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GROSS MARGIN BUDGETS FOR FIELD CROPS IN THE DOUGLAS-DALY REGION 1991-92

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Northern Territory Department of
Primary Industry and Fisheries

CROP GROSS MARGIN BUDGETS

FOR THE DOUGLAS-DALY REGION

1991-92

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SUSTAINABLE AGRICULTURE

THE DEPARTMENT OF PRIMARY INDUSTRY AND FISHERIES IS COMMITTED TO THE PRINCIPLES AND PRACTICES OF SUSTAINABLE AGRICULTURE

Definition:

Sustainable agriculture is the use of practices and systems which maintain or enhance:

- the economic viability of agricultural production:
- the natural resource base: and
- other ecosystems which are influenced by agricultural activities.

Principles:

1. Agricultural productivity is sustained or enhanced over the long term.
2. Adverse impacts on the natural resource base of agricultural and associated ecosystems are ameliorated, minimised or avoided.
3. Harmful residues resulting from the use of chemicals for agriculture are minimised.
4. The nett social benefit (in both dollar and non-dollar terms) derived from agriculture is maximised.
5. Agricultural systems are sufficiently flexible to manage risks associated with the vagaries of climate and markets.

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1. INTRODUCTION AND SOME IMPORTANT NOTES

Standardised gross margin budgets for the Douglas-Daly region are presented in this booklet. They are a guide to the costs and returns that can be expected if specific conditions (relating to climate, prices, management, etc.) prevail. If these conditions are not met, then the gross margin estimates can be wide of the mark. That doesn't mean we're wasting our time, though. For instance, the budgets can be looked at more closely to see how variations in yields and prices affect cropping returns. They can also be used as a basis for assessing the risk associated with planting a certain crop measured in dollar terms. *In any case, farmers are encouraged to prepare gross margin estimates based on their own situation, experience, and expectations since these are likely to be different from those assumed in the standardised budgets.*

Standardised gross margin (GM) budgets provide a benchmark for comparing farm specific gross margins (eg. you can compare your GM for sorghum against the 'standardised GM' budget for sorghum) and are useful for comparing the profitability of different crops (eg. maize vs sorghum).

GM analysis is a simplified budgeting technique since it ignores overhead costs. Overhead costs can be safely ignored, however, if comparing activities of a similar nature (eg. no-till maize vs no-till sorghum) that use existing farm plant and equipment. If new capital equipment is required (eg. installation of irrigation equipment, purchase of minimum tillage equipment, purchase of livestock) or if activities are not of a similar nature (eg. fattening steers vs no-till maize), then more complicated budgeting is required. Contact the DPIF for further information.

As a rule of thumb, a GM of between $150 - $250/ha is required for a broadacre farm in the Douglas-Daly region to breakeven (ie to cover overhead costs). Cattle enterprises can operate profitably at much lower GMs/ha. The requirement for specialty cropping areas is variable. In general, a large component of overhead costs may be loan repayments and interest charges.

Once the techniques of farm budgeting have been mastered, they become second nature in evaluating the uncertain outcomes that a farmer faces. Budgeting after all, is merely attaching dollar values to those decisions that need to be made during the production process. Very few people in the farming game today are in a position where they don't need to keep a close eye on their finances.

The alternative option, making decisions on the basis of gut-feeling or guess-timation, seems foolhardy, especially under the deteriorating terms of trade faced by farmers these days.

2. WHAT IS A GROSS MARGIN?

A **gross margin** is the difference between **gross income** and total **variable costs** for a **farm activity**.

The **total gross margin** for a farm is the sum of all individual activity gross margins.

Gross Income can be measured by total receipts received from the sales of produce plus the value of any retained output.

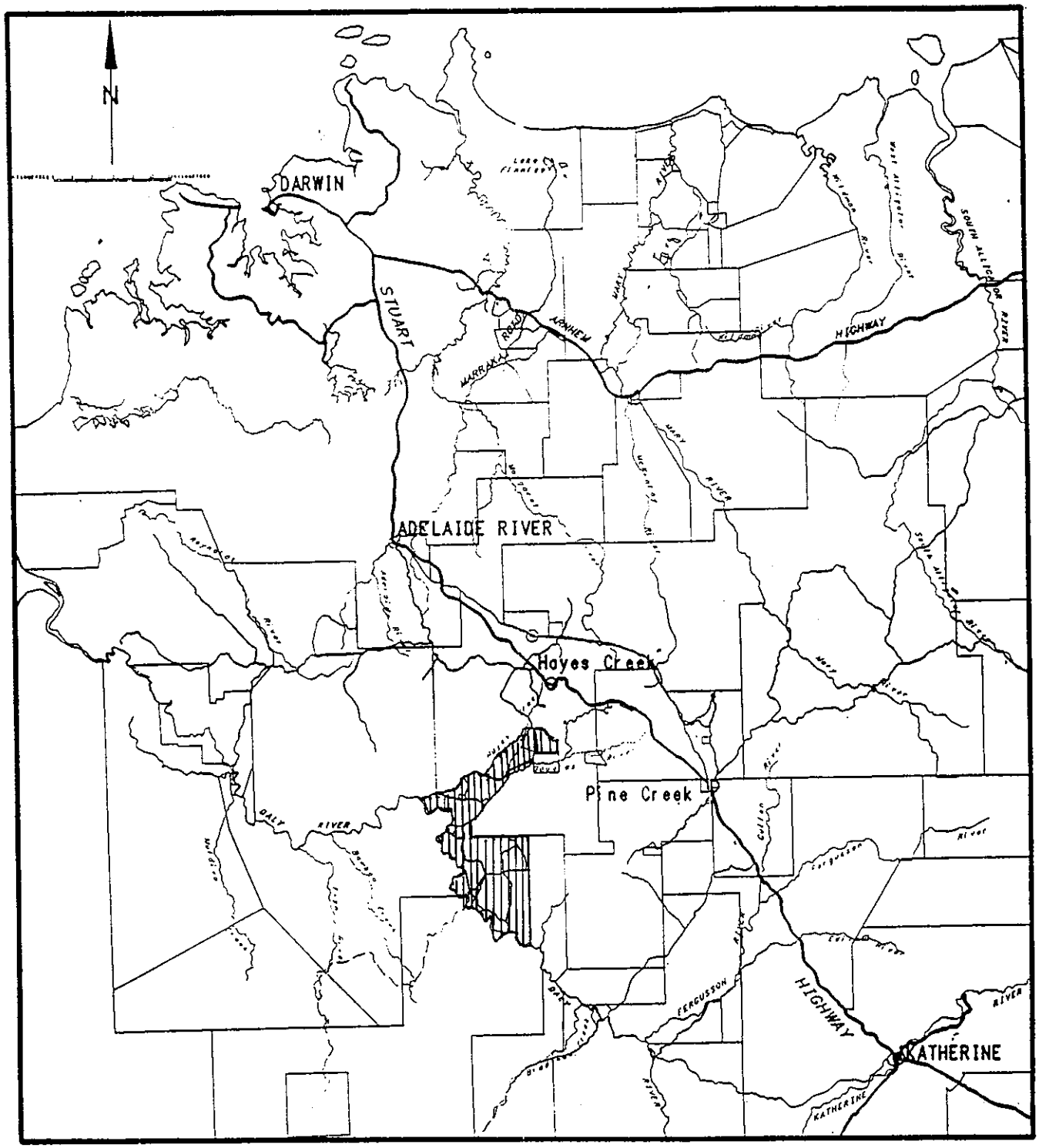
Variable Costs (also known as running costs). As the name implies, these costs vary with the size of farm activities. For example, if the area sown to sorghum is increased from 200 hectares to 400 hectares then roughly twice the amount of seed and fertiliser will be required. Other variable costs include: fuel, oil and repair and maintenance to machinery; casual labour costs; weed and pest control; harvesting and marketing costs. Variable costs are distinct from overhead costs.

Farm Activity refers to the particular method employed in producing a commodity. For example, minimum tillage maize and conventional tillage maize are two different farm activities. Both, however, are described by the more general expression of a maize **enterprise**.

Overhead Costs (or fixed costs). These costs are difficult to avoid each year and are unlikely to vary with changes in the levels of different farm activities, unless some capital expenditure is required for these changes to occur. Overhead costs include the wages of permanent workers, living expenses of the family, finance costs, insurance, telephone, replacement of buildings and machines, business expenses, rates and land taxes. Overhead costs plus variable costs represent total costs.

The relationship between the total gross margin and farm overhead costs provide a useful guide when computed on a per hectare basis. The average gross margin per hectare should be greater than the average overheads per hectare for the farm to make money.

Gross margins alone do not provide a basis for farm planning. Crop rotations, demands on farm labour, finance, risk and other constraints need to be considered in the context of farm objectives. Gross margins are simply the most commonly used, first-step, budgeting technique.



THE DOUGLAS DALY REGION

3. THE DOUGLAS-DALY REGION

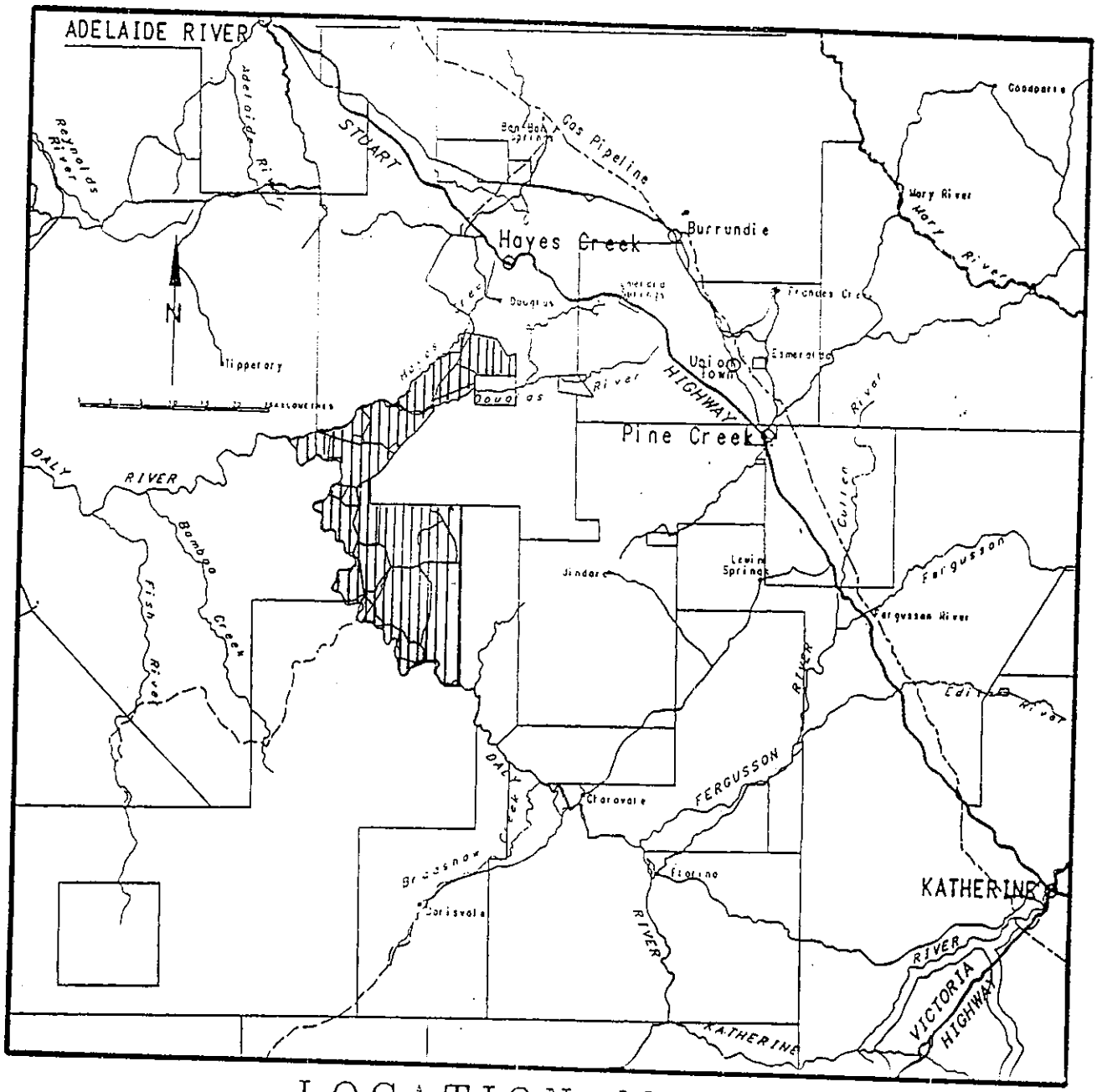
The area surrounding the junction of the Douglas and Daly river systems has been the major crop growing area in the Northern Territory in recent years. The general location of the region is given in Figure 1, and in more detail in Figure 2. The other major cropping area in the NT is around Katherine.

Cropping on a broadacre scale was initiated on Tipperary Station in the 1960's. It was not until the early 1980's, however, that major new agricultural developments occurred. The initiative came from the NT government, which acquired 20,000 hectares of Douglas Station and subsequently the whole of Oolloo and Fish River Stations. The Douglas-Daly and Oolloo acquisitions were subdivided into individual farm lots each comprising approximately 1,000 hectares of arable land and larger areas of non-arable scrub, resulting in blocks ranging in size from 4,500 to 14,000 hectares. The attractiveness of the region was considered to be its relatively good soils (commonly known as 'Blain' and 'Tippera' soil types), permanent water, proximity to the Douglas-Daly Research Farm and road access. Available soil water, soil temperatures, erosion factors and soil fertility (Williams, Day, Isbell and Reddy, 1985) have been considered the limiting agronomic factors in farm production to date.

Arable land areas in the region were cleared and farmed either under contract to then Agricultural Development and Marketing Authority (ADMA), or in some cases independently, after purchasing the land from the government.

In 1991-92 there are eight broadacre farms in the Douglas-Daly acquisition area, all of which are now operating independently of government.

Crop production in the NT is still at development phase and is small relative to the Australian States. The farmers readily testify that broadacre - scale farming in the semi-arid tropics is quite a challenge, and there is very little experience world-wide to draw upon. An appraisal of the long term economic potential for the industry would be premature at this stage without more experience and results in the field. Farm-gate production costs seem likely to remain higher than most Australian States, however, there are cost advantages in proximity to the local and Asian markets. Current local demand for stockfeed grains and pulses remain unmet, whilst there is interstate and export market potential for some of the high value crops from the NT (especially sesame, peanuts and mungbeans).



LOCATION MAP
Douglas – Daly

4. SOME COMMENTS ON THE STANDARDISED BUDGETS

(a) Not all machinery costs are included in the gross margins. Only repairs and maintenance costs to machinery plus fuel and oil costs are included. All other costs, including depreciation, interest, provision of shelter, operators labour and insurance costs are treated as overhead costs. The ability to cover this latter group of costs is usually measured by preparing a whole farm budget.

The fuel, oil, and repair and maintenance bill was calculated as an average of 10,000 rated hours of use from tractors purchased new and 1,200 - 2,400 rated hours use from new implements. This is merely a simple accounting technique. Individual growers should have better idea of their own fuel, oil, repairs and maintenance costs. Actual machinery running costs for a particular farm may be much higher if old, worn-out equipment is used.

Fuel cost have been budgeted at 40¢/L. This is net of the NT government tax rebate and the customs and excise rebate for on-farm use.

(b) Seeding rates will vary, depending on the weight of seed, germination percentage and individual's sowing practices.

(c) Fertiliser rates should be varied with the nutrient status of the soil and particular crop requirements. Ask your district agronomist if you need advice on this matter.

The NT fertiliser freight subsidy for 1991-92 has been approved at $95.00/ tonne or actual freight cost (whichever is lower). Claims should be submitted before June 1992. The minimum claim is for 2 tonnes, the maximum is 300 tonnes per producer.

(d) Herbicide and pesticide application rates vary with climate, incidence of insects, etc. It is illegal to use any herbicide or pesticide that is not registered for use in the NT and to use registered chemical contrary to their label specifications. Contact the DPIF for further information if required.

(e) Crop prises are indicative only.

(f) Trade names are used in this publication solely for the purpose of providing specific information. Mention of a registered trade name does not constitute a guarantee or warranty of the product by DPIF, nor does it endorse the product over brand names not mentioned. Trade names have been included because producers seem to identify more readily with these than with chemical names.

GROSS MARGIN BUDGET

ENTERPRISE NAME: No-Till Sorghum
ENTERPRISE UNIT: 1 hectare

REGION: Douglas/Daly
DATE: October 1991

		$/ha	Your Estimate
INCOME			
Yield	2.50 t/ha @ $235/tonne	588	
Other Income	Fertiliser Subsidy 250 kg @ $95/tonne	24	
	Agistment Income 1 head/ha @ $1.50/head/week for 17 weeks	26	
A. TOTAL INCOME		**637**	
VARIABLE COSTS			
Land Preparation			
Control Grazing			
1 Knock Down Spray (RoundupCT)	2 L/ha @ $13.46/L	27	
1 application	9.6 ha/h @ $12.73/h	1	
Sowing			
Seed	8 kg/ha @ $3.50/kg	28	
Sowing Operation	4.2 ha/h @ $14.28/h	3	
Fertilisers			
NPKS (19-10-0-13)	150 kg/ha @ $550/tonne	83	
Urea	100 kg/ha @ $525/tonne	53	
1 application (pre-planting)	7.2 ha/h @ $12.73/h	2	
1 aerial application	@ $18/ha	18	
Weed Control			
Atrazine	3 L/ha @ $4.33/L	13	
1 application	9.36 ha/h @ $12.73/h	1	
Harvesting			
Heading	3.15 ha/h @ $69.36/h	22	
Marketing			
Freight to Depot	@ $10/tonne	25	
B. TOTAL VARIABLE COSTS		**276**	
C. GROSS MARGIN PER HECTARE (A-B)		**361**	

Sensitivity of Sorghum Gross Margin ($/ha) to Varying Yields and Prices

Price	Yield (tonnes per hectare)				
($/t)	1.5	2.0	2.5	3.0	3.5
125	-39	23	86	148	211
175	36	123	211	298	386
235	126	243	361	478	596
285	201	343	486	628	771
335	276	443	611	778	946

Breakeven Analysis (Gross Margin Breakeven)

Breakeven Yield at a price of $235/tonne = 0.96 t/ha
Breakeven Price at a yield of 2.5 t/ha = $106.63/tonne

GROSS MARGIN BUDGET

ENTERPRISE NAME: No-Till Maize
ENTERPRISE UNIT: 1 hectare

REGION: Douglas/Daly
DATE: October 1991

		$/ha	Your Estimate
INCOME			
Yield	2.50 t/ha @ $280/tonne	700	
Other Income	Fertiliser Subsidy 300 kg @ $95/tonne	29	
	Agistment Income 1 head/ha @ $1.50/head/week for 17 weeks	26	
A. TOTAL INCOME		**754**	
VARIABLE COSTS			
Land Preparation			
Control Grazing			
1 Knock Down Spray (RoundupCT)	2 L/ha @ $13.46/L	27	
1 application	9.36 ha/h @ $12.73/h	1	
Sowing			
Seed (Hycorn 80)	17 kg/ha @ $4.80/kg	82	
Sowing Operation	4.2 ha/h @ $14.28/h	3	
Fertilisers			
NPKS (19-10-0-13)	150 kg/ha @ $550/tonne	83	
Urea	150 kg/ha @ $525/tonne	79	
1 application (pre-planting)	7.2 ha/h @ $12.73/h	2	
1 aerial application	@ $18/ha	18	
Weed Control			
Atrazine	3 L/ha @ $4.33/L	13	
Dual	2 L/ha @ $22.20/L	44	
1 application	9.36 ha/h @ $12.73/h	1	
Harvesting			
Heading (own harvester)	2.1 ha/h @ $69.36/h	33	
Marketing			
Freight to Depot	@ $10/tonne	25	
B. TOTAL VARIABLE COSTS		**411**	
C. GROSS MARGIN PER HECTARE (A-B)		**343**	

Sensitivity of Maize Gross Margin ($/ha) to Varying Yields and Prices

Price	Yield (tonnes per hectare)				
($/t)	1.5	2.0	2.5	3.0	3.5
220	-27	83	193	303	413
280	63	203	343	483	623
340	153	323	493	663	833
400	243	443	643	843	1043
460	333	563	793	1023	1253

Breakeven Analysis (Gross Margin Breakeven)

Breakeven Yield at a price of $280/tonne = 1.27 t/ha
Breakeven Price at a yield of 2.5 t/ha = $142.83/tonne

GROSS MARGIN BUDGET

ENTERPRISE NAME: Sesame
ENTERPRISE UNIT: 1 hectare

REGION: Douglas/Daly
DATE: October 1991

		$/ha	Your Estimate
INCOME			
Yield	0.35 t/ha @ $900/tonne	315	
Other Income	Fertiliser Subsidy 250 kg @ $95/tonne	21	
A. TOTAL INCOME		**336**	
VARIABLE COSTS			
Land Preparation			
1 Disc Ploughing	4.48 ha/h @ $27.05/h	6	
1 Chisel Ploughing	4.48 ha/h @ $26.63/h	6	
1 Cultivation	6.30 ha/h @ $24.96/h	4	
1 Harrowing	8.40 ha/h @ $12.00/h	1	
Sowing			
Seed	3 kg/ha @ $1.44/kg	4	
Sowing Operation	3.84 ha/h @ $14.24/h	4	
Fertilisers			
NPKS (19-13-0-9)	155 kg/ha @ $560/tonne	87	
Urea	70 kg/ha @ $525/tonne	37	
1 aerial application	@ $18/ha	18	
Weed Control			
Allowance for weed control		25	
Pest Control			
Methomyl	350 g a.c./ha	15	
1 aerial application	@ $18/h	18	
Harvesting			
Heading (own harvester)	2.10 ha/h @ $69.36/h	33	
Marketing			
Clean & Grade	@ $45/tonne	16	
Bag	@ $25/tonne	9	
Freight to Depot	@ $22/tonne	8	
B. TOTAL VARIABLE COSTS		**290**	
C. GROSS MARGIN PER HECTARE (A-B)		**46**	

Sensitivity of Sesame Gross Margin ($/ha) to Varying Yields and Prices

Price	Yield (tonnes per hectare)					
($/t)	0.2	0.35	0.5	1.0	1.5	2.0
700	-129	-24	81	431	781	1131
800	-109	11	131	531	931	1331
900	-89	46	181	631	1081	1531
1000	-69	81	231	736	1231	1731
1100	-49	116	281	831	1381	1931

Breakeven Analysis (Gross Margin Breakeven)

Breakeven Yield at a price of $900/tonne = 0.30 t/ha
Breakeven Price at a yield of 0.35 t/ha = $768.00/tonne

GROSS MARGIN BUDGET

ENTERPRISE NAME: B-Grade Mung Beans
ENTERPRISE UNIT: 1 hectare

REGION: Douglas/Daly
DATE: October 1991

		$/ha	Your Estimate
INCOME			
Yield	0.68 t/ha @ $320/tonne	218	
	0.12 t/ha @ $230/tonne	28	
Other Income	Fertiliser Subsidy 110 kg @ $95/tonne	10	
A. TOTAL INCOME		**256**	
VARIABLE COSTS			
Land Preparation			
1 Disc Ploughing	4.48 ha/h @ $27.05/h	6	
2 Cultivation	6.30 ha/h @ $24.96/h	8	
Sowing			
Seed (Putland)	15 kg/ha @ $1.27/kg	19	
Sowing Operation	3.84 ha/h @ $14.24/h	4	
Fertilisers			
Superphosphate	110 kg/ha @ $360/tonne	40	
1 application	7.2 ha/h @ $12.73/h	2	
Weed Control			
Treflan	2 L/ha @ $7.43/L	15	
1 application	9.36 ha/h @ $12.73/h	1	
Pest Control			
Thiodan	2 L/ha @ $9.23/L	18	
1 aerial application	@ $18/ha	18	
Harvesting			
Heading (own harvester)	2.10 ha/h @ $69.36/h	33	
Marketing			
Clean & Grade	@ $45/tonne	36	
Bag	@ $25/tonne	20	
Cartage to Depot (Kath)	@ $22/tonne	18	
B. TOTAL VARIABLE COSTS		**237**	
C. GROSS MARGIN PER HECTARE (A-B)		**18**	

Sensitivity of B-Grade Mung Beans Gross Margin ($/ha) to Varying Yields and Prices (assuming 85% B Grade & 15% Splits and B Grade Price + $230/tonne for Splits)

Price	Yield (tonnes per hectare)					
($/t)	0.5	0.8	1.5	2.0	2.5	3.0
235	-99	-40	100	200	300	400
245	-95	-33	113	217	321	425
300	-72	5	183	311	438	566
320	-63	18	209	345	481	617
400	-29	73	311	481	651	821
500	13	141	438	651	863	1076

Breakeven Analysis (Gross Margin Breakeven)

Breakeven Yield at a price of $320/tonne = 0.62 t/ha
Breakeven Price at a yield of 0.8 t/ha = $293.16/tonne

GROSS MARGIN BUDGET

ENTERPRISE NAME: Cavalcade Hay
ENTERPRISE UNIT: 1 hectare

REGION: Douglas/Daly
DATE: October 1991

		$/ha	Your Estimate
INCOME			
Yield	7.00 t/ha @ $135/tonne	945	
Other Income	Fertiliser Subsidy 200 kg @ $95/tonne	19	
A. TOTAL INCOME		**964**	
VARIABLE COSTS			
Land Preparation (virgin land)			
1 Disc Ploughing	4.48 ha/h @ $27.05/h	6	
2 Cultivation	6.30 ha/h @ $24.96/h	8	
Sowing			
Seed	10 kg/ha @ $10.00/kg	100	
Sowing Operation	3.84 ha/h @ $14.24/h	4	
Fertilisers			
Superphosphate	150 kg/ha @ $360/tonne	54	
MOP	50 kg/ha @ $460/tonne	23	
1 application	7.2 ha/h @ $12.73/h	2	
Weed Control			
Basagran	2 L/ha @ $24.53/L	49	
1 application	9.36 ha/h @ $12.73/h	1	
Harvesting			
Mow/Condition	0.84 ha/h @ $18.86/h	22	
Round Baling	0.58 ha/h @ $17.98/h	31	
Wrapping	@ $2/bale	70	
B. TOTAL VARIABLE COSTS		**370**	
C. GROSS MARGIN PER HECTARE (A-B)		**594**	

Sensitivity of Cavalcade Hay Gross Margin ($/ha) to Varying Yields and Prices

Price	Yield (tonnes per hectare)					
($/t)	4.5	5.0	6.0	7.0	8.0	9.0
115	109	224	339	454	569	684
125	149	274	399	524	649	774
135	189	324	459	594	729	864
145	229	374	519	664	809	954
155	269	424	579	734	889	1044

Breakeven Analysis (Gross Margin Breakeven)

Breakeven Yield at a price of $135/tonne = 2.60 t/ha
Breakeven Price at a yield of 7 t/ha = $50.19/tonne

NOTE: This gross margin relates to first time cultivation. In subsequent cultivations the cost of production will be lower.

GROSS MARGIN BUDGET

ENTERPRISE NAME: Rice
ENTERPRISE UNIT: 1 hectare

REGION: Adelaide River
DATE: October 1991

		$/ha	Your Estimate
INCOME			
Yield	3.00 t/ha @ $230/tonne	690	
Other Income	Fertiliser Subsidy 300 kg @ $95/tonne	29	
A. TOTAL INCOME		**719**	
VARIABLE COSTS			
Land Preparation			
1 Disc Ploughing	4.48 ha/h @ $27.05/h	6	
2 Cultivation	6.30 ha/h @ $24.96/h	8	
1 Laser Levelling (assume one third of area levelled per year)	1 ha/h @ $45/h	15	
Sowing			
Seed	100 kg/ha @ $405/tonne	41	
Sowing Operation	3.84 ha/h @ $14.24/h	4	
Fertilisers			
Urea	200 kg/ha @ $525/tonne	105	
Dbl. Super + Zinc	100 kg/ha @ $550/tonne	55	
1 application (with sowing)	3.8 ha/h @ $14.24/h	4	
1 aerial application	@ $18/ha	18	
Weed Control			
Propanil	8 L/ha @ $6.00/L	48	
Saturn	2 L/ha @ $12.32/L	25	
1 aerial application	@ $18/ha	18	
Pest Control			
Ammunition (for birds)		10	
Allowance for Insect Control		35	
Harvesting	7 tonne/h @ $180/h	77	
Contract Harvester			
Marketing	@ $22/tonne	66	
Cartage to Depot			
B. TOTAL VARIABLE COSTS		**534**	
C. GROSS MARGIN PER HECTARE (A-B)		**185**	

Sensitivity of Rice Gross Margin ($/ha) to Varying Yields and Prices

Price	Yield (tonnes per hectare)				
($/t)	1.0	2.0	3.0	4.0	5.0
210	-295	-85	125	335	545
220	-285	-65	155	375	595
230	-275	-45	185	415	645
240	-265	-25	215	455	695
250	-255	-5	245	495	745

Breakeven Analysis (Gross Margin Breakeven)

Breakeven Yield at a price of $230/tonne = 2.20 t/ha
Breakeven Price at a yield of 3.0 t/ha = $168.33/tonne

Appendix A: Field Crop Yields: Historical Data

GRAIN SORGHUM

Areas Sown, Commercial and Test Yields by Season

Year	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91
Area Sown (ha)	637	612	992	2335	1845	2382	2590	1207
Commercial Yield/ Area Sown (t/ha)	2.3	2.5	1.8	1.6	2.1	1.8	1.3	1.98
Test Yield/ Test Area Sown	4.8	3.8	4.1	-	5.1	5.2	5.4	5.2

MAIZE

Areas Sown, Commercial and Test Yields by Season

Year	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91
Area Sown (ha)	978	1304	1701	1100	1740	310	380	85
Commercial Yield/ Area Sown (t/ha)	2.3	2.7	0.8	1.5	0.7	1.8	0.45	1.74
Test Yield/ Test Area Sown	5.3	5.8	2.9	2.4	4.0	3.3	1.7	3.8

SOYBEANS

Areas Sown, Commercial and Test Yields by Season

Year	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91
Area Sown (ha)	404	692	383	106	110	80	0	0
Commercial Yield/ Area Sown (t/ha)	1.9	0.5	0.7	1.1	1.1	0.3	NA	NA
Test Yield/ Test Area Sown	3.8	2.8	2.5	-	2.0	0.3	NA	NA

PEANUTS

Areas Sown, Commercial and Test Yields by Season

Year	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91
Area Sown (ha)		60	175	310	110	20	0	0
Commercial Yield/ Area Sown (t/ha)		1.2	1.7	1.2	2.1	0.5	NA	NA
Test Yield/ Test Area Sown	-	-	2.8	2.5	3.1	2.2	NA	NA

SESAME

Areas Sown, Commercial and Test Yields by Season

Year	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91
Area Sown (ha)	-	-	145	480	585	602	205	370
Commercial Yield/ Area Sown (t/ha)	-	-	0.8	0.2	0.4	0.2	0.23	0.19
Test Yield/ Test Area Sown	-	-	-	0.7	1.2	0.8	0.3	1.0

MUNGBEANS

Areas Sown, Commercial and Test Yields by Season

Year	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91
Area Sown (ha)	202	117	264	63	238	311	0	10
Commercial Yield/ Area Sown (t/ha)	0.6	1.2	0.4	-	0.8	0.7	NA	1.1
Test Yield/ Test Area Sown	1.9	1.7	1.2	-	1.3	1.0	0.25	1.1

Appendix B: Machinery Work Rates

		Tractor Details		Implement Details			Field Eff. %	Work Rate ha/h
Operation	**Implement**	**PTO (KW)**	**Price ($)**	**Width (m)**	**Price ($)**	**Speed (kph)**		
Ploughing	Offset Discs	145	122000	8	45000	8.0	70	4.48
Chisel Ploughing	Chisel Plough	145	122000	8	40000	8.0	70	4.48
Cultivation	Cultivator	145	122000	10	20000	9.0	70	6.30
Harrowing	Harrows	66	60000	12	13000	10.0	70	8.40
Sowing	Combine	66	60000	6	24000	8.0	80	3.84
Sowing	Row Crop Planter	66	60000	6	35000	10.0	70	4.20
Spreading	Spreader	66	60000	10	9000	12.0	60	7.20
Spraying	Boom Spray	66	60000	12	9000	12.0	65	9.36
Harvesting	Header (sorghum)			6	180000	7.0	75	3.15
Harvesting	Header (Maize, Sesame etc)			6	180000	5.0	70	2.10
Harvesting Hay	Mower/conditioner	66	60000	2.8	30000	4.0	75	0.84
Baling Hay	Baler	66	60000	3.2	26500	3.0	60	0.58
			A	B	C	D	E	F

Notes

$$\text{Work Rate (ha/h)} = \frac{\text{Width x Speed x Field efficiency (\%)}}{1000}$$

Appendix C: Machinery Operating Costs

Implement	Fuel ($/L)	Repairs & Maint. Prop. of Price		Expected Life		Fuel Used (L/h)	Fuel & Oil ($/h)	Repairs & Maint.		Total Operating Cost ($/h)
		Tractor (%)	Implement (%)	Tractor (h)	Implement (h)			Tractor ($/h)	Implement ($/h)	
Offset Discs	0.40	72	20	10000	2400	33	14.52	8.78	3.75	27.05
Chisel Plough	0.40	72	20	10000	2400	33	14.52	8.78	3.33	26.63
Cultivator	0.40	72	20	10000	2400	33	14.52	8.78	1.66	24.96
Harrows	0.40	72	20	10000	2400	15	6.60	4.32	1.08	12.00
Combine Planter	0.40	72	20	10000	2400	18	7.92	4.32	2.00	14.24
Row Crop Planter	0.40	72	20	10000	2400	16	7.04	4.32	2.92	14.28
Spreader	0.40	72	30	10000	1200	14	6.16	4.32	2.25	12.73
Boom Spray	0.40	72	30	10000	1200	14	6.16	4.32	2.25	12.73
Header (sorghum)	0.40	72	50	10000	1800	44	19.36	-	50.00	69.36
Header (Maize, sesame etc)	0.40	72	50	10000	1800	44	19.36	-	50.00	69.36
Mower/Conditioner	0.40	72	30	10000	1200	16	7.04	4.32	7.05	18.86
Baler	0.40	72	30	10000	1200	16	7.04	4.32	6.62	17.98
	G	H	I	J	K	L	M	N	O	P

Notes

1. Columns F and P provide estimates used in the standardised GM budgets.
2. Reductions in field operating efficiency occur due to; turning at the end of a paddock, failure to use full implement width, time taken to load seed and fertiliser, unloading of harvested crops, minor adjustments and repairs and lubrication whilst in the field.
3. Actual header speed and efficiency will vary for each crop.
4. The fuel price is calculated net of fuel rebates.
5. R&M costs are expressed as a percentage of the new purchase price.
6. M = 1.1 G*L
   N = (A*H)/(J*100)
   O = (C*I)/(K*100)
   P = M + N + O

Appendix D:

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