TRAVEL GRANT REPORT:

NEW ZEALAND GRASSLAND ASSOCIATION CONFERENCE, 1993

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The 1993 NZGA Annual Conference was held at Masterton, from 26th to 29th October. I attended the conference as the representative of the Grassland Society of NSW. The following paper describes the organisation of the conference, outlines the main topics and discusses issues relevant to the organisation of the NSW Society's conference.

Organisational aspects

Participants

The conference attracted in excess of 300 participants - approximately half were farmers and the remainder represented a cross section of research, agribusiness, consultancy and education. About half the presentations were from the research/technology transfer sectors and twenty per cent from farmers. Generally speaking, this aspect is similar to the NSW Conference.

Venue

The venue alternates between North and South Islands - last year's conference was at Gore (Southland, South Island), this year's at Masterton (East Coast, North Island) and in 1994 it will be at Hanmer Springs (North Canterbury, South Island). Centres apply for the "right" to hold the conference and venues are determined two years in advance. A keen, active local organising group is one of the key criteria used to select the venue.

Program

The conference ran over three full days - lunchtime Tuesday to lunchtime Friday. The AGM is held on the first night, dinners on the second and third nights, and there are field trips on the afternoons of the second and third days. Approximately 30 papers (20 minute duration) were presented in the indoor sessions. A ninety minute session was set aside for participants to inspect posters or for demonstrations of computer software packages.

Papers

The organising committee nominates the theme and calls for papers in March. Final selection is made by May (the conference is normally held the first week in November). Competition is such that only about half those submitted are successful. The committee may invite papers from particular people to ensure that there is an acceptable range of presentations or to review special topics. Papers are drawn from throughout NZ, although some emphasis is placed on items relevant to the region where the conference is held.

General

A variety of procedures ensures that the NZGA executive has a blend of experience and new blood, and that close links and cooperation are maintained with the local conference committee. The program includes recent research, and clearly the aim is to maximise the level of participation by the audience (Note: the 1994 conference committee intends to include some small group workshops). The papers were all presented in a highly professional manner (there are prizes for best paper and best poster) and the only criticism I have is that some of the field sessions were too formal and we did not see any of the new drought-resistant pastures, despite the fact that this was a major theme of the conference.

The NSW Grassland Society's conference currently runs for slightly less than two days, so we have less flexibility than our counterparts across the Tasman. New Zealand also has advantages in a more closely settled rural population and more varied pastoral industries intermingled in the one region. However, our conference has, since its inception in 1986, run with basically the same format - review papers and farmer experiences in a fairly formal setting. Every NSW Grassland Conference has attracted a satisfactory number of participants, so radical changes are not necessary. However, I believe we should at least consider some of the variations outlined above for future conferences.

The NSW executive has tried to spread the conferences around the state - a new venue attracts new members (from that region) but an enthusiastic local committee with supporting resources is essential. Prizes for papers (in NSW) are probably not appropri-

ate, given that all speakers are invited at present, but a prize for the best contributed poster could act as an incentive and add interest to the proceedings.

Conference topics

The conference theme was "Intelligent Farming", a broad title which covered many topics. It is not possible to cover the 40+ presentations - what follows is my assessment of the main topics, chosen partly for their relevance to Australia.

Technology transfer (TT)

There is a general perception that the rate of adoption of proven technology is slower that desirable in NZ (Hay)[1]. Extension "for public good" has diminished since the changes to MAF in the 80's meant that their equivalent "Ag New Zealand" personnel are now commercial consultants (Walker, 1990) . Different agencies of TT are emerging - the Conference saw several examples including the following:

Farm improvement clubs: During the 1960's there were more than 50 FIC's, of which only two (Waiarapa and Canterbury) still function, both with strong inputs from private consultants. Consultancies were seen (Garland, Baker) as the means to facilitate two-way flow of information between farmers and researchers. In the Masterton groups, which contain 350 members, farms are classified on the basis of five land capability classes. Physical and financial databases are computed annually, from which farmers get feedback and can compare their performance with the "top 10%" of farms in the relevant land capability class. This is used to identify strengths and weaknesses and set targets for productivity. Regular discussion groups (10-20 members) and a newsletter are other features of the FIC's.

Farm monitor groups: These are sponsored by the Meat Research and Development Committee. Twenty three sheep and beef farms throughout NZ have been selected as typical of their region. The farmer and a group of local professionals meet four times/year to plan, monitor programs, and collect data, and hold at least one field day/year (to which everyone is invited). Ag New Zealand (formerly MAF) consultants are usually part of the group. The roles for monitor farms include establishing bench marks (ie likely productivity from new technology at a farm level). The value of field days and credibility of farm data was stressed.

Farmer first research: While many speakers emphasised productivity as a vital goal, Reid (Massey University group) took a different tack, aiming to find out why farmers were not adopting proven technology, and what alternatives they preferred. Preliminary findings point to the diverse nature of farmers and their situations. 70% were willing to adopt procedures but many were constrained by financial, physical or legal reasons. There was a tendency, when cash was available, to buy more land and use proven, relatively low-input technology (subdivision, topdressing). Farmers satisfied with their current situation were unwilling to change. Only 20% of farmers were willing and able to adopt intensive land improvement.

Technology transfer specialists: Crown Research Institutes employ TT officers (*eg.* Grassline) who were active at the Conference.

Consultant Officers: The NZ Dairy Board employs special consultants (free to farmers). They work with groups of about 20 and at least two thirds of dairy farmers use this service.

Drought strategies

The eastern sides of both the North and the South Islands are often subject to moisture stress in summer. In addition, a severe drought affected the eastern half of NZ in 1988-89 (Milne and Fraser, 1990), so strategies to minimize the risks of drought, particularly those relating to species selection and animal management, occupied a lot of attention.

Species: Research has shown that the 'triple mix' (tall fescue, phalaris, cocksfoot) gives more production over summer/autumn than ryegrass, and recovers more quickly from drought. Gavin Milne described a project in which the drought resistant species have been evaluated on 90 farms in 15-20 ha paddocks - farmers keep records of grazing days and animal performance. Pastures were established by cultivation, direct drilling or oversowing (including spring and autumn sprays, with a summer fallow). Cocksfoot (esp. cv. Wana) and white clover established satisfactorily by all methods in most sites, but phalaris and fescue established poorly when oversown. Establishment costs are considerable (over $400/ha), and consensus seemed to be that the sowing of these drought-resistant species will be restricted to the flats and gentler slopes on most farms.

Risk management: Consultants and several farmers presented papers with risk and drought management as a theme. Average stocking rates (10 ewes/ha) in this hill country are high by Australian standards, and a consistent idea was that stocking rates should be appropriate to the average year (not the dry year). Similar thoughts were expressed at the NSW Conference at Orange last year (Allworth, 1993). Animal numbers are manipulated to match pasture growth rates as closely as possible, using several strategies, including:

Footnote 1: Citations without dates refer to papers presented at the New Zealand Grassland Conference

- Lambing and calving in early spring;
- Reducing stock numbers to winter carrying capacity by January;
- Selling killable stock (lambs, steers, bulls) early;
- Conserving silage to flush ewes prior to mating and for drought reserve;
- Subdivision and grazing management to ration feed in periods not critical to animal performance and maximise utilisation of pasture.

The "normal" strategy is to graze continuously (sheep separate from cattle) from before lambing to weaning, with various forms of rotational grazing (including mob-stocking sheep with cattle) from December to July (Coop, 1986). Cattle and sheep (ratio 1:5-10) are both kept on most farms to spread risks (diversity) and maintain pasture quality (cattle are less selective grazers than sheep). Probably the key risk-management strategy is to have killable stock which can be sold early, or fattened through the summer, depending on the seasonal conditions. Feed budgets help decide when and how many to sell.

Computers in Agriculture

Several software packages were displayed, ranging from relatively simple farm business packages (Howden) and spreadsheets for feed budgeting (Brookes), to sophisticated decision-support models, such as Stockpol (McCall) and Udder (Lewis). Stockpol, a NZ model for beef/sheep farms, and Udder, a model developed in Victoria for dairy farms, have been used extensively by consultants and are now being marketed for farmers (each costs $3000 plus, although a cheaper version of Udder is available). Udder is currently used by farmers via their consultants (such as Ag NZ). Clients build up a database on pasture performance, etc, so the model can be modified to fit their particular farm.

A second aspect of computers was their use by researchers to investigate (model) the impact of new technology or changed conditions (economic, environmental) on farming systems. Examples included the sowing of drought-resistant species (Korte, Baker), changing sheep/cattle combinations (Webby) and stocking rate/fattening strategies for beef (McCall), all of which used Stockpol as a basic tool. Such research strategies are not new to Australia - Grazplan was an essential part of the paper on residual dry matter and grazing management presented at the NSW Grasslands Conference in 1993 (Bell and Blackwood, 1993). The use of these models (in research) has obvious advantages in labour and the ability to investigate many variables. However, continual checking is required to verify the results from the models in different regions and at the farm level. In New Zealand, the MRDC monitor farms (see above) would seem to be ideal for this purpose, and similar strategies appear appropriate for NSW.

Sustainable Agriculture

As in Australia, sustainability is a word frequently encountered in Agricultural publications and conferences in NZ. The passing of the Research Management Act (1991) means sustainable farming practices are influenced by legal obligations as well as ethical, economic and ecological aspects (New, 1992; Williams, 1993). President John Hay, in his opening address, stressed that NZ needs to preserve its "clean, green" agricultural image, even though the world's increasing population (predicted to double to 11 billion in the period 1990-2010) offers a sound future for its pastoral industries. Erosion and trees/debris blocking streams have caused serious flooding problems in the recent past. Whole catchment management projects (involving erosion control, repair of slips, forestation of steep slopes, and clearing of streams) such as the Whareama scheme have reduced the flooding risk except in extreme rainfall events and thereby lifted the value of flood plain country (Blakemore).

Two papers (Lambert, Quilter) discussed the repair of land slips. Lotus (*L. pedunculatus* cv. Maku) and cocksfoot were the most successful species - 80% ground cover could be achieved within two years by a simple oversowing procedure. Fencing (to exclude stock) speeds up the repair process, but the response to fertiliser was relatively small, presumably because of low levels of competition from resident vegetation. Red clover established well but did not persist; white clover was successful in one series of experiments (Lambert) but failed in the other series. There was no obvious reason for these differences with white clover.

Two papers (Pottinger, Forde) discussed forestry, which is experiencing a boom in New Zealand. Forestry is now the third highest export earner (behind meat and dairy products) and is tipped to become the biggest export by 2010 (Knowles, 1991). Returns of 60-$100,000/ha are being achieved from 25-30 year old radiata pine plantations. About 5 million hectares of farmland (steeper hill country pastoral land) have been identified as suitable for forestry. However, despite the high returns, investment has been dominated by the non-farming sector, with most farmers being spectators rather than participants until recently (Hawke and MacLaren, 1990). Worthwhile grazing can be obtained for ten years of the stand (years 3-12), but appropriate silvicultural practices (good tree stock, adequate density, pruning) need to be observed, otherwise income drops substantially (Knowles, 1991).

Fertiliser aspects were frequently mentioned, al-

though there were only a few papers in which it was the major theme. Fertiliser application rates have dropped in recent years on many hill country farms, as a result of declines in income from sheep. Overall, fertiliser applications in the decade from 1980-1990 dropped from 21 to 9 kg/Stock Unit (Lambert *et al.*, 1990). Despite this, the farms we saw were still receiving 15-20 kg P/ha (dairy farms much more). The dominant phosphorus source is still single superphosphate - reactive rock phosphate is less than five percent of sales and, according to Company reports, its proportion of the market is not increasing (Anon, 1993).

There has been a substantial lift in nitrogen fertiliser usage - 20% of all fertiliser used in the Waiarapa (Masterton region) contains nitrogen (Morton). This has in part been promoted by the price of DAP which is now competitive with superphosphate as a P source (and contains 18% N "free"). A DAP/13% S product is also available. One paper (Zhou) stressed the importance of Molybdenum in maintaining hill country pastures, while Co, Se and Cu were mentioned in conjunction with animal health by various speakers. However, overall, trace elements played a minor role at the Conference.

In a more general paper, Mackay noted the requirements of the Resource Management Act, and past measurements of erosion (insidious surface erosion as well as the more dramatic land slips), nutrient losses and water eutrophication. He suggested that future land use, especially in hill country, will require maintenance of a more complete ground cover. This in turn may require more conservative stocking rates.

Implications for NSW

The climate, soils and Agricultural systems of NSW and New Zealand are very different (eg NZ summers are cooler, drought risks are lower and soil profiles are deeper), so considerable caution is needed in looking for practices that could be applicable in both regions.

I have already mentioned the possible value of the monitor farm concept as a research tool in NSW. Farms need to be "typical" of a region for results to have widespread value. Such farms could be part of already existing groups, such as Landcare or farm management groups. Williams (1993) advocates a shift in research funding (in NZ) to accommodate this type of on-farm research. Such an approach is applicable in NSW.

The Farmer-First approach has also been advocated in Australia - it is very similar to the Action Research concept discussed by Russell (1990). While public extension free to farmers still exists in Australia, the amount of resources for extension is diminishing in real terms (Leslie, 1993), and farm discussion groups are steadily increasing in NSW. With the exception of the dairy industry, my feeling is that NSW is as advanced and well served as NZ in this regard.

New Zealand pasture sowings have been dominated by ryegrass and white clover for many years, and farmers have been reluctant to change species (as distinct from cultivars), despite periodic effects of drought, insects, and ryegrass staggers (Lancashire, 1990). NSW, with more frequent periods of moisture stress and more diverse climates and soil types, already has a wide range of species. In his report on NZ, Duncan (1992) commented on the value of several species in the sowing mix. However, New Zealand experience is that complex sowing mixtures are rarely successful because of compatibility problems (eg cocksfoot and ryegrass will dominate fescue) and different requirements of species in grazing management.

New Zealand methods of grazing management (or elements of them) have been advocated for NSW (*eg.* Michalk *et al.*, 1993). However, the grazing pressure on NZ farms is much higher (on average 60% utilisation compared to 45% or less in Australia) and, as pointed out by Hutchinson (1993), grazing management is used not only to maintain pasture quality but also to ration feed and restrict feed intake at certain times. In New Zealand, the increased productivity from rotational grazing systems (compared to set stocking) occurs mainly under high grazing pressures (Smetham, 1990). Most farmers in NSW adopt a conservative stocking rate and hence low grazing pressure and, in these circumstances, the use of NZ grazing management strategies would not seem to be appropriate for the whole farm. However, they may be effective, perhaps combined with the high input strategies advocated by Lewis and Sale (1992), for some of the best paddocks within the farm.

There is a general increase in tree planting on NSW farms - mostly this seems to be for shelter, conservation and aesthetic reasons. The same has been true of NZ, but this is changing. I feel there should be scope for farm forestry (*ie.* trees as a source of income) in NSW, whether in the form of agroforestry (ie with grazing) or as straight timber on second class land. New Zealand has set up a strong marketing structure (largely private enterprise), which is an essential part of its success.

Finally, the suggestion by Mackay of the need for more conservative farming practices highlights a dilemma for NZ agriculture. On the research front, and amongst some consultants, there seemed to be a strong accent on increasing productivity. NZ farming has been based on highly efficient systems, using moder-

ate input levels, with legumes supplying most nitrogen. Farms are relatively small but returns to capital are quite high, which has the positive attribute that young people have a reasonable chance of "getting into agriculture" (certainly a better chance than in Australia).

However, productivity within the existing systems is reaching an upper limit in the main pastoral industries. Further intensification, such as through greater use of nitrogen fertiliser and high stocking rates, can increase outputs, but also risks intensifying the conflict between productivity and ecological sustainability. The natural environment (climate, soils and rivers) is more suited to agriculture and less prone to degradation problems than Australia - New Zealand does not have major acidity or salinity problems, for example. However, soil erosion and nutrient losses from hill country are significant (Lambert *et al.*, 1985) and, perhaps because the environment is more favourable, New Zealanders are prepared to push the limits of productivity more strongly than Australians. Hence, for different reasons, the need to guard against land degradation is equally valid in both countries.

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