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THE USE OF THE COMPUTER IN ANALYSING DATA FROM FARM MANAGEMENT ACCOUNTING GROUPS

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1. *Farm Management Accounting Groups*

Records are obtained by the Economics Research Branch of the Queensland Department of Primary Industries from a group of farmers; with the object of making comparisons more meaningful, the farmers in the scheme have been put into five groups. Each group is relatively homogeneous with respect to geographical area and type of produce.

During 1962-63, records were obtained from farmers in the Farm Management Accounting Groups scheme. The data from these farmers consisted of—

- (a) A capital inventory with details of items and their costs.
- (b) Details of all cash costs.
- (c) Details of all cash receipts.

2. *Comparative Analysis*

The costs and returns in each of the farms were split up during 1962-63 into 38 different items. These are shown in Appendix 1.

An average of each item was required within each group. This would then enable comparison of the size of each item on a farm with the group average for the item. For each item, the size per acre was to be calculated, and when this was done for each farm in the group, an unweighted average was required of the size of the item per acre for the group. It was also required to calculate each item on a per cow basis with consequent calculations of group averages per cow.

Information was to be calculated and made available to the farmers in the groups as shown in Appendix 2. A set of such sheets was to be sent to each farmer with figures relating to that particular farm in the first three columns and group averages in the remaining columns.

Further information was to be made available as shown in Appendix 3.

3. *Use of Computer*

Two WIZ programmes were drawn up to calculate the required information. These were put through the GE 225 computer held at the University of Queensland.

*This article has been written to give an outline of the method used to analyse data obtained from Queensland Farm Management Accounting Groups. The use of the computer for this purpose had distinct advantages and these promise to increase in the future.

With reference to Appendix 2, this consisted of calculating information required for all columns except the first (the size of each item is entered). The data required for the programme consisted of the size of each of the 38 items on each farm, the number of acres and the number of cows.

The information required as shown in Appendix 3 consisted of calculating a ratio, e.g. Gross Income per Labour Unit, for each farm. From the individual farm ratios, averages were calculated for the groups. The data required from each farm for the computer programme consisted of the two parts required for the calculation. For the above ratio, this would be the gross income and the number of labour units. A separate programme was drawn up to carry out the necessary calculations.

Both programmes are fairly simple, particularly that used to calculate the ratios (Appendix 3).

Use of the Programme

The data analysed in 1962-63 consisted of 38 items relating to each of 61 farms which were divided into five groups. For each item, it was necessary to obtain the per acre and per cow figures, and this was required for each of the 61 farms. A second programme was used to calculate the ratios referred to in Appendix 3. It was necessary to estimate 14 ratios for each of the 61 farms, besides the group averages. The total number of results required from the two programmes was 6,130. Apart from time spent "de-bugging" the programmes, the programmes took about a quarter of an hour to run through the GE Computer. As the programmes have been written to handle any number of groups, to a large extent they will be applicable in future years.

The time-saving aspect of the use of the computer promises to be stronger still when applied to 1963-64 data. The number of farms in the scheme, as at the end of 1963-64, promises at present (May, 1964) to be about 100. The information required is to be increased to include item averages per farm, per acre and per cow for the farms with the highest three returns to management and for those with the lowest three returns to management. It is proposed to use a slightly more sophisticated method of grouping with each of the groups used in the previous year split into a number of sections, with estimates calculated for each section and for the group as a whole. It is also proposed to split the farms in each section (and each group) into size groups according to the number of acres on each farm, with estimates for each size group.

As farms other than dairy farms are included in 1963-64, an adjustment to the programme or an additional programme will be necessary to allow for this.

Conclusion

There is no doubt that the use of the computer in the analysis of Farm Management Accounting Data has enabled a considerable saving in the number of man-hours required.

The actual time taken to process the data on the computer once the programme had been "de-bugged" was only about a quarter of an hour. The total time taken to draw up the programme, "de-bug" it and run it through the computer was about two man-weeks. This includes time spent travelling to and from the computer centre. The same

computations were never done on a desk calculator so the actual time which would have been involved is not known. However, it is likely that the time required to obtain the 6,130 results would be considerably more than 2 man-weeks. A rough estimate indicates that if an average of one result every two man-minutes was maintained continuously, the same computations would have taken about six man-weeks.

The time saved is likely to be much more marked when 1963-64 data are analysed. There are likely to be about 100 farms in 1963-64 compared with the 61 of 1962-63 and additional information is required. As a result, the number of calculations will be much greater than that required for 1962-63.

The cost to the Queensland Department of Primary Industries for the use of the computer and high-speed printer for all work associated with the 1962-63 calculations was £39. This was at a rate of £50 an hour for the computer and £5 an hour for the printer. This seems a small cost compared with the saving in labour time achieved. There is also the advantage of obtaining more timely results for publication.

APPENDIX 1

Farm Management Accounting Groups

COMPUTER SHEET

Group: Cloyna Composite (D-5)

Number in group: 11

Cash Receipts

- | | |
|---------------|------------------------|
| 1. Milk/Cream | 5. Other Cattle |
| 2. Crops | 6. Sundry |
| 3. Pigs | 7. Total Cash Receipts |
| 4. Calves | |

Cash Payments, Fixed Costs

- | | |
|-----------------------------|------------------------|
| 8. Wages—full time | 11. Rent, Rates, Taxes |
| 9. Repairs—Structures | 12. Sundry Expenses |
| 10. Administrative Expenses | 13. Total Fixed Costs |

Variable Costs

- | | |
|-------------------------|---------------------------------|
| 14. Casual Labour | 21. Feed |
| 15. Contract Payments | 22. Seeds, Fertilizer |
| 16. Repairs—Plant | 23. Poisons, Sprays |
| 17. Fuel, Oil, etc. | 24. Cartage and Selling Charges |
| 18. Electricity charges | 25. Sundry Expenses |
| 19. Dairy Requisites | 26. Total Variable Costs |
| 20. Animal Health | |

Capital Investment

- | | |
|-------------------------|----------------------|
| 27. Land | 30. Livestock |
| 28. Structures | 31. Total Investment |
| 29. Plant and Equipment | |

Receipts

- | | |
|---------------------------------|-----------------------|
| 32. Livestock | 34. Gross Farm Income |
| 33. Livestock Inventory Changes | |

Payments

- | | |
|----------------------|-------------------------|
| 35. Total Cash Costs | 37. Total Farm Expenses |
| 36. Depreciation | 38. Farm Income |

APPENDIX 2

Farm Management Accounting Groups

Summary for the year ending 30th June, 1963 (in £'s)

FARM No.	D1 MURGON GROUP			D2 NANANGO GROUP			D3 MONDURE-PROSTON GROUP			D4 GOOMERIE-TANSEY GROUP			D5 CLOYNA-COMPOSITE GROUP		
	Total Per Acre	Per Acre	Per Cow	Aver.	Per Acre	Per Cow	Aver.	Per Acre	Per Cow	Aver.	Per Acre	Per Cow	Aver.	Per Acre	Per Cow
<i>Cash Receipts</i>															
Milk/Cream	2962	8.5	40.9	1632	3.8	32.7	1548	4.0	30.1	2272	7.2	35.7	1788	3.1	28.4
Crops	147	.5	2.5	158	.4	3.9	373	1.5	9.5	187	.8	3.8	468	.4	15.5
Pigs	486	1.9	9.8	1547	3.9	31.2	1343	3.9	34.3	1250	2.7	17.8	2988	5.0	39.4
Calves	121	.3	1.7	176	.4	3.5	132	.3	2.8	121	.3	1.8	133	.2	3.4
Other Cattle	391	1.0	5.1	388	.7	7.6	291	.7	5.1	416	.9	5.8	495	.7	8.3
Sundry	53	.2	1.1	8	*	.2	90	.2	1.8	127	.4	2.2	53	.1	1.5
Total Cash Receipts	4160	12.4	61.1	3909	9.3	79.1	3777	10.6	83.6	4373	12.3	67.1	5925	9.5	96.5
<i>Cash Payments</i>															
<i>Fixed Costs</i>															
Wages — Full Time	291	.7	3.3	222	.5	4.1	129	.3	1.9	231	.3	2.6	194	.3	1.7
Repairs — Structures	47	.1	.7	59	.2	1.1	26	*	.4	47	.2	.8	35	.1	.6
Administrative Expenses	70	.2	1.1	54	.1	1.1	59	.2	1.5	54	.2	.9	67	.1	1.1
Rent, Rates, Taxes	171	.5	2.4	104	.2	2.1	133	.3	2.7	134	.4	2.2	151	.2	2.9
Sundry Expenses	18	.1	.2	20	*	.4	12	*	.2	11	*	.2	11	*	.3
Total Fixed Costs	597	1.6	7.7	459	1.0	8.8	359	.8	6.7	477	1.1	6.7	458	.7	6.6
<i>Variable Costs</i>															
Casual Labour	12	.1	.2	70	.2	1.5	45	.1	1.4	25	.1	.4	24	*	.3
Contract payments	43	.1	.6	54	.1	1.1	54	.2	1.5	53	.1	.6	90	.1	1.7
Repairs — plant	175	.5	2.6	186	.5	3.9	223	.6	4.9	295	.8	4.5	338	.5	5.2
Fuel, Oil, etc.	159	.5	2.5	178	.4	3.5	165	.5	3.5	241	.7	3.8	229	.4	5.1
Electricity charges	107	.3	1.5	70	.2	1.4	48	.1	1.0	74	.2	1.2	72	.1	1.1
Dairy requisites	22	.1	.3	7	*	.1	13	*	.3	16	.1	.3	13	*	.2
Animal Health	49	.1	.7	50	.1	1.0	28	.1	.6	59	.1	.9	74	.1	1.1
Feed	539	1.5	7.3	351	.9	7.4	393	1.2	8.6	661	1.9	10.5	772	1.4	11.5
Seeds, Fertilizer	109	.4	1.8	88	.2	1.9	128	.3	2.7	76	.2	1.2	118	.2	2.7
Poisons, Sprays	7	*	.1	7	*	.1	14	*	.4	5	*	.1	4	*	.1
Cartage and selling charges	164	.5	2.3	116	.3	2.4	83	.3	1.9	126	.3	1.8	170	.3	2.4
Sundry expenses	15	.1	.3	24	.1	.5	23	.1	.5	42	.1	.7	38	.1	.8
Total Variable Costs	1401	4.2	20.2	1201	3.0	24.8	1217	3.5	27.3	1673	4.6	26.0	1942	3.2	32.2

APPENDIX 3

Farm Management Accounting Groups

COMPUTER SHEET

*Group: Cloyna Composite (D-5)**Number in group: 11*

- | | |
|--|--|
| 1. Gross Income per Labour Unit | 7. Production per Cow |
| 2. Gross Income per £1,000 Invested Capital | 8. Acres per Cow |
| 3. Gross Income per £100 Cash Costs | 9. Lactation per Cow |
| 4. Gross Income per £100 Variable Costs | 10. Cows per Labour Unit |
| 5. Gross Income per £100 Fixed Costs | 11. Capital Investment per Labour Unit |
| 6. Gross Income per £100 Annual Machinery Cost | 12. Pigs sold per Sow |
| | 13. Gross Return per Sow |
| | 14. Annual Machinery Cost per Acre |