

**TECHNICAL BULLETIN
NO. 180**

**GROSS MARGIN BUDGETS
FOR FIELD CROPS
IN THE
KATHERINE REGION
1991-92**

Northern Territory Department of
Primary Industry and Fisheries

**GROSS MARGIN BUDGETS FOR FIELD CROPS
IN THE KATHERINE 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.

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 farms 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, together with later than recommended planting dates, can result in less than viable crops.

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 fell during 1989 and 1990, mainly reflecting high interest rates. Land prices ranged from \$1.7 to \$3.4 per hectare for three sales - all unimproved properties with large areas of uncleared arable land. Total area ranged from 600 to 700 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	\$80,000
Chisel Plough	\$19,000
Tynd Cultivator	\$15,000
Trash Culti Drill	\$25,000
Coulters for above drill	\$9,000
Fertiliser Spreader	\$7,000
Boom Spray	\$10,000
Grain Harvester	\$225,000
Mower - Conditioner	\$30,000
Hay rake	\$6,000
Round Baler	\$30,000
Mobile Bins	\$20,000
Elevator	\$6,000
Tools	\$10,000
Machinery Shed	\$45,000
Weldmesh Silos	\$10,000
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 maintain a supply of grain for stockfeed manufacture in the NT) and the New Crop and Technology Development Scheme. A 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 October, 1991.

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-III	MUNGBEANS	MUNGBEANS (Stockfeed)	SESAME	PEARL MILLET	HAY
Yield (t/ha)	2.0	2.5	0.8	1.0	0.75	1.0	7.0
Price (\$/t)	235	235	450 x 80% 260 x 20%	300	900	200	120
GROSS INCOME (\$/ha)	470	588	330	300	675	200	840
Land preparation	14	24	9	9	14	14	14
Planting	45	44	25	25	9	14	49
Fertiliser	90	90	29	29	113	47	52
Weed Control	17	17	17	17	10	-	-
Insect Control	-	-	21	0	76	-	-
PRE-HARVEST COSTS	166	176	100	80	221	75	114
HARVESTING COSTS	21	21	33	27	21	21	65
Wrap	-	-	-	-	-	-	56
Cartage @ \$30/t	60	75	24	30	23	30	-
Clean, Grade, Bag	-	-	56	-	53	70	-
POST-HARVEST COSTS	60	75	80	30	75	100	56
TOTAL VARIABLE COSTS (\$/ha)	246	271	213	137	317	195	235
GROSS MARGIN (\$/ha)	224	316	116	163	358	5	605

4.1

GRAIN SORGHUM - Conventional tillage

ENTERPRISE NAME: Grain Sorghum
 ENTERPRISE UNIT: 1 hectare

REGION: Katherine
 DATE: October 1991

INCOME		\$/ha	Your Estimate
Yield	2.0 t/ha @ \$235/tonne	470	
Other Income	Fertiliser subsidy 195 kg/ha @ \$95/tonne	19	
A. TOTAL INCOME		489	
VARIABLE COSTS			
Land Preparation			
1 Ploughing	2.9 ha/h @ \$14.77/h	5	
2 Cultivations	4.0 ha/h @ \$14.44/h	4	
	3.1 ha/h @ \$15.27/h	5	
Planting			
Seed	10 kg/ha @ \$4.00/kg	40	
Planting	3.1 ha/h @ \$15.27/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 @ \$14.94/h	2	
Weed Control			
Atrazine	3 L/ha @ \$4.75/L	14	
1 Spraying	6.2 ha/h @ \$15.69/h	3	
Harvesting	4.0 ha/h @ \$82.13/h	21	
Marketing			
Cartage to Depot	@ \$30/tonne	60	
B. TOTAL VARIABLE COSTS		265	
C. GROSS MARGIN PER HECTARE (A-B)		224	

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	-21	144	309	474	639
205	-11	164	339	514	689
215	-1	184	369	554	739
225	9	204	399	594	789
235	19	224	429	634	839

Breakeven Analysis

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

Breakeven Yield at a price of \$235 t/ha = 0.91 t/ha

Breakeven Price at a yield of 2.0 t/ha = \$216/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)	1986-87	1987-88	1988-89	1989-90	1990-91
Area sown (ha)	1559	1950	2351	1190	1212
Highest paddock yield	3.78	n.a.	2.84	n.a.	n.a.
Paddock size (ha)	50	n.a.	50	n.a.	n.a.
Highest test yield	5.40	3.30	n.a.	n.a.	4.47
Average yield	1.66	0.52	0.67	0.55	1.78

n.a. = not available

4.2

GRAIN SORGHUM - Zero tillage

ENTERPRISE NAME: Grain Sorghum
 ENTERPRISE UNIT: 1 hectare

REGION: Katherine
 DATE: October 1991

INCOME		\$/ha	Your Estimate
Yield	2.5 t/ha @ \$235/tonne	588	
Other Income	Fertiliser subsidy 195 kg/ha @ \$95/tonne	19	
A. TOTAL INCOME		606	
VARIABLE COSTS			
Roundup CT	1.6 L/ha @ \$13.46/L	22	
Knock down spray	6.2 ha/h @ \$15.69/h	3	
Planting			
Seed	10 kg/ha @ \$4.00/kg	40	
Planting (incl. fertiliser)	3.7 ha/h @ \$16.02/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 @ \$14.94/h	2	
Weed Control			
Atrazine	3 L/ha @ \$4.75/L	14	
1 Spraying	6.2 ha/h @ \$15.69/h	3	
Harvesting			
Heading	4.0 ha/h @ \$82.13/h	21	
Marketing			
Cartage to depot	@ \$30/tonne	75	
B. TOTAL VARIABLE COSTS		290	
C. GROSS MARGIN PER HECTARE (A-B)		316	

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	-31	134	216	297	464	629
205	-21	154	241	329	504	679
215	-11	174	266	359	544	729
225	-1	194	291	389	584	779
235	9	214	316	419	624	829

Breakeven Analysis

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

Breakeven Yield at a price of \$235 t/ha = 0.96 t/ha

Breakeven Price at a yield of 2.5 t/ha = \$108/tonne

4.3

MUNGBEANS

ENTERPRISE NAME: Mungbeans
ENTERPRISE UNIT: 1 hectare

REGION: Katherine
DATE: October 1991

INCOME		\$/ha	Your Estimate
Yield	0.8 t/ha ex harvester		
	80% @ \$450/tonne	288	
Other income	30% @ \$240/tonne	42	
	Fertiliser subsidy		
	110 kg/ha @ \$95/tonne	10	
A. TOTAL INCOME		341	
VARIABLE COSTS			
Land Preparation			
1 Ploughing	2.9 ha/h @ \$14.77/h	5	
1 Cultivation	4.0 ha/h @ \$14.44/h	4	
Planting			
Seed	16 kg/ha @ \$1.27/kg	20	
Planting	3.1 ha/h @ \$15.27/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	6.2 ha/h @ \$15.69/h	3	
Insect Control			
Thiodan	2 L/ha @ \$9.00 /L	18	
1 Spraying	6.2 ha/h @ \$15.69/h	3	
Harvesting	2.5 ha/h @ \$82.13/h	33	
Marketing			
Cartage to depot	@ \$30/tonne for 0.8 tonne	24	
Clean and grade	@ \$45/tonne for 0.8 tonne	36	
Bags and bagging	@ \$25/tonne for 0.8 tonne	20	
B. TOTAL VARIABLE COSTS		224	
C. GROSS MARGIN PER HECTARE (A-B)		116	

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 @ 260/t)**

Price	Paddock Yield (tonnes per hectare)			
(\$/t)	0.6	0.8	1.0	1.2
350	6	52	99	145
400	30	84	139	193
450	54	116	179	241
500	78	148	219	289
550	102	180	259	337

Breakeven Analysis

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

Breakeven Yield at a price of \$450/tonne = 0.43 t/ha ex harvester

Breakeven Price at a yield of 1.2 t/ha ex harvester = \$199/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)	1986-87	1987-88	1988-89	1989-90	1990-91
Area sown (ha)	303	307	331	160	55
Highest paddock yield	0.53	n.a.	0.74	n.a.	0.4
Paddock size (ha)	50	n.a.	90	n.a.	20
Highest test yield	1.17	n.a.	n.a.	n.a.	n.a.
Average yield	0.36	0.14	0.40	0.18	0.16

n.a. = not available

4.4

MUNGBEANS - Stockfeed

ENTERPRISE NAME: Mungbeans

REGION: Katherine

ENTERPRISE UNIT: 1 hectare

DATE: October 1991

INCOME		\$/ha	Your Estimate
Yield	1.0 t/ha @ \$300/tonne	300	
Other Income	Fertiliser subsidy 110 kg/ha @ \$95/tonne	10	
A. TOTAL INCOME		310	
VARIABLE COSTS			
Land Preparation			
1 Ploughing	2.9 ha/h @ \$14.77/h	5	
1 Cultivation	4.0 ha/h @ \$14.44/h	4	
Planting			
Seed (Putland)	16 kg/ha @ \$1.27/kg	20	
Planting	3.1 ha/h @ \$15.27/h	5	
Fertilisers			
Superphosphate	110 kg/ha @ \$363/tonne	40	
Weed Control			
Treflan	2 L/ha @ \$7.00/L	14	
1 Spraying	6.2 ha/h @ \$15.69/h	3	
Harvesting			
Harvesting	3.0 ha/h @ \$82.13/h	27	
Marketing			
Cartage to depot	@ \$30/tonne	30	
B. TOTAL VARIABLE COSTS		148	
C. GROSS MARGIN PER HECTARE (A-B)		163	

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
260	-15	31	77	123	169	215
270	-11	37	85	133	181	229
280	-7	43	93	143	193	243
290	-3	49	101	153	205	257
300	-1	55	109	163	217	271

Breakeven Analysis

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

Breakeven Yield at a price of \$300 t/ha = 0.40 t/ha

Breakeven Price at a yield of 1.0 t/ha = \$138/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: October 1991

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 Ploughing	2.9 ha/h @ \$14.77/h	5	
2 Cultivations	4.0 ha/h @ \$14.44/h	4	
	3.1 ha/h @ \$15.27/h	5	
Planting			
Seed	3 kg/ha @ \$1.44/kg	4	
Planting	3.1 ha/h @ \$15.27/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	6.2 ha/h @ \$15.69/h	3	
Insect Control			
2 x Thiodan	2 L/ha @ \$9.00 /L	36	
2 Aerial sprayings	@ \$20.00/ha	40	
Harvesting	4.0 ha/h @ \$82.13/h	21	
Marketing			
Cartage to depot	@ \$30/tonne	23	
Cleaning and bagging	@ \$70/tonne	53	
B. TOTAL VARIABLE COSTS		340	
C. GROSS MARGIN PER HECTARE (A-B)		358	

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	-92	58	208	358	508
800	-67	108	283	458	633
900	-42	158	358	558	758
1000	-17	208	433	658	883
1100	8	258	508	758	1008

Breakeven Analysis

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

Breakeven Yield at a price of \$900 t/ha = 0.30 t/ha

Breakeven Price at a yield of 0.75 t/ha = \$423/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)	1986-87	1987-88	1988-89	1989-90	1990-91
Area sown (ha)	40	100	260	380	50
Highest paddock yield	0.37	n.a.	0.34	n.a.	0.41
Paddock size (ha)	40	n.a.	200	n.a.	40
Highest test yield	0.53	n.a.	n.a.	n.a.	0.48
Average yield	0.37	0.12	0.33	0.05	0.35

n.a. = not available

4.6

PEARL MILLET

ENTERPRISE NAME: Pearl Millet
ENTERPRISE UNIT: 1 hectare

REGION: Katherine
DATE: October 1991

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. Ploughing	2.9 ha/h @ \$14.77/h	5	
2. Cultivations	4.0 ha/h @ \$14.44/h	4	
	3.1 ha/h @ \$15.27/h	5	
Planting			
Seed (Katherine Pearl)	10 kg/ha @ \$0.92/kg	9	
Planting	3.1 ha/h @ \$15.27/h	5	
Fertilisers			
CL 19:13	100 kg/ha @ \$566/tonne	57	
Harvesting	4.0 ha/h @ \$82.13/h	21	
Marketing			
Cartage to depot	@ \$30/tonne	30	
Cleaning and bagging	@ \$70/tonne	70	
B. TOTAL VARIABLE COSTS		205	
C. GROSS MARGIN PER HECTARE (A-B)		5	

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	-36	-27	-19	-10	-2	6
200	-25	-15	-5	5	15	25
400	115	145	175	205	235	265
550	220	265	310	355	400	445

Breakeven Analysis

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

Breakeven Yield at a price of \$200 t/ha = 0.96 t/ha

Breakeven Price at a yield of 1.0 t/ha = \$196/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: October 1991

INCOME		\$/ha	Your Estimate
Yield	7.0 t/ha @ \$120/tonne	840	
Other Income	Fertiliser subsidy 100 kg/ha @ \$95/tonne	10	
A. TOTAL INCOME		850	
VARIABLE COSTS			
Land Preparation			
1 Ploughing	2.9 ha/h @ \$14.77/h	5	
2 Cultivations	4.0 ha/h @ \$14.44/h	4	
	3.1 ha/h @ \$15.27/h	5	
Planting			
Forage Sorghum	8 kg/ha @ \$2.95/kg	24	
Lablab	10 kg/ha @ \$2.00/kg	20	
Planting	3.1 ha/h @ \$15.27/h	5	
Fertilisers			
CL 18:20	100 kg/ha @ \$615/tonne	62	
Harvesting			
Mow/condition	0.7 ha/h @ \$20.69/h	29	
Round baling	0.6 ha/h @ \$20.69/h	36	
Wrapping	@ \$2.00/bale	56	
B. TOTAL VARIABLE COSTS		244	
C. GROSS MARGIN PER HECTARE (A-B)		605	

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	185	290	395	500	605
120	245	365	485	605	725
135	305	440	575	710	845
150	365	515	665	815	965
165	425	590	755	920	1085

Breakeven Analysis

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

Breakeven Yield at a price of \$120/tonne = 1.96 t/ha

Breakeven Price at a yield of 7 t/ha = \$34/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	80,000	5.2	19,000	8.0	70		2.9
Tined Cultivator	75	80,000	5.0	15,000	10.0	80		4.0
Trash Cult Drill	75	80,000	4.9	25,000	9.0	70		3.1
TC Drill with Coulters	75	80,000	4.9	34,000	10.0	75		3.7
Fertiliser Spreader	75	80,000	10.0	7,000	12.0	70		8.4
Boom Spray	75	80,000	8.0	10,000	12.0	65		6.2
Grain Harvester (Mungbeans, Sesame & Guar)			6.0	225,000	6.0	70		2.5
Grain Harvester (Sorghum, Millet)			6.0	225,000	9.0	75		4.0
Mower-Conditioner	75	80,000	2.4	30,000	4.0	77		0.7
Hay Rake	75	80,000	3.2	6,000	8.0	80		2.0
Baler	75	80,000	3.2	30,000	3.0	60		0.6

A

B

C

D

E

F =

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
		Tractor (%)	Implement (%)	Tractor (h)	Implement (h)			Tractor (\$/h)	Implement (\$/h)	
Chisel Plough	0.41	72	20	10000	2400	16.65	7.43	5.76	1.58	14.77
Tyned Cultivator	0.41	72	20	10000	2400	16.65	7.43	5.76	1.25	14.44
Trash Culti Drill	0.41	72	20	10000	2400	16.65	7.43	5.76	2.08	15.27
TC Drill with Coulters	0.41	72	20	10000	2400	16.65	7.43	5.76	2.83	16.02
Fertiliser Spreader	0.41	72	30	10000	1200	16.65	7.43	5.76	1.75	14.94
Boom Spray	0.41	72	30	10000	1200	16.65	7.43	5.76	2.50	15.69
Grain Harvester	0.41	72	50	10000	1800	44.00	19.63	-	62.50	82.13
Mower-Conditioner	0.41	72	30	10000	1200	16.65	7.43	5.76	7.50	20.69
Hay Rake	0.41	72	20	10000	1200	16.65	7.43	5.76	1.00	14.14
Baler	0.41	72	30	10000	1200	16.65	7.43	5.76	1.00	20.69

G H I J K L M N O P=

Notes:

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

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	\$4.75/L
Dual	\$18.00/L
Roundup CT	\$13.46/L
Insecticide	
Thiodan	\$9.00/L
Lannate	\$16.00/L
Seed	
Mungbeans (var. Putland)	\$1.27/kg
Sorghum (Pacific, deKalb)	\$4.00/kg
Forage sorghum (var. Jumbo)	\$2.95/kg
Lab Lab	\$2.00/kg
Sesame	\$1.44/kg
Millet (Katherine Pearl)	\$0.92/kg
Contracts	
Clean & grading	\$45/t
Bagging	\$25/t
Cartage	\$30/t
Other	
Bale wrap	\$2.00/bale
Inoculum	\$3.50/pkt
Fertiliser subsidy	\$95/t
Diesel fuel	68.33¢/L
Comm. diesel rebate	25.77¢/L
NT diesel rebate	2.00¢/L
Produce	
Mungbeans - Sprouting	\$450/t
Mungbeans - Splits	\$260/t
Mungbeans - Feed grade	\$380/t
Sorghum	\$235/t
Hay	\$120/t
Sesame	\$900/t
Expected Yield	
Mungbeans - Sprouting	0.8 t/ha
Mungbeans - Stockfeed	1.0 t/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

