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IMPACT ASSESSMENT OF THE 1990 EAST COAST TECHNOLOGY TRANSFER PROGRAMME

A thesis submitted in fulfilment of the requirements for the degree Master of Agricultural
Science in Farm Management.

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Abstract

The East Coast of the North Island experienced serious drought conditions during the summer of 1988/89, which severely depressed farm production and profitability. To assist farmers recover from the drought the Government provided \$30 million in the form of a special "Drought Recovery Assistance Programme". Part of the budget was assigned to a Technology Transfer Programme (incorporating an Alternative Pasture Demonstration Programme). This programme aimed to mitigate future drought risk, promote dryland farming sustainability and reduce the need for future Government intervention by encouraging farmers to adopt a range of short- and long-term practices in their overall farming system. A farm 'systems' approach to technology transfer differentiated this programme from previous adverse event assistance. The Government, farmers and the agencies responsible for the East Coast Technology Transfer Programme were interested in whether this new approach to technology transfer had been successful.

The objectives of this research were to assess the programme's success relative to its objectives and in terms of its on-farm impact. Telephone, mail and interview surveys of farmers located in the East Coast region were conducted. Data about processes used for the dissemination of information, the type and amount of technology adopted, and the attitude of farmers to future droughts and Government intervention were collected.

Most of the farmers (91%) contacted in the telephone survey (n=200 farmers) had changed some aspect of their farming system in order to decrease its susceptibility to drought, and 81% now consider themselves to be better equipped to successfully manage drought conditions. Written material prepared for the programme was most often cited by farmers as an information source. The most common changes made by farmers were the incorporation of new pasture (52%), more timely decision making (48%), increased proportions of readily disposable livestock and greater use of feed supplements to counteract the effects of a drought. Half (50%) of the farmers surveyed believed that no Government assistance should be provided if a drought was to occur again.

The mail survey to evaluate farmers (n=69) involved in the Alternative Pasture Species Demonstration Programme indicated that the area sown in alternative pasture species had increased from an average of 16 hectares in 1991/92 to 37 hectares in June 1994. Most farmers believed that the alternative pasture species were superior to their existing traditional ryegrass/white clover pastures. However, out of a list of six drought management options encouraged through the Technology Transfer Programme, farmers rated alternative pasture species as second to least important in reducing the effect of a drought on their farm, although they still considered this option as either "important" (49%) or "very important" (44%). Most farmers (74%) said that "early decisions on livestock numbers for summer" was "very important". Adoption of alternative pasture species by farmers who had made direct contact with alternative pasture demonstration farmers was low.

Personal interviews with farmers (n=10) neighbouring Focus Farms (n=2) and a mail survey of the consultants (n=14) responsible for their selection and field day programme indicated that Focus Farms did not attract large numbers of farmers, although those that attended were generally positive about the information provided through this medium. Some of the recommended technologies and management practices were not appropriate for some farmers. Technologies that were encouraged through the field days, and which have been adopted, were a greater proportion of trading stock, the use of alternative pasture species, reduction of overall stocking rate, incorporation of summer-moist run-offs, and more reserved supplementary feed.

Most farmers had made at least one 'drought proofing' change to their farming system since 1989 and now felt more confident to cope with drought conditions. However it was not possible to determine how much change occurred due to the influence of the Technology Transfer Programme relative to the farmer's own drought experience, the wider base of agricultural knowledge available to farmers, the influence of other farming and non-farming objectives and improved financial returns for farm products since 1990. The present Government policy of non-intervention is now accepted by the majority of farmers. Future adverse event relief programmes are therefore not expected by farmers, although some would like flexibility with items such as taxation when farm profit is radically altered because of drought management.

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Chapter 1 - Introduction

Introduction

The East Coast of the North Island experienced serious drought conditions during the summer of 1988/89, and this had both immediate and short-term effects on farm productivity and profitability in the region. To assist farmers to recover from the drought, and to reduce their exposure to future drought risk, the Government provided \$30 million in the form of a special "Drought Recovery Assistance Programme". The components of the programme included Farm Management Consultancies, Drought Rehabilitation Loans, Family Income Support, New Start Grants and a Technology Transfer Programme (King, Government announcement, 13 March 1990). Approximately \$413,000 was budgeted for the Technology Transfer Programme with a further \$10,000 obtained from commercial sponsorship to provide total funds for the programme of \$423,000 (Rhodes, 1992). Approximately \$775,000 was also budgeted for a separate Pasture Demonstration Programme (Milne *pers. comm.*, 1994).

The Technology Transfer Programme including the Pasture Demonstration Programme, sought to enhance the "adoption of new and improved on-farm technology and management systems" (Rhodes 1994). It was believed that this would "provide the basis for the mitigation of future risk in areas of the region which are continually prone to summer dry conditions and a high frequency of drought events" (Rhodes 1994). It purposely did not seek a "quick-fix" solution by simply encouraging the adoption of 'off-the-shelf' technology and providing direct financial assistance. This approach to state assistance, which had met with varying degrees of acceptance in the past, was restricted by the diverse circumstances of farmers (and their farming systems) in the East Coast region. Instead a more inclusive approach, which encouraged farmers to adopt a range of both short- and long-term practices in their overall farming system, was sought so that the need for future Government intervention was reduced. This approach to farmer assistance built on experience obtained through the South Island pasture establishment project (MAFPol Technical Paper 91/2).

As mentioned previously the programme sought to incorporate an inclusive, whole farm

systems approach. This required an appropriate extension framework. Common extension theories and processes are reviewed in the next section, along with the outcomes of earlier Government Adverse Events Relief programmes. This provides background to the research reported in this thesis which sought to quantify the on-farm impact of the Technology Transfer component of the East Coast Drought Assistance programme.

Extension Theory

What is extension?

Extension is defined by the Collins English Dictionary (1991) as, "A service by which some of the facilities of an educational establishment are offered to outsiders". Early agricultural extension programmes in New Zealand and other developed countries, which were largely Government funded, were based on this principle (Williams, 1968). They sought to provide farmers with technical advice as a guide to improved farming methods. The personal objectives and goals of individual farmers and their families were seldom ever formally considered, since all planning came from the "top downwards" to farmers, rather than being developed upwards from the farmer to the planners (Savile, 1978). Leagans (1961) defined extension as, "Helping people by means of education to put useful knowledge to work for them". This definition expresses an important element of extension, that of two-way communication between clients and a source (Blackburn & Vist, 1984).

Hartley (1992) described three approaches to extension; the missionary approach, the interventionist approach and the co-learning approach. In the missionary approach the extension worker makes judgements about the farmer, then proceeds to tell the farmer what to do. It tends to focus on technology and is characterised by one-way communication. The interventionist approach, a development of the missionary approach, recognises that the farmer is part of the social system which the extension worker attempts to intervene in (or manipulate) to achieve certain objectives. Although some consultation occurs within the "system" on attitudes and perceived needs, it still basically involves one-way communication of information that the extension worker perceives to be good for the farmer. Hartley (1992) claimed that most extension in Australia, and other parts of the world, over the last 20 years

falls into this category. By contrast, the co-learning approach establishes a learning environment where both the extension worker and the farmer are 'equals' and learn together. Learning is self-directed and there is a high level of ownership by the participants. The three approaches to extension described above each aim to bring about voluntary change to existing farming systems. In this respect, extension can be defined as an educational process which aims to elicit voluntary change in the client group.

Traditional and alternative extension models

Within the traditional linear model of extension (i.e. the missionary and interventionist approaches described above) the steps followed by a farmer considering change are; awareness of an idea without details, information gathering, evaluation in terms of the individual's own situation, personal trial or close observation of someone else's trial and finally adoption. This process can stop at any stage at which the individual perceives negativity and is adversely effected by technical complexity. With this 'model' innovators and early adopters are normally targeted within the community. It is assumed that information and uptake will then diffuse through (i.e. trickle down) the community (Prewett, 1992 & Scrimgeour *et al.* 1991). Communication is essentially one way and persuasive (or manipulative) "down" through a system. It has found to be successful only with farmers who already have a high level of access to information and resources, or homogeneous groups of farmers that have been specifically targeted (Rolling *et al.*, 1987). Within other grouping it has failed (Strachan, 1992 and Ortiz *et al.*, 1991).

The alternative collaborative resource model (i.e. co-learning) considers communication of information to be cyclical rather than linear, and to be gained from many directions and through many relationships. The full matrix of values, beliefs, goals, objectives, resources, relationships, activities and commitments that make up a [farming] system are taken into consideration, not just the information to be communicated (Seepersad, 1985). As a result information flows from farmers to researchers and vice versa. Thus, farmers become co-workers in the research by providing information which may remove barriers to adoption. The programme works primarily towards mutual understanding, consensus and collective action rather than persuasion (Prewett, 1992).

A large number of personal factors influence a farmer's willingness and/or ability to learn. These may include age, self concept, emotion and stress, previous experiences, attitude to risk, aspirations and personal motivation. Although these factors are beyond the extension worker's control, it is important that they are recognised, and every endeavour should be made to create a learning environment that will minimise their negative impact (Hartley, 1992).

The collaborative model can take into account social processes such as group dynamics and the power of group consensus, group conformity, emotional persuasion and leadership influence. The level of communication, research methodology, planning, group dynamics and so forth required within this model cannot occur easily across geographic boundaries, particularly when different farming systems are practised in the regions concerned (Seepersad, 1985). Effective nationwide, and maybe even within region, extension programmes are therefore almost impossible (Prewett, 1992).

While there is definitely a role for both the traditional and alternative models, it is critical to select the model best suited to the programme objectives. The traditional model may be completely adequate where the technology is relatively simple (e.g. changing a pasture cultivar), but where the technology is complex (e.g. changing the management of farming systems) the alternative model may more successfully achieve technology adoption and change in management decision-making behaviour.

Farmer and community involvement in extension

Bembridge (1987), from an evaluation of agricultural extension in less developed areas of Southern Africa, identified three main issues in the development and delivery of effective extension programmes for technology transfer. First, the amount of communication between research subject-matter specialists and extension workers and farmers is important. Extension and research programmes have to be developed *with* farmers rather than *for* them, to be acceptable and profitable to the farmer. Farmers must be able to supply feedback to the researcher, through the extension worker, on their problems and the constraints they face. Second, extension programmes must not be narrowly confined to just progressive farmers.

Consultation with and participation of whole farming communities in the planning and implementation of research and extension activities should occur. It should be recognised that farmers, and the communities in which they live, are rarely homogeneous groups and oversimplification of recommendations should be avoided (Williams, 1993). Farming people differ in their personal characteristics, responses, available physical resources and inherent managerial ability. A policy of focusing on less progressive farmers can be a successful alternative to working with progressive farmers (Bembridge, 1987). Howard (1984) and Ortiz (1991) also suggested that without the involvement of community leaders to legitimise programmes, it is difficult to bring about change in farming communities. Third, extension services should aim to reach the maximum number of target farmers, or groups of farmers, with appropriate technological messages. Where large number of farmers are to be serviced the emphasis should be on groups of farmers, or utilising communication channels such as mass media. Communication technique and presentation method are important in the process of reaching more clients (Burk *et al.*, 1984). Systematic monitoring to evaluate the impact of extension on farmers and extension methods should also occur (Bembridge, 1987). The two companion elements that make up evaluation are measurement, using numerical data on actual uptake, and comparison of the extension programme with the objectives set at the beginning of the programme and/or the standards set by other programmes (Brack & Moss, 1984).

Bembridge (1987) concluded that if these three principals were considered, and combined with political commitment, adoption of recommendations by farmers would be high and returns on investment in extension would be great.

Systematic learning of agricultural technologies

Extension is usually concerned with learning by adults (Savile, 1978; Williams, 1968; Blackburn & Vist, 1984). The role of learning in agricultural production has not been studied in depth, but the nature of agricultural production suggests that learning by doing may be highly significant (Hilgard & Bower, 1966). However, agriculture is a biologically-based production system with complex input interactions and often control over the external environment (e.g. climate and Government policy) is limited. It is not surprising then that

farmers find it hard to predict the full ramifications of a change to production practices. In addition to the complexity of agricultural production, there is usually a wide variation in resources between farms, and this means that farmers must 'fine tune' new technology to the individual resources under their management control (Wake *et al.*, 1988 and Garland, 1993).

In broad terms three fundamental types of learning by farmers occurs in agricultural production. First, "informational learning" stems from secondary sources such as printed material. Second, "observational learning" originates from the first-hand observation of others and third, "experiential learning" results from experience gained from one's own actions. Each type of learning contributes importantly to the overall knowledge base of the farmer, and complement each other to develop farmer knowledge (Wake *et al.*, 1988). However, it is thought that learning which stems from secondary sources or someone else's experience does not result in as rapid an increase in overall proficiency as that which results from one's own experiences (Hirsleifer, 1962; Spence, 1981).

There are costs associated with each type of learning. Informational and observational learning requires the farmer's time and resources, while experiential learning has real or opportunity costs (or profits) during the first attempts with a new technology. The costs of learning may be a factor in the differential rate of technology adoption between large and small farmers (Wake *et al.*, 1988). While smaller farmers tend to lag in adoption, they adopt new technologies at a rate equal to or even surpassing the larger farmers once the initial lag phase has been worked through (Perrin & Winklemann, 1976; Ruttan, 1977; Byerlee & Hesse de Polanco, 1983, 1986). This is probably due to smaller farmers' aversion to risk of resource depletion until the technology has been proven and adapted for local conditions. This local improvement to technology is similar to a technological change, but it stems from the quality of information that allows farmers to make subtle adjustments to production activities. Early adopters therefore bring community benefits by adapting technology to the farming area. More widespread community experience increases the supply of production information and thereby decreases the cost of obtaining information (Wake *et al.*, 1988).

The timing of teaching anyone, anything is also important in the learning process. Griffith (1984) suggested the best time to teach is when the intended learner anticipates a need to use

the skill or knowledge. If an individual is not motivated to learn, then the extension efforts will most likely be unsuccessful.

At the outset of a technology transfer programme a gap exists between researchers' and farmers' knowledge of the technology to be promulgated. The researchers are familiar with the elements that make up the technology and are proponents of the ultimate potential of the technology. Farmers, on the other hand, have little information on the new technology but substantial proficiency with their present technology. Because of their familiarity with present technology, and uncertainty associated with the new technology, they are reluctant to change and will need to adapt aspects of the new technology to their local conditions (Johnson, 1993). It is during this adaptation process that researchers should also be learning (Wake *et al.* 1988). Joint learning will lead to a more complete knowledge base than which results if each group learns in isolation (Wilson *et al.*, 1986).

To establish joint learning processes in technology transfer programmes, researchers and farmers must work interactively on an informational, observational and experiential basis. In this setting researchers and farmers both have the opportunity to advance their understanding of the factors that lead to the desired increase in productivity or attainment of other programme aims (Wake *et al.*, 1988).

Defining the target of technology transfer

As mentioned previously, problems faced by farmers vary according to the agro-ecological and socioeconomic conditions they confront. To help target research efforts to the particular problems of a farmer group, farming systems researchers developed the concept of 'recommendation domains'. A recommendation domain is a group of farmers with similar practices and circumstances for whom a recommendation would be broadly appropriate (Perrin *et al.*, 1976; Byerlee *et al.*, 1980; Shaner *et al.*, 1982). Williams (1993) suggested that classifying farmers into recommendation domains could serve a number of useful purposes. First, it could assist researchers to promote efficient allocation of research resources amongst farmers. Second, it could assist policy makers to achieve national [development] goals by permitting policies and resources to be directed to domains that have the greatest potential for

satisfying the pre-determined goals.

There is some debate as to how recommendation domains should be defined. Some suggest domains should be based on size of land holdings, cropping systems, or the purpose of production (e.g. Rhoades, 1982). Others such as Swinton & Samba (1986) suggest that domains should be based on physical, environmental and sociological factors, while Wotowiec *et al.*, (1986) contended that domains should be defined with a problem in mind. The latter implies that methods used to classify farmers should be related to problem-solving. This could be accomplished by classifying farmers according to their potentialities and constraints (Williams, 1993). Regardless of how recommendation domains are defined Williams (1993) concluded that classification should occupy a central role in any realistic assessment of the constraints and opportunities that exist within a farming system. It can also help define research priorities for homogenous groups of producers.

The farming systems approach to technology transfer

Horton (1985) suggested that the first requirement for successful innovation is the availability of a package of technical components that is complete, reliable, and suitably designed for the conditions to which it is to be applied. He found very little 'demonstrated technology' that could be transferred directly to farmers without local refinement or adaptive research. Moreover, Horton found farmers to be active researchers and developers in their own right rather than passive recipients of recommended technologies. On this basis he concluded that 'participatory' research and development models involving farmers from the outset are more likely to be successful than those based on the 'top-down' approach to technology transfer.

Farming systems research (FSR) can be defined in broad terms as a component of the research process that views the farm in a holistic manner and considers interactions in the system (Nagy & Sanders, 1990). Simmonds (1984) categorised farming systems research into three main parts. The first involves the study of farming systems *per se*. This requires an in-depth description and analysis of the technical and socioeconomic aspects of the farming system. The second is concerned with on-farm research; this recognises the importance of interactions in the farming system. On-farm research is problem-oriented and assumes that

technologies must be adapted to the farmer's circumstance and that a change in the farming system is a step-wise process. The third part seeks new farming systems development. This is a revolutionary and simultaneous change in the elements of the farming system in contrast to the step-wise change of on-farm research. New farming systems development applies most often applies to Government intervention, especially in developing countries.

Nagy and Sanders (1990) outlined several important stages in the operation of FSR. First a delineation of recommendation domains (as previously described) is required to incorporate a balance in the size and number of domains in terms of the economic trade-off between the amount of research conducted and the effectiveness of each recommendation (Dillon & Anderson, 1985). Second the descriptive and diagnostic stage, aims to provide an assessment of farmers' priorities, decision criteria, resource availabilities, constraints, and possible development opportunities (Dillon and Anderson, 1985). This then leads to the design stage, in which an overall on-farm research strategy is constructed with specific technology and farm management interventions specified for on-farm testing. On-farm testing and evaluation follows, with tests of the effects of the interventions on the biological, physical and socioeconomic components of the farm environment. Ideally each on-farm trial should have a companion control treatment representing the traditional farm practices. The final stage is dissemination and monitoring of interventions with proven positive results through an extension service. Within FSR extension workers have the opportunity to become directly involved with on-farm testing and evaluation and the provision of feed-back to policy makers and researchers. Amir & Knipscheer (1986) also suggested that this framework inevitably involves the researcher in the technology transfer process.

It is believed that communication between farmers and agricultural scientists functions better in developed countries than in developing countries. This is due to higher farmer education levels, established information systems and financial pressure on research establishments to resolve farm-level production problems. FSR can mitigate the effects of poor education and inadequate institutional organisation (Nagy & Sanders 1990), and these attributes may also be beneficial in a developed country such as New Zealand.

Two desired final products of FSR are a more efficient agricultural research system and an

improved relationship between farmers, researchers and extensionists. Another product is the facilitation of adoption of new agricultural technology systems by more rapidly incorporating them into testing and diffusion programmes (Nagy & Sanders, 1990).

Ellman (1986) suggested that on-farm adaptive research has its risks, both to researchers who are working in an inter-disciplinary framework and finding that their results are regarded with suspicion; and more importantly to the farmers on whose land the often untried and potentially risky enterprises are being screened. However putting the needs of the farmer first, and guiding all the other parties involved towards a coordinated satisfaction of those needs is of primary importance. Sanders and Lynam (1982) also suggested that the 'bottom-line' of new technology evaluation is farm profitability and 'fit' into the farmer's system.

Preliminary on-farm work enables the identification of problems and the adjustment of the technology to farmer circumstances (Atta-Krah & Francis, 1987). However, it is important that suitable (preferably low-constraint) technologies be tested on-farm. If technologies can be adapted to local conditions adoption of the entire technology, rather than incomplete and less beneficial piecemeal adoption, is more likely (Swindale, 1984).

Technology transfer programme categorisation

Extension personnel should take a broad and flexible approach when developing extension programmes (Seepersad, 1984). Thus *approaches* to, or *processes* of, programme development should be considered rather than *the approach* to or *the process* of programme development. Second, *what is to be done* should be emphasized rather than *how it should be done*. A range of possible methods may be required to carry out a particular step, and these may vary from those that are less than ideal but require minimal resources and skills to those that are closer to the ideal but requiring more resources and sophisticated programming skills.

In order to select the most appropriate approach or process, programme activities should be categorised in some meaningful way and, an overview of the whole programme developed. As previously mentioned, traditional or alternative programme models may be suited to a particular situation, depending on the technology to be adopted and who is to adopt it. Some

situations need to be addressed by extension organisations very rapidly, for instance in response to natural disasters (i.e. flooding, drought, storms, pest and disease outbreaks). This may be referred to as "Ad hoc programming" (Seepersad, 1984).

Natural occurrences

Programmes in response to these situations usually require quick, decisive action and thus the process of planning and programme delivery may be different from those previously outlined. In developing a plan, whether in advance or at the time of the event, it would be useful to consider; how it had been handled in the past, the measures most useful, recommendations made at the time for dealing with such events in the future and who the most critical people to involve are. Where a tentative plan does not exist, the first step might be to undertake a quick appraisal of the situation. Action may then be taken to forestall further consequences as well as to initiate a strategy to deal with the problem (Seepersad, 1984). There is also a need to separate short-term disaster recovery assistance and long-term adjustment assistance extension (Morriss, 1991).

Conclusion

When developing a technology transfer programme, the total picture must be considered so that different programmes and activities can be used to support and reinforce each other. Savile (1978) suggested extension should be an educational approach to the solution of problems and the development of communities. Important factors in successful extension programmes are the use of appropriate problem-based technology, involvement of the whole farming community and the incorporation of a farm and farmer perspective on change.

Extension Processes

The processes used to promote the adoption of technologies is vitally important for technology transfer to succeed. Farmers do not adopt new technology through a single process. In this section some of the processes used by farmers, mostly in developing countries, to adopt technology in response to extension programmes are investigated.

Farmers' stepwise adoption of technology

Extension agents typically promote technological packages containing a number of components. It is argued that this approach is needed to capture positive interactions between components of the programme (Walker, 1981). However, because of capital scarcity and risk considerations, farmers are rarely in a position to adopt complete packages. Packages can be disaggregated into subsets of one or two components and this allows critical interactions to be exploited and stepwise adoption (Mann, 1977). In Mexico the sequence of technology adoption by farmers closely followed that predicted from the profitability and riskiness of each component; components giving the highest returns on capital were adopted earliest (Byerlee & Hesse de Polanco, 1986). Providing information to farmers on the likely profitability of recommendations is important. This information can also be used to establish research priorities and for classifying farmers into recommendation domains for extension.

Information accumulation and important associated factors

Information accumulation

Bonny (1992) investigated how a sample of French farmers accumulated information and the factors affecting the accumulation of information. In terms of information source popularity, it was found that the farming press was far in the lead, irrespective of the socio-structural characteristics of the farm: it was cited by 88% of those replying to the question and 85% of the whole sample. Professional or technical advice (53%) (including advisors, technicians and salesmen) was cited next, followed by other farmers or neighbours (40%). More active or far-reaching attempts to acquire information or training such as membership of an agricultural extension group (31%), attendance at training courses (24%) were the least used means of acquiring information. A quarter of those replying also cited the non-farming press as a source of information.

In a survey of Australian farmers, Bardsley (1982) discovered that 84% sought information from more than one source, but no more than five. A large proportion of farmers (around 80%) used either other farmers or the Department of Agriculture (free) advisors as an information source, depending on the type of information sought. In comparison to previous

research (Havelock, 1969 and Salmon, 1980 as cited by Bardsley, 1982) the importance of other farmers as information sources was predictable but, the high usage of formal sources such as the Department of Agriculture (being only one component of the 'pool of agricultural knowledge') was unexpected.

In a study covering various parts of the Netherlands, Van Den Ban (1963) found 75% of Dutch farmers mentioned the mass media (farm papers, radio, etc) as the most important source of information about new practices. However, at the decision making stage of the adoption process, 75% of the farmers mentioned personal contacts (other farmers, local extension officers, field days at demonstration plots) as the most important source of information. Van Den Ban (1963) suggested that where people have confidence in those with whom they have personal contact, they will also have confidence in their ideas.

Factors affecting information accumulation

Bonny (1992) discovered that the number of information sources cited by farmers increased with economic size of the farm, investment level and above all educational qualifications, but the influence of these three factors varied according to the information source. Thus salesmen were more influential for economically larger farms, but not for farmers with a higher educational level. The influence of other farmers and neighbours decreased with economic size but increased with education. The role of agricultural advisors was positively associated with education and investment. Membership of an extension group increased markedly with economic size, investment level and education, but the main factor that varied with educational level was participation in training sessions: those farmers with the highest educational qualification also attended the most training sessions. Bardsley (1982) also demonstrated that farmers who were involved in self-directed learning used a wider range of information sources. These studies indicate that an understanding of local socio-economic factors is therefore vital before engaging in an extension programme.

Other factors affecting the adoption process

Research conducted by Polson and Spencer (1991) on the uptake of new cassava varieties by Nigerian farmers identified a number of important factors in the process of new technology

adoption. The release of new cassava varieties, resulted in mixed adoption rates by subsistence farmers, even though they offered higher resistance to disease and higher yields. Adoption of new technologies was higher for young farmers who cultivated a large enough land area to produce marketable surpluses, apparently because they were more likely to accept the risks associated with the new technology.

Hossain and Crouch (1992) sought to identify the differences between opinion leaders and followers in the adoption of farm practices, based on farm-level data obtained in a remote area of Bangladesh. Opinion leaders did not differ significantly from the followers in the adoption of new farm practices, and were not highly innovative farmers across the whole spectrum of selected farm practices. A predominant trend across levels of farm development was a logical and sequential adoption of interrelated farm practices rather than a random adoption of a single innovation. Farm income was also an important factor in the adoption of improved farm practices.

Conclusion

When introducing any practice, extension workers should consider the inter-relationships between practices, especially where farmers cannot afford to adopt an innovation on the basis of 'novelty-value'. Also local needs should be considered. Extension personnel also need to take note of the influence of personal, socio-economic and communication factors within the community where technology transfer is to occur. While some aspects of the extension identified in this section in developing countries may not be appropriate to New Zealand agriculture (e.g. level of education and written communication), the overall process for achieving successful technology adoption is likely to be similar. Some recent New Zealand extension programmes are reviewed in the following section.

Extension in New Zealand

Scrimgeour *et al.*, (1991) conducted a survey of farmers' attitudes towards extension to obtain information on farmer access to, need for and value placed on new information and its dissemination. Information was obtained mainly from written material (61%). Other sources of information subsequently applied to farming practice included: study groups and other users (31%), field days (21%), MAF consultants (14%), private consultants (14%), industry

advisors (7%), vets (6%), and stock firms (4%). Advertising, radio and television were hardly mentioned. These data suggest that newsletters, brochures and booklets are an effective method for extension.

In a survey on the Meat Research and Development Council (MRDC) monitor farm programme, Rhodes & Aspin (1993) reported that farmers received information from newspapers, field days and other farmers. Respondents liked to see the same information presented from several sources to add validity. Field days were highly valued as an information source. Also, large group size prompted the formation of subgroups so that more effective debate of issues could occur.

In a review of the Livestock Improvement Cooperation extension programme to dairy farmers, Exton (1992) commented that field days and mass media, including the widely read "Dairy Exporter" magazine, created awareness and provided information to farmers. Field days held on topics requested by dairy farmers are especially worthwhile because specific help is given to farmers who need it (Earle, 1980). Discussion groups allow the farmer to test applied knowledge and challenge attitudes, within a small group of acceptable friends. The extension worker's role is to facilitate learning rather than to provide information (Exton 1992).

Garland (1993) claimed that farmers are not, *"...sponges waiting to soak up new technology"*. First, technology must be proven by a successful farmer who works out the practical applications. The modified technology then "trickles-down" to the rest of the community. This is supported by results from the MRDC programme which showed that the most common reason for non-adoption of new technology was that it was too early in the project to see the long term result of change (Rhodes & Aspin, 1993). In a review of the Northland and Baymilk focal farm schemes, Johnson (1993) suggested that farmers will readily "fine-tune" their system, but they are reluctant to make major changes to the critical parameters. A greater understanding of farmers' goals and the constraints they face, combined with the continued extension of basic principles using a whole farm approach, should lead to more rapid gains in production and profit.

Expense (37%), inadequate advice or poor back-up (16%) and inappropriateness (16%) were

reasons given by farmers for not applying information (Scrimgeour, 1991). Only 34% paid for the information. Many commented that they saw the opportunity to increase productivity by 20% or more by simply improving current methods; when this was done, and they had more capital, they would look towards new methods or products. Only 3% of farmers rated innovation and information high in their list of needs. Most farmers (56%) rated the need for profitability as most important, while 11% rated lifestyle as most important. Given this information, Scrimgeour suggested it was not surprising that diffusion of new techniques and methods tends to be slow and conservative.

The Impact of Recent Adverse Event Relief Programmes

Establishing the direct effect of an Adverse Events Relief programme on the rate, or type, of adjustment in the agricultural sector is difficult (Morriss 1991). However, reviews of the major Adverse Event programmes (described below), during the last few years have provided some leads.

1. Cyclone Bola Agricultural Assistance Scheme Review

Cyclone Bola struck the East Cape region in early March 1988 (Morriss, 1991). The event resulted in severe flooding, erosion and wind damage. The Government provided \$56 million in compensation payments to 2,217 farmers and properties in four affected regions: Gisborne East Coast (\$43.9 million), Northern Hawkes Bay (\$4.7 million), Northland (\$5.2 million) and Taranaki (\$2.5 million) (Morriss, 1991). The aims of the package were to help; maintain a sense of social cohesion in the region as a whole, ensure farmers who wished to continue their operations to determine their own priorities for restoration or other expenditure, and enable other farmers in less viable situations either to determine appropriate changes to their land use or to exit their farms with a degree of dignity (Weber *et al.* 1989).

Weber (1989) concluded that the first two objectives were satisfied by the compensation scheme, though the economic flow-on benefits were probably over-estimated. A significant amount of compensation funds were used to reduce debt.

Some evidence indicated that improved social cohesion was only temporary and declined soon after the compensation programme ended. Factors contributing to this decline were the poor economic conditions on the coast (such as high unemployment and reductions in work schemes) and a sense of vulnerability to further climatic disasters.

The third objective of the package was generally not fulfilled. Little change in land-use took place and compensation payments were used to restore previous land-uses rather than develop more appropriate land-uses (Weber, 1989).

Weber (1989) suggested that the benefits of this type of Government response to an adverse event was short-lived and that the scheme was probably not the most effective way to deal with fundamental social and economic problems. Rather, future programmes should encourage proper risk management and address longer term issues of risk prevention.

2. Review of the 1988/89 South Island Drought Relief Programme

In 1988/89 a severe drought struck the East Coast of the South Island (Morriss, 1991). It was considered, based on meteorological data, to be an event likely to occur once every 100 to 200 years. The drought coincided with poor farming economic returns, low reserves of supplementary feeds due to the poor 1988 winter, and low confidence levels in the agricultural sector. As a result of the Cyclone Bola Relief Programme report, the objectives of the drought relief programme were more specifically targeted to; maintain a minimum family income and household expenditure, make finance available for farm rehabilitation to those otherwise unable to borrow, assist farmers assess their current practices, encourage farm restructuring to mitigate future droughts and reduce the need for future Government assistance, and stimulate the rural economy and increase farmer confidence (Morriss 1991).

To achieve these objectives the programme included a number of components, including; an Adverse Events Family Income Support, Humane Slaughter of Livestock,

Holding of Capital Livestock Proceeds in Trust, Farm Appraisal Scheme, a Technology Transfer and Farm Management Consultancy Programme, and a Drought Rehabilitation Loan Scheme.

Most of the components of the relief programme were effective. Rapid assistance to those in need, stimulation of the rural economy, improvement in the long term viability of badly affected farms, and an increase in farmer confidence were all achieved. However, the regional impacts were less than anticipated because many farmers used the assistance to reduce debt rather than restore the farms production and profitability while decreasing drought risk. The Technology Transfer Programme was only moderately successful in raising the awareness of farmers to management strategies for coping with future drought. The New Start Grants, Adverse Event Income Support and Drought Rehabilitation Loans supported current management systems rather than developing better preparedness for future droughts (Morriss, 1989).

3. Taranaki-Wanganui Flood Relief Programme Review

The Government provided assistance following heavy rains and flooding in parts of Taranaki and Wanganui during January to March 1990 (Morriss, 1991). Funding was provided to contribute 25% of the restoration costs for damaged boundary fences, internal access ways, and essential water supplies, and up to 50% for damaged farm access bridges (Morriss, 1991). The aim of the package was to provide reassurance to badly affected farmers that some of the costs involved with restoration would be provided by Government and direct financial assistance was provided to farmers whose farming future was jeopardised due to the cost of essential restoration.

Although the Government announced in December 1989 that adverse climatic events relief should also encourage farmers to adopt improved risk management strategies (Morriss, 1991), no improved risk management objectives were set for the flood relief package.

Weber (1991) concluded that the Flood Relief programme succeeded in providing

some reassurance to the farming sector and that it would not need to meet all of the restoration costs from its own resources. However, on the basis that flood damage placed only a small number of farmers in anything approaching serious financial jeopardy, the programme was not crucial in preserving the viability of a great number of farmers.

Because compensation paid for only 25% of the estimated restoration costs, many farmers elected for lower cost solutions which did not require major additional expenditure from their own resources. Some farmers also allocated compensation funds into other more urgent areas of farm expenditure. Compensation in this programme was 'somewhat better targeted' (Weber, 1991) and treated affected farmers more equitably than the Cyclone Bola Relief Programme. However, the programme failed in terms of encouraging greater individual farmer responsibility for reducing future climatic risks and improved risk management (Morriss, 1991).

Conclusion

Reviews of recent Adverse Event Assistance Programmes in NZ show that the viability of the individual farm, and the general farming economic environment at the time of the event, are important determinants of the long-term value of relief assistance. While programmes have achieved much in terms of the short-term restoration of confidence to individuals, farm businesses, and the wider rural communities, it has not effectively encouraged these groups to minimise or mitigate risk associated with adverse events or led to the development of appropriate long-term risk management practices for future adverse events.

The East Coast Technology Transfer Programme

Introduction

In this section background information is provided on the East Coast Technology Transfer Programme and the scope and purpose of the thesis is described. As previously mentioned (see page 1), the East Coast Technology Transfer Programme was announced by the

Government on the 13 March 1990. Responsibility for management of the programme was assigned to both MAF Technology-Consultancy Business Group and DSIR-Grasslands. DSIR-Grasslands were made responsible for the establishment of 1500 hectares of alternative pasture species specifically suited to dryland conditions. MAF technology was allocated responsibility for implementing a technology transfer plan to increase farmer awareness of drought management options and adoption of enhanced drought management practices (Rhodes 1992).

Along with the Alternative Pasture Demonstration Paddock Programme and associated field days, the processes used to integrate the Technology Transfer Programme were:

1. The distribution of a "Drought Proofing Your Farm" booklet for every farmer in the East Coast region through farm management consultants, federated farmers, and agribusiness sources.
2. A series of four follow-up newsletters entitled "Sustainable Farming Systems" which were distributed to all farmers through the rural mail delivery service.
3. The establishment of "Focus Farms" in each local area by Agriculture New Zealand which held periodic field days.

Farm Management Consultancy reports for 1300 individual properties were also prepared, their effectiveness was independently assessed prior to this report (see Engelbrecht *et al.* 1991).

The distribution and delivery of the various technology transfer components was organised and conducted largely by MAF Technology consultants (e.g. organisation and running of Focus Farm field days and publication of the 'Drought Proofing Your Farm' booklet and 'Sustainable Farming Systems' update newsletters). However, agribusiness agents (e.g. private consultants, banks, stock and station agents and agricultural produce and merchandise dealers), Federated Farmers and the Rural Trust Support representatives were also involved

in aspects of the overall programme (Rhodes, 1994).

The processes used in the 1990 East Coast Technology Transfer Programme were different to those used in previous programmes. They sought to encourage the adoption of a range of short- and long-term practices suited to a farmer's own needs, incorporated within a whole farm approach to dryland pastoral production (Rhodes, 1992).

Scope and Purpose of the Thesis

The Government, farmers and the agencies responsible for the East Coast Technology Transfer Programme are each interested in whether or not the new approach to technology transfer was successful in terms of achieving the programme's objectives and accordingly whether the tax-payer's investment was worthwhile.

Prior to this study two reports had been produced on the East Coast Technology Transfer Programme in December 1992 and January 1994 (Rhodes, 1992, 1994). After a brief introduction to the East Coast Drought Programme and Technology Transfer Programme, the 1992 report concentrated on detailing the processes used during the programme (i.e. the production and distribution of the publications, where and what research had been conducted on alternative pasture species, the attendance at and number of Focus Farm field days and the total expenditure associated with the programme). The 1994 report consisted of a description of the technologies, farm management practices, and motivational and risk issues encouraged during the programme. It did not attempt to assess farmer uptake or the farm impact of these 'technologies'.

The research described in this thesis is an *ex poste* evaluation of the impact and effectiveness of the Technology Transfer Programme (incorporating the Alternative Pasture Demonstration Programme), relative to its objectives and the on-farm impact achieved. The work was undertaken in two stages. In Stage I the effectiveness of the over-all Technology Transfer Programme was assessed through a telephone survey of 200 farmers (4% in the East Coast region). Quantitative data was collected on how many farmers had/had not adopted drought management practices and why, what types of practices have been adopted, constraints to

uptake, the influence of the various components had on changing practices and in what way were they useful/not useful.

Because of their significant contribution to the overall programme and the importance of field days and on-farm research to technology transfer, as identified in the literature review, the DSIR Grasslands Alternative Pasture Species Demonstration Programme and the Focus Farm field days were specifically investigated in Stage II of the research. The impact of both of these programmes in achieving "sustainable farming" in the study region was assessed. Information on the appropriateness of the technology, the method of information delivery and the factors that contributed to the adoption of 'new' technology was sought. Quantitative and qualitative data were collected through mail and interview surveys to establish a greater understanding of the data gathered during Stage I. A brief outline of the remainder of the thesis is as follows:

- * Chapter 2 - An assessment of the overall technology transfer programme, achieved by conducting a telephone survey involving 200 randomly selected farmers located throughout the East Coast region.
- * Chapter 3 - An assessment on the DSIR Grasslands Alternative Pasture Species Demonstration Programme, achieved by a mail survey of all farmers involved in the programme.
- * Chapter 4 - A specific assessment on the Focus Farm field days as perceived by field day host farmers, attending and non-attending farmers in the southern Hawkes Bay.
- * Chapter 5 - An assessment of the Focus Farm field day concept from the viewpoint of the consultants who organised them.

Chapter Six overall conclusions on the effectiveness of the 1990 East Coast Technology Transfer Programme are drawn. Appendices include a discussion on farming trends in the East Coast and New Zealand, copies of the survey questionnaires and tables of additional supporting data.

Chapter 2 - Telephone Survey of East Coast Farmers

Introduction

The research described in this chapter sought to evaluate the overall Technology Transfer Programme in terms of the delivery methods used and on-farm impact of the technologies and management practices encouraged. The study was based on a telephone survey of 200 randomly selected farmers located throughout the East Coast region of the North Island.

Method

Before the questionnaire was developed background information on the Technology Transfer Programme was obtained through personal interviews with individuals concerned with the development and delivery of the programme. This included Mr Tony Rhodes (Agriculture New Zealand, Dannevirke), Mr Gavin Milne (AgResearch, Palmerston North) and Mr John King (MAF Policy, Hastings). This preliminary investigation allowed questions to be designed so that the outcomes of the Technology Transfer Programme could be measured relative to the original objectives for the programme.

Questionnaire development

The telephone questionnaire covered three broad areas (see Appendix B for a copy of the questionnaire). The first area investigated farmer participation in the programme and assessed the Technology Transfer processes used. This included the Focus Farm Field days, the "Drought Proofing Your Farm" booklet, the four "update" newsletters, the Farm Management Consultancies and to a lesser extent farmer use of other parts of the Drought Relief Programme (i.e. Rehabilitation Loans, Family Income Support etc). A brief indication of other sources of information used by farmers in relation to drought management was also obtained. The second area of the questionnaire aimed to measure the amount of technology uptake. This included the changes that farmers had made to their farming system since the 1988/89 drought in order to make their farm less susceptible to drought. The main factors that prevented farmers from

changing their system in order to make it more "drought proof" were also identified. The third area of the survey established information about the farmers and their farming systems. Descriptive information was therefore obtained for variables such as farm size, farmer age, years of management responsibility, farm susceptibility to drought and whether the farmer was farming in the East Coast region during the 1988/89 drought. Also, farmers were asked to rate the importance of drought management practices which had been promulgated through the Technology Transfer Programme, and whether they believed they were less susceptible to drought now than in 1988/89. Finally farmers were asked for their views on what future assistance, if any, the Government should provide to farmers when a serious drought occurs again.

The questionnaire was reviewed by Mr T Rhodes and Mr J. King, and pretested with three East Coast farmers. This resulted in several changes to the wording and sequence of the questions. Also some questions were omitted and replaced with more appropriate alternatives.

Sample list of farmers

The survey involved a final sample of 200 farmers, or approximately 4% of the farmer population, in the East Coast region as it had been defined for the Drought Assistance Programme (i.e. this included all of the East Coast except the Woodville and Pahiatua counties and western parts of Eketahuna and Dannevirke). The development of a comprehensive list of farmer's names in the region was required so that an unbiased sample could be drawn. Various sources including Federated Farmers, The East Coast Rural Support Trust and New Zealand Post were contacted to establish the list. Only New Zealand Post was able to provide a reasonably comprehensive database of rural listings for the region (from Martinborough in the Wairarapa to Tikitiki, north of Gisborne). However, the list included only names and addresses. Corresponding telephone numbers were therefore obtained from the respective directories for the region.

The list of farmer names was then divided into four geographic areas; Wairarapa (Martinborough to Pahiatua), Southern Hawkes Bay (Pongaroa to Otane), Hawkes Bay (Havelock North, Hastings and Napier) and Gisborne (Wairoa to Tikitiki). This allowed

telephone interviewers to be assigned to areas and provided the basis for subsequent within region analysis. Approximately 200 telephone numbers were then randomly selected. These were weighted so that the final number of interviews completed was proportional to the number of farmers in each area.

The telephone interviews were carried out during May 1994 by staff and post-graduate students from the Department of Agricultural and Horticultural Systems Management at Massey University. Most farmers were contacted during the evening between 6.00 and 9.00 pm. With few exceptions farmers were very helpful and answered all of the questions put to them. Individuals on lifestyle and orchard blocks, and people situations whose income from the farming business (or activity, in the case of farm managers) contributed to less than 80% of the total family income, were not interviewed.

Statistical analysis

Questionnaire responses were coded and entered into a computer file for analysis by the SPSS/PC statistical package. Frequencies, cross tabulations and Duncans Multiple Range Test were applied to the data set.

Results

Farmer and farm details

The predominant livestock system on the survey farms was sheep and beef cattle production (83% of the farms) (Table 2.1). The average farm size was 650 ± 53 ha with properties in the Gisborne area being significantly ($P < 0.05$) larger than those in the other regions.

The average age of the interviewed farmers was 48 years and they had an average of 17 years of management experience on their present farm. Almost all (96%) of the farmers had been farming in the East Coast region during the 1988/89 drought.

A measure of the frequency of severe droughts was obtained for each geographic area. In terms

of the number of times capital stock needed to be sold every 10 years, Hawkes Bay farmers had the highest frequency (1.57) and this was significantly higher ($P < 0.05$) than for farmers located in southern Hawkes Bay. Gisborne farmers had the highest frequency for grazing stock off the farm every ten years (1.95) and this was significantly ($P < 0.05$) higher than for all other areas. Southern Hawkes Bay farmers least frequently needed to sell capital stock and/or graze off animals (0.74 and 0.39, respectively).

Table 2.1 Summary of main livestock enterprises, farm size, frequency of sale of capital and grazing off due to summer drought, average farmer age and years of management experience on current property, for East Coast survey farms. Figures in brackets are the percentage of cases within columns.

	Wairarapa (n=51)	Southern HB (n=46)	Hawkes Bay (n=65)	Gisborne (n=38)	Total (n=200)
Livestock type					
Sheep/beef	43 (84)	39 (85)	50 (77)	34 (90)	166 (83)
Beef only	1	5	4	-	10 (5)
Dairy	4	1	-	-	5 (3)
Sheep/beef/deer	-	-	8	2	10 (5)
Deer	-	1	-	-	1 (1)
Sheep/beef/other	3	-	3	2	8 (4)
Farm size (effective)¹					
0-250 ha	5 (10)	20 (44)	21 (32)	4 (11)	50 (25)
251-500 ha	20 (39)	17 (37)	26 (40)	10 (24)	72 (36)
501+ ha	26 (51)	9 (20)	18 (25)	24 (65)	77 (39)
Ave. area (ha)	628 ^a	391 ^a	547 ^a	1156 ^b	650 \pm 53
Farmer details					
Farming in region 1988/89	48 (94)	46 (100)	62 (95)	37 (97)	193 (96)
Farmer age (yrs)	44	49	47	46	48
Management experience (yrs)	16	19	17	16	17
Drought impact					
Capital stock sold (/10 yrs)	1.18 ^{ab}	0.74 ^a	1.57 ^b	1.21 ^{ab}	1.21 \pm 0.09
Stock grazed off in (/10 yrs)	0.76 ^a	0.39 ^a	1.02 ^a	1.95 ^b	0.99 \pm 0.12

^{a,b} Means with different superscripts within rows are significant at $P < 0.05$.

¹ Effective grazing area data were requested in order to exclude non-pastoral farming enterprises.

Farmer involvement in drought assistance programme

Slightly over half (55%) of the farmers surveyed had received no assistance from the East Coast Drought Programme (Table 2.2). Of those farmers who had received assistance, this was most frequently in the form of a drought loan (33%) or a farm management consultancy report (33%). Of those who had received a consultancy report, 61% considered that it was useful and 41% had put ideas, which had been recommended in the report, into practice on their farms. Initial indication of farmer involvement in all parts of the drought assistance programme was totally unprompted (refer Appendix B, question 3). This resulted in 20 farmers (10%) admitting they had received a consultancy report. However, when specifically prompted later in the interview (refer Appendix B, questions 12 and 13) 66 farmers (33%) said they had received a consultancy report.

Of the 200 farmers surveyed only 7% indicated participation in the family income support programme; whereas the actual participation was around 20%. This large difference could be due to either the telephone survey sampling being unrepresentative of East Coast farmers or farmers not wanting to admit that they had received a family income support "handout".

Participation in the drought loan and consultancy report programme was slightly higher in the survey than for the overall farmer population. This can probably be attributed to random sample variation, due to its relatively small size, in the telephone survey.

Table 2.2 Farmer involvement with various aspects of the East Coast Drought Assistance Programme by geographic area. Figures in brackets are the percentage of farmers within each column.

	Wairarapa (n=51)	Southern HB (n=46)	Hawkes Bay (n=65)	Gisborne (n=38)	Total (n=200)	Actual uptake (n=5000) ¹
None	26 (51)	24 (52)	35 (54)	24 (63)	109 (55)	
Family Income Support	7 (14)	3 (7)	4 (6)	0	14 (7)	960 (20)
Drought Loan	20 (39)	17 (37)	21 (32)	7 (18)	65 (33)	1205 (24)
Consultancy Report	14 (28)	19 (41)	25 (39)	8 (21)	66 (33)	1280 (26)
- was useful (n=66)	7 (50)	11 (58)	16 (64)	6 (75)	40 (61)	
- ideas practised (n=66)	7 (50)	11 (58)	5 (20)	4 (50)	27 (41)	
Pasture Demonstration Programme	3 (6)	0	2 (3)	0	5 (3)	79 (2)
Unspecified	0	0	1 (2)	0	1 (1)	

¹East Coast farmer population estimated at 5000.

Farmer views on future Government assistance

Half of the farmers surveyed said that no assistance from the Government should be provided to farmers if a serious drought, similar to that which occurred in 1988/89, was to occur again (Table 2.3). However, of those who did suggest some form of Government assistance should be provided, 16% of the total sample indicated that this should be in the form of a tax break for the sale of capital livestock (i.e., the income gained from the sale of capital stock should have a special tax exemption applied to it). Ten per cent of the farmers felt that an assistance programme similar to that developed in 1990 should be repeated because the money was well targeted to farmers in need. Slightly fewer (9%) suggested that the Government should supply feed, or compensate for bought-in feed, or assist with cartage costs incurred because capital livestock had to be trucked to outside grazing. As an aside, one Gisborne farmer commented that the threat of TB had become a serious restriction to the use of outside grazing. Thus, an historically important drought management option for this farmer was no longer viable.

Table 2.3 Farmer views on whether Government assistance should be provided to farmers who are seriously affected by drought and the form that this assistance should take. Figures in brackets are the percentage of farmers within each column.

	Wairarapa (n=51)	Southern HB (n=46)	Hawkes Bay (n=65)	Gisborne (n=38)	Total (n=200)
None	25 (49)	32 (70)	26 (40)	17 (45)	100 (50)
Tax relief for capital livestock sold	5 (10)	2 (4)	16 (25)	9 (24)	32 (16)
Same as 1990 programme	3 (6)	8 (17)	7 (11)	2 (5)	20 (10)
Supply feed or cash for extra feed and cartage	6 (12)	2 (4)	4 (6)	5 (13)	17 (9)
Loans with discounted interest rates	8 (16)	1 (2)	6 (9)	1 (3)	16 (8)
Guaranteed livestock prices	2 (4)	-	2 (3)	2 (5)	6 (3)
Subsidy on fertiliser	-	-	3 (5)	-	3 (2)
Family income support	1 (2)	-	1 (2)	-	2 (1)
Cash compensation for livestock loss	1 (2)	-	-	1 (3)	2 (1)
Subsidised programme for tolerant grasses and demonstration programme	-	1 (2)	-	1 (3)	2 (1)

Effectiveness of drought-related publications

When prompted about the drought related publications (refer Appendix B, questions 4, 5 and 6) approximately two-thirds of the farmers in the East Coast region remembered receiving the booklet "Drought Proofing Your Farm" (Table 2.4). Of the farmers in this category 58% found it to be useful for their management purposes. In contrast, the update newsletters were less well remembered, with only 30% of the farmers recalling that they had received any of the four newsletters, but of these, 55% found the information presented in this format to be useful for their management purposes.

Overall 31% of the farmers had kept the booklet, newsletters, or both, in their records (presumably where they can be recovered for future reference). With respect to the "Drought

"Proofing Your Farm" booklet, a number of farmers commented that while its content was not particularly new, the emphasis on integrating components of drought management into an overall farming system was particularly helpful. A second aspect of the booklet which the farmers recalled, was the material on alternative pasture species and their role in dryland farming systems.

Table 2.4 Number of farmers who recalled receiving "Drought Proofing Your Farm" and "Sustainable Farming Systems" Newsletter updates, and who found the information from these publications to be useful. Figures in brackets are the percentage of farms within columns.

	Wairarapa (n=51)	Southern HB (n=46)	Hawkes Bay (n=65)	Gisborne (n=38)	Total (n=200)
Publications received					
Drought proofing your farm	33 (65)	29 (63)	42 (65)	24 (63)	128 (64)
Sustainable farming systems update	17 (33)	14 (30)	20 (31)	9 (24)	60 (30)
Information useful					
Drought "proofing" booklet	18 (35)	17 (37)	24 (37)	15 (40)	74 (37)
Newsletter updates	8 (16)	8 (17)	11 (17)	6 (16)	33 (17)
Publications kept					
Drought "proofing" booklet	15 (29)	9 (20)	17 (26)	10 (26)	51 (25)
Newsletter updates	0	0	1 (1)	0	1 (1)
Both	3 (6)	4 (9)	1 (2)	1 (3)	9 (5)
Total ^a	18 (35)	13 (28)	19 (29)	11 (29)	61 (31)

^a Total number of farmers who had retained technology transfer publications prepared for the East Coast Drought Assistance Programme.

Effectiveness of focus farm field days

Most of the farmers contacted (81%) were aware of the Focus Farm field days, but only 30% had actually attended one of these events (Table 2.5). Of those who had attended, 53% found the field days to be useful in terms of the farm management advice proffered. A breakdown of the farmers who had attended the field days indicated that 54% went to one field day, 37% went

to two, and 9% went to three or more. Thus, only a small percentage of farmers were regular attenders of the Focus Farm field days.

Of those farmers who had attended the Focus Farm field days, 29% subsequently sought further information from farm consultants and 15% indicated that they had changed their management practices as a result of the material presented or seen at the Focus Farm. However, only a small proportion of the farmers (9%) had visited a Focus Farm at a time other than during a field day in order to seek advice and information from the host farmer.

On a regional basis, significantly ($P < 0.05$) more farmers in the Hawkes Bay area had attended a field day than in the Wairarapa. The level of attendance of Focus Farms in the other regions was similar.

Table 2.5 Farmer awareness and attendance of Focus Farm field days by geographic area (number of farmers per region). Figures in brackets are the percentage of cases within columns.

	Wairarapa (n=51)	Southern HB (n=46)	Hawkes Bay (n=65)	Gisborne (n=38)	Total (n=200)
Aware of field days	44 (86)	38 (83)	53 (82)	27 (71)	162 (81)
Field day attendance					
- one day	5	9	11	7	32 (16) ^c
- two days	4	5	7	6	22 (11) ^d
- three days	0	1	4	0	5 (3) ^e
Total attendance	9 ^a (18)	15 ^{ab} (32)	22 ^b (34)	13 ^{ab} (34)	59 (30)
Field days were useful (n=59)	3 (33)	8 (53)	13 (59)	7 (54)	31 (53)
Visited at time other than field day	5 (10)	7 (15)	4 (6)	3 (5)	18 (9)
Field day outcome (n=59)					
Sought further information from consultants	9 (100)	7 (47)	9 (41)	8 (62)	33 (56)
Changed management practices	3 (33)	2 (13)	4 (18)	0	9 (15)

^{a,b} Means with different superscripts within rows are significantly different at $P < 0.05$.

^{c,d,e} Farmer attendance at 1, 2 or 3+ field days are mutually exclusive.

The most frequent reason given by farmers (30% of the number of reasons provided) for not

attending a Focus Farm field day was that they were too busy at the time (Table 2.6). The second most frequent reason given was that the farmers felt that the topics covered at the field day were not applicable due to limitations on their own farm (situation) such as topography or finance. Some also felt that their farm was not seriously affected by summer drought and therefore the information presented at the Focus Farm was not especially relevant to their situation. More than one third (35%) of the farmers either could not recall a particular reason, or did not want to specify a reason, why they were not able to attend a field day.

Table 2.6 Primary reason given by farmers for non-attendance of Focus Farm field days. Figures in brackets are the percentages of total reasons within columns.

	Wairarapa	Southern HB	Hawkes Bay	Gisborne	Total
Too busy	15 (37)	5 (17)	13 (30)	9 (38)	42 (30)
Not applicable for home farm	8 (20)	7 (23)	10 (23)	1 (4)	26 (19)
Drought management already adopted	2 (5)	3 (10)	1 (2)	2 (8)	8 (6)
Don't like field days	3 (7)	1 (3)	1 (2)	0	5 (4)
Not interested	3 (7)	1 (3)	1 (2)	0	5 (4)
Held too far away	2 (5)	0	1 (2)	1 (4)	4 (3)
No reason offered	8 (10)	13 (43)	16 (37)	11 (38)	48 (35)
Total reasons	41	30	43	24	138

Relevant information

Aspects of the various information sources provided through the technology transfer programme which the farmers found to be useful are summarised in Table 2.7. The "Drought Proofing Your Farm" booklet was most frequently cited as a source of useful information (78 mentions). Information in the booklet with the greatest utility related to alternative pasture species (23 mentions), livestock policies (9), and timely decision making (8). However, a relatively large number of farmers who claimed to have read the booklet and newsletters, and to have taken the information into account, were not able to specify how it had been useful in relation to their farm (27 and 20 mentions, respectively).

Overall, the newsletter and Focus Farm field days were not widely rated as being useful. The Focus Farm field days, however, were noted for providing useful information on alternative

pasture species (15 mentions).

The Farm Management Consultancy Report was mentioned as a useful information source by 44 farmers. Thus, by this criterion it was rated the second most useful source of information on drought management. Twelve of the 44 farmers indicated that the report provided a worthwhile overall review of their current farming situation.

Table 2.7 Reasons given by farmers as to why various sources were useful to their situation. Farmers could provide responses to more than one category. Figures in brackets are the percentage of the total farmers (n=200) surveyed.

Topic	Booklet	Newsletters	Focus farm field days	Consultant input	Visit to focus farm	Consultancy Report
Information on:						
Alternative pasture species	23 (12)	3 (2)	15 (8)	12 (6)	1 (1)	8 (4)
Livestock policies	9 (5)	2 (1)	5 (3)	9 (5)	7 (4)	5 (3)
Supplements	5 (3)	-	3 (2)	1 (1)	1 (1)	6 (3)
Decision making	8 (4)	1 (1)	-	-	-	4 (2)
Tree planting	1 (1)	-	-	-	-	5 (3)
Personal contact	1 (1)	-	-	-	-	-
Overall review	3 (2)	3 (2)	1 (1)	7 (4)	-	12 (6)
Fertiliser	1 (1)	1 (1)	-	2 (1)	-	2 (1)
Objective setting	-	-	1 (1)	-	-	-
Water supply	-	-	1 (1)	-	-	-
Financial management	-	-	-	5 (3)	-	2 (1)
Read or took advice into account	27 (14)	20 (10)	8 (4)	-	-	-
Unspecified ¹	-	3 (2)	-	-	-	-
Total	78 (39)²	33 (17)	34 (17)	36 (18)	9 (5)	44 (21)

¹ "Unspecified" represents farmers who said information source was useful, but gave no direct answer as to how it was useful.

² Total percentages add to over 117% because some farmers indicated more than one topic from the various information sources that were useful.

Reasons for information irrelevance

While many farmers were not able to specify why particular sources of information were

irrelevant to their situation (Table 2.8), two reasons stood out as to why information sources were not considered relevant to a particular farm or farmer. First, the farmer was already practising what was being recommended through the information source. This probably arose from their experience with, or information presented at the time of, previous droughts. Second, the information was not relevant due to the current situation of either the farm or the farmer. For example, the farmer did not believe that information provided would make his/her farm more drought tolerant.

Table 2.8 Reasons given by farmers as to why different sources of information were not useful for their situation. Farmers could provide responses to more than one category. Figures in brackets are the percentage of the total farmers (n=200) involved in the survey.

Reason	Information source					
	Booklet	Newsletters	Focus farm field days	Consultant input	Visit to focus farm	Consultancy Report
Not in drought prone area	7 (4)	-	2 (1)	-	-	-
Already doing what was suggested	15 (8)	9 (5)	14 (7)	-	5 (3)	12 (6)
Not relevant	9 (15)	3 (2)	4 (2)	-	-	4 (2)
Didn't agree with it	1	-	-	-	-	1 (1)
No use due to good summers since 1988/89	3 (2)	1 (1)	1 (1)	-	1 (1)	1 (1)
Can't do anything about drought	1 (1)	-	-	-	-	-
Advice was not practical	4 (2)	1 (1)	2 (1)	-	2 (1)	2 (1)
Cost too high to implement	3 (2)	1 (1)	3 (2)	-	-	1 (1)
Manager limited by owner	2 (1)	2 (1)	2 (1)	-	-	-
Unspecified ¹	84 (42)	150 (75)	141 (71)	168 (84)	183 (92)	141 (71)
Total	129 (65)	167 (84)	169 (95)	168 (84)	191 (96)	162 (81)

¹ "Unspecified" represents those farmers who either did not receive or take part in the information source, or gave no answer.

Farmers were also asked to identify sources of information, other than that specifically identified with the Technology Transfer Programme, that assisted them with drought management (refer Appendix B, question 15) (Table 2.9). The most frequent source of alternative information was

neighbours (30%) and that generated from previous experience with drought (22%). Previous experience was an especially important source of information in the Gisborne area (45%), while the "other farmer" source of information was particularly cited in Hawkes Bay (40%). As could be expected, most farmers used one or more sources of information with respect to drought management. The highest overall use of information was in the Gisborne and Hawkes Bay areas, while the lowest citation of information for drought management use was in the southern Hawkes Bay (52%) which was also previously identified (Table 2.1) as being the area least affected by serious drought.

Table 2.9 Sources of information, other than those specifically identified with the Technology Transfer Programme, used by farmers to assist with drought management. Figures in brackets are the percentage of cases within columns.

	Wairarapa (n=51)	Southern HB (n=46)	Hawkes Bay (n=65)	Gisborne (n=38)	Total (n=200)
Media					
Consultant newsletters	3 (6)	-	-	-	3 (2)
Farming magazines and papers	1 (2)	3 (7)	13 (20)	8 (21)	25 (13)
Local newspapers	1 (2)	-	17 (26)	7 (18)	25 (13)
Personal contact					
Local consultants	10 (20)	1 (2)	4 (6)	10 (26)	25 (12)
Other farmers	12 (24)	10 (22)	26 (40)	12 (32)	60 (30)
AgResearch	3 (6)	1 (2)	-	-	4 (2)
Agribusiness sector	3 (6)	7 (15)	4 (6)	2 (5)	16 (8)
Seminars/Field days					
Local discussion group (including consultants)	9 (18)	-	4 (6)	5 (13)	18 (9)
DSIR field days	1 (2)	-	-	-	1 (1)
Ag courses at Flockhouse	-	1 (2)	-	-	1 (1)
Other field days	-	-	-	2 (5)	2 (1)
Other Sources					
Previous experience	10 (20)	1 (2)	17 (26)	17 (45)	45 (22)
Records on weather/farm	2 (4)	-	-	-	2 (1)
Family member at Lincoln or Massey	1 (2)	-	1 (2)	1 (3)	3 (2)
Total	56 (110)	24 (52)	86 (132)	64 (168)	230 (115)

¹ Some total percentages sum to more than 100% due to farmers using more than one source of information.

Farm management changes

The management changes made on the surveyed farms since the 1988/89 drought are summarised in Table 2.10. (A more detailed breakdown of this information is provided in Tables I-VI in Appendix C). The most common change to farming systems (52%) was the establishment of new pasture species, while 41% had changed their livestock policies, 48% indicated they had improved the timeliness of decision making (e.g. early decisions on stocking rate for summer) and 37% had increased the quantity of feed supplements (including hay, silage and forage crops) to counteract the effects of a drought on their farm. Only 9% of the farmers had not changed any part of their farming system. It was not possible, however, to clearly identify which of the changes could be directly attributed to the Technology Transfer Programme compared to those associated with other adjustments in the farming industry (e.g., an increase in the value of cattle relative to the price of sheep over the 1990-92 period).

Table 2.10 Management changes made since the 1988/89 drought (no. of mentions). Figures in brackets are the percentage of farmers who identified specified management change within each column.

	Wairarapa (n=51)	Southern HB (n=46)	Hawkes Bay (n=65)	Gisborne (n=38)	Total (n=200)
New pasture sown (Table I) ¹	26 (51) ²	27 (59)	38 (59)	13	104 (52) ³
Financial management (Table II)	2 (4)	3 (7)	3 (5)	1 (3)	9 (5)
Clearer farm objectives	-	1 (2)	-	1 (3)	2 (1)
Livestock policies (Table III)	15 (30)	16 (35)	26 (40)	25 (66)	82 (41)
Timely decision making (Table IV)	23 (45)	13 (28)	38 (58)	22 (58)	96 (48)
Incorporating feed supplements (Table V)	17 (33)	11 (24)	32 (49)	14 (37)	74 (37)
Other (Table VI)	22 (43)	19 (41)	15 (23)	11 (29)	67 (34)
No changes	4 (8)	7 (15)	5 (8)	2 (5)	18 (9)

¹ For a detailed breakdown of this category refer to Appendix C, Tables I to VI.

² Total percentages add to 226% due to farmers making more than one change.

³ New pasture sown figures include the establishment of species other than those regarded as drought tolerant (e.g. ryegrass and white clover). The improved varieties of traditional grasses generally have better productivity through most seasons of the year and can be regarded as improving the farm's drought tolerance as well. It is estimated that 92% of the new plantings included the alternative pasture species targeted in the Technology Transfer programme.

Farmer and farm limitations to change

Factors preventing farmers from making changes to their existing system so that it would be less affected by summer drought are described in Table 2.11. The limitation to change most frequently cited was the topography of the farm (36%). However, a relatively large number of the farmers also stated that finance (21%) and an inadequate water supply (11%) were limitations to making their farm less affected by a serious summer drought. Just over one quarter of the farmers stated that their farm had no limitations, or at least none came to mind at the time of the telephone interview.

Table 2.11 Farmer (or farm) limitations that restrict a change from the existing system to one that is less affected by summer droughts. Figures in brackets are the percentage of the farm(ers) within each column.

	Wairarapa (n=51)	Southern HB (n=46)	Hawkes Bay (n=65)	Gisborne (n=38)	Total (n=200)
Finance	17 (33)	9 (20)	13 (20)	3 (8)	42 (21)
Topography of farm	21 (41)	15 (33)	21 (32)	14 (37)	71 (36)
Age and/or motivation	2 (4)	-	-	1 (3)	3 (2)
Water supply	6 (12)	5 (11)	4 (6)	7 (18)	22 (11)
Inflexible stock class or rate	-	1 (2)	9 (14)	2 (5)	12 (6)
Soils - poor physical characteristics	1 (2)	1 (2)	2 (3)	-	4 (2)
Fertility/fertiliser	5 (10)	1 (2)	1 (2)	1 (3)	8 (4)
None specified	6 (12)	17 (37)	17 (26)	12 (32)	52 (26)

Importance of drought management options

Farmers were asked to rate the importance of various management options in terms of drought management on their farms (Table 2.12). Most farmers stated that all of the farm management aspects read from the questionnaire were either important or very important in reducing the effect of a drought (i.e., mean scores > 3 for a 1-4 scale). The exception to this was alternative pasture species, which were generally rated not important or important (mean score 2.7). This may have been due to the fact that finance and topography, and also a time factor, had prevented many of the farmers from establishing alternative pasture species on their farms since the 1988/89 drought. The most highly rated aspects of drought management were "early

decisions on livestock numbers for summer" (58% indicated that this was "very important") and the "specification of farm objectives" (53% indicated that this was "very important"). These two factors were strongly emphasised in the Technology Transfer programme and were features in the "Drought Proofing Your Farm" booklet and were reemphasised through the update newsletters and Focus Farm field days as well.

The relatively low mean score of 2.7 given by farmers for the importance of alternative pasture species contrasts with the 52% of farmers who had established new pasture species (Table 2.10). This may indicate that their reasons for establishing new pasture species were either unclear or for reasons other than drought management (e.g. animal health considerations). Alternatively the ease with which new pastures could be incorporated into a farming system, relative to some of the other management changes, may have influenced the farmer's view on the importance of pasture species. In addition, the responses in Table 2.12 refer to the overall farming system, whereas results in Table 2.10 refer mainly to component changes in farm management.

Table 2.12 Farmers rating of the importance of various management options on their farm that could reduce the affect of a summer drought (n=200). Figures in brackets are the percentage of total responses.

Management option	Very unimportant	Not important	Important	Very important	No effect	Mean ¹ score (± se)
Incorporation of hay or silage	10 (5)	41 (21)	61 (31)	85 (43)	3 (2)	3.12 ± 0.07
Maintenance of financial records	4 (2)	22 (11)	74 (37)	92 (46)	8 (4)	3.32 ± 0.06
Early decisions on livestock numbers for summer	0	20 (10)	59 (30)	115 (58)	6 (3)	3.49 ± 0.05
Alternative pasture species	17 (9)	66 (33)	63 (32)	43 (22)	11 (6)	2.70 ± 0.07
Specification of farm objectives	1 (1)	5 (3)	77 (39)	106 (53)	11 (6)	3.51 ± 0.05
Incorporation of a whole farm plan (pasture, stock and finance)	1 (1)	11 (6)	85 (43)	94 (47)	9 (5)	3.39 ± 0.05

¹ Based on an ordinal scale; 1 = very unimportant, 2 = not important, 3 = important, 4 = very important. Answers for farms where the option had "no effect" were excluded from the mean score calculation.

Other aspects that were considered to be important by farmers for drought management on their properties are described in Table 2.13. The most frequently mentioned aspects were an adequate water supply (7.5%) and flexibility with respect to the livestock policy (7.5%). Overall most farmers (72.5%) could not think of any aspects of farm management, other than those listed in Table 2.12, that would reduce the impact of a drought on their property.

Table 2.13 Other aspects that were considered important by surveyed farmers for drought management on their farms (n=200). This information supplements that provided in Table 2.12.

Item mentioned	No. of farmers	(% of total mentions)
None	145	72.5
Adequate water supply	15	7.5
Livestock flexibility	15	7.5
Fertiliser	6	3.0
Monitoring weather patterns	6	3.0
Extra grazing (runoffs, etc)	6	3.0
Meat price monitoring	3	1.5
Referring to previous records	2	1.0
Calving or lambing date	2	1.0

Summary of overall changes

Only 8% of the farmers indicated that they had not received any information through the Technology Transfer Programme (Table 2.14). Of the farmers who had received drought assistance (a drought loan or family income support), 42% had changed their farming system (as described in Table 2.10). A substantial percentage (84%) of the farmers who had received or taken part in any of the Technology Transfer Programme had made some change to their farming system (see Table 2.10 for details) and 81% considered themselves to be better equipped now to successfully manage a serious drought such as that which occurred in 1988/89. The fact that they had gained more experience was a commonly cited factor for their better preparedness for a drought situation. There was very little difference in the results for the four East Coast geographic area in terms of overall changes to farming systems.

Table 2.14 Summary of overall changes to a more 'drought proof' farming system categorised by farmer involvement with the Drought Assistance Technology Transfer Programme. Figures in brackets are the percentage of farmers within each column.

	Wairarapa (n=51)	Southern HB (n=46)	Hawkes Bay (n=65)	Gisborne (n=38)	Total (n=200)
Farmers who received no Tech. Transfer information	5 (10)	2 (3)	4 (6)	4 (11)	15 (8)
Farmers who received drought assistance (loan, income support, etc)	24 (47)	19 (41)	29 (45)	11 (29)	83 (42)
Farmers who received or took part in any of the Tech. Transfer programme	42 (82)	37 (80)	56 (86)	32 (84)	167 (84)
Farmers who consider themselves better equipped to manage drought conditions	41 (80)	34 (74)	53 (82)	34 (90)	162 (81)

Conclusions

A telephone survey of 200 farmers was under taken to evaluate the 1990 East Coast Technology Transfer Programme. The sample represented approximately 4% of the farmer population in the East Coast region. Therefore the results represent an estimate of the amount of technology transfer which occurred. A high level of farmer participation in the survey was obtained, but the period of time which had elapsed since the main events of the Technology Transfer Programme was a constraint to the recall of information for some farmers. On the other hand, the information that was recalled is likely to represent the lasting impacts of the programme.

The main findings were:

- (a) Half of the farmers believed that no Government assistance should be provided to farmers if a serious drought, similar to that which occurred in 1988/89, was to occur again. The remainder generally wanted assistance to be carefully targeted so that only those in genuine need were helped (e.g. farmers forced to sell a large proportion of high

quality capital stock that had been breed-up over a long period of time). Most believed that this assistance should take the form of tax exemptions on income earned from the sale of capital stock due to drought.

- (b) Most farmers (91%) had changed some aspect of their farming system in order to decrease its susceptibility to drought. These changes included sowing new pasture species (52%), more timely decision making (48%), running more saleable stock at the expense of less capital stock (41%) and incorporating more feed supplements to counteract the effects of a drought (37%). It was not possible to directly attribute these changes to the Technology Transfer Programme. However, 84% of the farmers who had received information or attended any event related to the Technology Transfer Programme, changed their farming system so that it was more "drought proof".
- (c) Some parts of the Technology Transfer Programme were more effective than others in providing useful information to farmers. The "Drought proofing Your Farm" booklet was most widely remembered by farmers (64%), and cited as being particularly useful for providing information on alternative pasture species, livestock policies and timely decision making. Other forms of information provided by the Technology Transfer Programme (the four newsletters and the Focus Farm field days) were apparently less effective. The Focus Farm field days were most noted for providing useful information on alternative pasture species. It should also be noted that it was not possible through the telephone survey to determine the degree to which extension messages were reinforced by the various parts of the Technology Transfer Programme. For example, both the update newsletters and Focus Farm field days attempted to reinforce the information initially presented in the "Drought Proofing Your Farm" booklet.
- (d) Overall, 81% of farmers now considered themselves to be better equipped to successfully manage a drought than they were in 1988/89. When asked to rate the importance of various aspects of management in reducing the impact of a drought on their farm, 58% identified "early decisions on livestock numbers for summer" and 53% identified the "specification of farm objectives" as being "very important". Both of these factors were strongly promoted through the Technology Transfer Programme.

Chapter 3 - Assessment of The Alternative Pasture Species Demonstration Programme

Introduction

Paddock-sized demonstrations of new pastures within districts were found to be an effective means of promoting this technology to farmers (Belgrave *et al.* 1990). This research formed the basis of the 1988 Government-funded programme to renew 1600 ha of drought affected pastures in North Otago and South Canterbury (Milne & Fraser 1990). This initiative sought to demonstrate the benefits of drought tolerant species which, at that time, were not in common use by farmers in dryland regions. Despite unfavourable climatic conditions in both 1989 and 1990, only 3% of the pastures had to be resown. This outcome provided further evidence that paddock demonstrations were an effective method of presenting new pasture species directly to farmers (Milne & Fraser 1990).

The aim of the North Island Alternative Pasture Demonstration Programme was to develop farmer confidence in sowing, establishing and grazing drought tolerant pasture species, and thereby to encourage the adoption of this "drought proofing" technology into their farming system. To achieve this aim a large area (1500 hectares) of drought tolerant pasture species were to be established on farms representative of the East Coast region. The initial target was to plant approximately 20% of this area on steeper hill country by oversowing.

The Alternative Pasture Demonstration Programme, farms were selected jointly by representatives from DSIR Grasslands, the Ministry of Agriculture and Fisheries (MAF), Federated Farmers and the Rural Support Trust. A total of 91 Alternative Pasture Demonstration farms were selected, however, 12 subsequently withdrew mainly due to either financial reasons or the relatively high risk associated with oversowing on steeper country (Milne 1994 pers. comm). Approximately 20 field days were held during the programme which ran from spring 1990 to autumn 1992. An estimated 1725 people attended these events (Milne *et al.* 1994).

Survey Method

Background information on the overall Technology Transfer Programme as well as the Alternative Pasture Demonstration Programme was collected in April 1994 by interviewing Mr Gavin Milne (AgResearch, Palmerston North), Mr Danny Smith (AgResearch, Poukawa, Hawkes Bay) Mr Tony Rhodes (Agriculture New Zealand, Dannevirke) and Mr John King (MAF Policy, Hastings) and by reviewing MAFPolicy documents outlining the programme (Tony Rhodes 1994). This preliminary investigation prevented repetition of previous survey work conducted by AgResearch and enabled the questionnaire to be designed so that assessment could be related to the objectives for the programme.

Questionnaire development

The questionnaire to evaluate the Alternative Pasture Demonstration Programme (Appendix D) covered three broad areas. The first sought to establish physical information about the farm and farmer. This included the types of farming enterprise, farm area (total, effective and cultivatable), farmer age, amount of farmer experience, number of field days held on the farm, the number of other farmers who have visited the alternative pasture species and the number of farmers who have sown alternative pasture species as a result of visiting the demonstration farm.

The second area investigated was the success of the alternative pasture species relative to existing (i.e. traditional) ryegrass / clover pastures. This was measured in terms of pasture characteristics (i.e. amount of seasonal growth, ease of establishment and stock performance), effectiveness in reducing the impact of drought and their effect on the overall farming system. Farmers were also asked whether they had increased, decreased or maintained the initial area of pastures established for the programme and the reasons for this action.

The third measured was farmer attitudes towards 'drought proofing' technologies, their views on the quantity of the help offered by DSIR (Grasslands) (now AgResearch), the likelihood of their use of research institutions, and their views on how much government assistance

should be provided should a serious drought (similar in magnitude to that of 1988/89) occur again. The Alternative Pasture Demonstration Programme questionnaire was pretested with three East Coast farmers and reviewed by staff members in the Department of Agricultural & Horticultural Systems Management at Massey University.

Sample list of farmers and consultants

The names and addresses of farmers involved in the Alternative Pasture Demonstration Programme were obtained from Mr Gavin Milne (AgResearch, Palmerston North). The original list comprised of 92 farmers however, as explained previously, only 80 of these actually took part in the programme. Since information obtained from the farmers who had withdrawn from the programme could provide important information about the selection of suitable farms, the survey questionnaire was sent to all 92 farmers along with a letter of explanation and a postage-paid return envelope.

Statistical analysis

The Alternative Pasture Demonstration Programme questionnaire responses were coded and entered into a computer file for analysis by the SPSS/PC statistical package. Frequencies, cross tabulations and Duncans Multiple Range Test were applied to the data set.

Results

Farmer and farm details

The predominant livestock system on the Alternative Pasture Demonstration farms was sheep and beef cattle production (72% of the farms) (Table 3.1). Almost all (91%) of the farmers surveyed ran a finishing livestock enterprise. Total farm size averaged 730 (standard error \pm 105 ha), while the average effective and cultivatable areas were 631 ± 74 ha and 202 ± 22 ha, respectively. Thus, the area in pasture or crop accounted for 86% of the farm area. The cultivatable area represented 22% of the effective area. Properties in the Gisborne region had a significantly ($P < 0.05$) smaller area of land that was cultivatable than those in southern

Hawkes Bay.

The average farmer age was 48 years; the same as in the East Coast telephone survey. Farmers had an average of 16 years of management experience on their present farm.

Table 3.1 Summary of main livestock enterprises, farm size, average farmer age and years of management experience for Alternative Pasture Demonstration Programme farmers. Figures in brackets are the percentage of cases within columns.

	Wairarapa (n=18)	Southern HB (n=27)	Hawkes Bay (n=11)	Gisborne (n=13)	Total (n=69) Mean \pm SE
Livestock type					
Sheep/beef	12 (67)	20 (74)	7 (64)	11 (85)	50 (72)
Beef	1 (6)	1 (4)	-	2 (15)	4 (6)
Dairy	4 (22)	2 (7)	-	-	6 (9)
Sheep/beef/deer	1 (6)	3 (11)	1 (9)	-	5 (7)
Sheep/beef/other	-	-	2 (18)	-	2 (3)
Sheep	-	1 (4)	-	-	1 (1)
Stud cattle	-	-	1 (9)	-	1 (1)
Livestock system					
Finishing livestock enterprise	14 (78)	25 (93)	11 (100)	13 (100)	63 (91)
Farm size					
Total (ha)	874	593	732	814	730 \pm 105
Effective ¹ (ha)	678 (78)	526 (89)	655 (89)	765 (94)	631 \pm 74 (90)
Cultivable ² (ha)	157 (23)	261 ^a (50)	243 (37)	112 ^b (15)	203 \pm 22 (42)
Farmer details					
Farmer age (yrs)	48	48	47	47	48
Management experience (yrs)	16	15	17	19	16

^{a,b} Means with different superscripts within rows are significant at $P < 0.05$.

¹ Figures in square brackets are the effective area expressed as a weighted percentage of the total area.

² Figures in square brackets are the percentage of cultivatable area expressed as a weighted percentage of the effective area.

Areas of alternative pasture species sown

The average area of alternative pasture species sown in the 1991-92 programme was 16 ha (n=69 farms). This had increased to 37 ha by 1994 (Table 3.2). As a percentage of effective and cultivatable area this equates to an average increase from 4.3% to 9.6% and from 15.6% to 25.6% respectively per farm. Approximately 15% of the farmers had established all of their

cultivateable land and would therefore need to adopt oversowing technology if the area of alternative pasture species was to be increased further on non-cultivateable land.

The substantial increase in area of alternative pasture species since the initial plantings in 1991/92 also means that these new species now have a greater impact on total seasonal and annual dry matter production on most of the farms and therefore potentially on overall stock and financial performance.

Table 3.2 Areas of alternative pasture species sown during the 1991-92 programme and in June 1994.

	During programme 1991-92 (n=69)	June 1994 (n=69)
Average area sown per farm (ha)	16 ± 1.5	37 ± 5.6
Percentage of effective area (ha)	4.3 %	9.6 %
Proportion of effective area sown		
0-25 %	67 (99)	64 (93)
26-50 %	1 (1)	3 (4)
51-75 %		1 (1)
76-100 %		1 (1)
Percentage of cultivatable area (ha)	15.6 %	25.6 %
Proportion of cultivatable area sown		
0-25 %	57 (85)	42 (62)
26-50 %	6 (9)	19 (28)
51-75 %	2 (3)	4 (6)
76-100 %	2 (3)	3 (4)

Farmers' views on future Government funding

Almost two thirds of the farmers surveyed believed that similar Government input (\$30 million) should again be provided (45%), or increased (17%), if a drought similar to that experienced in 1989 occurred again. About one third (30%) of the farmers indicated that no funding should be provided. This contrasts with the 50% of farmers who held this view in the telephone survey. A possible explanation for this difference in viewpoint was that the alternative pasture demonstration farmers had received more direct (and tangible) benefits from the overall drought programme and therefore recognised it (and future funding) as being more advantageous than those who had not participated in the programme.

Reasons for farmer participation in the programme

The most common reason given by farmers for participating in the Alternative Pasture Demonstration Programme was the need to improve pasture growth during summer (25%) (Table 3.3). A history of dry summers (20%) and the opportunity to establish drought tolerant pastures at a subsidised rate (19%) were other common reasons for entering the programme. The participation of eight farmers (12%) was attributed to advice given to them from various sources (consultants, other farmers, media, Federated Farmers). Two farmers (3%) indicated that their participation was aimed at decreasing ryegrass staggers.

Types of pasture species sown

The most common new pasture established was fescue-based (30%) (Table 3.3). Triple mix (fescue, phalaris and cocksfoot) (17%), cocksfoot-based (10%), and fescue and cocksfoot based (10%) pastures were also established.

Table 3.3 Reasons why farmers participated in the Alternative Pasture Demonstration Programme and the types of pasture sown. Figures in brackets are the percentage of respondents in each category.

	Total (n=69)
Reason for farmer participation	
Need grass growth in summer	17 (25)
Dry summers	14 (20)
To establish drought tolerant grasses cheaply	13 (19)
Previous experience with grasses	6 (9)
Advice given from consultants and/or other farmers	5 (7)
To compare new pasture performance	5 (7)
Advice through media	2 (3)
Decrease grass staggers	2 (3)
Through Federated Farmers advice	1 (1)
No reason given	4 (6)
Species of pasture sown	
Fescue-based	21 (30)
Triple mix	12 (17)
Cocksfoot-based	7 (10)
Fescue and cocksfoot based	7 (10)
Triple mix with clover	5 (7)
Cocksfoot and phalaris	4 (6)
Cocksfoot, phalaris and clover	3 (4)
Fescue, cocksfoot and clover	2 (3)
Fescue, cocksfoot, clover and chicory	2 (3)
Fescue and phalaris	2 (3)
Prairie grass	1 (1)
Not specified	3 (4)

Area established in alternative pasture species

Nearly two-thirds (n=43 or 62%) of the farmers surveyed had increased the area of alternative pasture species from the initial area sown under the DSIR (Grasslands) programme (Tables 3.1 and 3.4). Only 7% (n=5) had decreased the area established in alternative pasture species. The majority (58%) of farmers who increased the area had done so because summer pasture productivity and hence stock performance had been improved relative to their traditional ryegrass/white clover pastures. However, summers since 1990 (except summer-autumn 1994) have been relatively moist in most of the East Coast region. This productivity response is unlikely to reliably represent the drought tolerance of the alternative pasture species.

Of the farmers that had maintained the same area of new pasture, 40% indicated that a lack of finance was the main limitation to further establishment. Topography limited further planting on 15% of the properties. A few farmers (3%) were monitoring longer-term pasture persistence before deciding whether to increase the area in alternative pasture species.

Poor pasture persistence was the main reason for decreasing the area in new pasture (40%). However, only one of the 69 farmers surveyed said that the alternative pasture species had poor summer performance (but the previous comment on summer rainfall should be noted here as well).

Table 3.4 **Reasons for increasing, decreasing or maintaining the area of alternative pasture species.**
Figures in brackets are the percentage of respondents in each category.

	Total (n = 69)
Established area (no. of farmers)	
Increased	43 (62)
Maintained	20 (29)
Decreased	5 (7)
Reasons for increasing area	
Better summer pasture performance	25 (58)
As part of pasture renovation	7 (16)
To test different species	3 (7)
Provide grass grub tolerant species	1 (2)
To further "drought proof" farm	1 (2)
Increased, no reason	6 (14)
Total	43 (100)
Reasons for maintaining the same area	
Lack of finance	8 (40)
Limited by topography	3 (15)
Waiting to see how grasses persist	2 (10)
No need to change area	2 (10)
Poor sowing conditions (climate)	1 (5)
Same area, no reason	4 (20)
Total	20 (100)
Reasons for decreasing area	
Poor pasture persistence	2 (40)
Growing crops instead	1 (20)
Poor summer performance	1 (20)
Poor palatability	1 (20)
Total	5 (100)

Importance of alternative pasture species

Increasing summer feed supply (mean "importance" score 1.55) and improving livestock growth rates (2.23) were rated as the most important reasons for using of alternative pasture species (Table 3.5). Increasing summer feed supply was ranked as most important by 58% of the farmers, and 32% as second most important. Protection against ryegrass staggers was rated as most important by 22% of the farmers (compared with only 3% of the farmers who originally took part in the programme in order to decrease grass staggers (Table 3.3)). Improving winter pasture supply (12%) and testing for on-farm performance (17%) were also rated as "important" factors.

Table 3.5 Importance rating (1 = most important, 6 = least important) of reasons for using alternative pasture species. Figures in brackets are the percentage of respondents in each category.

Reason	Least ²	Level of importance ¹					Mean score
		5	4	3	2	Most	
To increase summer feed supply	-	2 (3)	1 (1)	2 (3)	22 (32)	40 (58)	1.55
To improve livestock growth rates	2 (3)	1 (1)	8 (12)	12 (18)	18 (26)	24 (35)	2.23
To protect against staggers in summer/autumn	5 (7)	8 (12)	9 (13)	19 (28)	7 (10)	15 (22)	3.05
To improve winter feed supply	4 (6)	13 (19)	19 (28)	13 (19)	6 (9)	8 (12)	3.56
To test how they performed on my farm	4 (6)	20 (29)	15 (22)	6 (9)	6 (9)	12 (17)	3.59
Other ³	13 (19)	3 (4)	1 (1)	2 (3)	2 (3)	4 (6)	4.44

¹Some farmers ranked more than one aspect at a particular level of importance.

²Some farmers did not specify any ranking (hence importance = 0) and therefore omitted from the results.

³Other included: Drought protection (3), grass grub tolerance (3), increasing milksolids production (3), and one mention each of increased summer pasture quality, even growth pattern, to replace old pasture and as an alternative greenfeed crop.

Desirable characteristics of alternative pasture species

The farmers' ratings of specific characteristics of alternative pasture species compared to traditional ryegrass/white clover species are shown in Table 3.6. Ease of establishment was

rated as the worst characteristic of alternative pasture species. with 61% of farmers rating this aspect as "difficult" (mean score = 2.13). Pasture persistence (mean score = 3.14) was rated similar to ryegrass/white clover, although 32% of the farmers rated this attribute to be "slightly worse". Livestock performance, summer and winter pasture production, value for money and pest resistance all scored higher than for ryegrass/white clover pasture. Thus, the overall view of farmers toward the alternative pasture species was positive compared to existing pastures. These findings imply that improving establishment techniques, which will impact both on the cost-effectiveness and productivity of the new pasture species deserves further research and extension input.

Table 3.6 Farmers' ratings of attributes of alternative pasture species compared to traditional ryegrass/white clover pasture (rating = 3). Figures in brackets are the percentage of respondents in each category.

Attribute	Rating of attribute					Mean Score
	Very difficult/ much worse 1	Difficult/ slightly worse 2	Same 3	Easy/Better 4	Much Better 5	
Ease of establishment	11 (16)	42 (61)	11 (16)	3 (4)	1 (1)	2.13
Pasture persistence	3 (4)	22 (32)	9 (13)	21 (31)	8 (12)	3.14
Winter pasture production	1 (1)	9 (13)	17 (25)	31 (45)	9 (13)	3.57
Value for money spent	4 (6)	6 (9)	7 (10)	35 (51)	14 (20)	3.74
Pest resistance	1 (1)	0 (0)	22 (32)	28 (41)	14 (20)	3.83
Livestock performance	1 (1)	1 (1)	11 (16)	30 (44)	24 (35)	4.12
Summer pasture production	0	1 (1)	3 (4)	31 (45)	32 (46)	4.40

Effectiveness of alternative pasture species

Farmers' rating of the effectiveness of alternative pasture species, relative to ryegrass/white clover pastures, on reducing the effect of drought on farm profit and production are shown in Table 3.7. The majority of farmers rated them as either "better" or "much better" than the existing pastures. However, as noted previously farmers are generally basing this assessment on relatively favourable summer-autumns for pasture production. Very dry conditions, such as those experienced in late autumn 1994, may change farmer ratings (although the survey was conducted during this dry period).

Table 3.7. Farmer ratings (1 = very poor, 5 = much better) of the effectiveness of alternative pasture species relative to traditional ryegrass/white clover pastures for reducing the effect of a drought on farm production and profitability. Figures in brackets are the percentage of respondents in each category.

	Very poor	Effectiveness rating			Much better	Mean Score
		Poor	Same	Better		
Farm profit	2 (3)	2 (3)	2 (3)	35 (51)	27 (39)	4.22
Livestock performance	1 (1)	1 (1)	4 (6)	31 (45)	31 (45)	4.32

Importance of drought management options

Farmer views were obtained on the importance of specified drought management options for their farms (Table 3.8). Most rated that all of the listed farm management aspects as either "important" or "very important" for reducing the effect of drought, with "Early decisions on livestock numbers for summer" (74% indicated that this was "very important") and the "specification of farm objectives" (62% indicated that this was "very important") being rated most highly. This result is in agreement with the findings of the East Coast telephone survey where 58% of the farmers rated early decisions on livestock numbers for summer as "very important" and 53% rated specification of farm objectives as "very important". Alternative pasture species were rated as the second least important (mean score = 3.38) drought management option, however, just under half (49%) of the alternative pasture demonstration farmers rated alternative pasture species as "important" and 44% rated these as "very important". This contrasts with the telephone farmer survey where 33% of farmers rated alternative pasture species as "not important" and 32% rated these as "important". The higher importance rating of alternative pasture species by the alternative pasture demonstration farmers, compared to the randomly selected sample of East Coast farmers, probably reflects their greater experience with this technology.

Table 3.8 Farmer ratings (1 = very unimportant, 5 = no effect) of the importance of various management options on their farm that could reduce the effect of a summer drought.

	Importance Rating					Mean score
	Very unimportant	Not important	Important	Very Important	No effect	
Maintenance of financial records	1 (1)	8 (12)	23 (33)	31 (45)	5 (7)	3.33 ¹
Alternative pasture species	0 (0)	4 (6)	34 (49)	30 (44)	0 (0)	3.38
Incorporation of hay or silage	1 (1)	3 (4)	18 (26)	41 (59)	2 (3)	3.57
Incorporation of a whole farm plan ²	0 (0)	2 (3)	23 (33)	41 (59)	2 (3)	3.59
Specification of farm objectives	0 (0)	1 (1)	21 (30)	43 (62)	1 (1)	3.65
Early decisions on livestock numbers for summer	0 (0)	1 (1)	16 (23)	51 (74)	0 (0)	3.74

¹"No effect" responses were excluded from the mean score calculation.

²Including pasture, livestock and finance.

DSIR (Grasslands) performance in alternative pasture demonstration programme

The quality of information and service provided by DSIR Grasslands in relation to critical steps in the establishment and grazing of alternative pasture species was rated as either "good" or "very good" by the majority of farmers (Table 3.9). In agreement with Table 3.6 results, "establishment and use of new pasture in existing system" was rated overall as the least effective component of DSIR (Grasslands) input (but even here the score was above average). This may be associated with decreased DSIR involvement with the farmers toward the end of the programme.

Farmers commented appreciatively, and most frequently (15%), on DSIR (Grasslands) help and advice. Twelve percent of farmers stated that they were "very pleased" with the overall performance of their new pastures and 9% indicated that more local research into alternative pasture species is needed.

Most farmers indicated that they were either now more likely (71%) or as likely (23%) to seek further advice from research institutions as a result of their involvement in the Alternative

Pasture Demonstration Programme. This indirectly supports the positive view of the farmers toward the quality of information provided by DSIR (Grasslands) during the pasture demonstration programme (Table 3.9) and the overall success of the alternative pastures established (Tables 3.7 and 3.8).

Table 3.9 Farmer ratings (1 = very poor, 5 = very good) of the information given on various aspects of alternative pasture species by DSIR (Grasslands) (now AgResearch). Figures in brackets are the percentage of respondents in each category.

	Rating of information and service					Not sure	Mean score
	Very poor	Poor	Adequate	Good	Very good		
Establishment and use of new pasture in existing system	2 (3)	2 (3)	11 (16)	18 (26)	33 (48)	1 (1)	4.18
Grazing management in first 6 months of establishment	2 (3)	2 (3)	10 (15)	16 (23)	38 (55)	0 (0)	4.26
Cultivation methods for seedbed preparation	1 (1)	1 (1)	11 (16)	19 (28)	35 (51)	0 (0)	4.28
Rate information on pre-cultivation of pasture	1 (1)	2 (3)	9 (13)	17 (25)	37 (54)	1 (1)	4.32
Sowing depth for seeds	2 (3)	1 (1)	8 (12)	18 (26)	37 (54)	0 (0)	4.32

DSIR (Grasslands) alternative pasture demonstration field day analysis

A total of 45 field days were held during the Alternative Pasture Demonstration Programme, however, only 25 of the farms surveyed actually hosted a field day (Table 3.10). Most of these farmers (55%) indicated that few (< 10) farmers visited their properties at times other than field days to inspect and discuss the new pasture species. Total farmer visits were estimated to be 500 (or 10% of the East Coast farming population). Similarly, most farmers (52%) indicated that they knew of few (< 10) farmers who had sown alternative pasture species as a result of visiting their farm. The moderate level of farm visits over a three year period and establishment of alternative pasture species by other farmers could mean; farmers could not perceive any advantages from alternative pasture species, or farmers had gained all the information they required at the field days (and/or other sources), or that farmers had too many limitations to incorporate new species on their own properties.

The telephone survey (Table 2.10), indicated that 48% of farmers had used alternative pasture species in some way over the last three years. It was not possible to accurately establish where the farmers who had adopted alternative pasture species obtained their information, but the present survey suggests that sources such as field days, "Drought proofing your farm" booklet, media releases, and consultants, were more effective than by direct contact with Alternative Pasture Demonstration Programme farmers.

Table 3.10 Number of field days on alternative pasture species, non-field day visits and impact on adoption of pasture technology by East Coast 'districts'.

	Wairarapa (n=18)	Southern HB (n=27)	Hawkes Bay (n=11)	Gisborne (n=13)	Total (n=69)
Total number of field days	11	18	9	7	45
Number of farmers who hosted field days	6	9	6	4	25
Average number of field days held per farm (n=25)	1.83	2.00	1.50	1.75	1.80
Farmers visits other than on field day					
None	1	7	1	2	11
A few (< 10)	9	14	8	7	38
Some (10 to 20)	4	3	2	2	11
A lot (> 20)	4	3	-	-	7
Farmers who have sown alternative pasture species due to visit					
None	2	9	2	5	18
A few (< 10)	10	14	8	4	36
Some (10 to 20)	4	3	1	3	11
A lot (> 20)	1	-	-	-	1

Conclusions

A mail survey of the DSIR (Grasslands) Alternative Pasture Species Demonstration Programme was undertaken to further evaluate the Technology Transfer component of the 1990 East Coast programme. Survey responses were obtained from 69 of the 80 farmers who had participated in this programme.

The main findings were:

- (a) Approximately one third (30%) of the farmers surveyed believed that no Government assistance should be provided if a serious drought, similar to that which occurred in 1989, was to occur again. This figure is much less than the 50% figure obtained in the telephone survey of farmers. This disparity is probably due to the greater direct benefit received by the farmers in the alternative pasture demonstration programme.
- (b) The average area sown in alternative pasture species on the demonstration farms has sharply increased from 16 hectares in 1991/92 to 37 hectares in June 1994. As a percentage of effective and cultivatable area this equates to an increase from 4% to 10%, and 15% to 25%, respectively. Alternative pasture species therefore have the potential to significantly impact on overall farming system performance on some of the properties surveyed.
- (c) Most farmers indicated that the alternative pasture species sown on their farm were superior to existing traditional ryegrass/white clover pastures in terms of persistence, winter production, value for money, pest resistance, livestock performance and summer production. They also said they were more effective than existing traditional ryegrass/white clover pastures in reducing the effect of drought on farm production and profitability. However, summers since 1990 (except summer-autumn 1994) have been relatively moist in most of the East Coast region and this result may not reliably reflect the drought tolerance of the alternative pasture species. It should also be noted that improved varieties of ryegrass and white clover have the potential to improve the annual and summer pasture productivity relative to existing swards (Percival & Duder, 1983; and Pennell *et al.*, 1990).
- (d) Almost three-quarters (74%) of the farmers surveyed indicated that "early decisions on livestock numbers for summer" was "very important" in reducing the effect of a summer drought on their farm. Alternative pasture species were rated the second least important drought management option, however, they still considered this as either "important" (49%) or "very important" (44%). This contrasts to the telephone survey results where

33% of the farmers rated alternative pasture species as "not important" and 32% rated it as "important". The difference between the two surveys probably reflects the alternative pasture demonstration farmers greater experience with this technology. Overall the pasture demonstration farmers rated the importance of the management options identified for the technology transfer programme higher than farmers contacted through the telephone survey.

- (e) Adoption of alternative pasture species through direct contact with alternative pasture demonstration farmers was moderate. Most demonstration farmers (55%) said that only a few (<10) farmers had visited their properties to inspect and discuss the new pasture species. Similarly most demonstration farmers (52%) indicated they knew of only a few (<10) farmers who had sown alternative pasture species as a result of visiting their farm. This low level of success could be due to; farmers not identifying any advantage from alternative pasture species; farmers gaining all of the information required at the field days (or through other sources); or other limitations (e.g. finance) constraining the adoption of new species. The results obtained in the telephone survey indicated that 48% of farmers had used alternative pasture species in some way over the last three years. Combined, the results from the two surveys indicate that most farmers who adopted alternative pasture species did so using information gained from sources other than through direct contact with Alternative Pasture Demonstration Programme farmers.

The Alternative Pasture Demonstration Programme survey indicated reasonably strong evidence that alternative pasture species have several important advantages over existing traditional ryegrass/white clover pastures. They are also important in reducing the effect of drought, although not as important as other "drought proofing" technologies.

Chapter 4 - Focus Farm Field Day Programme: Farmer Case Studies

Introduction

A series of Focus Farm field days were organised for East Coast farmers to disseminate information about the alternative pasture species and other "drought proofing" technologies. These days had the same overall aims as the Technology Transfer Programme, i.e. to enhance the "adoption of new on-farm technology and management systems" (Rhodes 1994) and were intended to "provide the basis for the mitigation of future risk in areas of the region which are continually prone to summer dry conditions and a high frequency of drought events" (Rhodes 1994). A further intention of the field days was to "provide opportunities to examine technology and provide interaction among farmers, and between farmers and consultants" (Rhodes 1994).

The Focus Farms were selected jointly by representatives from DSIR Grasslands, the Ministry of Agriculture and Fisheries (MAF), Federated Farmers and the Rural Support Trust. The MAF requirements for a district Focus Farm were that they:

- (a) Already operated a flexible livestock policy suitable for combating dry/drought conditions; and/or
- (b) Had developed out of (traditional) seasonal production and were achieving an improved fit between feed demand and feed supply; and/or
- (c) Included a range of animal types in their policies; and/or
- (d) Used a viable supplementary feed policy; and/or
- (e) Had already established drought tolerant pasture species and managed these in a manner that enabled dry/drought effects to be reduced.

The use of innovative farmers as hosts who already adopted suitable systems, was expected to speed up the process of technology transfer. Importantly, lead time would be minimised, and systems would be seen as farmer-proven rather as a superimposed "good idea" (King 1990).

A total of 78 Focus Farm field days were held between 25 July 1990 and 7 July 1992. These attracted in excess of 3660 farmers and agribusiness participants (Rhodes 1992). However, the attendance records do not distinguish between single- and multiple-visitors to field days and are therefore likely to overestimate the actual number of participants.

The Focus Farm field day assessment was conducted in two parts. First, a farmer case study, described in this chapter, was undertaken to obtain further qualitative data to supplement the telephone and mail survey results. It investigated the Focus Farm field days from the host farmers and neighbouring attending and non-attending farmers viewpoints via personal interviews. Second, the organisers of the field days were surveyed by mail. This survey is described in chapter five.

Method

Background information on the overall Technology Transfer Programme as well as the Focus Farm field day programme was collected in April 1994 by interviewing Mr Tony Rhodes (Agriculture New Zealand, Dannevirke) and Mr John King (MAFPolicy, Hastings) and by reviewing MAFPolicy documents outlining the programme (Rhodes 1994).

The aims of the study were identified as:

- (a) Establish the factors that farmers consider to be important in effectively managing drought conditions.
- (b) Evaluate farmers' perception of the technology transfer programme message.
- (c) Analyse the impact of the Focus Farm concept by measuring the success (or

otherwise) of the field days in terms of information flow, technology/systems adoption, attitude change and group dynamics.

Case studies development

The Southern Hawkes Bay area was selected as the location for the case studies because farmer names were available (through Tony Rhodes) and the locality was close to Massey University, Palmerston North where the research was based. Two of the three Focus Farms in Southern Hawkes Bay were studied. The farm not studied was located in a higher rainfall area, and hence considered to be less representative of the East Coast than the two 'drier' farms. The Focus Farms selected were located 5 km north of Pongaroa and at Ti Tree point, approximately 10 km east of Weber, respectively.

Six farms located around each Focus Farm were randomly selected (12 in total) from a list of neighbouring properties. Letters were then sent to each Focus and surrounding farmer outlining the aims of the study and, several days later were contacted by telephone to establish a suitable date and time for an informal personal interview. Both of the Focus farmers agreed to participate however, 3 of the other 12 farmers did not want to be interviewed because they felt they could not provide the information required, considered the drought too long ago to remember accurately or were too busy. A fourth farmer could not be reached by telephone. Two other farmers, contacted by telephone were willing to be interviewed, bringing the final group of neighbouring farmers to 10. Some of these farmers had not attended the Focus Farm field days. They were deliberately included to achieve a more 'balanced' view of the drought and associated drought relief programme.

Due to the informal nature of the interviews, a questionnaire was not prepared. However, a schedule of topics to be discussed was drawn-up (see below). All of the interviews were tape recorded (with the farmers approval) and these were transcribed for analysis. Interviews took around 1 hour to complete and were conducted in October/November 1994.

Question areas

The majority of the questions were framed in an open-ended format to allow the farmers to

express themselves in terms of how they viewed drought, drought management, and the 1990 technology transfer programme and its various components. The issues raised by the farmer were then probed to obtain more specific data. It was also important to gauge the importance of these issues in relation to the farmer's social context that included their attitudes, objectives and beliefs. Although most of the questions developed as the interview progressed, some general pre-interview question areas were established. These were:

- 1) General questions that covered the farm and farmer history, farmer likes and dislikes about their farm, and farming in general. Details on farmer goals and issues that effected the attainment of these goals were obtained. Information was also sought on what had occurred on the farm during the 1989 drought and how the farmer had coped.
- 2) The farmer's response to the drought including information on management responses to cope with drought conditions (both physically and personally), reasons for these responses, and factors that influenced decision making. Where farmers had made no change, an understanding of the reasons for this was sought.
- 3) The farmer's present situation in terms of his/her attitude towards drought (in relation to the whole farming picture) and whether the changes had helped the farmer to achieve his/her goal(s).

The "question areas" served only as a guide to the interview and farmers were encouraged to talk about areas which were not listed above.

Data analysis

The interviews provided qualitative data. The recorded conversations were transcribed and key phrases and words were identified. Common views and themes were aggregated across interviews for each Focus Farm. In presenting the data an attempt has been made to retain the original meaning and context of the interview conversations.

Results - Focus Farm Field Day host farmers

Focus Farm 1 - brief history and background

The present owners managed the 240 hectares of rolling to moderately steep hill country farm for 4 years prior to its purchase in 1981. A further 90 hectares was purchased from a neighbouring farmer in May 1993. Soil types range from winter-wet clays on the lower flats to free draining Argillite based soils on the hills. Over the last few years a sheep breeding flock and an 18-month Friesian bull beef operation have been run (Table 4.1). Since 1981 the owners have increased subdivision, up-graded the water supply and maintained fertiliser applications as finance has permitted. One third of the farm has a westerly aspect and this combined with a relatively high altitude means that it is very exposed to wind and hence can dry out quickly during the summer.

Table 4.1 Stock units wintered, stocking rate, reproductive performance and profitability of Focus Farm 1 before, during and after the 1989 drought.

	1988	1989	1990	1991
Stock units wintered				
Sheep	1900	2021	1493	2083
Cattle	500	681	578	968
TOTAL	2400	2702	2071	3051
Effective area (Ha)	240	240	240	370 ^a
SU per hectare	11.0	11.3	8.6	8.25
Lambing %	99.0	83.4	82.7	
Calving %	100.0	100.0	100.0	
Lamb price (\$)	15.94	8.17	28.65	
Ewe price (\$)	11.08	7.15	20.31	
Wool price (\$)	4.10	4.42	3.88	
Income \$/SSU	37.38	26.36	34.88	
Income \$/CSU	39.90	31.25	42.82	
FARM SURPLUS	\$49,093	\$17,341	\$28,311	

^a Area includes lease block of 130 hectares.

Focus Farm 2 - brief history and background

Ownership of this farm has changed since the Focus Farm field days were run. The farm is now owned by a forestry development company which intends to plant pine trees on the 485 hectares of relatively steep hill country. The owner at the time of the Focus days bought the farm off his father in 1987, through a high level of debt financing. In the three years after the 1989 drought stock classes run included a sheep breeding flock and bull beef, however the latter has been replaced with grazing cows and heifers (Table 4.2). Because the farm is mostly hilly with relatively free draining soils it is more prone to summer dryness than Focus Farm 1.

Table 4.2 Stock units wintered, stocking rate, reproductive performance and profitability of Focus Farm 2 before, during and after the 1989 drought.

	1988	1989	1990	1991
Stock units wintered				
Sheep	3647	3592	3092	3379
Cattle	370	537	89	557
TOTAL	4017	4129	3181	3936
Effective area (Ha)	514	514	514	514
SU per hectare	7.8	8.0	6.2	7.65
Lambing %	97.4	82.1	58.0	
Calving %	n/a	n/a	n/a	
Lamb price	11.74	11.89	21.8	
Ewe price	10.40	10.38	18.48	
Wool price	4.13	4.44	4.10	
Income \$/SSU	24.92	23.05	20.71	
Income \$/CSU	81.19	6.06	21.88	
FARM SURPLUS	\$55,232	\$19,272	\$2,217	

Effects of the 1989 drought

Both farms, as were most farms in the district, were badly effected by the 1989 drought. Key difficulties were the need to replace capital stock (sold cheaply during the drought) at

high prices, loss of feed quality after the drought due to low stocking rates, poor ewe liveweights at tupping and hence low lambing percentages the following season (Tables 4.1 and 4.2), increased costs for grazing stock off the farm for a longer than normal period of time, increased health problems and losses in animals grazed off the farm. These effects, combined with an economic environment of high interest rates on debt and low returns on farm produce, created very difficult farming conditions from 1989 through to 1992 when the overall farming economy began to improve.

Previous dry summers had been coped with by selling non-replacement stock (such as bulls and lambs) by Christmas. However the 1989 drought dry conditions persisted well into the autumn and this created problems for both farmers. In both cases farm income was supplemented through off-farm work and this resulted in more pressure on their families. Focus farmer 2 received the drought relief income support but still had to borrow additional money to buy weaner bulls.

The Focus Farm field days

Both farmers had been involved with MAFTech (now Agriculture New Zealand) consultants based in Dannevirke since the early to mid 1980's. They had sought advice from the consultants on improving farm profitability and production and were classified as "progressive farmers". Both farmers considered that hosting the Focus Farm field days would benefit them (at no cost), and were eager to participate. However, Focus farmer 2 admitted that hosting the field days had been very stressful. He felt that, *"Being in the limelight with people looking and talking about you, being very judgemental on how you should be doing this and how you should be doing that, combined with the hard times after the drought with struggling production, no working capital and no bank security it all got a bit much"*. As a result, only four field days were held on the farm. When questioned about aspects of the field days, the main points of importance were:

- 1) Focus farmer 1 regarded farmer attendance at the 4 farm field days as poor, especially considering the large area the host farm

field day
attendance was
poor on one farm
possibly because of
'over exposure'

represented. MAF records show attendance figures as being 7, 20, 8, and 8, respectively. The farmer was not sure whether the poor attendance was due to, *"the farm being hammered over the years for field days with various discussion groups or it was just that they [farmers] couldn't be bothered"*. He went on to say that, *"the ones that were under financial stress never turned up, it was really tough on them, they just couldn't afford to make the changes"*. However, *"once a few started coming they kept coming and got quite involved"*. As a result of the poor attendance, the farmer considered not holding the last field day. The scheduled fifth field day for both farms was then combined and farmers met in a local hall, before visiting various farms in the district where alternative pasture species had been established.

Focus farmer 2 regarded the attendance at the Focus Farm field days to be good relative to the number of farmers in that particular area. MAF records show attendance figures of 17, 27, 17, and 27, respectively.

2)

"...farmers who
needed to come,
didn't..."

In the opinion of Focus farmer 1 the types of farmers who attended were, *"the ones that could take the knocks (financially). They could listen to what was being said, take it on board if they wanted to and if they didn't, not worry about it. The ones that probably needed to come, didn't and subsequent to that they have gone. The pressure came off a bit too; we were out of the drought and things had started to green up again so farmers weren't thinking about drought."*

"...farmers got
sick of hearing

Focus farmer 2 believed, *"a lot of them [farmers who attended] were very traditional farmers. The younger age group were the ones that were more interested in change and taking it on board."*

a b o u t b u l l
beef...they looked
at how to apply
principals, and not
change a big part
of their system..."

I was the only one into bull beef, a few farmers got sick of hearing about it because MAF were pushing it all the time. They were coming out here, preaching these ideas into an area that is very traditional. It could have been done better if they approached it from a different angle. Maybe altering your [breeding] cows to the best advantage instead of bulls. Farmers looked at how the principals could be applied to their existing system, not necessarily changing a big part of their system (eg cows into bulls)."

...topics such as
decision making,
'trigger points',
a n d s t o c k
flexibility have
proved to be of
most benefit...

The other topics covered at the field days such as timely decision making, having "trigger points" and stock flexibility were generally well received and have proved to be of most benefit to the focus farmers. Both commented that overall the technology and management practices promoted at the field days were relevant for their respective districts. They identified the field days' aims as, *"highlighting to farmers some alternative ways of farming, being aware of drought (and not thinking it's going to rain one day and things will come right) and when and how to react to a dry season"*.

3)

"...we couldn't
afford alternative
pasture species..."

t o p o g r a p h y
r e s t r i c t e d

Both Focus farmers commented that the item which was probably of least use to them at the time was alternative pasture species. Farmer 1 commented, *"It was quite costly, putting new species in and at the time we couldn't afford it. Farmers may have been interested in it, but I doubt if only but a handful have done anything about it"*. On Focus farm 2 *"A maximum of only 10 out of 50 paddocks could possibly be worked over. Even then you are risking your whole flat land production, it doesn't work"*. Focus farmer 2 agreed that alternative pasture species was not an option because, *"...most farmers can't do any cultivation, they look at stock management"*. However, Focus Farmer 1 is now planning

cultivation

to sow some alternative pasture species. The main reason for changing is, *"more information and evidence of species being worthwhile"* and better financial returns has improved their affordability.

4)

**the field days
provided a good
opportunity for
discussion
farm policy
changes "...may
have happened
anyway..."**

Both Focus farmers said that the level of farmer participation at the field days was good and the discussion was, *"usually pretty lively"* with most farmers able to *"say their piece"*. Focus Farmer 1 said, *"People could discuss what their situation was like, it was good for farmer encouragement"*. However, interest started to decrease towards the end of the field day series. They agreed that most farmers in the immediate district had either, *"...become more flexible with their stock policies by selling weaners in the spring rather than autumn and using terminal sires to get rid of lambs earlier or diversified into selling sheep for live export"*. However Focus Farmer 2 commented that the diversification into selling policies, *"...may have happened anyway, whether it came out of the field days or not, it was hard to tell"*. Both Focus farmers were now more confident of coping with a drought successfully. They also said that overall, farmers in the district could now handle a drought much better, depending on its timing and severity. However, it is also difficult to determine whether it was due to the field days, the overall technology transfer programme or learning purely through experience. Focus Farmer 1 said, *"the drought experience in the early 1980's was when it all started"* in terms of decreasing drought susceptibility and that, *"you need to experience it for yourself"*. Together with first-hand experience and being forced to survive with high debt, *"we were willing to take on anything"*.

**i n c r e a s e d
confidence with
d r o u g h t
management**

**difficult to identify
cause(s) of change**

5)

people were just
unwilling to
change

According to Focus Farmer 1 the major problem encountered with the Focus Farm field day series was that people just didn't want to change. *"Many see drought as a thing that happens and they accept it. They didn't seem to want to become involved. Nothing has changed on some properties for 20 or 30 years. One or two younger farmers, who have taken over the family farm, have taken new technology/management practices up for a while but a lot of them have found it pretty easy to slip back into the old habits. There is also some peer-pressure to conform to tradition; the field days were well organised and advertised but people just don't want to change. Because of poor attendance the Focus Farm field days were not a success".* In contrast, Focus Farmer 2 said that, *"Everybody who was eligible to attend the field days was there, I thought that the farmers who did take part needed something".* He viewed the field days as a success.

6)

...field days are
still necessary to
get information
across...

publications help

In terms of information transfer both farmers agreed that field days are still necessary to get information across to farmers. Focus Farmer 2 stated, *"If people are interested they will go along and take the idea home with them and chuck it around for a while. You still need experts coming out and saying this is what's available and to get you to think about your position. The Focus Farm field days gave me confidence to deal with drought better".* He also identified the Income Support and Drought Rehabilitation Loan as helping through the 1989 drought. Focus Farmer 1 commented that he had received the "Drought Proofing Your Farm" booklet and had found it "good". *"If people can't come along to a field day, a publication is good. If we had another drought, perhaps something else could be done".*

- 7) Both Focus farmers said the drought management technologies and management practices encouraged at the field days had helped them towards their future objectives and goals. Both said, "*it had made them more aware*" of how to handle a drought and farm positively.
- increased awareness

Focus Farmer 2 has since bought a smaller, flatter farm 7km North of Pongaroa, at a location which is less summer dry and with which he will have minimal debt to service. Both farmers stressed during the interview that the effects of the 1989 drought were made worse by the impact of high interest rates with high debt and poor farm returns throughout the mid to late 1980's. This combination of factors made it especially difficult for them and other farmers to cope.

Results - Focus Farm 1 district farmers

Farm backgrounds

Typically the livestock classes run on the case study farms located around Focus Farm 1 were a sheep breeding flock with either bull beef, breeding cows or both. One farmer had also planted an area in forestry, with species ranging from Pines to Blackwoods. The farm sizes ranged from 340 hectares (with a further 70 hectare run-off close to Dannevirke) to 800 hectares. All farms had at least some area of flatter, wetter, cultivatable land however, the majority was moderate to steep hill country which is prone to summer dryness and winter erosion.

All of the farmers were well established with 15 to 20 plus years of management experience on their present farm. The majority had taken the farm over from their parents, however some had also bought into the area. One farmer had completed an agricultural degree at Lincoln College (now Lincoln University) before assuming management responsibility for the family farm. Farm labour usually consisted of a husband and wife team however, some farms had additional full-time labour in the form of another family member (e.g. son) or the use of casual labour (e.g. a Massey student over the summer holidays).

field days were practical, thought provoking and had open discussion

battling an attitude thing and I wasn't learning anything because of it". In contrast another farmer said, "I went to three field days and found they were good. The organiser is a very adept person and can explain things. They were very practical and very good." One farmer commented that, "Everyone could say their piece, you come away a bit wiser and they gave you something to think about".

2)
drought is expected but you farm for the average situation

Response to what was said at the field days was mixed, one farmer commented, *"Everybody is an expert after a drought, then people seem to forget about it and things go back to normal. You can't farm for a drought every year otherwise you would be losing, so you just forget about it - a drought will happen again one day, for sure".* Another said, *"...people were negative to any sort of advice or comment that was being made, they always had the contrary to it. After the drought, moral was down, but they weren't prepared to have a good hard look and say what did we learn from it, lets find a new path".* When questioned why people were negative, he said, *"It just seems to be they are more traditional".* One farmer thought the attendance was poor and that, *"...not as many farmers that should have"* attended the field days. He went onto say, *"Considering they were free, with MAF there, farmers were foolish not to take advantage. Too many farmers don't want to learn, they will repeat the same mistakes if a drought strikes again."*

attendance was low, moral was down, "some farmers don't want to learn...it seems they are more traditional"

3)
still need field days, most farmers

Although attendance was considered to be poor and there was some resistance to what was being suggested at the field days, most farmers agreed that field days are necessary for information transfer. One farmer commented, *"Field days will always have to*

enjoy them

**"...should be
targeting groups of
farmers..."**

**"a video tape may
be more effective".
MAF should have
provided earlier
notice of drought**

**farmers will attend
relevant field days**

4)

**The aims were to
"make farmers
more aware".**

**'drought proofing'
booklet is useful**

"...it was a good

be an option. I think they should be targeting groups of farmers of similar initiative and aspirations, probably having 2 or 3 groups going from a conservative group to a group which will try [new] things. I think if a drought happened yesterday and you held the field days now, things would be different. There's a lot more confidence and change of attitude. You would increase the percentage from 5 to 20, you are never going to get everyone." He also suggested, *"A video tape may be more effective than a booklet, a lot of farmers are not good readers and a video would be an option."* Another said, *"At field days you get to say your bit, you might get shot-down a couple of times, people might laugh at you, but it's good really, I enjoy them."* In hindsight, one farmer said the field days could have been more effective if, *"MAF started talking about it earlier."*

The general consensus was that if farmers were interested in what was to be discussed at a field day, they would attend. Most farmers interviewed stated that they had attended forestry field days because it was relevant for their type of land, and quite a few farms in the district had been sold to forestry.

Overall the farmers interviewed thought the aims of the Focus Farm field days were to, *"Make farmers aware of the problem and how to cope with the problem". "I think a point which we all learnt was we all needed to carry a higher proportion of trading stock".* All of the farmers also received the 'Drought Proofing Your Farm' booklet and have it kept it. However, most needed to be reminded what it contained; one farmer said, *"if we think we are getting a drought we had better get the booklet out!".* Another farmer said the field days along with the booklet were *"done pretty well...it was a good series, it wasn't too much and had good topics*

series...good topics discussed...it's up to the individual to make decisions"

which were discussed. [MAF] can't do everything, its up to the individual to make his or her own decisions". However there was some disagreement as to whether the Focus Farm field days were a success.

5)
most farmers interviewed have made changes

Most of the farmers interviewed have made some change to their farming system to reduce drought susceptibility. One farmer said, *"I'm more aware of the alternative pasture species, although I'm still not convinced that they are the answer. I query their persistence and cost, all the same I'm going to put a paddock into Tall Fescue and get my own experience. I've also improved my water supply, decreased overall stocking rate and run more flexible stock (steers and bulls)."* When asked if this change had occurred solely for drought reasons, the answer was *"No, prices have something to do with it as well"*. Another farmer stated he had also increased bull numbers, decreased sheep numbers and overall stocking rate, would be prepared to sell lambs early and has purchased a run-off near Dannevirke. However these changes have not occurred just for drought protection and he said they were not directly attributable to the Focus Farm field days. Improved financial return from cattle compared to sheep and the requirement for a 'retirement block' closer to town have been major influences. Other changes farmers had made were *"...realising I have to make decisions at the right time"* and the incorporation of a *"summer cropping programme and pasture renovation (using ryegrass, cocksfoot with red and white clover)"*. All of the farmers said that they would be better prepared in the event of a future drought.

factors other than 'drought proofing' were important in instituting change

better prepared for drought

6)

As mentioned, one farmer was now incorporating a summer crop and pasture renovation into his system using 'traditional' pasture

**doubts persist
about alternative
pasture species**

species. When asked why alternative pasture species weren't used he replied, *"I don't know much about them"*. Referring to the cultivatable, flatter and wetter country, he said, *"this place gives us the best return on overall production. If we are able to get stock up to marketable weights as soon as possible, that gives us flexibility"*. When asked about how farmers responded to presentations on alternative pasture species at the field days, one farmer said, *"they were quite receptive to that idea, but I doubt whether 5 percent of farmers have done anything about it!"*. Another farmer commented that the alternative pasture species could be worth-while and would consider *"giving it a go"*, but hasn't as yet.

**alternative pasture
species success
story misleading**

The one farmer who was planning to sow some Tall Fescue also went to the 1994 Grasslands Conference in Masterton. He said he over-heard a conversation between a local farm management consultant and a Grasslands executive, who agreed that the information presented at the Conference was potentially misleading to farmers and they knew of many who had tried alternative pasture species and failed.

**farmers favour
own experiments**

The farmer went on to say that, *"Grasslands have put across such a success story, I doubt many farmers are aware of the down side of the pastures"*. When asked if that had discouraged him to use alternative pasture species he replied *"Their is only one way to find out (if they are beneficial) and that is to try them yourself"*.

7)

**some doubt as to
whether drought**

There was some disagreement as to whether much had changed in the district in terms of decreasing drought susceptibility. One farmer commented, *"I don't think farmers are better prepared for drought, they farm for the season"*, and that the Focus Farm field

susceptibility has
been reduced

days "have not made much difference". Other farmers said, "I think we would be more awake, our knowledge is better now. Along with the drought programme there has been an on-going series of articles about "drought proofing strategies". "Farmers are more wary of drought but whether their perception, decision making and anticipation of a serious problem has changed, I doubt it!. Farmers will still say it's going to rain next week, when the hard decision should have been made last week. I'm not really sure whether farmers have changed their farm policy either. I think farmers are still very vulnerable, they may be less susceptible than a few years ago. I think farmers have learnt through experience."

Overall, the interviewed farmers perceived the "drought proofing" strategies they had incorporated had coincided with their farming objectives and to a small extent helped to achieve those objectives. One farmer commented that drought strategies "can limit production (therefore not coinciding with objectives), but you must consider the type of land this is and farm accordingly, which means to have flexibility to be able to handle a drought situation".

Results - Focus Farm 2 district farmers

Farm backgrounds

The case study farms around Focus Farm 2 supported mainly a sheep breeding flock with either bull beef, steers and breeding cows. In this respect they were similar to those located around Focus Farm 1. Bull beef was less common than cattle policies with traditional beef breeds. Farm size ranged from 304 to 3500 hectares. One farmer also had a 90 hectare, summer moist, run-off located at the Ruahine Range foothills. The majority of the farms consisted of moderate to steep hill country, with minimal cultivatable area. The farms are further away from the Puketoi Range and therefore somewhat drier than those located around Focus Farm 1. Forestry has made a big impact in the area in the last 3 or 4 years, half of

the farmers interviewed had planted pine trees. One farmer, who had bought a block of land in 1989 for \$250,000, sold it to a forestry development company in 1994 for \$1.2m.

Most of the farmers had taken over their farm from their parents, and in many cases the properties had been run by family members since the early 1900's. Only two had bought into the area, and one of these had previously managed the farm next door. The farmers were all well established with between 10 and 30 years of management experience on their present farm (or on the farm previously managed).

Effects of the 1989 drought

Farmers in the district of Focus Farm 2 were effected by the 1989 drought in much the same way as those near Focus Farm 1. Effects included; the need to graze stock off the farm (one farmer leased a 400 hectare block in Taumaranui) and as the drought continued, the need to sell many of the stock that had been grazed off, poor lambing percentages the following year, low lamb prices, replacement of capital stock sold at high prices, and loss of income in the following three years due to reduced capital stock numbers. One farmer, less affected by the drought, due to his farm being closer to the rainfall shadow of the Puketoi Range, said, *"I sold all of the breeding cows and immediately bought wether lambs with the proceeds so we didn't decrease overall stock numbers. It worked quite well, all of those hoggets (bought as lambs) went on the boats (as live export)"*.

The Focus Farm field days

Just under half the farmers interviewed attended the Focus Farm field days. One farmer who hadn't attended had been to a field day at Poukawa Research Station, after the 1989 drought, on alternative pasture species. When questioned about aspects of the Focus Farm field days, and drought management in general, the main points of importance were:

Non-attending farmers:

- 1) Various reasons were given by farmers as to why they did not attend the field days. One farmer said, *"I believe they were tied*

**confusion on
eligibility to attend**

other commitments

**effective
newspaper
publicity**

**low community
moral**

up with the local (host farmer's) discussion group" which he didn't belong to. Others said, "We were working closely with our accountant, who was directly linked with MAF, our farm was used to set the [drought] policies, so there wasn't the need to attend" and "something else was on and I couldn't go". One farmer commented, "My wife had started back at work so I had to be at home to baby-sit the kids as well as do the farm work. I would have liked to have gone, but I couldn't get away. They were quite well covered by the media, the results of the field days were published in the Hawkes Bay Herald Tribune, which I read and I guess others did, if they didn't go to the field days".

One farmer commented, "Some guys out here handled the drought really well, others didn't. Some of the older people couldn't face up to it being a bad drought which made it hard for the young guys, there was a bit of a lack in moral support".

2)

**all field day non-
attenders consider
themselves less
droughtsusceptible**

**reasons for change
were; increased
financial returns,
lower labour**

All of the farmers interviewed who had not attended the Focus Farm field days indicated they had changed their system in some way since the 1989 drought. Most also considered that they would be less effected if a drought occurred in the future. The changes made were; more trading stock (bulls, steers, dry sheep), lower overall stocking rate (by decreasing breeding ewes), incorporating a summer crop, selling lambs and calves early, and generally making decisions earlier. One farmer had bought a summer-moist run-off, while another said he had tried running bull beef after the 1989 drought, but found that liveweight gain was poor and even negative over the summer months. He said, *"We thought they would be on and off the property in 12 months, instead it took us 18 months, so we slowly went back to [breeding] cows"*. However, farmers also said that the changes made were to increase financial returns, lower labour inputs and to meet other farming and non-

**inputs as well as
decreasing drought
susceptibility**

farming objectives, as well as to improve drought management. Changes to management and policy had been made slowly, occurring over the last three or four years for many farmers.

For farmers who had not attended the field days, the sources influencing management and policy changes were; participation in local discussion groups, the 'Drought Proofing Your Farm' booklet, other media releases (NZ Farmer etc) and, most importantly, the experience of going through a bad drought in 1989. These influences were also important to the farmers who did attend the field days. One farmer said, *"The combination of [MAFs] efforts and the hard reality of how the drought effected individuals made us learn really quick"*.

Attending farmers

3)

**timing of decisions
was of most benefit**

Farmers who attended the field days, in general, thought they were well done. One farmer said, *"I found them stimulating, the main thing I got out of it was the timing of decisions. Some of MAF's policy was not suitable for me, but overall they were good. I think the host farmer may have been the wrong person and I felt that he was being talked into things that he might not have wanted to do"*.

**appropriateness of
host farmer**

However another farmer commented, *"They were a bit of a knee-jerk reaction. The methods they were talking about to ensure against further drought meant quite drastic changes in management. Over the next 3 years it didn't stop raining. I think if you can recognise drought symptoms early and take action accordingly you are more likely to get through it than changing your management system for all the years you don't have a drought. I'm not knocking MAF for what they did, there was also a fair bit of hype at the time about the climate getting warmer and drier"*.

**reluctance to make
suggested 'drastic'
changes in farm
management**

4)

poor recall of
topics

Most of the farmers could not remember what was covered at the field days, however one farmer commented that he still has the field day hand-out pamphlets. The topics covered at the field days, that were identified by the farmers interviewed, were early decision making and incorporating more flexible (trading) stock.

"...farmers treated
what was being
said with
scepticism..."

Response to what was being said at the field days was mixed, one farmer commented, *"Farmers agreed to what was being said to a certain extent, but you can't run a farm from an office in Dannevirke"*. Another farmer said, *"There was some discussion and enthusiasm, but I don't think people carried it out...Farmers treated what was being said with scepticism. MAF couldn't prove what they were saying was going to work, it was very hypothetical."* However another farmer said, *"Most [farmers] were in favour of what was being said and realised it was a correct solution to drought...the person giving advice must have the ability to assess the situation they are giving it in. Some people at MAF are very good at it, others aren't, Tony Rhodes is second to none"*.

options given were
"correct solutions"

open discussion
was good but
attendance was
poor

Farmers commented that the Focus Farm field days were *"much less informal"* than other field days, and that *"you could stand up and say what you thought"*. Attendance was regarded as poor; one farmer estimated it to be between 25 and 30 percent of the farming population in the area. *"Neither the older, established guys with no debt etc, or the large stations run under management were interested, their wages would still get paid anyway"*.

5)

most considered
Focus Farm field
days were
successful

Farmers identified the aims of the field days as being *"to ensure the county's production doesn't have a big 'blip' in it again"* and *"to 'drought' proof farms and inform farmers how to be a little less affected"*. Of those who attended the Focus Farm field days, the majority thought they were successful. One farmer said, *"I'm sure*

a lot of farmers benefited from them", while another said, "They were helpful for me but not so for the immediate district. They drew in the younger, less established, more financially at risk farmers".

**suggested changes
required
expenditure, which
most couldn't
afford**

Another farmer said "I don't think they were successful, if there had been a drought the following year, they could have been. In a lot of cases [the changes suggested] involved expenditure of some kind and people couldn't afford it until recently".

**changes also
resulted from
factors other than
field days**

Most farmers found the information about 'drought proofing' their farm supplied at the field days useful. However one farmer said, "I didn't make changes from going to the field days and not solely because of drought. I had already made up my mind, they might have 'fine-tuned' my ideas, but that's all. Most people have altered their 'stock structure' (more trading stock) but that was happening anyway. I think there would be very little difference in the outcome if MAF hadn't run the field days". Another farmer also commented "...everybody would be running less stock per hectare now".

Attending and non-attending farmers

**6)

contrast in views:
"field days are
outdated" verses
"useful if relevant"**

There was some disagreement as to whether field days are an effective method of information transfer. One farmer said, "There is enough information coming from all sorts of sources, I think field days are for a by-gone era". Another suggested that future field days "should be more selective...I personally would prefer to go to a field day, you can talk to your neighbour and other people as well as listen to the speaker". Generally, most farmers said they would attend field days in the local area if it was relevant to them (e.g. forestry field days). One farmer commented, "Field days are good particularly if something is happening at the time

and needs a bit of discussion. It's a good way to just getting people to talk".

**t o o m u c h
i n f o r m a t i o n
through the mail**

When asked about alternative methods of transferring information, many farmers said, *"We get that much stuff in the mail all of the time, you get sick of it, there's so many people competing with the same type of information, everyone just gets confused in the end".*

**drought booklet a
good reference**

However, one farmer commented, *"We used to get the Ag-link, that was quite good and you could refer back to it".* Most farmers considered the 'Drought Proofing Your Farm' booklet as a good reference. One farmer said, *"If things look like they are getting dry, MAF could advertise in the local paper and suggest that farmers consider their situation and refer to the booklet".* Another farmer commented, *"Some people will never change, most people who are prepared to change will figure it out themselves".*

**those prepared to
change will do it
themselves**

**7)
mixed response to
'new' pasture
species**

Only one farmer interviewed had sown alternative pasture species. He said, *"I put in three paddocks of cocksfoot, they were good for two to three years then they died out. I wouldn't put any [cocksfoot] in again, I've put in a paddock of tall fescue this year".*

**alternative species
poorly suited to
hill country**

Overall there seemed to mixed responses to alternative pasture species. All of the interviewed farmers had visited Poukawa Research Station, or had visited, or knew of the DSIR Grasslands demonstration paddock. The general farmer attitude was that alternative pasture species were not well suited to their farm and are costly to establish. One farmer said, *"They will work on the right sort of country. On most hill country, applying by plane, it is a very expensive waste of time, and there isn't enough flat area to have a significant effect."* Another farmer commented, *"When the alternative pasture species programme first started I thought it was a good idea. In hindsight the money spent and the follow-up was a complete waste of time out here".* However one farmer said

**disappointments
with new species**

he would consider putting new species in if they were further proven by on-farm trials.

8)

**contradiction in
MAF policy before
and after drought**

A number of factors inhibited attendance at the Focus Farm field days and the uptake of 'drought proofing' technologies and management practices. One farmer identified one of these as MAFs reversal of its lambing policy. He said *"...before the 1989 drought we had [MAF] field days encouraging us all to go for heavy weight lambs, so everyone did. We were growing crops and all sorts of things to keep stock on, when the drought came we got hit. It was really interfering in individual farm policy...a lot of people just followed along"*. However, the farmer disagreed that MAFs credibility was in question. He said, *"During the drought a lot of guys couldn't get their priorities right, MAF gave them a list of recommendations, which was the right thing to do"*.

**farmers must see
benefit in change**

Another limiting factor was farmers' reluctant attitude to change. One farmer said, *"Farmers are a bit frightened to change. The way the older farmers have farmed has been satisfactory over the years, if farmers can see no benefit in changing, why change? There may also not have been enough younger farmers to come into the area at the one time to concentrate on change"*. Another farmer commented, *"I know of farmers who have farmed the same way for years and don't see the need to change, they always farm for a dry summer"*. Another farmer suggested lack of change could be due to *"lack of education higher than secondary school"* especially for farmers who have taken over the family farm.

tradition

**lack education
above secondary
school level**

9)

all farmers believe

Unlike farmers in the Focus Farm 1 district, there was no disagreement as to whether much had changed in the Focus Farm 2 district in terms of decreased drought susceptibility. All of the

d r o u g h t
susceptibility has
been reduced

farmers interviewed believed that they could manage a drought better now and, that as a district, they were less susceptible to the effects of drought. One farmer said, *"I think farmers would be better off, whether it's got anything to do with the MAF programme or whether it's just through experience from the last drought, I'm not sure."* Another farmer said, *"I think there are a few farmers who have done something and a few who haven't, so that raises the average"*. Most farmers commented that when they thought a drought was going to occur this summer (1994) many had already decided what stock to sell first, where to send their stock for grazing and how they were going to cope with reduced pasture production.

There was some disagreement amongst farmers as to whether 'drought proofing' strategies coincided with their farming objectives. One farmer commented, *"Drought management is pretty important in achieving our objectives"*. Farmers generally considered that when a drought occurs they will be ready and will handle it as the situation at the time dictates.

Conclusions

A case study of the Focus Farm field days was undertaken to further evaluate the Technology Transfer component of the 1990 East Coast Drought Recovery programme. Two Focus Farm host farmers located in Southern Hawkes Bay were interviewed, as well as 10 farmers located near the Focus Farms. Six of the latter farmers had attended at least one of the Focus Farm field days. The time lapsed since the field days constrained the recall of information for some farmers, however, the detail which was recalled is likely to represent lasting impacts of the field days.

The main findings were:

- (a) The selection of the Focus Farms was perceived by some to be inappropriate. One of the Focus Farmers indicated that the farm had been extensively used for other field days prior to the Focus Farm field days. He felt that the policies and management practices was already well documented and known to farmers in the district. While the Focus Farm fulfilled MAF's requirements perfectly, the field days may have been perceived as being repetitious of previous activities and this may have contributed to the disappointing field day attendances.

The other Focus Farm was also perceived to be inappropriate by some farmers, and its selection appeared to contradict the requirements specified by MAF for a Focus Farm. The livestock policy, although a valid option for combating dry/drought conditions elsewhere, had not previously been proven to be successful on the farm, or in the local area, and has since been abandoned. Farmers perceived the Focus Farm to be *"run by MAF from town"* and therefore questioned its applicability.

- (b) Overall, farmers regarded the attendance levels at the field days as poor, especially at Focus Farm 1. However, attendance figures for the two case farms were lower than the overall average field day attendance of 47 (Rhodes, 1992). The perception of the farmers who were interviewed was that farmers who attended were more progressive and financially secure (and therefore able to adopt alternative practices) than those who had not attended. The perceived main reason for the low attendance appeared to be that farmers, especially those who had taken over the family farm, were reluctant to change from traditional farming practices. Peer-pressure from other farmers and families, lack of education, farmer perception of no advantage in change, and financial insecurity were all mentioned as factors that may have reduced field day attendance, and are associated with *"traditionalism"*.

Attendance at the second Focus Farm was greater than at Focus Farm 1, with the majority of participants being younger, less established and more drought vulnerable farmers. The older, established and financially secure farmers, and those involved with managing stations, did not attend. Some farmers had other commitments and

so could not attend, however, one farmer commented that he was able to read the results of the field days in the newspaper. He suspected other farmers could have done so as well.

Farmer participation in discussion during the field days held at both Focus Farms was good. Farmers enjoyed the informal nature of the field days.

- (c) The field days were considered to be successful in terms of informing farmers how to reduce the impact of drought. The aims of the field days were perceived by farmers as being to make farmers aware of drought and inform them on how to manage drought conditions. The most relevant topics recalled by farmers who attended were timely decision making and increasing stock flexibility by incorporating more trading stock. Most farmers perceived 'alternative pasture species' as being the least relevant drought management option because of the costs and risks involved in pasture establishment and limited availability of suitable land. Establishing a small proportion of the farm in new species would only marginally affect the whole farm system. In addition the grasses were perceived to perform poorly under wetter conditions (as shown by the local DSIR Grasslands demonstration paddock).

Some farmers commented that the drought policy of selling lambs early contradicted the pre-drought MAF policy of producing heavy lambs, and this adversely effected farmer confidence in their recommendations. Overall, most farmers felt that field day topics were relevant, although some of the suggested changes required expenditure which most could not afford at the time (due to the prior down-turn in farming).

- (d) Most farmers farm for an 'average year', however, the majority considered that they could now manage a drought, similar to that experienced in 1989, more successfully. A greater proportion of trading stock, early selling policies, the use of alternative pasture species, reduced overall stocking rates, incorporation of summer-moist run-offs, and reserved supplementary feeds such as silage have all contributed to decreased drought susceptibility.

Improved financial returns, lower labour inputs, and the achievement of other farming and non-farming objectives encouraged changes to farm policy and management practices, as well as the drought management recommendations. Thus, the 'drought proofing' changes may have occurred regardless of the field days or the wider East Coast technology transfer programme. This was verified (albeit with a small sample) by the similar amount and type of change made by farmers who had not attended the field days. The sources influencing farm management and policy changes were identified as local discussion groups, the 'Drought Proofing Your Farm' booklet, other media releases (NZ Farmer etc) and, most importantly, the experience of going through the 1989 drought.

- (e) The majority of farmers still consider field days to be a useful method of transferring information and for getting the community together to discuss current issues. Most farmers would prefer to attend a relevant field day than to gain the same information through the mail or in some other form. Farmers suggested field days could be improved by targeting their organisation to specific groups of farmers and anticipating natural disasters, such as drought, earlier (a difficult task). The 'Drought Proofing Your Farm' booklet was well regarded. Video tapes may be an effective means of transferring information and could easily be referred to when needed.

On one hand, it could be concluded that from this qualitative evaluation, that the Focus Farm field days fulfilled a part in reducing the drought susceptibility of East Coast farmers. On the other hand, the vast majority of farmers who did not bother to attend the field days suggests that the programme completely missed the target of achieving effective mass extension. This view could also be mitigated (or supported) by the fact that, non-attenders of field days have instigated similar types and levels of change as those who attended the field days. While they may have been influenced non-directly by the programme, farmers indicated that a number of issues, rather than a single factor, contributed to changes being made to management or policy.

It was impossible to differentiate the amount of change derived from the experience of drought, field day attendance, the overall technology transfer programme or other more widespread changes in the farming economy. To quantify the relative effects of these

possible "agents of change" would require a much more detailed and expensive study than that reported here. It is suggested that farmer experience had a significant effect on instituting change, although history shows that farmers often forget the lessons learnt through tough experiences that have threatened the survival of their farm businesses.

Chapter 5 - Focus Farm Field Day Programme: Organiser Survey

Introduction

The Focus Farm field days had a significant role in the East Coast Technology Transfer Programme in terms of an information source and providing reinforcement of published information (see introduction to Chapter Four). In this Chapter, an assessment of the Focus Farm field days by MAF Tech consultants, who organised and ran the field days is presented.

Method

Questionnaire development

The Focus Farm field day questionnaire (Appendix E) was sent to the 14 Focus Farm organisers. The survey mainly concentrated on seeking their views on the success of the field days. These were measured in terms of farmer interest and uptake of 'drought proofing' technology. The types of further information required by farmers and ways in which the Focus Farm field days could have been improved were each identified. The survey was not pretested, however, it was reviewed by Messers Tony Rhodes (Agriculture New Zealand, Dannevirke) and John King (MAFPolicy, Hastings), and staff within the Department of Agricultural & Horticultural Systems Management, Massey University before mailing. The list of the 14 Focus Farm field day organisers was obtained from Mr Tony Rhodes.

Statistical analysis

The Focus Farm field day review questionnaire responses were coded and entered into a computer file for analysis by the SPSS/PC statistical package. Frequencies, cross tabulations and Duncans Range Test were then applied to the data.

Results

Consultant rating of focus farm field day success

Consultants rated the success of the focus farm field days in terms of farmer interest, number of farmers attending and farmer response to the information given (Table 5.1). Most rated the level of farmer interest as either "good" (57%) or "very good" (29%). The rating for farmer attendance was slightly lower, with most consultants indicating either an "adequate" (64%) or "good" (21%) level of success. The perceived response of farmers to the information provided was generally "positive" (57%) or "very positive" (29%).

Table 5.1 Consultants' (n=14) rating of overall success of Focus Farm Field Days (very poor = 1, very good = 5, negative = 1, very positive = 5). Figures in brackets are the percentage of responses in each category.

	Very poor	Poor	Adequate	Good	Very good	Mean \pm SE
Farmer interest in topics covered	-	-	2 (14)	8 (57)	4 (29)	4.14 \pm 0.18
Number of farmers attending	1 (7)	-	9 (64)	3 (21)	1 (7)	3.21 \pm 0.24
	Negative	Sceptical	Neutral	Positive	Very positive	
Farmer response to information and advice provided	-	1 (7)	1 (7)	8 (57)	4 (29)	4.07 \pm 0.22

Post-field day enquiry by farmers

All of the consultants indicated that they had received post-field day enquiry from farmers (Table 5.2) but in most cases (64%) this involved less than 10 farmers. This relatively low level of enquiry may indicate that; all of the information required by farmers was supplied at the field day; farmers were not prepared to incorporate the topics covered at the field days on their farms; or farmers did not recognise the opportunity to seek follow-up advice from consultants. More detailed information is required to establish the relationship between the field day presentations and the subsequent level of farmer follow-up.

Table 5.2 Consultants' (n=14) estimate of the number of farmers who sought further information and advice following Focus Farm Field Days. Figures in brackets are the percentage of responses in each category.

Number of farmers	Frequency
Less than (< 10)	9 (64)
Some (10 to 20)	4 (29)
More than 20	1 (7)
None	0 (0)

Following Focus Farm field days, farmers primarily sought further information about alternative pasture species (64%), stock policies (57%), or water supply (21%) (Table 5.3). The topics were covered fairly extensively at most field days or through the Alternative Pasture Demonstration Programme and this may explain the low level of post-field day farmer enquiry (Table 5.2).

Table 5.3 Topics for which farmers mainly sought further advice and information following Focus Farm Field Days. Consultants (n=14) could indicate more than one source of information and advice sought by farmers. Figures in brackets are the percentage of responses in each category.

Topic	Frequency
Alternative pasture species	9 (64)
Stock policies	8 (57)
Water	3 (21)
Fertiliser	1 (7)
Grass grub control	1 (7)
Financial management	1 (7)
Alternative feed supplies	1 (7)

Impact of field days on local and out of district farms

Consultants' rating of the impact of focus farm field days on the management practices of farmers located near the focus farm and outside the local district were reasonably positive (Table 5.4) with most indicating either "some" (57%) or a "high impact" (21%). As could be expected the estimated effect was lower for farms located outside of the host farm district. This was

probably related to the distance farmers would have had to travel to the field days, and hence the proportionally lower attendance by farmers in this category. In addition, consultants could more closely monitor adoption practices in their local service area than in outlying districts.

Table 5.4 Consultants' (n=14) rating of the impact (none = 1, a lot = 5) of the Focus Farm Field Days on properties local to or more distant from the host farm. Figures in brackets are the percentage of responses in each category.

	Impact rating					Mean \pm SE
	None	Very little	Some	High amount	A lot	
Management practices on farms located near focus farm	-	2 (14)	8 (57)	3 (21)	1 (7)	3.21 \pm 0.21
Management practices on farms located outside of local district	1 (7)	6 (43)	4 (29)	2 (14)	1 (7)	2.71 \pm 0.29

Types of technology or management widely implemented by farmers

Consultants involved with the focus farm field days believed that the technology/management practices that had been most widely adopted were related to alternative pasture species (71%) and/or stock policies (36%) (Table 5.5). These two factors were also strongly emphasised in the overall East Coast technology transfer programmes (i.e. "Drought proofing your farm" booklet, "Sustainable farming systems" updates and farm management consultancies). Thus, the Focus Farm results are consistent with the farmer list of management changes in the East Coast telephone survey. However, timely decision making was only indicated as being a widely adopted practice by 21% of the consultants compared with 48% of the farmers in the telephone survey.

Table 5.5 Aspects of technology or management covered at the Focus Farm Field Days which consultants (n=14) now believe are widely adopted by farmers. Figures in brackets are the percentage of responses in each category.

Technology/Management option	Frequency
Alternative pasture species	10 (71) ^a
Stock policies	5 (36)
Fertiliser application	3 (21)
Timely decision making	3 (21)
Water supply	1 (7)
Financial management	1 (7)
Nothing "widely adopted"	1 (7)

^aConsultants could indicate more than one change made by farmers.

Improvements to and impact of the Focus Farm Field Day concept

Consultants suggested a number of ways in which the Focus Farm Field Day concept could be improved (Table 5.6), but no single factor stood out as being the primary change required. About one fifth of the responses (21%) were for greater farmer and community involvement in the field days (i.e. more farmer input into farm selection and demonstration of technology/management practices). This is similar to the approach used for the Meat Research and Development Council (MRDC) "monitor farms". Other suggested changes were; field days with smaller groups of farmers at more locations (this would also increase total farmer attendance), targeting the involvement of 'top' farmers (i.e. well-respected) in each district, and to hold follow-up field days on the focus farms in order to demonstrate the long-term sustainability of management practices and new technologies.

Table 5.6 Changes suggested by consultants (n=14) to improve the effectiveness of the Focus Farm Field Day concept. Figures in brackets are the percentage of responses in each category.

Changes suggested	Frequency
Not specified	3 (21)*
More farmer involvement in coordination	3 (21)
Target a group of 'top' focused farmers	2 (14)
Require more follow-up monitoring	2 (14)
Smaller field days at more locations	2 (14)
Provide written reports for attendees	1 (7)
More emphasis on water supply	1 (7)
Require faster Government reaction to drought (advice from consultants and top farmers)	1 (7)
Less field days per farm, spread over a longer time period	1 (7)

*Consultants could indicate more than one change.

Some of the consultants believed that the Focus Farm Field Days created a positive outlook (n=3, 21%) for farmers after the economic recession of 1985-89 and that they were successful in encouraging farmers to adopt opportunities to increase sustainable production. Two consultants commented that the DSIR (Grasslands) alternative pasture species demonstration programme was financially inefficient, while one other consultant believed that attendance at some of the field days should be a compulsory requirement for Drought Rehabilitation Loan approval. In contrast, another stated that the Government could have probably seen a greater post-drought response in relation to farming sustainability and productivity if farmers received direct support to apply \$30 million of fertiliser to the East Coast.

Conclusions

A mail survey of the Focus Farm field day organisers was undertaken to further evaluate the Technology Transfer component of the 1990 East Coast Technology Transfer Programme. All 14 MAFTech consultants involved in the organisation of the field days completed the questionnaire. The main findings were:

- (a) Most consultants believed that the field days were successful in terms of farmer interest in the topics covered and their response to the information and advice provided.

However they also indicated (64%) that farmer attendance was only "adequate" (30% of farmers in the telephone survey indicated that they had attended a field day).

- (b) Most of the consultants surveyed believed that either "some" (57%) or "a high amount" (21%) level of impact had been made on management practices on farms located near the focus farm. Most consultants also believed that either "very little" (43%) or "some" (29%) impact had been made on management practices on farms outside the local district. Of the management options covered at the field days most consultants (71%) believed that alternative pasture species had been most widely adopted. About a third (36%) of the consultants also said that drought proofing stock policies had been widely adopted.
- (c) Suggested improvements to the Focus Farm field day concept included more farmer involvement in field day coordination (e.g. like the Meat Research and Development Council (MRDC) monitor farm field days), smaller groups of farmers at more locations and follow-up field days to demonstrate the long-term sustainability of management practices and introduced technology. It was believed that these modifications would increase farmer attendance and create more farmer interest.

The Focus Farm field day organisers' survey suggests that the field days were largely a success in providing farmers, who had attended, with information and advice about "drought proofing" technology. However, the consultants surveyed identified several important modifications to the overall Focus Farm field day concept that could improve field day effectiveness, and acknowledged that the farmer participation was low.

Chapter 6 - Conclusion

Effectiveness of the Technology Transfer Extension Programme

In Chapter One extension was defined as 'an educational process which aims to elicit voluntary change'. Extension incorporates two-way communication between clients and sources of information. Of the three extension models suggested, the East Coast programme can be best classified as following the 'interventionist approach'. Although some consultation with the farming community occurred within the programme on farmer attitudes and perceived needs, one-way communication was dominant from MAFTech and DSIR-Grasslands to the farmer. In some circumstances the technology encouraged was not adequately modified to a district level to meet specific physical and socioeconomic needs. This resulted in some farmers being supplied with inappropriate technology and/or drought management practices (see Chapter Four for example). Because the large group of targeted farmers was not homogenous, a collaborative (or co-learning) model may have been more successful i.e. applying the full matrix of farmer values, beliefs, goals, objectives, resources, relationships, activities and commitments that make up a farming system to the information to be communicated within a 'recommendation domain'. The majority of the technologies encouraged were developed for the farmer and not with the farmer. Techniques such as Rapid Multi-perspective Appraisal (RMA) could provide an effective method for obtaining farmer participation and providing sufficient quantitative information for decision makers within the short space of time that the design of programmes for adverse event assistance often requires (Van Beek & Hamilton, 1992; Curruthers & Chambers, 1981; Hildebrand, 1981; Curruthers, 1981).

Approaches rather than *the approach* to decreasing drought susceptibility were encouraged in the East Coast Technology Transfer Programme. The programme incorporated several processes (e.g. published material and field days) that reinforced programme aims. These were relatively successful in developing the confidence of farmers to make changes (or to increase their awareness of drought management options) and increased the programme's scope in terms of farmer clientele.

The aim of the programme to encourage farmers to adopt a range of both short- and long-term practices to their farming system rather than a 'quick-fix' solution was achieved. A relatively high proportion of farmers had incorporated both short- and long-term practices that had been promulgated through the Technology Transfer Programme. Examples of adopted short-term practices included options such as the use of feed supplements and more timely decision making, while longer term changes included the sowing of new pastures and changes in stock policy to increase the flexibility of feed demand (see Tables 2.10, 3.2 and 5.5).

The programme successfully provided informational and observational learning sources through published material and the Focus Farm and Alternative Pasture Demonstration Programme field days. Although the 'Drought Proofing Your Farm' booklet was cited most widely as a useful source of information (see Chapter Two), the various types of learning sources acted to reinforce farmer confidence in adopting new technologies and management practices (see Chapter Four). Many farmers also suggested experiential learning, gained from farming through the 1988/89 drought (see Table 2.9), influenced their decision to change their farming system to being less drought susceptible.

The majority of farmers, surveyed and interviewed during this study, had made at least one change to their farming system and feel more confident to cope with drought conditions (see Table 2.14). It is difficult, however to determine how much change occurred due to the influence of the Technology Transfer Programme relative to the farmer's drought experience, the wider base of agricultural knowledge available to farmers, other farming or non-farming objectives or improved financial returns for livestock products. It is also difficult to determine the extent to which the Technology Transfer Programme broadened the wider base of agricultural knowledge in terms of [drought] information and relevance (e.g. input of private agricultural consultants). However, it is certain that the experience gained through designing, implementing and reviewing the 1990 East Coast programme has added to that obtained through reviews of earlier adverse events.

Further evidence of the programme's impact can be inferred from farming trends in the East Coast region both before and after the 1990 programme, and compared with overall New

Zealand trends (e.g. increased sheep and beef trading stock and increased New Zealand sales of some alternative pasture species; see appendix A). Other trends, however, provide evidence that very little change has occurred in the East Coast compared to New Zealand (e.g. the decrease in breeding sheep numbers and the cumulative percent of lambs slaughtered from October to December except that in 1991/92 have been similar). Summer and autumn farming conditions, however, were generally favourable from 1990 to 1993. Drought conditions, such as those being experienced in late 1994 and 1995, will more clearly indicate the extent to which farmers have developed more effective drought management and sustainable dryland farming systems.

Policy implications

Although the East Coast programme was better targeted and appeared to generate a higher level of farmer awareness than previous programmes, future extension programmes could be further improved. First, the technology to be transferred must be relevant, proven and readily applicable to the local physical and socioeconomic environment (see Chapter Four, for examples of farmer comments on the deficiencies of the present programme). Benefits of change should preferably be readily apparent to farmers and this can best be achieved by working with local farmers in each region and includes the use of demonstration sites (such as the paddocks of alternative pasture species). However, this will increase response times and may not be appropriate for some adverse event situations. Second, specific technologies and management practices should be targeted to different types of farmers, especially in regard to field days, on the basis of their willingness to change and attitude to progress. These characteristics are themselves dependant on a number of inputs (e.g. financial security, physical resources, farmer goals and objectives and to a lesser extent, age and level of education). Relatively simple, risk averse technologies and management practices, for example, could be targeted to less progressive farmers and more complex technologies and management practices targeted to progressive farmers. It is likely that farmers would put themselves into groups with which they felt most comfortable. Farmers should be actively involved in the formation and leadership of these groups (see Table 5.6).

The present Government policy of non-intervention is now widely realised and accepted by the majority of farmers (i.e. the majority of farmers would prefer to take action to protect themselves against future drought events; Table 2.3). However, due to decreased meat processing capacity in the East Coast region, the feasibility of the recommendation to make an "early decision on livestock numbers for summer", encouraged throughout the Technology Transfer Programme, has been substantially reduced. This places an even greater reliance of effective forward planning and the medium-term (up to 3 months) assessment of risk associated with climate change. Research to further develop techniques and farmer skill in the application of these is warranted.

In conclusion, the 1990 Technology Transfer Programme, the lessons learnt by farmers from the 1988/89 drought and support from the agricultural infrastructure, has provided an improved basis for sustainable dryland farming and greater farmer independence from Government-funded relief in the East Coast region.

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Appendix A

Farming Trends

A number of key aspects of stock policy and feed supply were encouraged by the East Coast technology transfer programme. These included; incorporating a greater proportion of (flexible) trading stock, early decision making in selling surplus breeding stock progeny and the use of alternative pasture species. Most of these aspects are recorded by the New Zealand Department of Statistics, and could be analysed to assess the regional impact of the technology transfer programme. Overall New Zealand and East Coast trends, before and after and technology transfer programme, were analysed. These are reported below:

Stock class and type trends

From 1987 to 1992, overall NZ sheep and beef numbers decreased by 18.2 and 4.3 percent respectively. Both trading and non-trading sheep classes decreased at approximately the same rate. However, trading cattle increased by 9.8 percent while breeding cattle decreased 10.5 percent despite a 2.3 percent increase from 1990 to 1992 (Table 1).

Figures for the East Coast region were not easy to derive, because the 1987-90 and 1990-92 figures were based on slightly different areas (County vs District). Thus overall change from 1987 to 1992 cannot be calculated (Table 1). The data suggest that total beef cattle numbers decreased from 1987-90 by 9.8%. This decrease was reversed in 1990-92 by a 9.6% increase. Both trading and breeding cattle numbers increased from 1990-92 by 10.6% and 8.2%, respectively. Sheep numbers decreased during both periods (1987-90 and 1990-92) by 13.8% and 5.4% respectively, although an increase in dry (trading) sheep of 7.2% during the 1990-92 period was recorded.

Table A.1: Sheep and beef classes and types in New Zealand (% of total) and the East Coast region (East Coast figures are shown in brackets).

	1987-90 ¹	1990-92 ²	1987-92 ³
Cattle Stock			
Trading cattle	+7.1%	+2.5%	+9.8%
(steers & non-breeding bulls)	(n/a) ⁴	(+10.6%)	(n/a)
Breeding cattle	-12.6%	+2.3%	-10.5%
(beef cows and heifers)	(-14.5%)	(+8.2%)	(n/a)
Total beef cattle	-7.3%	+3.2%	-4.3%
	(-9.8%)	(+9.6%)	(n/a)
Sheep Stock			
Dry (trading) sheep	-6.3%	-12.7%	-18.2%
(MA ewes and ram & wether hoggets)	(n/a)	(+7.2%)	(n/a)
Breeding sheep	-10.9%	-9.3%	-19.2%
(breeding ewes 2-tooth and over)	(-13.3%)	(-9.7%)	(n/a)
Total sheep	-10.2%	-8.9%	-18.2%
	(-13.8%)	(-5.4%)	(n/a)

¹ 1987-90 East Coast figures by County.

² 1990-92 East Coast figures by District.

³ Accurate 1993 and 1994 figures were not available.

⁴ Figures 'not available'.

Timing of lamb slaughter trends

Nationally the number of lambs slaughtered in the months of October to December (inclusive), expressed as a percentage of total lambs slaughtered annually, decreased from 21.6% in 1988/89 to 15.7% in 1993/94. The average number of lambs slaughtered over the October to December period was 17.1% from 1988/89 to 1993/94 (Table 2).

The number of lambs slaughtered in the East Coast over the same time period (October to December) decreased from 25.9% in 1988/89 to 17.7% in 1993/94, the average number of lambs slaughtered was 20.7% from 1988/89 to 1993/94. The highest proportion of the annual East Coast lamb kill during this period was 28.9% in 1991/92 and the lowest was 14.4% in 1992/93. The percentage slaughtered in October to December was consistently higher in the East Coast than that of all New Zealand (Table 2).

Table A.2: Cumulative percent of lambs slaughtered from October to December (inclusive) in New Zealand and the East Coast region.

Cumulative percent of lambs slaughtered from October to December			
	New Zealand	East Coast ¹	Difference
1988/89	21.6	25.9	+4.3
1989/90	17.3	19.2	+1.9
1990/91	18.1	18.1	
1991/92	17.9	28.9	+11
1992/93	11.9	14.4	+2.5
1993/94	15.7	17.7	+2.0

¹ "East Coast" consists of Gisborne and Hawkes Bay (not Wairarapa).

Sale of alternative pasture species trends

Very little accurate information was available on the sale of alternative pasture species. One major company supplied Roa Tall Fescue and Maru Phalaris sales data for New Zealand. The company stated the data was confidential and therefore exact figures are not published. However, the amount of Roa Tall Fescue and Maru Phalaris sold from 1987 to 1993 increased by a factor of 8.1 and 10.4 respectively. Availability of seed restricted Tall Fescue sales in 1992 and 1993. Recent Tall Fescue sales have not reached the quantities sold in 1989 or 1990 at the time of the South and North Island alternative pasture demonstration programmes.

Appendix B

Telephone survey questionnaire

Introduction

"Good evening, it's _____ from Massey University here, could I speak to the person responsible for the management of the farm please."
(if unable to come to the phone or absent)

"Would there be a convenient time I could call then?"

_____ (NOTE TIME FOR RECALL)

"I am part of a research team conducting a telephone survey on the effectiveness of the 1990 East Coast Drought Package. Would you be able to answer a few questions".

(if willing go to question 1)

(if unwilling)

"Thank you for your time, good night".

1) Do you receive 80% or more of your income from pastoral farming.

* yes (continue with survey)

* no, if so. "The East Coast Drought Package was aimed at farmers who receive 80% or more of their income from pastoral farming, you are not required to answer any more questions. Thank you for your time, good night".

East Coast Drought Assistance Review

Code ₃

Farmer telephone survey

1) Were you farming in the East Coast region during the 1988/89 drought.

☐ yes

☐₄

☐ no

2) Out of every 10 years how often is your farm affected so seriously by a summer drought that you have to:

a) Sell capital livestock.

_____ times

☐₅

b) Graze stock off the farm in significant numbers.

_____ times

☐₆

3) Did you become involved in any way with the 1990 East Coast Drought Relief Package in response to the 1988/89 drought eg.

☐ no

☐ yes if so, in what way?

₉

☐ Adverse events family income support

☐ New start grant

☐ Drought rehabilitation loan

☐ Farm management consultancy

☐ Alternative pasture species demonstration programme

☐ Other, please state: _____

4a) Did you receive a booklet titled "Drought proofing your farm" produced by MAFTech in 1991.

☐ yes if so, go to question (4b)

☐₁₀

☐ no

☐ not sure

b) Did you use the information in the publication.

☐ yes if so, in what way:

₁₃

☐ no if so, why not:

5a) Do you recall receiving any of the four newsletters titled "Sustainable farming systems update" (published June 1991-August 1992)

☐ yes

☐ 14

☐ no if so, omit question (5b)

☐ not sure

b) Did you use the information in these publications.

☐ yes if so, in what way:

☐☐☐ 17

☐ no if so, why not:

6) Have you kept any of the Drought programme publications in your records.

☐ no

☐ yes if so, what ones.

☐☐ 19

7) Were you aware of the drought management focus farm field days which were organised by MAFTech from July 1990 to July 1992.

☐ yes if so, go to question (8)

☐ 20

☐ no if so, go to question (10)

8) How many focus farm field days did you attend.

_____ Focus Farm Field Days.

☐☐ 22

if none, why not (go to question 10)

9) Did the information presented at the focus farm field days contribute to you changing your management.

☐ yes if so, in what way: ☐☐☐25

☐ no if so, why not:

10) Did you seek further advice and information on drought management from farm consultants as a consequence of the field days or publications.

☐ no ☐☐☐28

☐ yes if so, what information did you seek

11a) Did you visit any of the focus farms at a time other than a field day to discuss and observe drought management.

☐ yes if so, go to question (11b) ☐29

☐ no

b) Did the visit prompt you to change your management.

☐ yes if so, in what way: ☐☐☐32

☐ no if so, why not:

12) Did you have a Farm Management Consultancy report prepared as part of the Drought Recovery Scheme.

☐ yes

☐ ₃₃

☐ no if so, omit questions (13 & 14)

13) Was the report useful in providing ideas for your farm in reducing future drought risk

☐ yes if so, in what way

☐ ☐ ☐ ₃₆

☐ no if so, why not

14) Did you put the ideas into practice.

☐ yes

☐ ₃₇

☐ no

15) What other information prompted you or assisted you in making changes to your farming system in relation to drought management after the 1988/89 drought.

☐ Media (newspapers, articles, etc) Please describe:

☐ ₃₈

☐ Personal contact (farmers, consultants etc) Describe:

☐ ₃₉

☐ Seminars, other field days etc. Please describe:

☐ ₄₀

☐ Other. Please describe:

☐ ₄₁

16) For you and your farm, rate the following aspects of management either very unimportant, not important, important, very important or no effect in reducing the impact of a drought similar to that experienced in 1988/89 (please circle).

The use of special
hay/silage reserves
for drought events

VERY NOT IMPORTANT VERY NO
UNIMPORTANT IMPORTANT IMPORTANT EFFECT

☐ 42

Maintenance of
financial records
and a knowledge of
the present farm cash balance

VERY NOT IMPORTANT VERY NO
UNIMPORTANT IMPORTANT IMPORTANT EFFECT

☐ 43

Early decisions on
livestock numbers
for summer

VERY NOT IMPORTANT VERY NO
UNIMPORTANT IMPORTANT IMPORTANT EFFECT

☐ 44

The use of alternative
pasture species

VERY NOT IMPORTANT VERY NO
UNIMPORTANT IMPORTANT IMPORTANT EFFECT

☐ 45

Having clear farm
objectives

VERY NOT IMPORTANT VERY NO
UNIMPORTANT IMPORTANT IMPORTANT EFFECT

☐ 46

Incorporating a whole
farm plan that
combines financial,
pasture and stock aspects.

VERY NOT IMPORTANT VERY NO
UNIMPORTANT IMPORTANT IMPORTANT EFFECT

☐ 47

Other
(Please specify)

VERY NOT IMPORTANT VERY NO
UNIMPORTANT IMPORTANT IMPORTANT EFFECT

☐ 48

17) What are your main limitations in modifying your farm system to one that is less affected by summer droughts. (ie. more drought tolerant).

☐ 49

18) Have you established any new pastures.

☐ no

☐ 50

☐ yes if so, what species and what area (ha/ac).

a) _____ ☐ ☐ ☐ ☐ 54

b) _____ ☐ ☐ ☐ ☐ 58

c) _____ ☐ ☐ ☐ ☐ 62

19) What changes have you made in your farm system since the 1988/89 drought that allows you to manage drought conditions more successfully.

☐ Alternative pasture species (as above)

☐ 63

☐ Financial management

☐ 64

☐ Setting of clear objectives

☐ 65

☐ Stock policies (please state)

☐ 66

☐ Timely decision making (please state) ☐ 67

☐ Incorporating feed reserves (please state) ☐ 68

☐ Other (please state) ☐ 69

20) Do you think you are better equipped to successfully manage drought conditions now than you were in 1988/89.

☐ yes

☐ 70

☐ no

21) Do you think the Government should provide assistance to farmers if a serious drought similar to that in 1988/89 was experienced again.

☐ no

☐ ☐ 72

☐ yes if so, in what form should this assistance be provided:

Finally some questions about you and your farm;

22a) What is the predominant type of livestock enterprise on your farm.

☐ 73

b) What is the effective area of your farm. _____ ac/ha

☐ ☐ ☐ ☐ 77

c) In what year were you born. 19__

☐ ☐ 79

d) In what year did you assume management responsibility of your farm. 19__

☐ ☐ 81

THANK YOU FOR YOUR HELP.

Appendix C

Additional tables I-VI

Table (I) **Total areas of different pasture species sown since post 1988/89 on the surveyed farms.**

Pasture species	Wairarapa (n=51)	Southern HB (n=46)	Hawkes Bay (n=65)	Gisborne (n=38)	Total (n=200)
Traditional ryegrass/clover	145 (18)	436 (40)	465 (36)	49 (9)	1095 (29)
Short rotation ryegrass	104 (13)	-	64 (5)	-	168 (5)
Chicory or chicory/clover mix	33 (4)	47 (4)	56 (4)	116 (22)	252 (7)
Triple mix (Phalaris, Tall fescue, Cocksfoot)	361 (45)	42 (4)	65 (5)	271 (50)	739 (20)
Tall fescue and clover	40 (5)	132 (12)	212 (16)	-	384 (10)
Cocksfoot and clover and ryegrass	-	36 (3)	153 (12)	24 (4)	213 (6)
Cocksfoot and clover	121 (15)	40 (4)	137 (11)	-	298 (8)
Prairie grass and clover ryegrass	-	340 (32)	130 (10)	-	470 (13)
Chicory and clover and grass mix	-	7 (1)	18 (1)	80 (15)	105 (3)
Total area (ha)	804	1080	1300	540	3724
Number of farms	26	27	38	13	104
Area sown per farm (ha)	30.9	40.0	34.2	41.5	35.8
Average farm size ¹ (ha)	628	391	547	1156	650
Area sown per farm (%)	4.9	10.2	6.3	3.6	5.5

¹ See Table 1.

Table (II) **Changes to financial management made by surveyed farmers since 1988/89. Figures in brackets are the percentage of farmers within each column.**

Change made	Wairarapa (n=51)	Southern HB (n=46)	Hawkes Bay (n=65)	Gisborne (n=38)	Total (n=200)
Clearer farm budgets	2 (4)	1 (2)	3 (5)	1 (3)	7 (4)
Refinanced mortgage and/or overdraft	-	1 (2)	-	-	1 (1)
Debt reduction	-	1 (2)	-	-	1 (1)
Total	2 (4)	3 (7)	3 (5)	1 (3)	9 (5)

Table (III) Changes to livestock policies made by surveyed farmers since 1988/89. Figures in brackets are the percentage of farmers within each column.

	Wairarapa (n=51)	Southern HB (n=46)	Hawkes Bay (n=65)	Gisborne (n=38)	Total (n=200)
Less capital sheep, more saleable sheep	3 (6)	-	2 (3)	1 (3)	6 (3)
Less capital beef, more saleable beef	1 (2)	-	1 (2)	3 (8)	5 (3)
Less capital sheep and beef, more saleable sheep and beef	3 (6)	3 (7)	8 (12)	9 (24)	23 (12)
Less capital sheep, more saleable beef	-	4 (9)	6 (4)	4 (11)	14 (7)
Less capital beef, more saleable sheep	-	1 (2)	-	-	1 (1)
Reduced overall stocking rate	5 (10)	8 (17)	9 (14)	7 (18)	29 (15)
Changed breed - more suited to drought conditions	3 (6)	-	-	1 (3)	4 (2)
Total responses	15 (29)	16 (35)	26 (40)	25 (66)	82 (41)

Table (IV) **Changes made with respect to the timeliness of decision making by surveyed farmers since 1988/89. Figures in brackets are the percentage of farmers within each column.**

	Wairarapa (n=51)	Southern HB (n=46)	Hawkes Bay (n=65)	Gisborne (n=38)	Total (n=200)
Sell lambs and/or calves early	12 (24)	7 (15)	21 (32)	13 (34)	53 (27)
Sell culls early	11 (22)	6 (13)	17 (26)	8 (21)	42 (21)
Sell saleable stock in small mobs	-	-	-	1 (3)	1 (1)
Total responses	23 (45)	13 (28)	38 (59)	22 (58)	96 (48)

Table (V) **Changes made with respect to the use of feed supplements by surveyed farmers since 1988/89. Figures in brackets are the percentage of farmers within each column.**

	Wairarapa (n=51)	Southern HB (n=46)	Hawkes Bay (n=65)	Gisborne (n=38)	Total (n=200)
Silage or baleage	6 (12)	3 (7)	9 (14)	2 (5)	20 (10)
Hay	1 (2)	2 (4)	13 (20)	6 (16)	22 (11)
Summer crop	3 (6)	6 (13)	5 (8)	4 (11)	18 (9)
Graze stock off	2 (4)	-	1 (2)	-	3 (2)
Additional runoff	2 (4)	-	1 (2)	1 (3)	4 (2)
Nitrogen fertiliser	1 (2)	-	-	1 (3)	2 (1)
Saved pasture	2 (4)	-	3 (5)	-	5 (3)
Total responses	17 (33)	11 (24)	32 (49)	14 (37)	74 (37)

Table (VI) Other changes made by farmers since 1988/89 to improve management during periods of summer drought. Figures in brackets are the percentage of farmers within each column.

Change	Wairarapa (n=51)	Southern HB (n=46)	Hawkes Bay (n=65)	Gisborne (n=38)	Total (n=200)
More fertiliser	5 (10)	6 (13)	6 (9)	3 (8)	20 (10)
Improved water supply	9 (18)	9 (20)	7 (11)	7 (18)	32 (16)
Monitoring of weather and rainfall patterns	1 (2)	-	-	-	1 (1)
Monitoring when to sell stock	1 (2)	-	-	-	1 (1)
Greater awareness of what to do	4 (8)	-	-	-	4 (2)
Irrigation	2 (4)	-	2 (3)	-	4 (2)
Trees for shelter and feed	-	4 (9)	-	1 (3)	5 (3)
Total responses	22 (43)	19 (41)	15 (23)	11 (29)	67 (34)

Appendix D

EAST COAST DROUGHT ASSISTANCE REVIEW

Mail survey of DSIR (Grasslands) Demonstration Farms

CODE ☐☐

1. (a) What is the predominant livestock enterprise on your farm (please describe):

☐ 3

- (b) Do you finish livestock for slaughter? ☐ Yes
☐ No

☐ 4

2. What is the area of your farm? _____ ha

☐☐☐☐ 8

What is the effective area of your farm? _____ ha

☐☐☐☐ 12

What area can be cultivated on your farm? _____ ha

☐☐☐☐ 16

3. In what year were you born? 19_____

☐☐ 18

4. In what year did you assume management responsibility of the present farm? 19_____

☐☐ 20

5. What prompted your initial interest in participating in the DSIR Grasslands' pasture demonstration programme?

☐ 21

6. What was the total area of alternative pasture species established on your farm as part of the East Coast programme? _____ ha

☐☐☐ 24

7. What alternative pasture species did you establish the largest area of? _____

☐☐☐ 26

8. Now you have had some experience with the alternative pasture species (identified in the previous question), how do you rate the following characteristics when compared to your traditional ryegrass white clover pasture. "SAME" represents equivalent to traditional ryegrass/white clover pasture. Circle the option where you would rate the new pasture species.

Ease of pasture established	VERY DIFFICULT	DIFFICULT	SAME	EASY	MUCH BETTER
-----------------------------	----------------	-----------	------	------	-------------

☐ 27

Pasture persistence	MUCH WORSE	SLIGHTLY WORSE	SAME	BETTER	MUCH BETTER
---------------------	------------	----------------	------	--------	-------------

☐ 28

Livestock performance	MUCH WORSE	SLIGHTLY WORSE	SAME	BETTER	MUCH BETTER
-----------------------	------------	----------------	------	--------	-------------

☐ 29

Summer pasture production	MUCH WORSE	SLIGHTLY WORSE	SAME	BETTER	MUCH BETTER
---------------------------	------------	----------------	------	--------	-------------

☐ 30

Winter pasture production	MUCH WORSE	SLIGHTLY WORSE	SAME	BETTER	MUCH BETTER
---------------------------	------------	----------------	------	--------	-------------

☐ 31

Value for money spent on establishment	MUCH WORSE	SLIGHTLY WORSE	SAME	BETTER	MUCH BETTER
--	------------	----------------	------	--------	-------------

☐ 32

Pest resistance	MUCH WORSE	SLIGHTLY WORSE	SAME	BETTER	MUCH BETTER
-----------------	------------	----------------	------	--------	-------------

☐ 33

9. Have you increased, decreased or maintained the same area of alternative pasture species on your farm?

☐☐☐☐☐ 38

- ☐ Increased. If so, what is the total area now? ___ ha
and why have you increased the area?
-
-
-
-

- ☐ Maintained the same If so, why have you not increased
or decreased the area?
-
-
-
-

- ☐ Decreased If so, what is the total area now? ___ ha
and why have you decreased the area?
-
-
-
-

10. Please rank in order of importance (1 = most important, 6 = least important) the following aspects in relation to alternative pasture species on your farm.

- ☐ To increase summer feed supply ☐ 39
☐ To protect against ryegrass staggers in summer/autumn
☐ To improve livestock growth rates
☐ To improve winter feed supply
☐ To test how they perform on my farm
☐ Other (please specify)

11. How do you rate the effectiveness of alternative pasture species relative to your traditional pastures for reducing the effect of a drought on the following? (Please circle).

Farm Profit	VERY POOR	POOR	SAME	BETTER	MUCH BETTER	<input type="checkbox"/> 40
Livestock performance	VERY POOR	POOR	SAME	BETTER	MUCH BETTER	<input type="checkbox"/> 41

12. In drought conditions how do you rate the following aspects of management to reduce the impact of a drought similar to that experienced in 1988/89 (please circle).

The use of special hay/silage reserves for drought events	VERY UNIMPORTANT	NOT IMPORTANT	IMPORTANT	VERY IMPORTANT	NO EFFECT	<input type="checkbox"/> 42
Maintenance of financial records and a knowledge of the present farm cash balance	VERY UNIMPORTANT	NOT IMPORTANT	IMPORTANT	VERY IMPORTANT	NO EFFECT	<input type="checkbox"/> 43
Early decisions on livestock numbers for summer	VERY UNIMPORTANT	NOT IMPORTANT	IMPORTANT	VERY IMPORTANT	NO EFFECT	<input type="checkbox"/> 44
The use of alternative pasture species	VERY UNIMPORTANT	NOT IMPORTANT	IMPORTANT	VERY IMPORTANT	NO EFFECT	<input type="checkbox"/> 45
Having clear farm objectives	VERY UNIMPORTANT	NOT IMPORTANT	IMPORTANT	VERY IMPORTANT	NO EFFECT	<input type="checkbox"/> 46
Incorporating a whole farm plan that combines financial, pasture and stock aspects.	VERY UNIMPORTANT	NOT IMPORTANT	IMPORTANT	VERY IMPORTANT	NO EFFECT	<input type="checkbox"/> 47
Other (Please specify)	VERY UNIMPORTANT	NOT IMPORTANT	IMPORTANT	VERY IMPORTANT	NO EFFECT	<input type="checkbox"/> 48

13. Compared to the 1990 East Coast Drought Package (\$30 million) how much Government Assistance do you believe should be provided to farmers who experience a drought similar to that of 1988/89?

- ☐ None
☐ Same amount
☐ More

☐ 49

14. For the alternative species programme, how do you rate the information and help offered by DSIR (Grasslands) (now AgResearch) in relation to the following?

Pre-cultivation information on pasture species production	VERY POOR	POOR	ADEQUATE	GOOD	VERY GOOD	NOT SURE
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☐ 50

Cultivation methods for seedbed preparation species production	VERY POOR	POOR	ADEQUATE	GOOD	VERY GOOD	NOT SURE
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☐ 51

Sowing depth for seeds	VERY POOR	POOR	ADEQUATE	GOOD	VERY GOOD	NOT SURE
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☐ 52

Grazing management during pasture establishment phase (first 6 months)	VERY POOR	POOR	ADEQUATE	GOOD	VERY GOOD	NOT SURE
--	--------------	------	----------	------	--------------	-------------

☐ 53

Establishment and use of new pasture within current farming system.	VERY POOR	POOR	ADEQUATE	GOOD	VERY GOOD	NOT SURE
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☐ 54

15. How many field days on the new pasture species were held at your farm?

☐ ☐ 56

_____ field days

16. How many farmers (other than for field days) have visited you to inspect and discuss the new pasture species?

- ☐ None
☐ A few (less than 10)
☐ Some (10 to 20)
☐ Alot (more than 20)

☐ 57

17. How many farmers do you know of who have sown alternative pasture species due to visiting and discussing your demonstration paddocks?

- ☐ None
☐ A few (less than 10)
☐ Some (10 to 20)
☐ Alot (more than 20)

☐ 58

18. By participating in this programme how likely are you now to use research institutions (such as AgResearch) as a source of technical information and management practice ideas in areas other than drought management?

- ☐ More likely
☐ As likely as before programme
☐ Less likely
☐ Not sure

☐ 59

19. Please feel free to add any other comments you wish to make.

☐ 60

THANK YOU FOR YOUR HELP.

Please return the completed questionnaire in the stamped addressed envelope provided.

Appendix E

Focus Farm field day organiser survey

Code ₂

1) How would you rate the overall success of the focus farm field days in terms of the following (please circle).

Farmer interest in the topics covered	VERY POOR	POOR	ADEQUATE	GOOD	VERY GOOD	<input type="text"/> ₃
The number of farmers attending	VERY POOR	POOR	ADEQUATE	GOOD	VERY GOOD	<input type="text"/> ₄
Farmer response to information and advice given	NEGATIVE	SCEPTICAL	NEUTRAL	POSITIVE	VERY POSITIVE	<input type="text"/> ₅

2) How many farmers came to you after a focus farm field day for more information and advice (please circle).

<input type="checkbox"/>	None	<input type="text"/> ₆
<input type="checkbox"/>	A few (less than 10)	
<input type="checkbox"/>	Some (10 to 20)	
<input type="checkbox"/>	A lot (more than 20)	

3) In what areas, if any, did the farmers mainly seek advice.

₈

4) What is your assessment of the impact the focus farm field days had on the following (please circle).

Management practices on farms located near to the focus farms	NONE	VERY LITTLE	SOME	A HIGH AMOUNT	A LOT	<input type="text"/> ₉
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Management practices on farms located outside the local district

NONE	VERY LITTLE	SOME	A HIGH AMOUNT	A LOT
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☐10

5) What technology or management information covered during the focus farm field days has been widely adopted by farmers.

☐☐12

6) If you were able to "rewind the clock" what would you do differently in relation to the focus farm concept.

☐☐14

7) Please feel free to add any other comments you wish to make.

☐☐16

THANK YOU FOR YOUR TIME

PLEASE SEND THE COMPLETED QUESTIONNAIRE IN THE POSTAGE PAID, ADDRESSED ENVELOPE PROVIDED.