Aiming for profitable and sustainable grazing systems:
Methods of Integrating Research, Extension and
Communication

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Summary

The provision of extension and educational frameworks in agriculture are key factors in obtaining sustainable production and business development systems. An essential component in aiming for sustainable systems is to link increased production efficiencies evident in many modern agricultural systems to clear market goals that are ultimately driven by consumer and retailer relationships. Without a clear and integrated view of the food chain primary producers will potentially find it more difficult to operate sustainable business practices. This paper demonstrates that linkage of farming, food production and market development is possible. Indeed, if we consider technical integration to have been successful on the farm in the last century our next step across the agricultural sector is market integration of farm based decision-making processes.

The British livestock sector offers many problematic issues and there is huge potential for the development of a sustainable framework that encompasses business, entrepreneurial and environmental goals within it. The experience of the Australian Landcare movement and PROGRAZETM training schemes offer a clear case study in how events associated with reconnection of livestock farming to training, community and markets may be provided. This report will also demonstrate how these schemes can stimulate environmental care and innovative business development.
Introduction

The British livestock sector has developed many clear problems over the past decade noted by the intense impacts of decreasing product prices and decreasing farm incomes (North 2001). Many of the trends that clearly identify failing farm incomes (DEFRA 2002) are not particular to the UK or European agriculture (Martin 2001). This paper will report on initiatives in the Australian livestock sector that have taken place in a similar economic downturn where farm incomes have dropped and specific farm product prices have plummeted in the last decade. The initiatives working in Australia described here have been successful at encouraging producers to be ‘green in the red’ and invest in environmental care (Campbell 1994). The training and educational aspects of farm management improvements within the Landcare model have been clearly linked and communicated with regard to environmental benefit equating to increased financial benefit.

The continued downturn across the agri-sector evident by indicators such loss of farm income, low produce prices relative to retail prices, increased management costs of production and declining contribution of agriculture to the National Gross Domestic Product (Marsh 2001). During this period it has become evident that the importance of grassland farming is not just limited to production of livestock products for the food chain.

For example, opportunities within the grassland sector have emerged during this period including the value of ecosystem services (Costanza et al. 1997) provided by grassland farmers in the UK (Bignal and McCracken 1996, and, Bignal and Baldock 2002). These services can be diverse and extremely difficult to quantify but include the utilisation of grasslands as carbon sinks (MAFF 2000; Powlson, Smith, Falloon and Coleman 2000), sources of biodiversity (Johnston, Poulton, Dawson and Crawley 2001), areas of conservation value, areas associated with tourism and areas that have inherent wealth associated with landscape value (Dart 2002).

It is useful to be reflective on the writing of Sir George Stapledon, whose memorial trust has made this report possible, from over half a century ago on the point of rural wealth potential (Stapledon 1964). Stapledon clearly saw the integration of food chain, dietary requirement, rural wealth and sufficient production to provide and stimulate rural wealth creation. Furthermore, in his writings, the farmer is the essential link between each facet of integration. Stapledon is perhaps most remembered for developing the importance rotational ley systems for the most
productive grassland systems and the use of varietal selection of grasses for different grassland systems (Stapledon 1939). However, his insight into reconnection, diversification and integration of farming into the food chain was truly stunning and currently poignant.

A current review of UK government policy within the livestock and agricultural sectors provides clear messages that the value of grassland farming is not limited to intensive food production. This is perhaps most evidently seen with DEFRA’s England Rural Development Plan (DEFRA 2001). Diversification and reconnection of farm products with markets is an area of opportunity that has been given intense attention in the Policy Commission report on Food and Farming published in 2002 (Policy Commission on the Future of Farming and Food 2002). Specific case studies of market and consumer based reconnection have been reported for a range of grassland based and livestock product enterprises (Dart 2002) and these provide clear examples of marketing successes.

An essential part of reconnecting of farming enterprise with markets, the establishment of frameworks for environmental care and the diversification of business outlook will be their inclusion in communication and education strategies that will facilitate changes in current practices that will be currently required on many UK livestock farms.

This paper reviews both education and communication with the experience of the methods employed in Australia by the Landcare movement that promotes sustainable land management practices, and an accreditation called PROGRAZE™ that targets training in the livestock sector.

The structure of the Australian agricultural industry is somewhat familiar to that of the UK in that central government support is available through the National Heritage Trust and the associated departments of Environment Australia and Agriculture, Fisheries and Forestry Australia. There are also levy funded bodies such as Meat and Livestock Australia and Australian Wool Innovation who essentially fund research and promote breeders and producers.
Creating stakeholder frameworks that link producers to markets and environmental responsibility; Can the Australian Landcare model work in the UK?

The Landcare movement in Australia has had a huge impact on how land owners view their commercial operations and social responsibility. The Landcare movement in Victoria, Australia has offered clear models of successful technology and knowledge transfer processes across the livestock sector that could be potentially used globally. The Landcare system of community involvement started in Australia at the end of the 1980's and has established itself in New Zealand and South Africa (Campbell 1994, Landcare Australia 1999). The Landcare movement has developed with the farm group or community Landcare group being central to decision making processes that tackle environmental issues such as the impact of agricultural production on landscapes (see Photo 1).

![Photo 1](image)

A typical view of the landscape in and around Hamilton, Victoria where Landcare and the Potter Farms developed at the end of the 1980’s. Mt Napier looms over the landscape here just south of Hamilton. South West Victoria is dominated by the Grampian Mountains and it was settled in the nineteenth Century by many Irish and Scottish families who developed livestock operations.

Environmental issues that are central to many Landcare groups include soil degradation and soil erosion and they have provided a focus for many Landcare activities.

The agricultural context is only one aspect of the Landcare movement and it is discussed specifically here. Many of the broader issues of Landcare can be found in reviews and books elsewhere (Campbell 1994). Funding for Landcare was initially helped by the National Soil Conservation Programme and in 1989 the Australian Prime-minister of the time, Mr Bob Hawke, committed substantial funds and stating the 1990’s would be ‘the decade of Landcare’.
This interest in environmental sustainability has occurred against a background of many income problems associated with livestock farming we have seen in the UK and Landcare has been successful. For example, the decline in livestock enterprises in Australia has occurred over the past decade leading to many farms diversifying into forestry products including production of blue gum wood tree plantations for high-grade paper intended for the Japanese market in areas such as the wool and dairy country of South West Victoria. These diversification opportunities when managed as part of an overall farm plan can offer huge opportunities in much the same way biomass and agro-forestry could in the UK. The development of a agricultural extension spectrum within Landcare includes technology transfer, problem solving, education and human development. The educational based approach has helped to facilitate flexibility and diversity into whole farm planning. These issues are clearly placed in the hands of the individuals within the Landcare group so that it is in effect learner led. The Landcare Group is the basic working unit of the movement, with its own charter and ability to hold its own activities to generate wealth. It is generally formed from the enthusiasm of concerned stakeholders drawn from communities and such groups will represent a range of views, skills and decision making goals.

**Stakeholder involvement in research and policy development through Landcare**

One of the most exciting outcomes of Landcare has been the fact that farmers and producers are central to an environmental research process and they have developed research programmes along-side commercial enterprises. This has been done with integration to agricultural institutes and research bodies but there are many examples of the direct generation of data and management information by farmers and farm groups themselves. These notably include the selection of salt tolerant grass ecotypes to grow in salinated gulleys on farm land; the conservation of native trees and implementation of agroforestry programmes; assessment of biodiversity on farmland; the development of animal genetics programmes; and, the generation of business benchmarking and environmental auditing data that can generate sources of income and sponsorship. For example, communicating the value of biodiversity in the UK is generally seen as a difficult task because biodiversity is not easy to measure and there may be no clear financial benefits. However, the benefits of re-vegetation in many Landcare projects have been essentially seen in providing shelter and shade, and dealing with rising water tables and salination of soils. The biodiversity benefit of re-
vegetation is recognised later with respect to harbouring predators in Integrated Pest Management programmes and potentially providing buffers to loss of nutrients into watercourses (Campbell 1994).

The generation of specific research and management data in the form of commercial benchmarking data has been used to generate income can support the farm group and research process itself. This represents a clear example of the sustainable production of wealth using the acquisition of data by stakeholders who provide a diverse range of skills and management experience to produce information that has clear commercial value. This information may be an ‘average’ picture of a farm for a specific location or stock breeding information for specific farm enterprises.

A particularly stunning example of farmer driven (and levy funded) research is the formation of genetics companies that are clearly instigated by producers and their need to improve livestock. There are programs for paternal or terminal genetics or maternal sire genetics (see Photo 2). The Lamb Plan programme is a prime example where sheep flocks are assessed for maternal and terminal genetic traits. Farmers pay a charge to be included in a particular programme for a specific breed and a number of anatomical and behavioural measurements are taken of their stock. This information is fed into a national programme so that an individual producer can identify particular animals or see how the flock compares to a national average. This is essentially a benchmarking process and it allows a breeder to target stock that is performing well (MLA 2002). A similar programme exists for fleece and lamb weight for Merino sheep (Merino Genetics Services). Measurements are interpreted as Estimated Breeding Values (EBV’s) where specific traits are composed together to give an overall value and this is clearly communicated to farmers.
A stunning example of farmer involvement in research is the Lamb Plan and Merino Genetics Services Programmes (http://www.mla.com.au/mgs and http://www.lambplan.com.au) where flocks are assessed for maternal and terminal genetic traits. The Coopworth ram from the Marriott’s (my hosts on this fellowship) flock in the photo is being measured for fat and muscle score and scrotal circumference. Farmers pay to be included in a particular programme for a specific breed and a number of anatomical and behavioural measurements would be taken of all the stock for Estimated Breeding Values (EBV’s). This information forms a national programme so individual producers can see how their animals compare to a national average. This is essentially a benchmarking process and it allows a breeder to know what stock are performing well in a flock.

The essential educational components of creating a sustainable livestock sector

A further development in the Australian livestock sector in the last 15 years has been the development of training programmes that have integrated research and practical farm management. These have included the initial ‘Pasture Manager’ syllabus that has developed into the PROGRAZE™ educational standard (MLA 2002). The PROGRAZE™ educational systems now include the beef, sheep and dairy sectors and they are supported through levy funding via Meat and Livestock Australia (MLA 2002). Most importantly, the initial ‘Pasture Manager’ syllabus was developed by farmers and farm consultants and it provided a clear practical approach to developing complex management systems such as assessing dry matter accumulation of pastures, clover content and weed survey. The importance of integrating practical management scenarios with principles that are founded on research data is central to the PROGRAZE™ syllabus and the associated suite of qualifications. For example complex processes such as dry matter accumulation are practically simplified and integrated to livestock nutrient budgeting to provide a producer with clear targets in
the use of fertiliser, feed and grass (see Photo 3). This type of approach is central to
the success of PROGRAZE™.

The aim of the PROGRAZE™ course is to empower farmers with the confidence to
do their own surveys for nutrients, pesticides and animal health with clear guidance.
A key theme throughout is converting efficient management decisions made at the
kilogram per head of stock production level such as phosphate fertiliser input per unit
of healthy stock to the monetary margin per kilogram of product such as wool, milk or
meat price margins. This is naturally assumed to make both good business and
environmental sense.

The need for sustainable grazing in successful businesses is a message that is
emphasised throughout the PROGRAZE™ syllabus and this encompasses
maintenance of profitability by increasing production and/or margins, utilising risk
management using flexibility in business enterprises and developing short term and
long term business outlooks.

Photo 3
Measuring dry matter accumulation and grass intake with a measuring stick with guideline pasture growth figures is covered in the
PROGRAZE™ programme. Such farm notebook based assessments are characteristic of PROGRAZE™ and the assessments are made by the farmer. PROGRAZE™ has been a key element in improving actions taken by grassland farmers in Australia in managing their land with respect to margins obtained and environmental impact.

The principles that support the PROGRAZE™ programme and the earlier ‘Pasture Manager’ syllabus grew out of farmers viewing sustainable grazing systems that were demonstrated on farms including one particular experimental farm. The experimental
farm was that of the Pastoral and Veterinary Institute near Hamilton in Victoria. The experiment that provided so much interest was a 30-year long term experiment that demonstrated phosphate management strategies available to grassland farmers (Saul, Cayley and McCaskill 1999). This experiment demonstrated how stocking rates could be increased with sufficient nutrient planning and clear attention to pasture composition.

**Farm advice and the potential of agricultural professional education programmes**

Many of the the PROGRAZE™ course learners are farmers and this provides a clear difference to agricultural accreditation in the UK. The UK has a well-developed consultant framework in the agricultural sector based on accreditation as is the case in the USA (eg. the Certified Crop Advisor programs of American Society of Agronomy 2002) and Australia (eg. PROGRAZE™ programmes as described in this review below). BASIS and FACTS (Martindale 1999 and 2000) are, in my own personal opinion and in light of the personal experience I have gained in the UK, Australia and the USA, essentially supply industry developed and are not necessarily farm system or farm management focussed. This is not the case for PROGRAZE™ which is clearly farm system (livestock and grazing) focussed. It therefore provides a clear standard for the livestock production operations and whole livestock product food chain. It does not specifically deal with fertiliser or agrochemical quality and advice but encompasses them along with many other issues related to livestock production.

A clear opportunity in potentially decreasing miscellaneous expenditure to the farmer is to encourage farmers and producers to develop their own consultancy and advice schemes. Marsh reports that expertise and advice cost brought by UK farmers is substantial (Marsh 2001) and it has potentially increased over the past decade. The PROGRAZE™ accreditation in Australia trains producers in the livestock sector and clearly demonstrates that this approach of decreasing reliance on external expertise can work and decrease farm operation costs. Further more, there is little evidence that this type approach decreases the importance of external advisers and consultants. In
many cases I have seen it can strengthen business relationships between adviser and farmer.

Increases in maintenance and energy expenditure for farms in the UK over the past decade (DEFRA 2002) also offer clear opportunities in developing educationally based initiatives aiming to decrease expenditure focussing management on energy conservation, biomass production cooperatives, renewable energy initiatives and estate or engineering planning.

The extension process and environmental education within the Landcare movement

Farmers have been central to the development of Landcare through farm demonstrations and farm based research studies. Environmental protection is clearly seen as an important goal of farmers. The potential impacts of intensive production of dairy, beef and sheep operations can have on land are clearly seen whilst the benefits of improving production 3-4 fold in 1 or 2 generations are also clearly recognised as successes. This situation has now created a position where farmers are trying to balance optimal production with environmental goals.

The benefits of increased production have created a position for many farmers to think sustainably about their operations for future generations even though it may mean going deeper into the red. This situation, as previously stated, has been termed by Andrew Chapman, the first National Landcare facilitator in Australia, ‘being green while in the red’. The Landcare movement farmers and their demonstration farms have convinced many that investment in environmental protection is possible in difficult times for business development.

The environmental problems faced by livestock farmers in Australia are somewhat different that farmers here in the UK. However water and soil conservation is central to all farm planning whether it is a beef, dairy or sheep enterprise in the UK or Australia. The damage of these resources produce the most directly visible of environmental problems in Australia as related to livestock production. The central cause of soil erosion and soil salination is clearance of trees and vegetation. Clearance was employed when farms were first settled and this was achieved by felling and ring-barking trees. This process has resulted in a constant loss of soil organic matter and increased wind and water erosion that are immediately visible today on many farms. The associated rising water tables due to the lack of water
being utilised by trees brings soluble salts from sub-soil to the top-soil amplifying a range of agronomic problems that include salination. It is important to note that these problems cross farm boundaries and the management of whole river catchments is an important approach to dealing with erosion and salination. It results in the development of networks and discussion between farms and other land management operations.

**The Potter Foundation farms and Landcare**

Many of the farmers that have become involved with Landcare have done so against a business outlook that has been similar to that faced by many farmers in the UK. At the end of the 1980’s the area around Hamilton, Victoria was the site for an ambitious project financed by the Ian Potter Foundation called the Potter Farm Plan. This project led the way for many farmers to begin to think about and develop sustainable farming systems as the only viable option is developing their businesses.

The Potter Farm plan took a number of farms from different landscapes that were livestock, mixed and arable enterprises. The Potter Farm Plan was 50% Potter Foundation funded (around AUS$250 000) and 45% farmer funded. The farms selected were 15 family run farms and it has been stated that these farmers effectively achieved in three years what it would have taken many 10 years to do. The enthusiasm of the farming families with support from the Potter Foundation and a network advisers was central to the demonstration farm successes. The 15 farms were not research farms but real working farms with the families living on them driving the whole research process. The farms essentially acted as demonstration farms to show how environmental problems such as erosion and salinity could be tackled over a period of three years. A whole farm planning view was taken, there were clear action plans and re-vegetation of previously cleared areas was central to many of the actions taken.

The Potter Farms also represented a clear change in mind-set for many farmers where the risk of acting more sustainably was at first thought too high. The Potter Plan Farms demonstrated that sustainable actions could be financially and environmentally viable. In fact the project effectively demonstrated the environment and financial aspects of farming complemented each other.

A key feature of the Potter Plan farmers was that they were integrally linked to a research and policy making process, they essentially took ownership of their own
group research and management information (see Photo 4). This has resulted in an exceptional dialogue between farmers and an appreciation of complex policy issues. These include clearly demonstrating the value of natural resources that not only relate to clear financial cropping gain (eg. reducing soil erosion and increasing water conservation) but also resources that do not directly relate to immediate cropping or animal husbandry profitability such as enhancing farm biodiversity.

Photo 4
A typical farm group meeting where PROGRAZE™ and improving practices was discussed.

Conclusion
Stakeholder approaches offer an opportunity for extension workers to develop case studies from which land managers can act with more security in decision making processes. Technology transfer and the knowledge held in our research infrastructure is hopefully able to provide confidence in making new decisions that diversify from pure production based goals in farm business planning. Extension programmes must provide a means for land managers to interface technical and the scientific literature to their day to day practices. The Landcare model provides a clear example where land owners are brought together to develop their own means of solving problems and developing policies for sustainable management. This type of process may provide a good extension medium that can be used in the UK.
The development of a PROGRAZE™ syllabus in the UK could also support the development of professional awareness within the livestock sector and increase the development of responsible environmental management. We currently have clear training accreditations for input and supply industries in the UK (eg. BASIS and FACTS, see Martindale 1999 and 2000). Such an accreditation could increase performance in areas of the livestock sector that are vital to sustainable business development including, optimising farm input use and operational activities; waste management and manure use; nutrient use and water quality; and, product development and traceability in our food chain.

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I am especially grateful to my hosts Sue and John Marriott, Branxholme, Victoria and the many people who have helped me of which special mention must go to my prime examples of Victorian wool growers Jeremy Drew and Robert Lyons and Hereford beef and Corriadale wool producers Jim and Midge Goff.
Sustainable Agricultural Systems - The Landcare Experience

by
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Sue Marriott, Secretariat for International Landcare, Hamilton, Victoria, Australia

Landcare and environmental sustainability
- The Landcare movement started at the end of the 1980’s
- Landcare has been driven by rural Communities starting Landcare groups, the 1990’s saw a decade of Landcare
- Farmers have been central to this process
- Local Landcare groups have ownership of their own charter, research and management information

The Potter Plan Farmers and Landcare
The Potter Plan Farms provided clear demonstrations of sustainable approaches at the end of the 1980’s. They effectively started key elements in the Landcare movement.
It resulted in an exceptional dialogue between farmers and a positive response to complex issues such as increasing the value of natural resources, reducing soil erosion, delivering water conservation and conserving biodiversity.
- The research was farmer led
- The farms acted as demonstration farms to show how environmental problems such as erosion, loss of biodiversity and salinity could be tackled
- A whole farm planning view was central to sustainable management

Further details at http://www.mpcresearch.co.uk

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**Sustainable Livestock Systems - The PROGRAZE Experience**

**by**

Dr Wayne Martindale, Askham Bryan College, York, UK

Sue Marriott, Secretariat for International Landcare, Hamilton, Victoria, Australia


**PROGRAZE, Developing Sustainable Outcomes**

The PROGRAZE™ programme is a training course that has essentially been developed by farmers for farmers.

- Over 9000 livestock Australian producers have gone through the PROGRAZE programme
- Many have followed specialised courses after it (eg. Lamb Cheque and Beef Cheque Programmes)

**PROGRAZE** is essentially a syllabus and course that covers basic grassland and livestock management systems. It equips farmers with a suite of skills that they can use to manage their operations optimally in terms of profit and the environment.

Further details at [http://www.mpcresearch.co.uk](http://www.mpcresearch.co.uk)

Wayne Martindale was awarded a Stapledon Trust Fellowship and BGS Bursary Award to visit Australia as a guest of the Secretariat for International Landcare, Australia in August 2002
This study reviews grazing system management initiatives that are promoting livestock products and reducing environmental impacts.

The Landcare movement

The Landcare movement has developed from communities starting their own Landcare Groups to work together to address local agricultural and environmental issues.

Landcare approach and environmental sustainability

- The Landcare movement started at the end of the 1980’s
- Communities have driven Landcare, its policies have evolved for over tens years now.
- Farmers have been central to this process with the management of land and farm demonstrations through to farm based research studies.
- Local Landcare groups have ownership of their own charter, research and management information

The Landcare movement has convinced many landowners that investment in environmental protection is possible in difficult times. The central role of soil and water resource management has been key to the development of Landcare.

The Potter Plan Farms in Victoria

The Potter Plan Farms provided clear demonstrations of sustainable approaches in farming at the end of the 1980’s. They effectively started key elements in the Landcare movement. The Potter Farms in Victoria resulted in an exceptional dialogue amongst farmers and a clear understanding of the value of natural resources, reducing soil erosion, delivering water conservation and conserving biodiversity.

- The Potter Plan research was farmer led
- The Potter farms acted as demonstration farms to show how environmental problems such as erosion and salinity could be tackled
- A whole farm planning view was central to sustainable management
PROGRAZE™

A need to manage grazing land sustainably is clearly communicated by farmers through a number of routes including the Landcare movement and the Meat and Livestock Australia levy funded programmes such as PROGRAZE™. The PROGRAZE™ programme is a training course that has been developed by farmers for farmers. Over 9000 livestock Australian producers have gone through the PROGRAZE programme and many have followed up with more specialised courses (eg. LambCheque and BeefCheque Programmes).

Farmers developed the PROGRAZE course in the early 1990’s. When the first form appeared it was called ‘Pasture Manager’ and covered sheep alone. Eventually PROGRAZE would include sheep, beef and dairy systems.

PROGRAZE is essentially a syllabus and course that covers basic grassland and livestock management systems. It equips farmers with a suite of skills that they can use to manage their operations optimally in terms of profit and the environment. The PROGRAZE courses are generally held on farms.

Farm based research in the livestock sector

A stunning example of farmer involvement in research is the Lamb Plan and Merino Genetics Services Programmes where flocks were assessed for maternal and terminal genetic traits. Farmers pay to be included in a particular programme for a specific breed and anatomical and behavioural measurements would be taken of all the stock for Estimated Breeding Values (EBV’s). This allows the farmer to select and benchmark the selection of stock with other farms.

Web site references

- Secretariat for International Landcare http://www.silc.com.au
- Landcare http://www.landcare.gov.au
- Further details of this Stapledon Trust/BGS fellowship study, films of the Rothamsted experiments, Palace Leas grazing experiment see http://www.mpcresearch.co.uk

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Wayne Martindale was awarded a Stapledon Memorial Trust Fellowship and BGS Bursary Award to visit Australia as a host of the Secretariat for International Landcare, Australia in August 2002. Wayne has previously developed extension programmes with FACTS. Between 1998-2000 he has developed on-line film and media for the Rothamsted Experiments and Palace Leas Grazing experiments (available at http://www.mpcresearch.co.uk) with an OECD fellowship. Wayne teaches agricultural and environmental studies, and farm planning at Askham Bryan College, York.

Wayne is available to discuss Landcare and grassland accreditation or anything with regard to this report

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