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The results and success factors of nine group farm monitoring programmes

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ABSTRACT

Results from 9 farmer groups located in the upper North Island and operating over the period of 1988 to 1998 showed that group farm monitoring has facilitated changes in farm practice performance and income. The process involved groups of farmers with associated consultants, veterinarians and scientists; and the detailed monitoring of a central farm for 3 to 4 years. Changes made on the monitor farm incorporated the optimisation of the farm system and the adaptation and use of new sheep and beef cattle farming technologies. Increases in production ranged from 8 to 37%; and increases in farm revenue from 13 to 31%. Changes to stock policies that better aligned feed demand and supply, increased growth rates of young animals and greater efficiencies in breeding ewe and cow performance were common contributors to improved performances. The group farm monitoring process emphasised the value of gathering and effectively using farm and product information and provided a collective learning environment for farmers within a group context. Critical success factors that have emerged from a decade of work experience associated with group process are highlighted and discussed in the paper.

Keywords: Farmer groups; farm monitoring; farm systems; information technologies; learning.

INTRODUCTION

There is a continuing expectation from stakeholders that the outputs from research and development ultimately benefit New Zealand's businesses. We have prepared this paper for those scientists and technologists who intend to work with innovative farmers and integrate their results into more successful farm systems. The paper is based on the overall results from 9 farm monitoring programmes which the authors have been associated with over the past 10 years (1988 to 1998). It reports on the range of outcomes, the factors critical to a successful group farm monitoring programme and the lessons learnt from farm monitoring to date.

Farm monitoring has occurred on sheep and beef farms in various forms. Some of the processes involved and the results achieved have been reported by Webby and Sheath (1991, 1993), Rhodes and Aspin (1993), Page *et al.,* (1996) and Ussher *et al.,* (1996). The group farm monitoring programmes reported in this paper emphasise the value of information and the opportunities to learn (Paine, 1993). The programmes have aimed to improve both the understanding of local farm systems and the flow of information between various participants in the agricultural sector. Group farm monitoring is a process that has helped guide future management decisions and has been a driver of increased profitability.

MONITOR FARM GROUPS

The background to four of the monitor farms and groups involved is described by Page *et al.,* (1996). A further three groups are described by Webby and Paine (1997). The remaining two groups reported here operated from 1995 to 1998 and were located in the Northern King Country (NKC) and Taupo districts. The NKC group comprised 30 owner-operated farms and was based around a farm at Mahoenui. The Taupo group comprised 17 farms of which 13 were under large corporate ownership (10 Maori, 2 State and 1 private) and run by managers. The remaining 4 were privately owned and operated units. For the Taupo group, a Maori corporate station was the monitor farm.

GROUP PROCESS

The process involved groups of farmers with associated consultants, veterinarians and scientists and the detailed monitoring of a central farm for 3 to 4 years. The groups developed as a means of technology transfer with an emphasis on understanding the farm system through information gathering, information sharing and adding value to information. During the early stages of a group, emphasis was placed on using the central monitor farm as the case study. As groups matured, benchmarking of key performance indicators was introduced and often towards the end of a programme focus topics were identified. Some of these topics have then been the basis of Study Group activities. Examples are the West Waikato Feed Quality Study Group which evolved out of the old Te Akau Monitor Farm Group (described as Group A in Webby and Paine 1997) and the Northern King Country Farm Study Group which evolved out of a group at Pio Pio (described as Group B in Webby and Paine 1997). Farm monitoring has been a starting point and this evolution over time is important to note if a group is to continue to make progress.

FARM PERFORMANCE

The opportunities for improving performance varied between farms, with some finding greater room for improvement in cattle and others in sheep. The extent to which changes were made depended on how far the monitor farmers were prepared, and able, to put in place the recommendations of the monitor group. Table 1 describes the 9 central farms involved and summarises the performance and financial gains achieved. Performance gains are expressed as the percentage increase in kilograms of meat per cattle stock unit, per sheep stock unit and total meat per hectare. Relative gains in farm income used the same per unit prices at the start and finish of each programme.

Across a wide range of property types and locations, very significant performance and financial gains were achieved in nearly all cases over a 3 to 4 year period. Except on Waiotira 1 and the Taupo farm, there was approximately a 30% increase in kilograms of meat produced per cattle stock unit. This reflects the emphasis on cattle especially in the period from 1988 to 1995. The gains in sheep meat per stock unit were more variable across farms. The emphasis on sheep is most evident on the Mahoenui and Taupo farms that operated in the period from 1995 to 1998. Overall meat production increased 8% at Te Akau to a high of 41% at Maungato.

Most significantly, all farms increased their income over the 3-4 years of monitoring, the smallest increase being 13% and the greatest being 31%. Given the nature of most of the system and practice changes, farm expenditure did not alter significantly and increased revenue was equally reflected in improved farm profit. In several cases the monitor programme ended just when the full impact of the changes was starting to take place. For example, the benefits of the changes in cattle policy on the Waiotira 1 farm had not developed to the extent of showing positive change by the end of the project; and at Mahoenui, a target has been set in place for a further 35% increase in revenue over the next 3 years.

Across the whole programme it can generally be stated that these production increases were driven by a combination of stock policy changes that improved the alignment of feed supply and demand; greater efficiencies of the breeding flocks or herds; and increased growth rates of young stock. The important practice changes for each property are given in Table 2.

ALIGNMENT OF FEED SUPPLY AND DEMAND

Any changes in livestock policy or feed supply were made within the context of improving the alignment of feed supply and demand and improving profitability. This required a farm systems approach where new stock policies or practice changes were tested for their biological feasibility and for their impact on whole farm profitability (Webby, 1993). The 'Stockpol' model (Marshall *et al.,* 1991) was extensively used for these analyses in all groups. Common policy and practice changes included:

Delaying lambing and calving dates to better match the onset of spring pasture growth.

Strategic and often earlier lamb disposal to avoid negative impacts on next season's production.

More flexible cattle finishing policies such as bulls instead of steers.

TABLE 1: Description and performance gains (%) of the central monitor farms

Farm Name Location	Waiotira 1 Northland	Waiotira 2 Northland	Waiotira 3 Northland	Maungato Northland	Te Akau Waikato	Pio Pio NKC	Kaitieke South KC	Taupo Taupo	Mahoenui NKC
Area (ha)	302	250	520	357	505	373	378	1650	450
Easy:Steep land	55:45	48:52	45:55	50:50	50:50	60:40	40:60	85:15	50:50
Sheep:Cattle	30:70	50:50	55:45	40:60	60:40	55:45	60:40	57:43	54:46
Start year	1988	1988	1993	1994	1989	1992	1992	1995	1995
Duration (yrs)	4	4	4	4	5	3	4	3	3
Beef (kg/csu)	0	37	36	42	31	28	33	13	25
Sheep (kg/ssu)	21	19	17	33	-8.4	13	9	27	63
Total meat (kg/ha)	25	26	26	41	8	15	20	23	37
Farm income	16	22	27	31	13	13	13	17	30

TABLE 2: Key changes made on the monitor farms.

Monitor Group	Key changes
Waiotira 1	Major shift from sheep to cattle; more breeding cows; and then a flexible bull finishing system. Summer green feed crops and improved pastures.
Waiotira 2	Early disposal of lambs; better feeding of yearling cattle; more flexible bull finishing; increased subdivision and water, capital fertiliser.
Waiotira 3	Change from steers to weaner bulls; feed budgeting to achieve target liveweights.
Maungato	Less sheep with an increase in heifers and finishing bulls; setting of minimum target liveweights and earlier selling of stock.
Te Akau	Calving and lambing delayed; move from store to works sales for steers; water supply upgraded and nitrogen added to finishing blocks.
Pio Pio	Steers, heifers and lambs sold earlier; male calves left entire for slaughter at 18 months; capital fertiliser added.
Kaitieke	Steer and heifer sales moved from 20-30 to 18-20 months; calving and lambing delayed 40 and 30 days respectively; capital fertiliser application; increased subdivision.
Taupo	Steers and heifers sold earlier at 18-20 months; calving delayed until 20 October; increase in portion of breeding cattle stock units; silage to grow young cattle through winter; increase in capital fertiliser.
Mahoenui	Increased lambing through crossbreeding and hogget mating; moved from 30-month steer to 18-month bull finishing; improved feed quality through grazing management.

Designing and managing stock policies to achieve target May pasture covers.

Tactical use of nitrogen fertiliser to achieve August pasture covers on the cattle blocks.

In nearly all cases, the sequence of change was firstly to improve the effective utilisation of feed that was already grown. Phased capital fertiliser programmes and the tactical use of nitrogen was often the next step; and the final changes centred on improving pasture composition and quality through cropping and pasture renewal.

IMPROVED EFFICIENCIES OF BREEDING STOCK

Within the sheep enterprises, increased lambing percentage was commonly the most significant opportunity for improving performance and profitability. The average increase across all properties was 19 percentage units with a range of 3 to 41 percentage units. These improvements resulted from a contribution of:

Improved weights and condition of ewes at both weaning and tupping.

Effective use of pregnancy scanning to differentially manage twinning ewes (e.g.: feeding, paddock allocation) and increase lamb survival.

Introduction of more prolific genes (e.g.: Finn) through crossbreeding of existing ewe flocks.

Hogget mating, thereby bringing the ewe into production one year earlier than otherwise.

For the cattle enterprises, two areas received attention. Calf to cow tagging at birth was encouraged and key weights at marking and weaning were taken on many of the farms. These on-farm data showed that there was no within-herd relationship between cow and calf weight at weaning. Therefore, emphasis was placed on identifying and culling inefficient, big cows that weaned light calves. The other area of interest was that calf growth rates from birth to weaning commonly averaged 0.9-1.0 kg/day, yet some systems achieved up to 1.2 kg/day. This difference in performance provides some significant marketing advantages, but unfortunately we were never able to ascertain the consistent drivers of these gains and implement them on a wider basis.

IMPROVED LIVEWEIGHT GAINS

The programmes were successful in encouraging farmers to weigh cattle, set clear weight gain targets and change their management practices to achieve these targets. Being able to provide adequate pasture cover (~2.0 t DM/ha average) on a designated finishing block during August-September was one of the main drivers of improved cattle performance. Movement towards bull finishing systems, both dairy and beef, contributed to improved cattle weight gains; and also provided greater marketing flexibility which was often important in helping avoid the vagaries of summer drought.

The programmes were less successful in getting farmers to weigh lambs, set targets and seek to improve post-weaning growth rates. An attitude still pervades that the time frame is too short and the practice changes too expensive and/or difficult to justify the setting of high target weight gains (+200-250 g/day). The important role of cattle in generating quality feed for lambs was well accepted and in several cases, the size of beef cow herds was increased to underpin summer pasture control.

In all 9 programmes there was intensive monitoring of animal health and input from veterinarians. Surprisingly, health issues were not a common constraint to livestock performance. Effective management of internal parasites, the effective supplementation of cobalt and copper and the avoidance of facial eczema challenge were recognised as essential husbandry practices.

BENEFITS TO GROUP MEMBERS

The previous sections of this paper have outlined the changes and progress made on the central monitor farms. Group farm monitoring is a collective learning and action process and consequently practice and performance changes also occurred for the other members of the group. For example, members of the Waiotira 3 and Maungaturoto groups increased average meat and wool production per ha by 16% from 1993/94 to 1997/98. Based on benchmarking results that were obtained from several other groups, the most common changes were:

Increased cattle weight gains; and heavier carcasses and/or earlier marketing.

Increased ewe weights and higher lambing percentages (e.g.: Mahoenui – Table 3).

TABLE 3: Average performance of Mahoenui group members.

	1995	1998
Ewe mating wt (kg)	55	61
Scanning (%)	144	152
Lamb survival (%)	79	82
Hoggets lambing (%)	6	25
Lamb carcass wt (kg)	15.7	16.2

However, it was also clear that there were significant shifts in beliefs and attitudes arising from the learning dimension of group activities (Webby and Paine, 1997). Often farmers are not in a financial and/or a resource position to express these attitudinal shifts as behavioural changes, yet they are critical to underpinning future progress in a rapidly changing industry. To understand the interaction of these changes, belief-behaviour mapping is a process that should accompany all farmer learning projects. The outward expression of what farm monitoring provided group members can best be illustrated by survey results of one group, which are given in Table 4. These were the most common responses in terms of personal benefits and the most valued aspects of group farm monitoring identified by group members.

TABLE 4: Survey results on the benefits and value of group farm monitoring.

1. Personal benefits:
New motivation and interest in farming.
Confirmation of ideas and new practices.
Opportunity to benchmark one farm system against another.
The sharing of ideas, views on practices, and results.
Acquisition of information from peers and others in the industry on technologies.
2. Most valued aspects:
Collective learning from others in like situations and scientists.
The use of monitoring as an incentive to implement change.
Opportunity to discuss and solve problems and difficulties.
Learning the value of objective measurements to set and realise targets.
Monitoring improvements and results of change in pasture and livestock performance.
Extending goals by realising their own and farm's potential.

FACTORS CRITICAL TO SUCCESS

After operating group farm monitoring programmes over the last decade, there are several key, critical success factors that have emerged. In highlighting these we hope that our experiences can assist others in the successful delivery of future, collective learning programmes that involve adult farmers.

Members of the group must have a common agenda. In our programme, all 9 groups were established on the basis of local initiatives with a willingness by farmers to work together. There was a common desire amongst the farmers involved to learn, update themselves with new information and technologies and improve their own farm business.

Progress can be rapid when group activities are based on and primarily driven by information that is generated from within the group, whether that be from a central monitor farm or individual members. Information that is gathered and analysed in a local context is always seen as more relevant and acceptable, compared to outside recommendations. In the Mahoenui group, the rapid uptake of hogget mating, the adoption of self-defined management guidelines and the success of this policy were driven by collective group information and results.

Value can be added to locally derived information when analyses are undertaken within the context of the whole farm system. This is most relevant where discrete information sets are available and complex systems and decisions are involved. For example, the long term impact of slow growth rates of lambs and delayed lamb disposal on next season's farm performance was generally underestimated until full systems analyses were conducted with the model Stockpol. The message emerging from these analyses was subsequently re-enforced when farmers eliminated late disposal of lambs and measured significantly higher pasture covers entering into winter.

A source of outside stimulation can complete the picture. New technical and industry information provided by researchers, company representatives and industry spokespeople can help build a context from which specific opportunities can be conceptualised. While new business and marketing opportunities rarely emerged from our group process, changes that involved production and practice decisions such as the use of new, superior animal genes can be stimulated by planned, outside input.

The focus of the group's activities must always be challenging in terms of new knowledge and opportunities. Whether it be the central monitor farm or a clearly focussed facet of practice (e.g.: improving feed quality), the interest of all members must be held. This is one of the most difficult aspects to manage in collective learning when the group makeup is diverse.

Membership of the group must be on the basis of a commitment to the group's objectives and the discipline to adhere to the agreed processes. A financial contribution ensures greater commitment and an expectation that the group process will deliver an outcome for them as individuals. Agreement by all members to gather and openly share a similar amount of information is also a very effective glue in holding together the group. There should be no "free lunches". As monitor groups evolve into more focussed study groups it is our experience that the commitment rules are driven by the members themselves. Getting to a position where members own and manage the group is the ultimate.

The process of group management must ensure an atmosphere of group interaction where information is shared and not be a lecture room environment. Members gain the most when they are stimulated to share their own knowledge and decisions between one another.

The outside providers of information and services must build a relationship of credibility with group members and be seen to return to face the outcomes of their recommendations. In our projects regular input was provided by local consultants, veterinarians, company representatives and researchers. A sincere interest in the well-being of members and their family was key to these people being respected, trusted and accepted by the group.

Group farm monitoring has not just been about gathering and analysing data. That discipline is just the first step. The wise and effective use of the emerging information for making practice and system decisions is where the true value lies. A collective learning process has been the primary vehicle for making progress. It is a powerful adult learning platform.