilisation (kg/ha)								
		12,000	16,000	20,000	24,000	28,000				
	4.2	0.20	0.15	0.12	0.10	0.09				
Irrigation	5.6	0.21	0.16	0.13	0.11	0.09				
use	7.0	0.23	0.17	0.14	0.11	0.10				
(ML/ha)	8.4	0.24	0.18	0.14	0.12	0.10				
	9.8	0.25	0.19	0.15	0.12	0.11				

Lucerne - Irrigated and grazed

Assumptions								Lucerne	
Machinery costs include Fuel, oil, repairs and maintenance								Irrigated	
Life of the crop (years)								4	
Irrigation costs								\$100 /ML	
								Grazed	
Establishment			Month	Machinery \$/ha	Inputs			Total \$/ha	
Spray - Roundup			Mar	5.43	3.0	L	8.80	26.40	
Offset			April	24.73				0.00	
Power harrow			April	36.32				0.00	
Spray - Broadstrike			April	5.43	0.05	kg	60.00	3.00	
Planting and seed using a combine			April	15.70	20.0	kg	10.00	200.00	
Fertiliser, Sulphate of Potash (with above)					100	kg	1.40	140.00	
Fertiliser, Super (with above)					200	kg	0.54	108.00	
Spreader - Gypsum			April	12.89	1000	kg	0.20	200.00	
Roller			April	5.42				0.00	
Irrigation			Various		1.0	ML	100.00	100.00	
Total establishment cost								883.32	
Establishment cost averaged over the life of the crop								220.83	
Annual maintenance			Month	Machinery \$/ha	Inputs			Total \$/ha	
Fertiliser, Super using spreader			April	5.41	200	kg	0.54	108.00	
Fertiliser, Sulphate of Potash using spreader			Aug	5.41	100	kg	1.40	140.00	
								0.00	
								0.00	
Irrigation (various times)					7.0	ML	100.00	700.00	
Total annual maintenance cost								958.82	
Total annual cost (maintenance and establishment)								1,179.65	
Feed production and utilisation									
Feed produced (kgDM/ha)								18,000	
Feed utilisation (kgDM/ha)								Utilisation % 70%	
Cost of feed (\$/kgDM)								\$0.09	
Risk assessment									
Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM		
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low
DM utilised (kg/ha)	25,000	12,600	17,500	0.05	0.09	0.07	-50%	0%	-28%
Irrigation cost (\$/M)	\$130	\$100	\$60	0.11	0.09	0.07	18%	0%	-25%
Irrigation use (ML/ha)	10.0	7.0	5.0	0.12	0.09	0.08	25%	0%	-17%
<i>Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level</i>									
Cost per kg DM at varying amounts of utilisation and irrigation use									
		Dry mater utilisation (kg/ha)							
		7,560	10,080	12,600	15,120	17,640			
	4.2	0.12	0.09	0.07	0.06	0.05			
Irrigation	5.6	0.14	0.10	0.08	0.07	0.06			
use	7.0	0.16	0.12	0.09	0.08	0.07			
(ML/ha)	8.4	0.17	0.13	0.10	0.09	0.07			
	9.8	0.19	0.14	0.12	0.10	0.08			

Maize - Irrigated and cut for earlage

Assumptions								Maize		
Machinery costs include Fuel, oil, repairs and maintenance								Irrigated		
Irrigation costs								Earlage		
				\$100	/ML					
Operation			Month	Machinery	Inputs			Total		
				\$/ha	Units/ha	Unit	\$/unit	\$/ha	\$/ha	
Offset discs			Sept	24.73				0.00	24.73	
Spray			Sept	5.43				0.00	5.43	
	Primextra Gold (with above)				3.2	L	\$13.20	42.24	42.24	
	Dual Gold (with above)				1	L	\$15.00	15.00	15.00	
Spreader			Sept	5.41						
	Fertiliser, Urea (with above)				700	kg	\$0.65	455.00	455.00	
	Fertiliser, Super (with above)				660	kg	\$0.54	356.40	356.40	
	Fertiliser, Muriate of Potash (with above)				360	kg	\$0.76	273.60	273.60	
Power Harrows			Sept	36.32				0.00	36.32	
Planting and seed with a 4 row planter			Sept	23.02	18	kg	\$21.00	378.00	401.02	
Harvest & ensile			Dec	→	14	t (wet)	\$23.00	310.50	310.50	
								0.00	0.00	
								0.00	0.00	
								0.00	0.00	
								0.00	0.00	
Irrigation			Various		4.0	ML	\$100.00	400.00	400.00	
Total annual cost (maintenance and establishment)								2,320.24		
Feed production and utilisation										
Feed produced (kgDM/ha)								9,500		
Feed utilisation (kgDM/ha)								Utilisation %	100%	9,500
Cost of feed (\$/kgDM)								\$0.24		
Risk assessment										
Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM			
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low	
DM utilised (kg/ha)	11,400	9,500	7,600	0.20	0.24	0.31	-17%	0%	25%	
Irrigation cost (\$/M)	\$120	\$100	\$80	0.25	0.24	0.24	3%	0%	-3%	
Irrigation use (ML/ha)	4.8	4.0	3.2	0.25	0.24	0.24	3%	0%	-3%	
<i>Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level</i>										
Cost per kg DM at varying amounts of utilisation and irrigation use										
		Dry mater utilisation (kg/ha)								
		5,700	7,600	9,500	11,400	13,300				
	2.4	0.38	0.28	0.23	0.19	0.16				
Irrigation	3.2	0.39	0.29	0.24	0.20	0.17				
use	4.0	0.41	0.31	0.24	0.20	0.17				
(ML/ha)	4.8	0.42	0.32	0.25	0.21	0.18				
	5.6	0.44	0.33	0.26	0.22	0.19				

Maize - Irrigated and cut for snaplage

Assumptions								Maize	
Machinery costs include Fuel, oil, repairs and maintenance								Irrigated	
Irrigation costs								Snaplage	
				\$100	/ML				
Operation			Month	Machinery	Inputs			Total	
				\$/ha	Units/ha	Unit	\$/unit	\$/ha	\$/ha
Offset discs			Sept	24.73				0.00	24.73
Spray			Sept	5.43				0.00	5.43
	Primextra Gold (with above)				3.2	L	\$13.20	42.24	42.24
	Dual Gold (with above)				1	L	\$15.00	15.00	15.00
Spreader			Sept	5.41					
	Fertiliser, Urea (with above)				700	kg	\$0.65	455.00	455.00
	Fertiliser, Super (with above)				660	kg	\$0.54	356.40	356.40
	Fertiliser, Muriate of Potash (with above)				360	kg	\$0.76	273.60	273.60
Power Harrows			Sept	36.32				0.00	36.32
Planting and seed with a 4 row planter			Sept	23.02	18	kg	\$21.00	378.00	401.02
								0.00	0.00
Harvest & ensile			Dec	→	20	t (wet)	\$23.00	460.00	460.00
								0.00	0.00
								0.00	0.00
								0.00	0.00
								0.00	0.00
Irrigation			Various		4.0	ML	\$100.00	400.00	400.00
Total annual cost (maintenance and establishment)								2,469.74	
Feed production and utilisation									
Feed produced (kgDM/ha)								7,000	
Feed utilisation (kgDM/ha)								7,000	
Utilisation %								100%	
Cost of feed (\$/kgDM)								\$0.35	
Risk assessment									
Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM		
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low
DM utilised (kg/ha)	8,400	7,000	5,600	0.29	0.35	0.44	-17%	0%	25%
Irrigation cost (\$/M)	\$120	\$100	\$80	0.36	0.35	0.34	3%	0%	-3%
Irrigation use (ML/ha)	4.8	4.0	3.2	0.36	0.35	0.34	3%	0%	-3%
<i>Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level</i>									
Cost per kg DM at varying amounts of utilisation and irrigation use									
		Dry mater utilisation (kg/ha)							
		4,200	5,600	7,000	8,400	9,800			
	2.4	0.55	0.41	0.33	0.27	0.24			
Irrigation	3.2	0.57	0.43	0.34	0.28	0.24			
use	4.0	0.59	0.44	0.35	0.29	0.25			
(ML/ha)	4.8	0.61	0.46	0.36	0.30	0.26			
	5.6	0.63	0.47	0.38	0.31	0.27			

Millet - Irrigated and grazed

Assumptions								Millet		
Machinery costs include Fuel, oil, repairs and maintenance								Irrigated		
Irrigation costs								Grazed		
			\$100	/ML						
Operation	Month	Machinery \$/ha	Inputs				Total \$/ha			
			Units/ha	Unit	\$/unit	\$/ha				
Spray - Roundup	Oct	5.43	3	L	\$8.80	26.40	31.83			
Planting and seed using a direct drill	Oct	32.59	40	kg	\$5.00	200.00	232.59			
Fertiliser, CK88 using spreader	Oct	5.41	200	kg	\$0.69	138.00	143.41			
Fertiliser, Urea using spreader	Nov	5.41	100	kg	\$0.65	65.00	70.41			
Fertiliser, Urea using spreader	Dec	5.41	100	kg	\$0.65	65.00	70.41			
Fertiliser, Urea using spreader	Jan	5.41	100	kg	\$0.65	65.00	70.41			
Fertiliser, Urea using spreader	Feb	5.41	100	kg	\$0.65	65.00	70.41			
						0.00	0.00			
						0.00	0.00			
						0.00	0.00			
						0.00	0.00			
						0.00	0.00			
						0.00	0.00			
						0.00	0.00			
						0.00	0.00			
Irrigation	Various		3.0	ML	\$100.00	300.00	300.00			
Total annual cost (maintenance and establishment)								989.47		
Feed production and utilisation										
Feed produced (kgDM/ha)								15,000		
Feed utilisation (kgDM/ha)								10,500		
Utilisation %								70%		
Cost of feed (\$/kgDM)								\$0.09		
Risk assessment										
Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM			
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low	
DM utilised (kg/ha)	12,600	10,500	8,400	0.08	0.09	0.12	-17%	0%	25%	
Irrigation cost (\$/M)	\$120	\$100	\$80	0.10	0.09	0.09	6%	0%	-6%	
Irrigation use (ML/ha)	3.6	3.0	2.4	0.10	0.09	0.09	6%	0%	-6%	
<i>Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level</i>										
Cost per kg DM at varying amounts of utilisation and irrigation use										
		Dry mater utilisation (kg/ha)								
		6,300	8,400	10,500	12,600	14,700				
	1.8	0.14	0.10	0.08	0.07	0.06				
Irrigation	2.4	0.15	0.11	0.09	0.07	0.06				
use	3.0	0.16	0.12	0.09	0.08	0.07				
(ML/ha)	3.6	0.17	0.12	0.10	0.08	0.07				
	4.2	0.18	0.13	0.11	0.09	0.08				

Peas (field) - Irrigated and cut for hay

Assumptions								Field peas
Machinery costs include Fuel, oil, repairs and maintenance								Irrigated
Crop baled into 350kg round bales								Hay
Irrigation costs			\$100	/ML				

Operation	Month	Machinery \$/ha	Inputs				Total \$/ha	
			Units/ha	Unit	\$/unit	\$/ha		
Offset discs	Mar	24.73				0.00	24.73	
Spray - Roundup	Mar	5.43	3	L	\$8.80	26.40	31.83	
Power harrows	Apr	36.32				0.00	36.32	
Planting and seed using a combine	Apr	15.70	40	kg	\$2.00	80.00	95.70	
Fertiliser, CK88 (with above)			200	kg	\$0.69	138.00	138.00	
						0.00	0.00	
Cut, bale, cart	Sep	→	14.3	Rd bale	\$25.00	357.50	357.50	
						0.00	0.00	
						0.00	0.00	
						0.00	0.00	
						0.00	0.00	
						0.00	0.00	
						0.00	0.00	
						0.00	0.00	
Irrigation	Various		3.0	ML	\$100.00	300.00	300.00	
Total annual cost (maintenance and establishment)								984.08

Feed production and utilisation							
Feed produced (kgDM/ha)							5,000
Feed utilisation (kgDM/ha)				Utilisation %	100%		5,000

Cost of feed (\$/kgDM)							\$0.20
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Risk assessment

Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM		
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low
DM utilised (kg/ha)	6,000	5,000	4,000	0.16	0.20	0.25	-17%	0%	25%
Irrigation cost (\$/M)	\$120	\$100	\$80	0.21	0.20	0.18	6%	0%	-6%
Irrigation use (ML/ha)	3.6	3.0	2.4	0.21	0.20	0.18	6%	0%	-6%

Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level

Cost per kg DM at varying amounts of utilisation and irrigation use

		Dry mater utilisation (kg/ha)				
		3,000	4,000	5,000	6,000	7,000
	1.8	0.29	0.22	0.17	0.14	0.12
Irrigation	2.4	0.31	0.23	0.18	0.15	0.13
use	3.0	0.33	0.25	0.20	0.16	0.14
(ML/ha)	3.6	0.35	0.26	0.21	0.17	0.15
	4.2	0.37	0.28	0.22	0.18	0.16

Prairie grass - Irrigated and grazed

Assumptions								Prairie grass	
Machinery costs include Fuel, oil, repairs and maintenance								Irrigated	
Life of the crop (years)								10	
Irrigation costs								\$100 /ML	
Fertiliser applied during establishment is recorded in the annual maintenance section as fertiliser applied in March								Grazed	
Year 1									
		Month	Machinery \$/ha	Inputs			Total \$/ha		
				Units/ha	Unit	\$/unit	\$/ha		
Offset discs		Mar	24.73				0.00	24.73	
Spray - Roundup		Mar	5.43	3	L	8.80	26.40	31.83	
Power harrows		Mar	36.32				0.00	36.32	
Planting and seed with a combine		Mar	15.70	40	kg	8.00	320.00	335.70	
							0.00	0.00	
Irrigation		Various		0.0	ML	100.00	0.00	0.00	
Total establishment cost								428.58	
Establishment cost averaged over the life of the crop								42.86	
Annual maintenance									
		Month	Machinery \$/ha	Inputs			Total \$/ha		
				Units/ha	Unit	\$/unit	\$/ha		
Fertiliser, CK88 using spreader		Mar	5.41	200	kg	0.69	138.00	143.41	
Fertiliser, Urea using spreader		May	5.41	100	kg	0.65	65.00	70.41	
Fertiliser, Urea using spreader		Jun	5.41	100	kg	0.65	65.00	70.41	
Fertiliser, Urea using spreader		Jul	5.41	100	kg	0.65	65.00	70.41	
Fertiliser, Greentop K using spreader		Aug	5.41	150	kg	0.72	108.00	113.41	
Fertiliser, Greentop K using spreader		Sept	5.41	150	kg	0.72	108.00	113.41	
Fertiliser, Urea using spreader		Oct	5.41	100	kg	0.65	65.00	70.41	
Fertiliser, Urea using spreader		Dec	5.41	100	kg	0.65	65.00	70.41	
							0.00	0.00	
Irrigation		Various		7.0	ML	100.00	700.00	700.00	
Total annual maintenance cost								1,422.28	
Total annual cost (maintenance and establishment)								1,465.14	
Feed production and utilisation									
Feed produced (kgDM/ha)								20,000	
Feed utilisation (kgDM/ha)								14,000	
Utilisation %								70%	
Cost of feed (\$/kgDM)								\$0.10	
Risk assessment									
Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM		
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low
DM utilised (kg/ha)	25,000	14,000	17,500	0.06	0.10	0.08	-44%	0%	-20%
Irrigation cost (\$/M)	\$130	\$100	\$60	0.12	0.10	0.08	14%	0%	-19%
Irrigation use (ML/ha)	10.0	7.0	5.0	0.13	0.10	0.09	20%	0%	-14%
<i>Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level</i>									
Cost per kg DM at varying amounts of utilisation and irrigation use									
		Dry mater utilisation (kg/ha)							
		8,400	11,200	14,000	16,800	19,600			
	4.2	0.14	0.11	0.08	0.07	0.06			
Irrigation	5.6	0.16	0.12	0.09	0.08	0.07			
use	7.0	0.17	0.13	0.10	0.09	0.07			
(ML/ha)	8.4	0.19	0.14	0.11	0.10	0.08			
	9.8	0.21	0.16	0.12	0.10	0.09			

Ryegrass (annual) - Irrigated and grazed

Assumptions								Ryegrass
Machinery costs include Fuel, oil, repairs and maintenance								Irrigated
Ryegrass direct drilled into kikuyu after mulching								Grazed
Irrigation costs			\$100	/ML				

Operation	Month	Machinery \$/ha	Inputs				Total \$/ha
			Units/ha	Unit	\$/unit	\$/ha	
Mulching of kikuyu	Mar	21.34				0.00	21.34
Planting and seed using a direct drill	Apr	32.59	65	kg	\$3.00	195.00	227.59
Fertiliser, DAP (with above)			125	kg	\$0.69	86.25	86.25
Fertiliser, Urea using spreader	May	5.41	100	kg	\$0.65	65.00	70.41
Fertiliser, Urea using spreader	Jun	5.41	100	kg	\$0.65	65.00	70.41
Fertiliser, Greentop K using spreader	Jul	5.41	150	kg	\$0.72	108.00	113.41
Fertiliser, Urea using spreader	Aug	5.41	100	kg	\$0.65	65.00	70.41
Fertiliser, Urea using spreader	Sep	5.41	100	kg	\$0.65	65.00	70.41
Fertiliser, Greentop K using spreader	Oct	5.41	150	kg	\$0.72	108.00	113.41
Fertiliser, Urea using spreader	Nov	5.41	100	kg	\$0.65	65.00	70.41
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
Irrigation	Various		6.0	ML	\$100.00	600.00	600.00
Total annual cost (maintenance and establishment)							1,514.05

Feed production and utilisation							
Feed produced (kgDM/ha)							20,000
Feed utilisation (kgDM/ha)				Utilisation %	70%		14,000

Cost of feed (\$/kgDM)							\$0.11
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Risk assessment

Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM		
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low
DM utilised (kg/ha)	16,800	14,000	11,200	0.09	0.11	0.14	-17%	0%	25%
Irrigation cost (\$/M)	\$120	\$100	\$80	0.12	0.11	0.10	8%	0%	-8%
Irrigation use (ML/ha)	7.2	6.0	4.8	0.12	0.11	0.10	8%	0%	-8%

Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level

Cost per kg DM at varying amounts of utilisation and irrigation use

		Dry mater utilisation (kg/ha)				
		8,400	11,200	14,000	16,800	19,600
	3.6	0.15	0.11	0.09	0.08	0.07
Irrigation	4.8	0.17	0.12	0.10	0.08	0.07
use	6.0	0.18	0.14	0.11	0.09	0.08
(ML/ha)	7.2	0.19	0.15	0.12	0.10	0.08
	8.4	0.21	0.16	0.13	0.10	0.09

Sorghum (forage) - Irrigated and grazed

Assumptions								Forage sorghum		
Machinery costs include Fuel, oil, repairs and maintenance								Irrigated		
Irrigation costs								\$100	/ML	
								Grazed		
Operation	Month	Machinery \$/ha	Inputs			Total \$/ha				
Offset discs	Oct	24.73	Units/ha	Unit	\$/unit	\$/ha				
Spray - Roundup	Oct	5.43	3	L	\$8.80	26.40	31.83			
Spray - Atrazine	Oct	5.43	1.5	L	\$5.25	7.88	13.31			
Power harrows	Oct	36.32				0.00	36.32			
Planting and seed using a combine	Oct	15.70	12	kg	\$15.30	183.60	199.30			
Fertiliser, CK88 (with above)			200	kg	\$0.69	138.00	138.00			
Muriate of Potash (with above)			60	kg	\$0.76	45.60	45.60			
Fertiliser, Urea using spreader	Nov	5.41	100	kg	\$0.65	65.00	70.41			
Fertiliser, Urea using spreader	Dec	5.41	100	kg	\$0.65	65.00	70.41			
Fertiliser, Urea using spreader	Jan	5.41	100	kg	\$0.65	65.00	70.41			
Fertiliser, Urea using spreader	Feb	5.41	100	kg	\$0.65	65.00	70.41			
						0.00	0.00			
						0.00	0.00			
						0.00	0.00			
						0.00	0.00			
						0.00	0.00			
Irrigation	Various		2.5	ML	\$100.00	250.00	250.00			
Total annual cost (maintenance and establishment)								1,020.73		
Feed production and utilisation										
Feed produced (kgDM/ha)								17,000		
Feed utilisation (kgDM/ha)								Utilisation %	70%	11,900
Cost of feed (\$/kgDM)								\$0.09		
Risk assessment										
Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM			
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low	
DM utilised (kg/ha)	14,280	11,900	9,520	0.07	0.09	0.11	-17%	0%	25%	
Irrigation cost (\$/M)	\$120	\$100	\$80	0.09	0.09	0.08	5%	0%	-5%	
Irrigation use (ML/ha)	3.0	2.5	2.0	0.09	0.09	0.08	5%	0%	-5%	
<i>Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level</i>										
Cost per kg DM at varying amounts of utilisation and irrigation use										
		Dry mater utilisation (kg/ha)								
		7,140	9,520	11,900	14,280	16,660				
	1.5	0.13	0.10	0.08	0.06	0.06				
Irrigation	2.0	0.14	0.10	0.08	0.07	0.06				
use	2.5	0.14	0.11	0.09	0.07	0.06				
(ML/ha)	3.0	0.15	0.11	0.09	0.07	0.06				
	3.5	0.16	0.12	0.09	0.08	0.07				

Sorghum (forage) - Dryland and grazed

Assumptions								Forage sorghum		
Machinery costs include Fuel, oil, repairs and maintenance								Dryland		
Irrigation costs								Grazed		
				\$0	/ML					
Operation			Month	Machinery \$/ha	Inputs			Total \$/ha		
					Units/ha	Unit	\$/unit	\$/ha		
Offset discs			Oct	24.73				0.00	24.73	
Spray - Roundup			Oct	5.43	3	L	\$8.80	26.40	31.83	
Spray - Atrazine			Oct	5.43	1.5	L	\$5.25	7.88	13.31	
Power harrows			Oct	36.32				0.00	36.32	
Planting and seed using a combine			Oct	15.70	10	kg	\$15.30	153.00	168.70	
Fertiliser, CK88 (with above)					150	kg	\$0.69	103.50	103.50	
Muriate of Potash (with above)					0	kg	\$0.76	0.00	0.00	
Fertiliser, Urea using spreader			Dec	5.41	100	kg	\$0.65	65.00	70.41	
								0.00	0.00	
								0.00	0.00	
								0.00	0.00	
								0.00	0.00	
								0.00	0.00	
								0.00	0.00	
								0.00	0.00	
Irrigation			Various		0.0	ML	\$0.00	0.00	0.00	
Total annual cost (maintenance and establishment)								448.80		
Feed production and utilisation										
Feed produced (kgDM/ha)								8,300		
Feed utilisation (kgDM/ha)								5,810		
Utilisation %								70%		
Cost of feed (\$/kgDM)								\$0.08		
Risk assessment										
Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM			
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low	
DM utilised (kg/ha)	6,972	5,810	4,648	0.06	0.08	0.10	-17%	0%	25%	
Irrigation cost (\$/M)	\$0	\$0	\$0	0.08	0.08	0.08	0%	0%	0%	
Irrigation use (ML/ha)	0.0	0.0	0.0	0.08	0.08	0.08	0%	0%	0%	
<i>Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level</i>										
Cost per kg DM at varying amounts of utilisation and irrigation use										
		Dry mater utilisation (kg/ha)								
		3,486	4,648	5,810	6,972	8,134				
Irrigation		0.0	0.13	0.10	0.08	0.06				
use		0.0	0.13	0.10	0.08	0.06				
(ML/ha)		0.0	0.13	0.10	0.08	0.06				
		0.0	0.13	0.10	0.08	0.06				

Sorghum (forage) – Dryland and cut for silage

Assumptions								Forage sorghum		
Machinery costs include Fuel, oil, repairs and maintenance								Dryland		
A reasonable ratoon crop for grazing could be expected with sufficient rainfall								Silage		
Irrigation costs		\$0 /ML								
Operation										
			Month	Machinery \$/ha	Inputs			Total \$/ha		
					Units/ha	Unit	\$/unit	\$/ha		
Offset discs			Oct	24.73				0.00	24.73	
Spray - Roundup			Oct	5.43	3	L	\$8.80	26.40	31.83	
Spray - Atrazine			Oct	5.43	1.5	L	\$5.25	7.88	13.31	
Power harrows			Oct	36.32				0.00	36.32	
Planting and seed using a combine			Oct	15.70	10	kg	\$15.30	153.00	168.70	
Fertiliser, CK88 (with above)					150	kg	\$0.69	103.50	103.50	
Muriate of Potash (with above)					60	kg	\$0.76	45.60	45.60	
Fertiliser, Urea (with above)					80	kg	\$0.65	52.00	52.00	
								0.00	0.00	
Cut and ensile			Jan	→	25	t (wet)	\$23.00	575.00	575.00	
								0.00	0.00	
								0.00	0.00	
								0.00	0.00	
								0.00	0.00	
								0.00	0.00	
Irrigation					0.0	ML	\$0.00	0.00	0.00	
Total annual cost (maintenance and establishment)								1,050.99		
Feed production and utilisation										
Feed produced (kgDM/ha)								8,300		
Feed utilisation (kgDM/ha)								8,300		
Utilisation %								100%		
Cost of feed (\$/kgDM)								\$0.13		
Risk assessment										
Risk factors		Risk inputs			\$/kgDM			% change in \$/kgDM		
		High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low
DM utilised (kg/ha)		9,960	8,300	6,640	0.11	0.13	0.16	-17%	0%	25%
Irrigation cost (\$/M)		\$0	\$0	\$0	0.13	0.13	0.13	0%	0%	0%
Irrigation use (ML/ha)		0.0	0.0	0.0	0.13	0.13	0.13	0%	0%	0%
<i>Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level</i>										
Cost per kg DM at varying amounts of utilisation and irrigation use										
		Dry mater utilisation (kg/ha)								
		4,980	6,640	8,300	9,960	11,620				
Irrigation		0.0	0.21	0.16	0.13	0.11	0.09			
use		0.0	0.21	0.16	0.13	0.11	0.09			
(ML/ha)		0.0	0.21	0.16	0.13	0.11	0.09			
		0.0	0.21	0.16	0.13	0.11	0.09			

Sorghum (grain) - Irrigated and cut for headlage

Assumptions								Grain sorghum		
Machinery costs include Fuel, oil, repairs and maintenance								Irrigated		
Irrigation costs								Headlage		
				\$100	/ML					
Operation			Month	Machinery \$/ha	Inputs			Total \$/ha		
			Oct	24.73	Units/ha	Unit	\$/unit	\$/ha	\$/ha	
Offset discs			Oct	24.73			0.00		24.73	
Spray - Roundup			Oct	5.43	3	L	\$8.80	26.40	31.83	
Spray - Atrazine			Oct	5.43	1.5	L	\$5.25	7.88	13.31	
Power harrows			Oct	36.32			0.00		36.32	
Planting and seed using a combine			Oct	15.70	6	kg	\$15.30	91.80	107.50	
Fertiliser, CK88 (with above)					200	kg	\$0.69	138.00	138.00	
Muriate of Potash (with above)					60	kg	\$0.76	45.60	45.60	
Fertiliser, Urea (with above)					100	kg	\$0.65	65.00	65.00	
							0.00		0.00	
Cut and ensile			Jan	→	12	t (wet)	\$23.00	264.50	264.50	
							0.00		0.00	
							0.00		0.00	
							0.00		0.00	
							0.00		0.00	
							0.00		0.00	
Irrigation			Various		2.0	ML	\$100.00	200.00	200.00	
Total annual cost (maintenance and establishment)								926.79		
Feed production and utilisation										
Feed produced (kgDM/ha)								7,000		
Feed utilisation (kgDM/ha)								7,000		
Utilisation %								100%		
Cost of feed (\$/kgDM)								\$0.13		
Risk assessment										
Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM			
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low	
DM utilised (kg/ha)	8,400	7,000	5,600	0.11	0.13	0.17	-17%	0%	25%	
Irrigation cost (\$/M)	\$120	\$100	\$80	0.14	0.13	0.13	4%	0%	-4%	
Irrigation use (ML/ha)	2.4	2.0	1.6	0.14	0.13	0.13	4%	0%	-4%	
<i>Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level</i>										
Cost per kg DM at varying amounts of utilisation and irrigation use										
		Dry mater utilisation (kg/ha)								
		4,200	5,600	7,000	8,400	9,800				
1.2		0.20	0.15	0.12	0.10	0.09				
Irrigation	1.6	0.21	0.16	0.13	0.11	0.09				
	2.0	0.22	0.17	0.13	0.11	0.09				
use	2.4	0.23	0.17	0.14	0.12	0.10				
	2.8	0.24	0.18	0.14	0.12	0.10				

Triticale - Irrigated and cut for silage

Assumptions								Triticale		
Machinery costs per ha include Fuel, oil, repairs and maintenance								Irrigated		
Irrigation costs								Silage		
				\$100	/ML					
Operation			Month	Machinery \$/ha	Inputs			Total \$/ha		
					Units/ha	Unit	\$/unit	\$/ha	\$/ha	
Offset discs			May	24.73				0.00	24.73	
Spray - Roundup			May	5.43	3	L	\$8.80	26.40	31.83	
Power harrows			May	36.32				0.00	36.32	
Planting and seed using a combine			June	15.70	80	kg	\$2.00	160.00	175.70	
Fertiliser, DAP (with above)					125	kg	\$0.89	111.25	111.25	
Fertiliser, CK88 (with above)					250	kg	\$0.69	172.50	172.50	
								0.00	0.00	
Harvest & ensile			Sep	→	35	t (wet)	\$23.00	805.00	805.00	
								0.00	0.00	
								0.00	0.00	
								0.00	0.00	
								0.00	0.00	
								0.00	0.00	
								0.00	0.00	
								0.00	0.00	
Irrigation			Various		3.0	ML	\$100.00	300.00	300.00	
Total annual cost (maintenance and establishment)								1,657.33		
Feed production and utilisation										
Feed produced (kgDM/ha)								12,250		
Feed utilisation (kgDM/ha)								12,250		
Utilisation %								100%		
Cost of feed (\$/kgDM)								\$0.14		
Risk assessment										
Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM			
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low	
DM utilised (kg/ha)	14,700	12,250	9,800	0.11	0.14	0.17	-17%	0%	25%	
Irrigation cost (\$/M)	\$120	\$100	\$80	0.14	0.14	0.13	4%	0%	-4%	
Irrigation use (ML/ha)	3.6	3.0	2.4	0.14	0.14	0.13	4%	0%	-4%	
<i>Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level</i>										
Cost per kg DM at varying amounts of utilisation and irrigation use										
		Dry mater utilisation (kg/ha)								
		7,350	9,800	12,250	14,700	17,150				
	1.8	0.21	0.16	0.13	0.10	0.09				
Irrigation	2.4	0.22	0.16	0.13	0.11	0.09				
use	3.0	0.23	0.17	0.14	0.11	0.10				
(ML/ha)	3.6	0.23	0.18	0.14	0.12	0.10				
	4.2	0.24	0.18	0.15	0.12	0.10				

Turnip – Irrigated and grazed

Assumptions								Turnip		
Machinery costs include Fuel, oil, repairs and maintenance								Irrigated		
Irrigation costs								Grazed		
			\$100	/ML						
Operation		Month	Machinery \$/ha	Inputs				Total \$/ha		
				Units/ha	Unit	\$/unit	\$/ha			
Spray - Roundup		Aug	5.43	3	L	\$8.80	26.40	31.83		
Offset discs		Aug	24.73				0.00	24.73		
Planting and seed using direct drill		Aug	32.59	4	kg	\$15.00	60.00	92.59		
	Fertiliser, DAP (with above)			125	kg	\$0.89	110.88	110.88		
Fertiliser, Urea using spreader		Oct	5.41	100	kg	\$0.65	65.00	70.41		
Fertiliser, Urea using spreader		Nov	5.41	100	kg	\$0.65	65.00	70.41		
							0.00	0.00		
							0.00	0.00		
							0.00	0.00		
							0.00	0.00		
							0.00	0.00		
							0.00	0.00		
							0.00	0.00		
							0.00	0.00		
							0.00	0.00		
							0.00	0.00		
							0.00	0.00		
							0.00	0.00		
Irrigation		Various		3.0	ML	\$100.00	300.00	300.00		
Total annual cost (maintenance and establishment)								700.85		
Feed production and utilisation										
Feed produced (kgDM/ha)								11,000		
Feed utilisation (kgDM/ha)								7,700		
Utilisation %								70%		
Cost of feed (\$/kgDM)								\$0.09		
Risk assessment										
Risk factors	Risk inputs			\$/kgDM			% change in \$/kgDM			
	High	Budgeted	Low	High	Budgeted	Low	High	Budgeted	Low	
DM utilised (kg/ha)	9,240	7,700	6,160	0.08	0.09	0.11	-17%	0%	25%	
Irrigation cost (\$/M)	\$120	\$100	\$80	0.10	0.09	0.08	9%	0%	-9%	
Irrigation use (ML/ha)	3.6	3.0	2.4	0.10	0.09	0.08	9%	0%	-9%	
<i>Cost per kgDM and the %changes show the effect of a change in 1 risk factor with the others remaining at the budgeted level</i>										
Cost per kg DM at varying amounts of utilisation and irrigation use										
		Dry mater utilisation (kg/ha)								
		4,620	6,160	7,700	9,240	10,780				
	1.8	0.13	0.09	0.08	0.06	0.05				
Irrigation	2.4	0.14	0.10	0.08	0.07	0.06				
use	3.0	0.15	0.11	0.09	0.08	0.07				
(ML/ha)	3.6	0.16	0.12	0.10	0.08	0.07				
	4.2	0.18	0.13	0.11	0.09	0.08				