

**TECHNICAL BULLETIN
NO. 197**

**GROSS MARGIN
BUDGETS FOR FIELD
CROPS IN THE
KATHERINE REGION
1992-93**

Northern Territory Department of
Primary Industry and Fisheries

**GROSS MARGIN BUDGETS FOR FIELD CROPS
IN THE KATHERINE REGION
1992-93**

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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.

SUSTAINABLE AGRICULTURE IN THE NORTHERN TERRITORY

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INTRODUCTION

This handbook contains guidelines for the calculation of gross margins for the various field crops grown in the Katherine District. It is designed to assist farmers in making decisions on which crops to grow and the area to plant.

1.1 What is a Gross Margin?

The gross margin of a farm enterprise is the difference between its gross income (i.e. total receipts which depend on yield and current prices) and its variable costs (i.e. those costs which vary in proportion to the size of the enterprise - costs such as fertilisers, fuel, cartage).

$$\text{GROSS MARGIN} = \text{GROSS INCOME} \text{ minus } \text{VARIABLE COSTS}$$

Gross margins are commonly calculated on a per hectare basis although they may also be expressed in terms of other limiting resources such as labour units, or per \$100 of capital invested. Comparisons of gross margins for different crops are only valid if they have been calculated on the same basis.

Gross margins may be used to:

- (a) Compare costs and returns for different crops provided overhead expenses are similar.
- (b) Show the effect on enterprise income of a change in yields, prices, or cultivation methods.
- (c) Show where money is being spent.

1.2 Limitations of Gross Margins

The gross margin for an enterprise is a good guide to the profitability of that enterprise under the conditions of crop production costs, yields and prices specified. Those farmers who have been operating in the district for a number of years should use the costs of their own production methods when preparing gross margins for existing or planned farm enterprises. Records of previous crops should be used to predict yields, to determine the quantities of physical inputs required and the crop yields that can be expected. Changes in fertiliser inputs required as a result of previous cropping on an area can be checked with the local crops agronomist. Current costs of materials should be checked with suppliers.

A gross margin is not the same as farm profit. The sum of all enterprise gross margins for a particular farm represents the whole farm gross margin. In order to derive total farm profit from this figure, fixed or overhead costs must be deducted. Overhead costs are those costs not directly related to the size of the farm enterprise, e.g., telephone, permanent labour and interest. The sum of the gross margins from each enterprise together with any other farm income must be sufficient to cover these overhead expenses if the farm is to remain viable.

NOTE: The breakeven yields and prices mentioned in this publication do not take into account fixed costs.

FARMING IN THE KATHERINE REGION

2.1 Location

Areas have been cleared for cropping on fourteen farms in the Katherine Region. While most farms are close to Katherine, the local commercial centre and site of a NT Grain Marketing Board terminal, some are situated up to 300 km away.

2.2 Rainfall

Rainfall is a primary constraint to agricultural development in the area. Daily rainfall records have been recorded at Katherine since 1873 (see Agnote No. 214). Mean annual rainfall is 972 mm but has ranged from a low of 365 mm in 1951/52 to 1923 mm in 1897/98. In 87% of years rainfall was between 600 mm and 1300 mm.

Rainfall in the Katherine area is strongly seasonal. About 92% of annual rainfall occurs in the five month period November to March while June, July and August experience no rainfall in most years. In 90% of years rainfall for the November - March period was 627 mm or more. However it has been amply demonstrated in the past few years that although total rainfall during the cropping period should be adequate for crop production, the incidence of dry spells during the growing period, or an early finish to the Wet can result in less than viable crops unless scheduled sowing dates for individual crops is adhered to.

2.3 Land Prices and Availability

Properties with land suitable for cropping come onto the market from time to time. However the cleared area is usually a very small proportion of the total area and therefore is not necessarily reflected in the purchase price.

Prices paid for properties in the region during 1991 and 1992 were low, reflecting the state of the economy in general. Land prices were around \$0.40 per hectare for two sales of pastoral properties with large areas of uncleared arable land. Property areas ranged from 400 to 1500 square kilometres.

In addition to the value of the unimproved land, a cost of \$350-400 per hectare will be incurred in clearing and preparing areas for cropping. This cost will vary with the time of year the operations are carried out, the type of vegetation, the property location and whether the work is done by a contractor or by the farmer.

2.4 Machinery and Improvements

Local conditions determine the type and range of equipment used for cropping. The cost of new machinery is used in calculating gross margin budgets. Machinery values, together with values for some crop-related improvements, are given below. The assumptions used in calculating the machinery work rates and the costs of fuel and repairs are set out in Appendix A.

Machinery & improvements	Approximate new value (landed in Katherine)
Tractor 75kw - 2wd	\$55,000
Chisel Plough - 5m wide	\$21,000
Tyned Cultivator - 6.97m	\$21,000
Trash Culti Drill - 5m wide	\$28,400
Coulters for above drill	\$9,000
Fertiliser Spreader - 20 bags	\$4,000
Boom Spray - 2000L 12m boom	\$10,000
Grain Harvester - 175kw 9.1m front	\$200,000
Mower-conditioner, roller	\$19,000
Hay rake	\$1,300
Round Baler	\$25,000
Mobile Bins	\$20,000
Elevator	\$6,500
Tools	\$10,000
Machinery Shed	\$45,000
Weldmesh Silos	\$8,000
Fencing, say 10 km @ \$3,000/km	\$30,000

2.5 Finance and Government Assistance

The Commonwealth Bank of Australia, Westpac and the ANZ Bank all have branches in Katherine and there is a Branch of the Commonwealth Development Bank in Darwin. The Commonwealth Rural Adjustment Scheme is managed in the NT by the NT Department of Primary Industry & Fisheries.

The NT Government provides financial assistance to crop farmers under the Stockfeed Grain Price Support Scheme (to assist with the supply of local grain for stockfeed manufacture in the NT). A fertiliser freight subsidy of up to \$95 per tonne is also available to help defray the cost of bringing fertilisers to the NT. In addition there are Commonwealth and NT fuel tax rebate schemes to lower the duty on diesel fuel used for agriculture. Further information on these schemes is available from the Regional Economist.

2.6 Marketing

The NT Grain Marketing Board has grain storage, grading and marketing facilities at Katherine. The functions of the Board are to acquire, process, treat, market and generally deal with commodities grown or produced in the N.T. and to administer the Marketing Scheme for commodities declared and vested in the Board. The crops currently declared and vested in the Board are grain sorghum and maize. Arrangements should be made with the NT Grain Marketing Board for delivery of grain to the Katherine Grain Receival Depot (telephone 722886) or other points as agreed. Delivery is the responsibility of the farmer. The grain is weighed and the quality assessed on delivery.

The Board announces indicative prices for most crops prior to the beginning of the cropping season. Payment for vested crops is made in instalments. The first advance, based on the indicative price, is paid soon after delivery and the final adjustment, including interest charges, is paid when the grain is sold.

BASIS FOR STANDARD GROSS MARGIN BUDGETS

3.1 Farm Size

The variable costs in the following examples are calculated for a farm in the Katherine District with an annual cropping area of 300-400 hectares. The costs are calculated on a per hectare basis. No labour costs are included as labour has been considered as a fixed cost.

3.2 Cultural Practices

The technical inputs are based on recommendations by Departmental Agronomists. Further agronomic information is available from the Extension Officer (Crops) for the Katherine Region (telephone 728739).

The prices of materials such as seed, fertiliser and twine are based on Katherine retail prices at September, 1992.

3.3 Machinery Operating Costs

Machinery work rates are based on Queensland figures modified where applicable to suit conditions in the Katherine Region. The workrate will vary with the size and age of the machinery, the soil conditions and the experience of the operator.

The cost of farm operations (\$/ha) is equal to the hourly operating cost of the machinery divided by the number of hectares worked in an hour (i.e. the workrate).

Machinery operating costs in these budgets include only fuel, oil, repairs and maintenance. Other overhead costs (e.g. labour, depreciation, interest on capital invested, insurance) are not included.

Most operations such as cultivating, planting and spraying involve a tractor and hitched implement. The operating costs therefore are equal to the sum of the tractor running costs (fuel, oil, repairs and maintenance) plus repairs and maintenance on the implement.

GROSS MARGIN BUDGET SUMMARY

	GRAIN SORGHUM Conventional	GRAIN SORGHUM No-till	MUNGBEANS	MUNGBEANS (Stockfeed)	SESAME	PEARL MILLET	HAY
Yield (t/ha)	2.0	2.5	0.8	0.8	0.75	1.0	7.0
Price (\$/t)	225	225	500 x 80% 290 x 20%	300	900	200	120
GROSS INCOME (\$/ha)	450	563	366	240	675	200	840
Land preparation	12	23	7	7	12	12	12
Planting	45	44	20	19	9	15	40
Fertiliser	90	90	29	29	113	47	70
Weed Control	17	17	16	16	9	-	-
Insect Control	-	-	17	0	45	-	-
PRE-HARVEST COSTS	164	175	89	71	187	74	122
HARVESTING COSTS	12	12	23	23	19	12	55
Wrap	-	-	-	-	-	-	56
Cartage @ \$30/t	60	75	24	24	23	30	-
Clean, Grade, Bag	-	-	60	-	56	75	-
Handling	24	30	10	10	9	12	-
POST-HARVEST COSTS	84	105	94	34	88	117	56
TOTAL VARIABLE COSTS (\$/ha)	260	292	205	127	294	203	233
GROSS MARGIN (\$/ha)	190	271	161	113	381	-3	607

4.1

GRAIN SORGHUM - Conventional tillage

ENTERPRISE NAME: Grain Sorghum

REGION: Katherine

ENTERPRISE UNIT: 1 hectare

DATE: September 1992

INCOME		\$/ha	Your Estimate
Yield	2.0 t/ha @ \$225/tonne	450	
Other Income	Fertiliser subsidy 195 kg/ha @ \$95/tonne	19	
A. TOTAL INCOME		469	
VARIABLE COSTS			
Land Preparation			
1 Trashwork	2.8 ha/h @ \$13.74/h	5	
2 Cultivations	5.6 ha/h @ \$13.74/h	2	
	3.2 ha/h @ \$14.36/h	5	
Planting			
Seed	10 kg/ha @ \$4.00/kg	40	
Planting	3.2 ha/h @ \$14.36/h	5	
Fertilisers			
CL 19:13	120 kg/ha @ \$566/tonne	68	
Urea	75 kg/ha @ \$524/tonne	39	
1 Spreading	8.4 ha/h @ \$12.99/h	2	
Weed Control			
Atrazine	3 L/ha @ \$5.25/L	16	
1 Spraying	9.4 ha/h @ \$14.49/h	2	
Harvesting	6.1 ha/h @ \$72.44/h	12	
Marketing			
Cartage to Depot	@ \$30/tonne	60	
Handling	@ \$12/tonne	24	
B. TOTAL VARIABLE COSTS		278	
C. GROSS MARGIN PER HECTARE (A-B)		190	

Notes:

An additional net value for sorghum stubble and regrowth as fodder, hay or mulch can be included for some farming systems.

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

Price	Yield (tonnes per hectare)				
(\$/t)	1.0	2.0	3.0	4.0	5.0
195	-23	130	283	436	589
205	-13	150	313	476	639
215	-3	170	343	516	689
225	7	190	373	556	739
235	17	210	403	596	789

Breakeven Analysis

Using the above gross margin budget the breakeven yield and prices are:

Breakeven Yield at a price of \$225 t/ha = 0.96 t/ha

Breakeven Price at a yield of 2.0 t/ha = \$130/tonne

Additional returns (i.e. over the breakeven yield or price) are required to meet the costs of overheads and management.

Grain Sorghum historical data

SORGHUM (Katherine)	1987-88	1988-89	1989-90	1990-91	1991-92
Area sown (ha)	1950	2351	1190	1212	1210
Highest paddock yield	n.a.	2.84	n.a.	n.a.	1.77
Paddock size (ha)	n.a.	50	n.a.	n.a.	300
Average yield	0.52	0.67	0.55	1.78	0.77

n.a. = not available

Note: Refers only to non-irrigated crops.

4.2

GRAIN SORGHUM - Zero tillage

ENTERPRISE NAME: Grain Sorghum

REGION: Katherine

ENTERPRISE UNIT: 1 hectare

DATE: September 1992

INCOME		\$/ha	Your Estimate
Yield	2.5 t/ha @ \$225/tonne	563	
Other Income	Fertiliser subsidy 195 kg/ha @ \$95/tonne	19	
A. TOTAL INCOME		581	
VARIABLE COSTS			
Roundup CT	1.6 L/ha @ \$13.70/L	22	
Knock down spray	9.4 ha/h @ \$14.99/h	2	
Planting			
Seed	10 kg/ha @ \$4.00/kg	40	
Planting (incl. fertiliser)	3.8 ha/h @ \$15.11/h	4	
Fertilisers			
CL 19:13	120 kg/ha @ \$566/tonne	68	
Urea	75 kg/ha @ \$524/tonne	39	
1 Spreading	8.4 ha/h @ \$12.99/h	2	
Weed Control			
Atrazine	3 L/ha @ \$5.25/L	16	
1 Spraying	9.4 ha/h @ \$14.49/h	2	
Harvesting	6.1 ha/h @ \$72.44/h	12	
Marketing			
Cartage to depot	@ \$30/tonne	75	
Handling	@ \$12/tonne	30	
B. TOTAL VARIABLE COSTS		310	
C. GROSS MARGIN PER HECTARE (A-B)		271	

Notes:

An additional net value for sorghum stubble and regrowth as fodder, hay or mulch can be included for some farming systems.

An increasing number of grain sorghum crops in the Katherine Region are now grown using conservation tillage systems.

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

Price	Yield (tonnes per hectare)					
(\$/t)	1.0	2.0	2.5	3.0	4.0	5.0
195	-34	119	196	272	425	578
205	-24	139	221	302	465	628
215	-14	159	246	332	505	678
225	-4	179	271	362	545	728
235	6	199	296	392	585	778

Breakeven Analysis

Using the above gross margin budget the breakeven yield and prices are:

Breakeven Yield at a price of \$225 t/ha = 1.02 t/ha

Breakeven Price at a yield of 2.5 t/ha = \$117/tonne

4.3

MUNGBEANS

ENTERPRISE NAME: Mungbeans
ENTERPRISE UNIT: 1 hectare

REGION: Katherine
DATE: September 1992

INCOME		\$/ha	Your Estimate
Yield	0.8 t/ha ex harvester		
	80% @ \$500/tonne	320	
Other Income	20% @ \$290/tonne	46	
	Fertiliser subsidy		
	110 kg/ha @ \$95/tonne	10	
A. TOTAL INCOME		377	
VARIABLE COSTS			
Land Preparation			
1 Trashwork	2.8 ha/h @ \$13.74/h	5	
1 Cultivation	5.6 ha/h @ \$13.74/h	2	
Planting			
Seed (Putland)	12 kg/ha @ \$1.27/kg	15	
Planting	3.2 ha/h @ \$14.36/h	5	
Fertilisers			
Superphosphate (applied at planting)	110 kg/ha @ \$363/tonne	40	
Weed Control			
Treflan	2 L/ha @ \$7.00/L	14	
1 Spraying	9.4 ha/h @ \$14.49/h	2	
Insect Control			
Thiodan	2 L/ha @ \$7.50/L	15	
1 Spraying	9.4 ha/h @ \$14.49/h	2	
Harvesting	3.2 ha/h @ \$72.44/h	23	
Marketing			
Cartage to depot	@ \$30/tonne for 0.8 tonne	24	
Clean and grade	@ \$50/tonne for 0.8 tonne	40	
Bags and bagging	@ \$25/tonne for 0.8 tonne	20	
Handling	@ \$12/tonne for 0.8 tonne	10	
B. TOTAL VARIABLE COSTS		216	
C. GROSS MARGIN PER HECTARE (A-B)		161	

Notes:

Departmental time-of-sowing trials show that as sowing dates progress from mid-January to early February, yield of mungbeans decline. Late rains can affect sprouting quality but the additional yields of early-sown mungbeans should compensate for any decline in quality.

**Sensitivity of Mungbean Gross Margin (\$/ha) to Varying Paddock Yields and Prices
(assuming 20% Splits @ \$290/t)**

Price	Paddock Yield (tonnes per hectare)			
(\$/t)	0.4	0.8	1.2	1.6
400	-7	97	202	306
450	9	129	250	370
500	25	161	298	434
550	41	193	346	498
600	57	225	394	562

Breakeven Analysis

Using the above gross margin budget the breakeven yield and prices are:

Breakeven Yield at a price of \$500/tonne = 0.33 t/ha ex harvester

Breakeven Price at a yield of 0.8 t/ha ex harvester = \$248/tonne

Additional returns (i.e. over the breakeven yield or price) are required to meet the costs of overheads and management.

Mungbean historical data

MUNGBEAN (Katherine)	1987-88	1988-89	1989-90	1990-91	1991-92
Area sown (ha)	307	331	160	55	150
Highest paddock yield	n.a.	0.74	n.a.	0.4	0.47
Paddock size (ha)	n.a.	90	n.a.	20	90
Average yield	0.14	0.40	0.18	0.16	0.43

n.a. = not available

4.4

MUNGBEANS - Stockfeed

ENTERPRISE NAME: Mungbeans

REGION: Katherine

ENTERPRISE UNIT: 1 hectare

DATE: September 1992

INCOME		\$/ha	Your Estimate
Yield	0.8 t/ha @ \$300/tonne	240	
Other Income	Fertiliser subsidy 110 kg/ha @ \$95/tonne	10	
A. TOTAL INCOME		250	
VARIABLE COSTS			
Land Preparation			
1 Trashwork	2.8 ha/h @ \$13.74/h	5	
1 Cultivation	5.6 ha/h @ \$13.74/h	2	
Planting			
Seed (Putland)	11 kg/ha @ \$1.27/kg	14	
Planting	3.2 ha/h @ \$14.36/h	5	
Fertilisers			
Superphosphate	110 kg/ha @ \$363/tonne	40	
Weed Control			
Treflan	2 L/ha @ \$7.00/L	14	
1 Spraying	9.4 ha/h @ \$14.49/h	2	
Harvesting			
Harvesting	3.2 ha/h @ \$72.44/h	23	
Marketing			
Cartage to depot	@ \$30/tonne	24	
Handling	@ \$12/tonne	12	
B. TOTAL VARIABLE COSTS		138	
C. GROSS MARGIN PER HECTARE (A-B)		113	

Notes:

One spraying for insect control may be necessary in some circumstances.

Sensitivity of Mungbean for Stockfeed Gross Margin (\$/ha) to Varying Yields and Prices

Price	Yield (tonnes per hectare)					
(\$/t)	0.4	0.6	0.8	1.0	1.2	1.4
280	2	49	97	144	192	240
290	6	55	104	154	204	254
300	10	61	113	164	216	268
310	14	67	121	174	228	282
320	18	73	129	184	240	296

Breakeven Analysis

Using the above gross margin budget the breakeven yield and prices are:

Breakeven Yield at a price of \$300 t/ha = 0.36 t/ha

Breakeven Price at a yield of 0.8 t/ha = \$159/tonne

Additional returns (i.e. over the breakeven yield or price) are required to meet the costs of overheads and management.

4.5

SESAME

ENTERPRISE NAME: Sesame
ENTERPRISE UNIT: 1 hectare

REGION: Katherine
DATE: September 1992

INCOME		\$/ha	Your Estimate
Yield	0.75 t/ha @ \$900/tonne	675	
Other Income	Fertiliser subsidy 244 kg/ha @ \$95/tonne	23	
A. TOTAL INCOME		698	
VARIABLE COSTS			
Land Preparation			
1 Trashwork	2.8 ha/h @ \$13.74/h	5	
2 Cultivations	5.6 ha/h @ \$13.74/h	2	
	3.2 ha/h @ \$14.36/h	5	
Planting			
Seed	3 kg/ha @ \$1.44/kg	4	
Planting	3.2 ha/h @ \$14.36/h	5	
Fertilisers			
CL 19:13	154 kg/ha @ \$566/tonne	87	
Urea	90 kg/ha @ \$524/tonne	47	
1 Spreading	8.4 ha/h @ \$14.94/h	2	
Weed Control			
Treflan	1 L/ha @ \$7.00/L	7	
1 Spraying	9.4 ha/h @ \$14.49/h	2	
Insect Control			
Thiodan	2 L/ha @ \$7.50/L	15	
1 Aerial spraying	@ \$30.00/ha	30	
Harvesting	3.8 ha/h @ \$72.44/h	19	
Marketing			
Cartage to Depot	@ \$30/tonne	23	
Cleaning and bagging	@ \$75/tonne	56	
Handling	@ \$12/tonne	9	
B. TOTAL VARIABLE COSTS		317	
C. GROSS MARGIN PER HECTARE (A-B)		381	

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

Price	Yield (tonnes per hectare)				
(\$/t)	0.25	0.50	0.75	1.00	1.25
700	-60	85	231	377	523
800	-35	135	306	477	648
900	-10	185	381	577	773
1000	15	235	456	677	898
1100	40	285	531	777	1023

Breakeven Analysis

Using the above gross margin budget the breakeven yield and prices are:

Breakeven Yield at a price of \$900 t/ha = 0.26 t/ha

Breakeven Price at a yield of 0.75 t/ha = \$392/tonne

Additional returns (i.e. over the breakeven yield or price) are required to meet the costs of overheads and management.

Sesame historical data

SESAME (Katherine)	1987-88	1988-89	1989-90	1990-91	1991-92
Area sown (ha)	100	260	380	50	40
Highest paddock yield	n.a.	0.34	n.a.	0.41	0.22
Paddock size (ha)	n.a.	200	n.a.	40	30
Average yield	0.12	0.33	0.05	0.35	0.17

n.a. = not available

4.6

PEARL MILLET

ENTERPRISE NAME: Pearl Millet
ENTERPRISE UNIT: 1 hectare

REGION: Katherine
DATE: September 1992

INCOME		\$/ha	Your Estimate
Yield	1.0 t/ha @ \$200/tonne	200	
Other Income	Fertiliser Subsidy 100 kg/ha @ \$95/tonne	10	
A. TOTAL INCOME		210	
VARIABLE COSTS			
Land Preparation			
1 Trashwork	2.8 ha/h @ \$13.74/h	5	
2 Cultivations	5.6 ha/h @ \$13.74/h	2	
	3.2 ha/h @ \$14.36/h	5	
Planting			
Seed (Katherine Pearl)	10 kg/ha @ \$1.00/kg	10	
Planting	3.2 ha/h @ \$14.36/h	5	
Fertilisers			
CL 19:13	100 kg/ha @ \$566/tonne	57	
Harvesting	6.1 ha/h @ \$72.44/h	12	
Marketing			
Cartage to depot	@ \$30/tonne	30	
Cleaning and bagging	@ \$70/tonne	70	
Handling	@ \$12/tonne	12	
B. TOTAL VARIABLE COSTS		212	
C. GROSS MARGIN PER HECTARE (A-B)		-3	

Notes:

Millet grain is used in some Territory feed mixes as a partial replacement for sunflower seed. Its protein content is usually higher than sorghum or maize.

There is also a small local market of about 40 tonnes per year for Bulrush Millet (preferably the later seeding Katherine Pearl) for use by vegetable growers as a cover crop during the Wet Season. This returns \$500 per tonne to farmers provided the seed is of adequate quality.

Additional net returns from forage before flowering, and from stubble as mulch, could be included in some farming systems.

Sensitivity of Pearl Millet Gross Margin (\$/ha) to Varying Yields and Prices

Price	Yield (tonnes per hectare)					
(\$/t)	0.7	0.8	0.9	1.0	1.1	1.2
185	-38	-31	-24	-18	-11	-4
200	-27	-19	-11	-3	6	14
400	112	141	169	197	226	254
550	218	261	304	347	391	434

Breakeven Analysis

Using the above gross margin budget the breakeven yield and prices are:

Breakeven Yield at a price of \$200 t/ha = 1.03 t/ha

Breakeven Price at a yield of 1.0 t/ha = \$203/tonne

Additional returns (i.e. over the breakeven yield or price) are required to meet the costs of overheads and management.

4.7

HAY

ENTERPRISE NAME: Hay
ENTERPRISE UNIT: 1 hectare

REGION: Katherine
DATE: September 1992

INCOME		\$/ha	Your Estimate
Yield	7.0 t/ha @ \$120/tonne	840	
Other Income	Fertiliser subsidy 150 kg/ha @ \$95/tonne	14	
A. TOTAL INCOME		854	
VARIABLE COSTS			
Land Preparation			
1 Trashwork	2.8 ha/h @ \$13.74/h	5	
2 Cultivations	5.6 ha/h @ \$13.74/h	2	
	3.2 ha/h @ \$14.36/h	5	
Planting			
Forage Sorghum	12 kg/ha @ \$2.95/kg	35	
Planting	3.2 ha/h @ \$14.36/h	5	
Fertilisers			
CL 19:13	100 kg/ha @ \$566/tonne	57	
Urea	50 kg/ha @ \$524/tonne	26	
Spreading	8.4 ha/h @ \$12.99/h	2	
Harvesting			
Mow/condition	0.7 ha/h @ \$16.74/h	23	
Round baling	0.6 ha/h @ \$18.24/h	32	
Wrapping	@ \$2.00/bale	56	
B. TOTAL VARIABLE COSTS		247	
C. GROSS MARGIN PER HECTARE (A-B)		607	

Notes:

An additional net value for sorghum stubble and regrowth as fodder, hay or mulch can be included for some farming systems.

Sensitivity of Hay Gross Margins (\$/ha) to Varying Yields and Prices

Price	Yield (tonnes per hectare)				
(\$/t)	4.0	5.0	6.0	7.0	8.0
105	187	292	397	502	607
120	247	367	487	607	727
135	307	442	577	712	847
150	367	517	667	817	967
165	427	592	757	922	1087

Breakeven Analysis

Using the above gross margin budget the breakeven yield and prices are:

Breakeven Yield at a price of \$120/tonne = 1.58 t/ha

Breakeven Price at a yield of 7 t/ha = \$33/tonne

Additional returns (i.e. over the breakeven yield or price) are required to meet the costs of overheads and management.

Appendix A

Assumptions Used In Calculating Machinery Work Rates And Operating Costs

Implement	Tractor details		Implement details			Field efficiency (%)	Work rate (ha/h)
	PTO (kW)	Price (\$)	Width (m)	Price (\$)	Speed (km/h)		
Chisel Plough	75	55,000	5.0	21,000	8.0	70	2.8
Tyned Cultivator	75	55,000	7.0	21,000	10.0	80	5.6
Trash Culti Drill	75	55,000	5.0	28,400	9.0	70	3.2
TC Drill with Coulters	75	55,000	5.0	37,400	10.0	75	3.8
Fertiliser Spreader	75	55,000	10.0	4,000	12.0	70	8.4
Boom Spray	75	55,000	12.0	10,000	12.0	65	9.4
Grain Harvester - Sesame - Mungbeans - Sorghum, Millet			9.1	200,000	6.0	70	3.8
			9.1	200,000	5.0	70	3.2
			9.1	200,000	9.8	75	6.1
Mower-Conditioner	75	55,000	2.4	19,000	4.0	77	0.7
Hay Rake	75	55,000	3.2	1,300	8.0	80	2.0
Baler	75	55,000	3.2	25,000	3.0	60	0.6

F =

E

D

C

B

A

Notes: F = B x D x E

Implement	Fuel (\$/L)	Repairs & maintenance (percentage of price)		Expected life		Fuel used (L/h)	Fuel & oil (\$/h)	Repairs & maintenance		Total operating cost (\$/h)
		Tractor (%)	Implement (%)	Tractor (h)	Implement (h)			Tractor (\$/h)	Implement (\$/h)	
Chisel Plough	0.44	72	20	10000	2400	16.65	8.03	3.96	1.75	13.74
Tyned Cultivator	0.44	72	20	10000	2400	16.65	8.03	3.96	1.75	13.74
Trash Culti Drill	0.44	72	20	10000	2400	16.65	8.03	3.96	2.37	14.36
TC Drill with Coulters	0.44	72	20	10000	2400	16.65	8.03	3.96	3.12	15.11
Fertiliser Spreader	0.44	72	30	10000	1200	16.65	8.03	3.96	1.00	12.99
Boom Spray	0.44	72	30	10000	1200	16.65	8.03	3.96	2.50	14.49
Grain Harvester	0.44	72	50		1800	35.00	16.88	-	55.56	72.44
Mower-Conditioner	0.44	72	30	10000	1200	16.65	8.03	3.96	4.75	16.74
Hay Rake	0.44	72	20	10000	1200	16.65	8.03	3.96	0.22	12.21
Baler	0.44	72	30	10000	1200	16.65	8.03	3.96	6.25	18.24

Notes: $M = 1.1 \text{ G} \times \text{L}$ $N = (A \times H) / (J \times 100)$ $O = (C \times I) / (K \times 100)$ $P = M + N + O$

$M = 1.1 \text{ G} \times \text{L}$
 $N = (A \times H) / (J \times 100)$
 $O = (C \times I) / (K \times 100)$
 $P = M + N + O$

Appendix B

Farm Costs And Prices Used In Budgets

Fertiliser	
Superphosphate	\$363/t
CL 19:13	\$566/t
CL 18:20	\$615/t
Urea	\$524/t
Herbicide	
Treflan	\$7.00/L
Atrazine	\$5.25/L
Dual	\$18.45/L
Roundup CT	\$13.70/L
Insecticide	
Thiodan	\$7.50/L
Lannate	\$15.25/L
Seed	
Mungbeans (var. Putland)	\$1.27/kg
Sorghum (Pacific, deKalb)	\$4.00/kg
Forage sorghum (var. Jumbo)	\$2.95/kg
Lab Lab	\$1.00/kg
Sesame	\$1.44/kg
Millet (Katherine Pearl)	\$1.00/kg
Contracts	
Handling	\$12.00/t
Clean & grading	\$50.00/t
Bagging	\$25.00/t
Cartage	\$30.00/t
Aerial Spraying	\$30.00/ha
Other	
Bale wrap	\$ 2.00/bale
Inoculum	\$ 3.50/pkt
Fertiliser subsidy	\$95.00/t
Diesel fuel	72.00¢/L
Comm. diesel rebate	26.15¢/L
NT diesel rebate	2.00¢/L
Produce	
Mungbeans - Sprouting	\$500/t
Mungbeans - Splits	\$290/t
Mungbeans - Feed grade	\$300/t
Sorghum	\$225/t
Hay	\$120/t
Sesame	\$900/t
Expected Yield	
Mungbeans - Sprouting	0.8 t/ha
Mungbeans - Stockfeed	0.8t/ha
Sorghum - Conventional tillage	2.0 t/ha
Sorghum - Zero tillage	2.5 t/ha
Hay	7.0 t/ha
Sesame	0.75 t/ha
Millet (Katherine Pearl)	1.0 t/ha

