

# Sustainable grazing systems (SGS) survey

conducted by ABARE for MLA

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# *Acknowledgments*

## *Industry*

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# ***Introduction***

Meat and Livestock Australia commissioned ABARE to conduct a survey aimed at benchmarking practices of southern Australian beef and sheep producers and concurrently assist in evaluating the Sustainable Grazing Systems Program.

The four main specific purposes of the survey were to:

- provide information to assist plan a new SGS program;
- describe the extent to which particular environmental issues are recognised by producers;
- identify management practices adopted by producers in response to identified environmental issues; and
- benchmark current practices.

The questionnaire, which was developed by ABARE and MLA, covered the following topics:

- graziers' demographics;
- physical characteristics of surveyed farms;
- financial information;
- pasture quality and grazing management;
- environmental issues; and
- graziers' awareness and use of SGS programs or PROGRAZE.

## **SGS program and PROGRAZE**

The Sustainable Grazing Systems program (SGS) is an initiative of Meat and Livestock Australia (MLA) involving a range of partners including state agricultural agencies, Land and Water Research and Development Cooperation, Murray Darling Basin Commission, the Department of Natural Resources and Environment and the University of Melbourne. SGS training is conducted through a network of regional groups or committees with the scientists and local producers who focus on sustainable pasture management and grazing strategies. SGS focuses on four main sub program areas - research (grazing studies, sustainability and ecological studies); a regional producer network; PROGRAZE (training) and Intergration of the sub program areas.

Through the Sustainable Grazing Systems Program, MLA manages and coordinates PROGRAZE. The PROGRAZE program commenced in New South Wales in 1994 and was adopted by the departments of agriculture in Victoria, Tasmania and South Australia in 1995 and Western Australia in 1997. Courses offered through PROGRAZE concentrate on setting and achieving livestock and pasture production targets using skills in assessing both livestock, and the quantity, quality and stability of plant species within the grazing system.

SGS/PROGRAZE activities are designed for graziers in the temperate higher rainfall zone of southern Australia where average annual rainfall is approximately 600 millimetres or more.

### Target population

The survey design and samples for this survey were based on data drawn from the Business Register maintained by the Australian Bureau of Statistics (ABS). This is a list of all Agricultural establishments with details of the farms' location, industry and size. Samples were selected from those farms in regions of interest to MLA in the southern high rainfall zone and in the following broadacre industries: Mixed Livestock-Crop industry (ANZSIC class 0122), Sheep industry (ANZSIC class 0124), Beef industry (ANZSIC class 0125) and Sheep-Beef industry (ANZSIC class 0123). The survey only covered establishments with an estimated value of agricultural operations of \$22 500 or more. A definition of the estimated value of agricultural operations is given in the ABS publication, *Australian Standard Industrial Classification*, 1983 (ABS cat. no. 1201.0).

### Regions in the MLA defined high rainfall zone

Regions	Target sample (Realised sample)	Frame Population (Estimated eligible population)
NSW Central Tablelands	136 (134)	2263 (1907)
Northern Tablelands	136 (137)	1896 (1651)
North-west slopes	136 (136)	2386 (2121)
Southern tablelands	136 (136)	2206 (1743)
South-west slopes	136 (132)	2333 (1921)
VIC Central West	136 (136)	2977 (2369)
Gippsland	136 (138)	1935 (1710)
North -East	136 (136)	3146 (2535)
West Victoria and South Australia	136 (138)	4750 (3677)
Queensland	136 (136)	3259 (2928)
Western Australia	136 (136)	3509 (2932)
Tasmania	136 (136)	1312 (1125)
<b>High Rainfall zone</b>	<b>1632 (1631)</b>	<b>31972 (26616)</b>

There was an additional eligibility criterion – only those farms with at least 100 sheep or 30 beef cattle were included in the survey. Stratification was by region by ANZSIC by size. Farms were selected in the following MLA defined regions:

The high rainfall regions defined by MLA for this survey were broader than the established definition used by ABARE, but reflect a region where SGS may have had a presence in delivery of information. In the analysis presented in this report, all national averages exclude the Queensland high rainfall region, as only a relatively small proportion of the sample (10 of the 136 farms surveyed) had participated in SGS or PROGRAZE activities.

### Data collection

Data were collected by telephone interviews using a computer assisted telephone interview (CATI) methodology. Interviews for farms in the high rainfall zone commenced 1 May and were completed on 30 May 2001.

# ***Chapter 1: Key survey results for high rainfall zone***

## **Physical characteristics**

The average farm size in the high rainfall zone was around 850 hectares (table 1), of which, around 80 per cent was devoted to native and perennial pastures. This pasture was used to run, on average, around 2000 head of sheep and 228 head of beef cattle. The primary sheep enterprise of farms with more than 100 sheep was to produce wool (44 per cent), wool and lambs (40 per cent) and specialist lamb production (14 per cent). Of the beef producers with more than 30 head of cattle, 88 per cent stated their primary beef enterprise was as a commercial beef operation. At the 31<sup>st</sup> March 2001, only 7.5 per cent of the average farm's land was dedicated to cropping activities.

Farm size ranged from almost 3500 hectares in Queensland to 320 hectares in the Victorian Gippsland region (table 2). Cropping intensity, as at the 31<sup>st</sup> of March 2001, was greatest in the Victorian Central-west district (13 per cent of area operated) and least in the Northern Tablelands of New South Wales (2.7 per cent).

## **Producers demographics**

Demographic estimates (age and level of education) are based on the person responding to the survey. Although the respondent was involved with running the farm business, they were not necessarily the person who participated in SGS/PROGRAZE training.

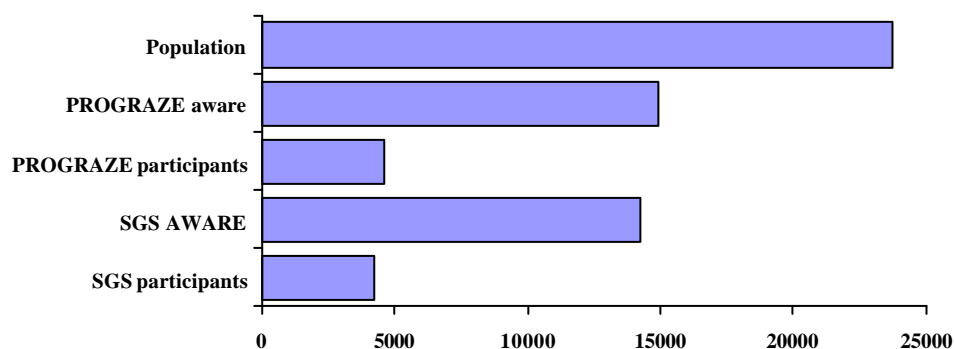
Around 60 per cent of producers in the high rainfall zone (excluding Queensland) were over 50 years of age, while only 2 per cent were less than 30 years (table 1).

Almost 70 per cent of producers in the high rainfall zone had school certificates or higher school certificates and 19 per cent had undertaken a TAFE course or certificates. Around 14 per cent of producers had university qualifications.

## **SGS and PROGRAZE**

Sixty per cent of producers, or just under 15 000 producers (figure 1.1), were aware of the SGS and PROGRAZE programs. Of these producers though, only 30 per cent and 31 per cent had participated in SGS and PROGRAZE programs respectively. The participation numbers in PROGRAZE derived from this survey were less than anticipated by MLA. This may be due to the sampling of a population broader than where MLA considered they actually had a delivery presence.

### **1.1 SGS and PROGRAZE in the high rainfall zone (excluding Queensland)**





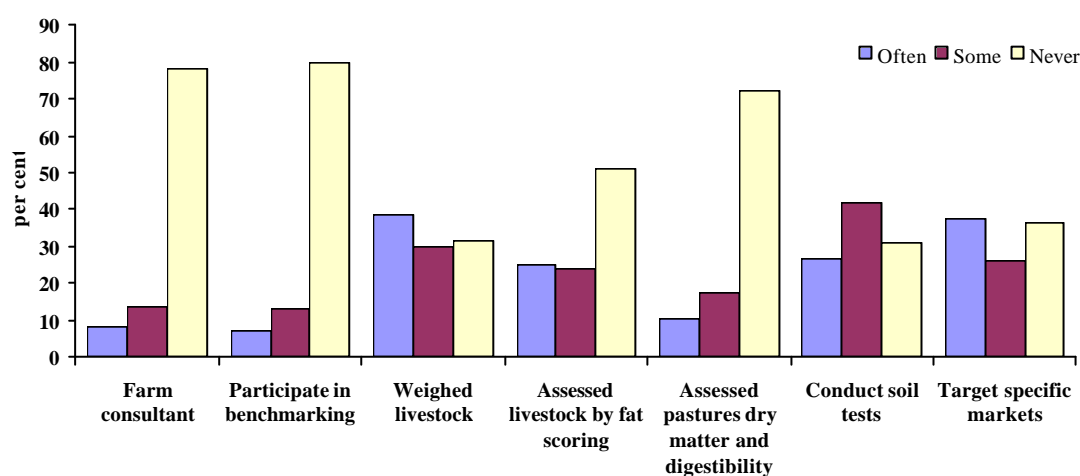
## Management and benchmarking practices

Testing and adoption of new practices was greater on those farms that had participated in one or both of the SGS and PROGRAZE programs, when compared to those farms that had participated in neither (tables 1 and 4). For example, a greater proportion of participating farms used temporary subdivision of grazing area, boxing of mobs/herds, calculated feed budgets, weighed livestock, assessed livestock by fat scoring, and targeted specific markets.

On those farms that have participated in the SGS and/or PROGRAZE programs expect adoption of new practices implemented in the last five years will have the greatest impact on profitability and sustainability (table 4). Among participating farms, 81 per cent and 85 per cent of farms stated that the changes they had implemented would increase profitability and sustainability respectively. This compares with only 62 per cent and 66 per cent, respectively, among non-participants.

At the national level (excluding Queensland), around 70 per cent of producers target specific markets, undertake soil tests, and weigh their livestock (figure 1.2). However, less than 30 per cent of producers undertake benchmarking activities, assess pasture dry matter and digestibility or seek out farm management consultants. Adoption of these practices showed very little variability across the high rainfall regions (table 4).

### 1.2 Adoption of new management practices

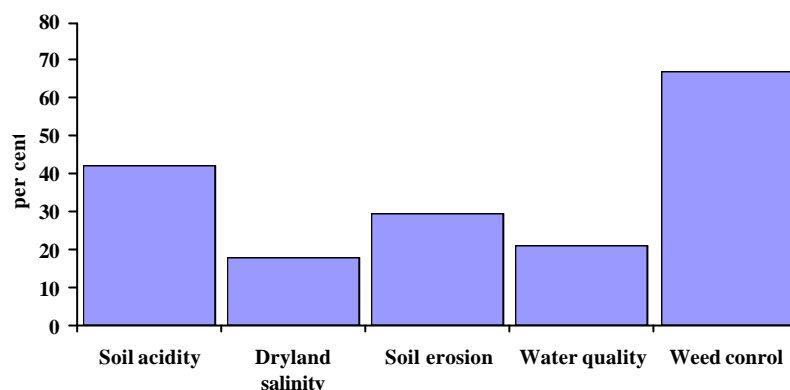


However, a significantly higher proportion of producers participating in the SGS and/or PROGRAZE programs was using these benchmarking variables than non-participants. For example, at the national level (excluding Queensland), 60 per cent of participating producers assessed pasture dry matter and digestibility compared with only 15 per cent of non-participants (table 1). Regional variability also becomes more apparent in these sub-groups, with the proportion of participating producers assessing pastures ranging from 29 per cent in Western Australia to 73 per cent in the northern and southern tablelands of New South Wales (table 4).

### Environmental issues

Weed control is the largest environmental issue affecting producers in the high rainfall region of Australia (figure 1.3, table 1), followed by soil acidity, soil erosion, water quality and dryland salinity.

### 1.3 Proportion of farms with environmental issues (National average, excluding Queensland)



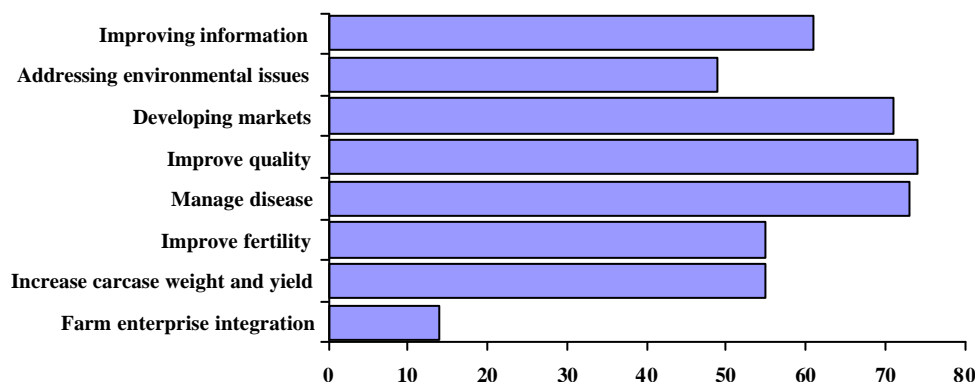
Around 66 per cent of producers stated that weed control was a major issue affecting their farm (table 4). Almost all of the producers (93 per cent) with this problem indicated they had used herbicides to manage weeds. Grazing management, perennial pastures and crop/pasture rotation had been used by 60 to 70 per cent of producers.

Soil acidity is a major issue on 42 per cent of farms, almost all of whom used soil tests, lime and perennial pastures to manage the problem. The most common management practice used on the 30 per cent of farms affected by soil erosion was to manage grazing to ensure sufficient ground cover remains to protect the soil. Sowing permanent pastures and trees were the most commonly used management options to deal with dryland salinity and water quality issues.

#### Planning priorities for MLA

Producers were asked to rank a range of possible future MLA research topics on a scale of low, medium and high priority. Improving quality, managing disease and developing markets stand out as the three most important areas of future research, with over 70 per cent of producers rating these areas as being of high priority (figure 1.4, table 8). However, only 14 per cent of producers ranked increasing farm enterprise integration as being of high priority.

### 1.4 Farmers ranking of research topics, high rainfall zone (excludes Queensland)



## ***Chapter 2: Comparison of SGS/PROGRAZE participants with non participants***

Tables 1 to 3 present estimates from the survey of Sustainable Grazing Systems (SGS) in the high rainfall zone at the national level for the following (mutually exclusive) groups of graziers, categorised according to the level of participation in SGS/PROGRAZE activities:

- a) Participants in both SGS (including Farmwalk) and PROGRAZE.
- b) Participants of PROGRAZE only.
- c) Participants of SGS regional activities (including Farmwalk) only.
- d) Graziers who have not participated in either SGS or PROGRAZE training but do receive the Prograzier magazine through MLA.
- e) Graziers who were aware of, but had not participated in either SGS or PROGRAZE training.
- f) Graziers unaware of either SGS or PROGRAZE training.

These six groups were then aggregated into three main groups and results for these groups are estimated at the national and regional level (see table 4) and forms the basis of much of the discussion in this chapter. The three groups are:

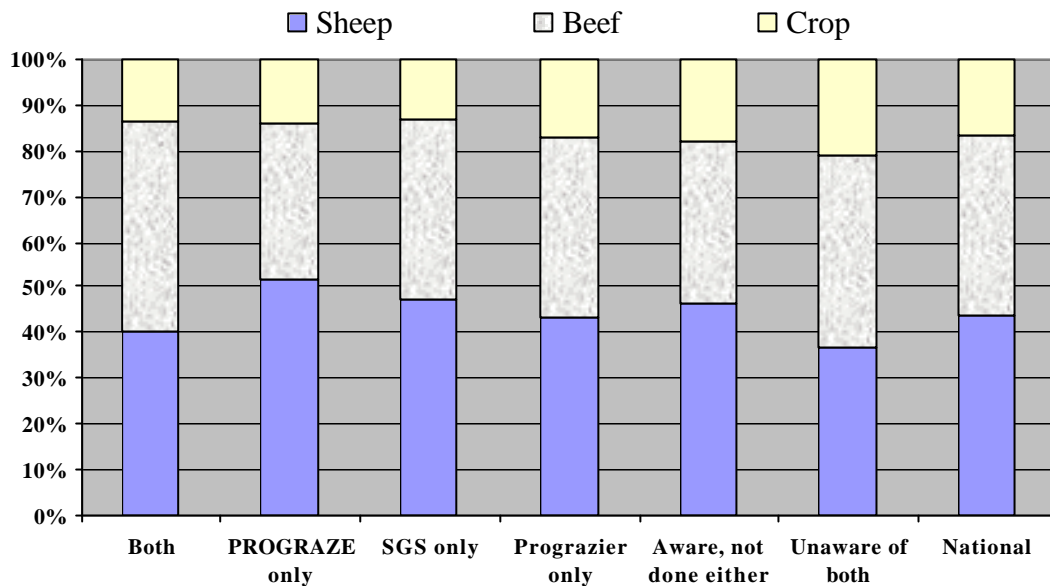
- PARTICIPANTS (a, b and c from above) – includes any property where a representative has participated in a PROGRAZE course or SGS regional activity or SGS Farmwalk.
- NON-PARTICIPANTS (e and f from above) – includes producers that have not had a representative participate in any SGS or PROGRAZE training activity.
- SEMI-PARTICIPANTS (d from above) – includes producers that receive the Prograzier magazine but they have not had a representative participate in any SGS or PROGRAZE training activity.

Out of the estimated 23 688 producers in the MLA defined high rainfall zone (excluding Queensland) approximately 6 140 producers (or 26 per cent) are termed PARTICIPANTS as a representative had participated in a PROGRAZE course or SGS activity by the 31<sup>st</sup> March 2001. An estimated 3 700 producers (or 16 per cent of producers excluding Queensland) are called SEMI-PARTICIPANTS as they received the Prograzier magazine but had no representative participate in SGS or PROGRAZE training activities. The remaining 13 850 producers or 58 per cent of the population excluding Queensland are allocated to the NON PARTICIPANTS group.

### **Enterprise mix**

The contribution of crops, sheep and beef cattle to the farm enterprise (on a sheep equivalent basis where one beef cattle equals 12 sheep and one hectare of crops is equivalent to 12 sheep) was similar for the 6 participation groups (figure 2.1). Generally, producers that had not participated in either SGS or PROGRAZE training had a slightly higher contribution of cropping to the enterprise in 2001 – estimated to be 21 per cent of the enterprise (sheep equivalent basis) for those producers that had not heard of PROGRAZE or SGS, and 18 per cent of the enterprise for those that were aware of PROGRAZE or SGS but they had not participated.

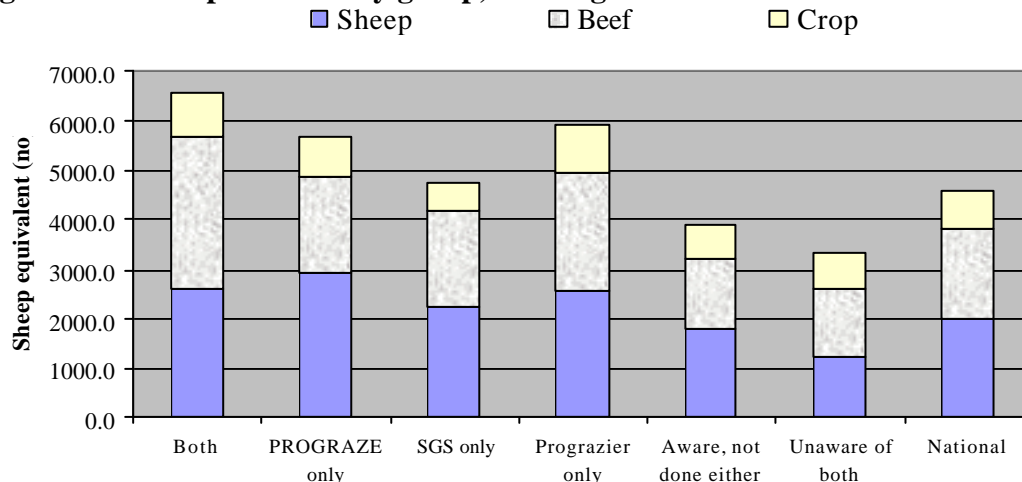
**Figure 2.1: Enterprise mix by group, SGS high rainfall 2001**



Over 83 per cent of producers in each of the six groups described their cattle enterprise as a commercial beef operation in 2001 however there was evidence of differences in the sheep enterprises between the groups. Producers who only participated in PROGRAZE training had the highest proportion of specialist wool producers in 2001 – estimated to be 63 per cent, which is considerably higher than the national average of 44 per cent.

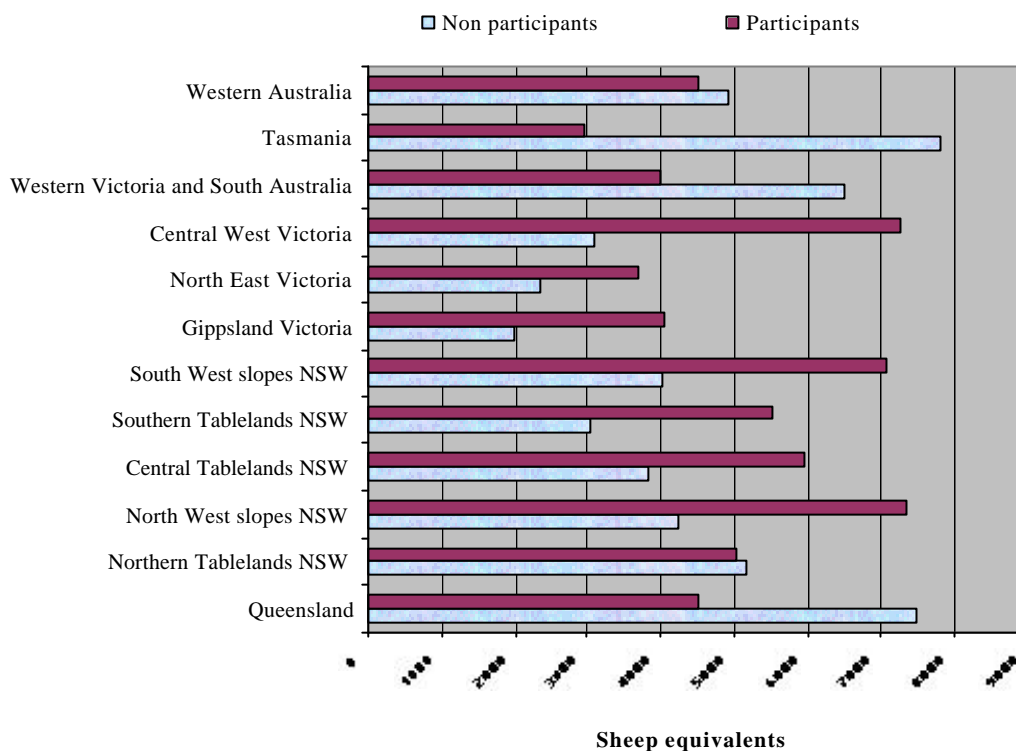
Although the contribution of sheep, beef cattle and crops to the farm enterprise (on a sheep equivalent basis) was similar between the six groups, the scale of the operation differed considerably. Generally properties with a representative who had participated in SGS and/or PROGRAZE were larger than properties that had no participants (figure 2.2). Participants in both SGS and PROGRAZE on average operated 32 per cent more land in 2001 and carried almost 80 per cent more stock (measured in sheep equivalents) compared with non participants. However, the group with the largest average area operated (26 per cent larger than the national average) consisted of producers who had not undertaken PROGRAZE or SGS training but subscribed to the Prograzier magazine.

**Figure 2.2: Enterprise scale by group, SGS high rainfall 2001**



The differences in the estimated scale of the enterprise between SGS/PROGRAZE participants and non participants observed at the national level is also evident at the regional level (figure 2.3). Generally it was the case that producers that had participated in SGS and/or PROGRAZE training operated larger properties, a result consistent with findings of previous studies carried out by ABARE for Meat and Livestock Australia (Management and training in the Australian beef industry, Australian Farm Surveys Report 1998).

**Figure 2.3: Enterprise scale by region, high rainfall areas, 2001**



### Age, education and involvement with other group activities

Participants in PROGRAZE or SGS training were more likely to have post secondary qualifications than non participants. Approximately 54 per cent of people who participated in both SGS and PROGRAZE training activities had completed a TAFE certificate, TAFE trade, Tertiary degree or post graduate studies by 2001 compared to 27 per cent of producers in the non participation group.

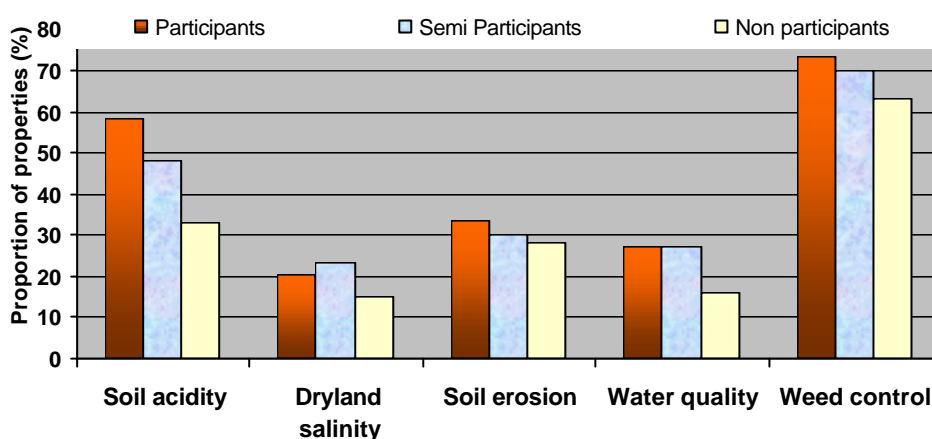
Participants in SGS and/or PROGRAZE training activities generally were younger as indicated by the distribution of the producers age within groups. For example 53 per cent of participants of both PROGRAZE and SGS activities were aged less than 50 years in 2001 compared to less than 40 per cent of non participants.

Participants of PROGRAZE and/or SGS training had considerably higher involvement with Landcare in 2001 compared with non participants. This result is consistent across regions and states. For example 70 per cent of SGS and PROGRAZE participants were a member of Landcare in 2001 compared with 35 per cent of non participants.

### Natural resource condition

Survey estimates indicate that weeds were the biggest environmental degradation issue on livestock properties in the high rainfall zone of Australia in 2001. Over two thirds of the producers at the national level (excluding Queensland) reported weed control was an environmental issue on their property. For the group of producers that had undertaken SGS and PROGRAZE training 78 per cent indicated soil erosion was a problem that they have on their property, higher than the proportion of producers that did not participate in such training (63 per cent).

**Figure 2.4: Environmental degradation problems that are an issue on properties in the high rainfall zone, 2001**



Similar to the result found with weeds, a higher proportion of producers that had participated in PROGRAZE or SGS regional activities reported environmental problems to be an issue on their property compared with non participants (figure 2.4). More participating producers reported soil acidity and water quality as issues on their property compared with the proportion of producers that have not participated in SGS or PROGRAZE activities. The higher reported incidence of environmental degradation may in part reflect better skills in natural resource assessment as a result of undertaking MLA training. Additionally, a higher proportion of participant producers had a property representative that was a member of Landcare in 2001 compared with non participants in SGS or PROGRAZE which would also be expected to have added to the resource management and analysis skills of the producer.

### Farm management practices and activities

The majority of producers that had participated in both SGS and PROGRAZE training activities regularly moved stock as part of their grazing management or used rotational grazing. Almost 60 per cent of producers that had undertaken SGS and PROGRAZE training in the high rainfall zone (excluding Queensland) used rotational grazing compared with 44 per cent of producers that had PROGRAZE training only. A large number of producers that had not been involved with PROGRAZE or SGS also described their grazing management as including rotational grazing - 45 per cent of the group.

The use of physical and financial information related to the livestock enterprise of the farm business to calculate costs of production on a per kilogram basis can be a

valuable management tool. An estimated 40 per cent of producers that had finished a PROGRAZE course and a third of producers that had undertaken both SGS and PROGRAZE training had calculated the costs of production associated with their sheep or beef enterprise. Less than 15 per cent of producers that had not participated in SGS activities or PROGRAZE courses knew their livestock costs of production.

An estimated 40 per cent of producers that had undertaken both SGS and PROGRAZE training used feed budgets as a core part of the management of the livestock enterprise compared with 25 per cent of the group of producers that had not participated in such training.

Farm management practices such as monitoring pasture conditions to ensure 70 per cent ground cover is maintained, boxing of mobs/herds and purposeful resting of pastures were a core part of the management program of the majority of producers that had completed SGS and PROGRAZE training activities. For each of these practices a higher proportion of participants than non participants of SGS and PROGRAZE training activities described the practice as a core part of the management of the beef and/or sheep enterprise.

In the 12 month period to May 2001 over 84 per cent of producers that had been involved in a SGS or PROGRAZE activity had conducted a soil test. This is significantly higher than the proportion of non participating producers that had undertaken soil testing which was estimated to be 61 per cent of producers. In the same twelve month period a higher proportion of producers that had participated in SGS and PROGRAZE training than those producers that had not undertaken such training used a farm management consultant (42 per cent compared with 17 per cent), had participated in farm benchmarking programs (43 per cent compared with 12 per cent), had assessed livestock by fat scoring (80 per cent compared with 36 per cent) and had assessed pasture for weight and digestibility of dry matter (71 per cent compared with 15 per cent of producers).

Producers in the livestock industries that had completed a PROGRAZE course or SGS regional activities including farmwalk were very positive about the benefits of involvement to the running of their livestock enterprise. Over 90 per cent of participants in SGS, Farmwalk or PROGRAZE reported that involvement has increased the sharing of information amongst fellow producers in the area. In addition to the improvements in communication between fellow producers over 80 per cent of producers undertaking the training indicated that their ability to manage nutrients, soil and water resources was enhanced from their participation as well as skills in managing pasture and livestock within the grazing system.

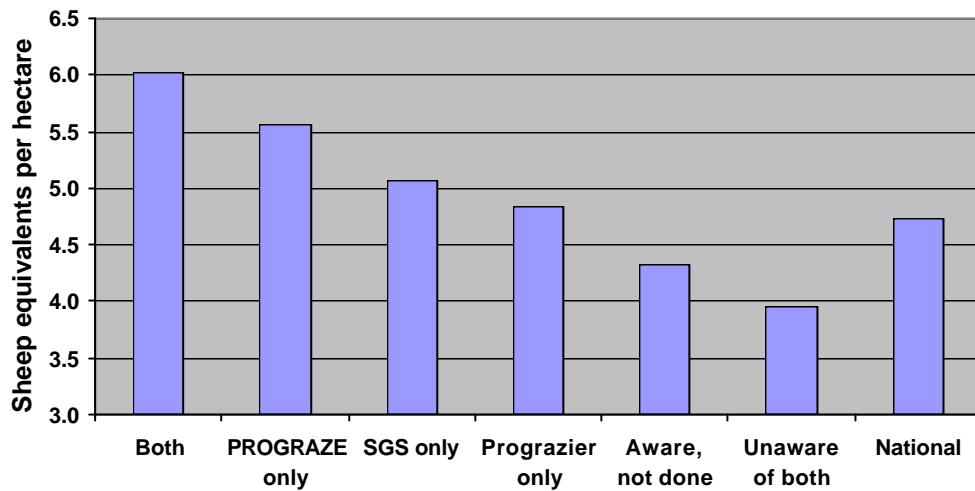
The performance of the farm business and the environment were expected to improve as a result of participation in PROGRAZE, SGS or Farmwalk. Over 80 per cent of participants believed their profitability will be enhanced in conjunction with a better understanding of environmental issues of the grazing system in their area.

### **Stocking rate, pasture condition and grazing management system**

Participants of SGS and PROGRAZE activities had significantly higher stocking rates (measured in sheep equivalents) in 2001. Defining grazing area as the total grazable area less two thirds of the crop area sown (assuming crop areas can be grazed for 4

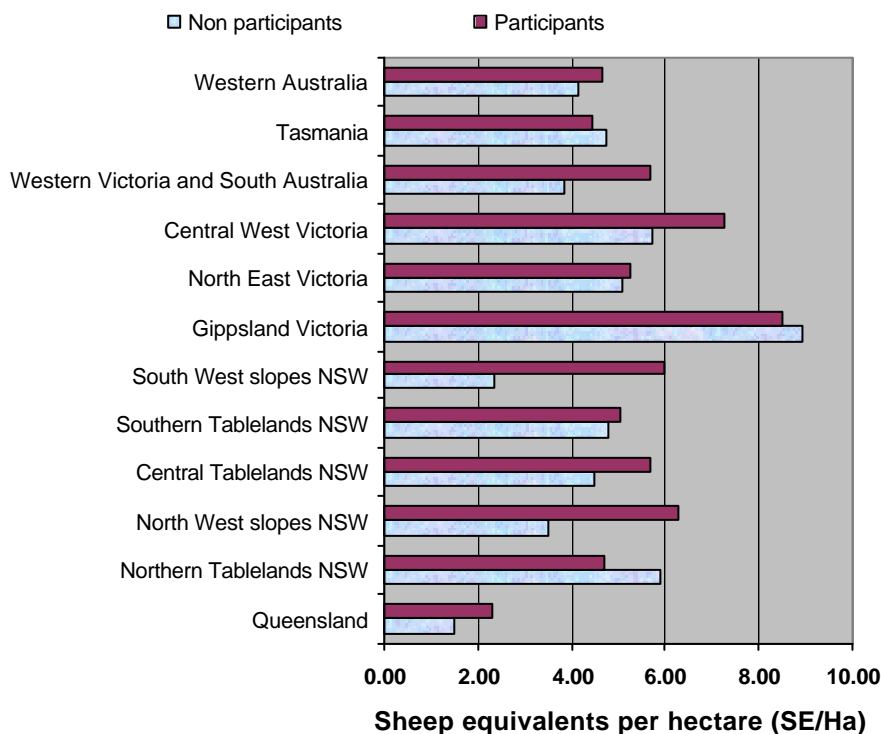
months of the year), SGS and PROGRAZE participants had an average stocking rate of 6.0 sheep per hectare in 2001 compared to 4.3 sheep per hectare for non participants – almost 40 per cent higher (figure 2.5).

**Figure 2.5: Stocking rate per grazeable hectare**



The higher stocking rate achieved by SGS/PROGRAZE participants in the southern high rainfall zone of Australia (excluding Queensland) can also be observed across many of the MLA defined regions (figure 2.6). The estimated stocking rate for SGS/PROGRAZE participants was over 50 per cent higher than the stocking rate of non participating producers in Queensland, North west slopes of New South Wales and the South west slopes of New South Wales. In Tasmania, Northern Tablelands of NSW and the Gippsland region of Victoria the trend was different with the estimated stocking rate of Participants slightly lower than that achieved by non participants in SGS or PROGRAZE training activities.

**Figure 2.6: Stocking rate by region in the high rainfall areas, 2001**





Almost three quarters of participants in SGS and PROGRAZE activities reported that the quality of their pasture (nutrition value to meet livestock needs) had improved in the last 5 years compared with around 56 per cent of non participants. Almost 80 per cent of SGS and PROGRAZE participants indicated that the changes in practices had impacted positively on profit and 86 per cent indicated that sustainability of the enterprise had been boosted.

The improvements in the quality of pasture observed by SGS and PROGRAZE participants had been achieved through testing and implementation of new management practices such as resting paddocks and ensuring groundcover. Fertiliser practices had also changed on many properties however only 45 per cent of producers had increased usage of phosphate and 25 per cent had increased the usage of nitrogen in the last 5 years – significantly less than the proportion of participants that had reported quality of pasture had improved over the five year period. This implies that the physical gains from pasture management had been achieved through the testing and implementation of other practices in conjunction with more concerted use of fertilisers on many properties.

# *Survey Methods*

## **Reliability of estimates**

Only a small number of farms out of the total number of farms in a particular region are used to produce the survey estimates. The differences between these estimates and the estimates that would have been obtained if information had been collected from all farms are called sampling errors. The more farms in the sample, the lower the likely sampling error. Thus, regional estimates are likely to have greater sampling errors than those for the whole high rainfall zone.

To indicate the reliability of the survey estimates, sampling errors have been calculated. These 'relative standard errors', expressed as percentages of the survey estimates, are given next to each estimate in parentheses.

### Example of use of relative standard errors

To obtain the standard error from the relative standard error, multiply the relative standard error by the survey estimate and divide by 100.

For example, if the percentage of farms identifying soil acidity as an issue on their farm are estimated to be 28 percent with a relative standard error of 15 per cent, the standard error for this estimate is  $(15/100)*28\% = 4.2\%$ .

There is roughly a two in three chance that the 'census value' (the value which would have been obtained if all farms in the target population had been surveyed) is within one standard error of the survey estimate.

There is roughly a nineteen in twenty chance that the census value is within two standard errors of the survey estimates.

Thus, in the above example, there is an approximately two in three chance that the census value is between 23.8% and 32.2%, and an approximately nineteen in twenty chance that the census value lies between 19.6% and 36.4%.

## **Sample weighting**

The weights were calculated by dividing the frame population by the sum of number of responding units and the number of ineligible farms at the stratum level. The sample was designed with an over-representation of large farms so large farms will have lower weights than small farms. The sum of weights of eligible responding farms is an estimate of the eligible population (Total number of farms within each region in the industries of interest and with at least 100 sheep or 30 beef cattle.)

## **Data Quality**

ABARE's survey system is designed to produce data of a quality suitable for research and analysis at the unit level. This involves a set of quality controls, with the procedures followed being tailored to the specific requirements of individual surveys. The key to the success of the system is employing specialist highly experienced survey officers and statisticians to guide the design and operation of the data collection and estimation process.