THE ECONOMICS OF HIGH RATES OF FERTILIZER ON SOUTH TARANAKI DAIRY FARMS

by

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CHAPTER 1

INTRODUCTION

This thesis reports the findings of a survey conducted to test the hypothesis that the use of increased rates of stock and fertilizer could lead to increased production on dairy farms in South Taranaki.

Increases in stocking rates and fertilizer rates had been taking place on some farms in the South Taranaki area for several seasons preceding the 1961-62 season. Farmers making these increases suggested that other management changes were necessary when increased rates of stock and fertilizer were used. These changes, when taken together, were thought to lead to increases in production.

Thus the specific aim of the survey was to find a well proven management system incorporating increased rates of stock and fertilizer, and to evaluate this system in physical and financial terms.

No attempt was made to find the best management system for increasing production since this attempt would have been defeated by the important differences between farms and between farmers. Rather, the aim was to fully document one management system so that the uncertainty associated with its adoption by farmers would be reduced. Should farmers feel that there are management systems superior to the one evaluated in this study, then it is to be hoped that a demand for further research will arise.

Throughout this study it has been necessary to consider individual farm problems. Resources available for increasing production vary widely from farm to farm. Each farm, for example, has a different locality, different soil characteristics and different herd quality. The capital resources of farmers, and their managerial abilities, vary widely. Thus,

problems arise in the integration of a new technology which are unique to each farm. Six of the farms visited in this survey are discussed in detail in Appendix F to show how these problems arose and how they were overcome.

1.1: Sources of information

It is important to note that there are five groups of farmers who may be referred to in this thesis. Firstly, there is the population of dairyfarmers, that is, 2,002 dairyfarmers in the 1956-57 season and 1,926 dairyfarmers in the 1960-61 season. These farmers supplied 23 dairy companies in South Taranaki, the survey area. Secondly, there are the dairyfarmers supplying 16 of the survey area dairy companies and for whom stock and production records were obtained. These records, obtained for 1,575 suppliers in the 1956-57 season and for 1,555 suppliers in the 1960-61 season, relate to suppliers with herds of ten cows and above.

The third group of 209 farmers are those who responded to a mail questionnaire about fertilizer usage circulated to 1,670 farmers in the survey area. This questionnaire is discussed in Appendix B. The 272 farmers of the fourth group are those for whom farm size data were collected from the Hawera and Waimate West County Councils. Production per acre in the 1960-61 season was estimated for these farmers. This estimate is discussed in Section 3.5,4, Chapter 3.

Finally, there are the forty farmers who were interviewed by the author and who will be referred to collectively as "the survey farmers." Supplementary information obtained from these farmers by means of a mail questionnaire is summarised in Appendix D.

Basic data relating to these groups is lodged with the Department of Agricultural Economics and Farm Management, Massey University of Manawatu, Palmerston North.

1.2: The survey farm groups

Throughout this thesis the survey farms will be referred to in three groups. The first group of 14 farms includes those farms on

which increases in cow numbers were made between the 1956-57 and 1960-61 seasons, but on which fertilizer usage remained constant. This group will be referred to as the "cows increased" group.

The second group of 25 farms includes those farms on which increases in stocking rate and fertilizer rate were made between the 1956-57 and 1960-61 seasons. This group will be referred to as the "cows and fertilizer increased" group.

The third group comprises one farm on which no changes were made in stocking rate and fertilizer rate between the 1956-57 and 1960-61 seasons. This group will be referred to as the "no change" group.

1.3: Definition of terms

In this section terms which will be used extensively throughout this thesis are defined. Production per acre is defined as butterfat supplied to the factory divided by total farm area. Stocking rate is defined as milking cows at 15th January per hundred acres of home farm area.

No allowance is made in the calculation of production per acre and stocking rate for unproductive areas on the home farm, for stock grazed away from the farm or for supplementary feed purchased. Neither is any allowance made for the number of dry stock reared.

Fertilizer rate is defined as tonnage of fertilizer, less nitrogenous fertilizers and mineral mixes, divided by the area to which the farmer said this was applied. Production per cow is defined as pounds of butterfat supplied to the factory in a season divided by the number of cows.

In all tables production per acre will be expressed as pounds of butterfat per acre, stocking rate as milking cows per 100 acres, fertilizer rate as hundredweights per acre and production per cow as pounds of butterfat per cow. Number of cows refers to the number of

milking cows per farm at 15th January and butterfat production the pounds of butterfat supplied per farm to the factory each season.

Unless otherwise indicated, "change" or "increase" refers to a change or increase between the 1956-57 and 1960-61 seasons. Similarly "the period" refers to the five seasons from 1956-57 to 1960-61 inclusive.

1.4: An outline of the thesis

The farm survey procedure on which the findings reported in this thesis are based is discussed in Chapter 2.

Chapter 3 presents a discussion of the physical features of the South Taranaki area, together with a general discussion of the area's dairy industry. This chapter is for the reader with little knowledge of dairyfarming in South Taranaki.

The selection of farms visited in this survey and the survey procedures used are discussed in Chapter 4. Some descriptive characteristics of the survey farms are presented in Appendix C.

The survey findings are presented in the main body of the thesis, Chapters 5 and 6. Management for increased production is discussed in Chapter 5 supported by six "Case Farm" studies in Appendix F. The scope for increased dairy production in South Taranaki is considered. Financial aspects of dairy farm development in the area are discussed in Chapter 6. Consideration is given to the problems involved in estimating the profitability of farm development plans and an assessment is made of the profitability of increasing production on some of the survey farms.

Chapter 7 summarises the survey findings.