

**A BASELINE OF ADOPTION OF PASTURE  
MANAGEMENT PRACTICES  
- PORT PHILLIP REGION**

**August 2001**

**CENTRE FOR LAND PROTECTION RESEARCH**

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**Abbreviations**

ABS Australian Bureau of Statistics

## SUMMARY

The aim of this report is to document baseline information about the state of adoption of pasture establishment and management practices in the Port Phillip Region of Victoria and to evaluate the tools for continued monitoring of the adoption of these practices.

Based upon the available data, the progress towards adoption of pasture management practices in the Port Phillip Region can be summarised as follows:

- The ABS farm census is the only available comprehensive measure of the rate of perennial pasture establishment in the Port Phillip Region. The ABS farm survey for 1993/94 shows a rate of all perennial pasture sowing in the catchment of 0.67 percent per annum, with two-thirds to phalaris based pastures and the remaining to lucerne. Lucerne resown rates remained the same in 1995/96 while perennial pasture resown rates increased significantly.
- There is no available independent study which can be used to calibrate the ABS pasture sowing data. It would be necessary to obtain more information on pasture resowing and improved pasture management practices in the region through farm surveys.
- Previous farm censuses did not differentiate annual from perennial pasture. However, it can be deduced from these that the rate of pasture sowing peaked in 1985/86 during a short period of high wool prices, fell in the latter part of the 1980s and appears to have continued to fall since.
- This low rate of perennial pasture sowing is unlikely to bring about a significant increase in the area of active perennial pasture in the catchment. At this rate it is unlikely to maintain existing perennial pasture area, as there is evidence that the lack of maintenance of perennial pasture is likely to reduce the persistence of pastures. ABS census data showed the low adoption of improved pasture management systems such as top dressing in the region.
- ABS farm survey in 1994/95 shows the rate of pasture top dressing as 29 percent. There is no other data available in the region which can be used to calibrate the ABS fertiliser data. However, comparisons between ABS data and data from farm surveys in other regions have shown that ABS fertiliser question provides a reliable measure of the maintenance of improved perennial pastures.
- There is no ABS or any other data that can be used to monitor the use of grazing rotation practices. Further information is needed to comment on pasture management practices on resown perennial pastures in the region.



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# **A BASELINE OF ADOPTION OF PASTURE MANAGEMENT PRACTICES - PORT PHILLIP REGION**

**August 2001**

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## **1 THE PORT PHILLIP REGION**

### **1.1 Sustainability in the Port Phillip Region**

The Port Phillip and Westernport Region lies south of the Dividing Range and includes the four major catchments of Yarra, Maribyrnong, Werribee and Westernport. This covers an area of approximately 1278 000 ha of which 758 000 ha is used for agriculture. The region has a temperate climate, with warm dry summers and cool, wet winters. Rainfall varies from less than 500 mm/yr near Werribee to greater than 1500 mm/yr in the highlands north-east of the region.

Agricultural land use in the region includes a wide range of farming activities such as intensive cropping, dryland grazing, dairy farming, horticulture and intensive animal industries such as poultry and piggeries (Port Phillip & Westernport Regional Catchment Strategy 1997; Port Phillip & Westernport Regional Landcare Plan 1993). The region is characterised by the small rural properties and many of these landowners do not have an agricultural background (Richards 1996). Hence, the Port Phillip Regional Landcare Plan identified the necessity to improve community understanding of sustainable land management issues.

The major land degradation forms in the region are dryland salinity, soil and stream erosion, loss of flora and fauna population numbers, and pest plants and animals. Land management practices such as excessive grazing, overcultivation, the replacement of woodlands and native perennial grasslands with introduced annual pasture species, and the growing residential population have largely contributed to these problems.

Establishment and improved management of perennial pastures, strategic tree planting, and fencing and revegetation of affected areas, along with a series of other cropping practices, are promoted in the area as solutions to these problems.

The benefits of sowing perennial pastures in overcoming soil degradation lies within their potential to reduce recharge by extracting water from a greater volume of soil than annual pastures, using their deep root system. Perennial pastures also have the capacity for trapping leached nitrates, reducing the rate of soil acidification by 50 kg lime/ha/year, compared to annuals (Ridley *et al.* 1990). However, appropriate pasture management practices such as use of fertiliser, pest and disease control methods, and more importantly, grazing management systems, largely affect the maximum water use by perennial pastures.

The potential to increase carrying capacity and gross margin per hectare are the additional benefits associated with perennial pasture. However, the initial capital costs involved in establishing perennial pastures is a major concern to farmers in the region.

## 1.2 Indicator practices

The following practices have been selected as indicators of the extent of adoption of sustainable pasture management practices in the grazing industry in the Port Phillip Region.

- Perennial pasture sowing rate

The Port Phillip Regional Landcare Plan recommends improving perennial pastures and lucerne pastures as a salinity control measure in the region.

- Top dressing of perennial pastures

Annual top dressing of newly sown pastures is an important factor in maintaining a dense, vigorous pasture in order to have an impact on reducing the watertable, and also to gain high productivity through increased gross margins. Unfertilised pastures will decline to annual pastures and eventually to an annual and native pasture mix.

- Stock management methods used: rotational grazing systems

Heavy grazing needs to be introduced through increased stocking rates to utilise newly sown pastures. It is often the best way to deal with any weeds to ensure optimum pasture growth and to achieve maximum profitability. From the salinity control point of view, it is also necessary to introduce rotational grazing systems which enable the pastures to increase leaf areas, plant growth and root development in order to maximise water use.

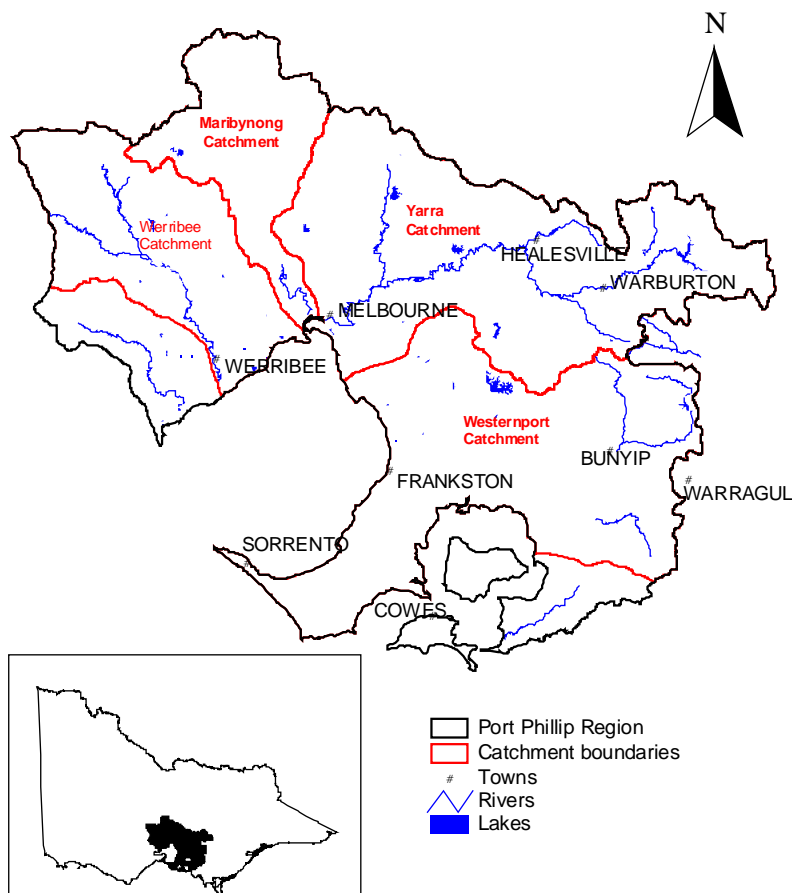


Figure 1 Port Phillip Region



## **2 DATA SOURCES AVAILABLE**

### **2.1 Australian Bureau of Statistics**

The Australian Bureau of Statistics (ABS) farm census is distributed annually to all Australian farming businesses that meet a minimum gross income criterion. There is a legislative requirement that all farm business operators complete and return the farm census. In the last decade the ABS farm census has intermittently included questions covering use of fallow, grain legumes, soil ameliorants, fertiliser use and pastures. In recent years questions have covered the total area and resown area of perennial pastures and lucerne pasture. Data from the ABS farm census is normally available only in aggregated form at state or local government area. As part of this project data was purchased disaggregated at parish levels. As parishes are significantly smaller than local government areas, the ABS data was reaggregated according to catchment and soil type boundaries.

### **2.2 Achieving sustainable land management on small rural properties in the Port Phillip Landcare Region (Richards 1996)**

A project was undertaken in the Port Phillip Region to develop and trial an extension strategy for small property managers to assist them to achieve sustainable land management practices. As part of this project a survey of small rural property owners in the region was carried out to: (i) determine their characteristics and goals for managing the properties, (ii) determine their current level of land management knowledge and (iii) identify the constraints to the adoption of these practices. Land management information required by the property owners and effective methods of getting this information to them were also determined. A set of respondents who volunteered to participate in the survey and another group of randomly selected property owners were included in the survey. Catchment management officers from Department of Conservation & Natural Resources (DCNR) were also informally surveyed to determine the characteristics of property owners.

## **3 MEASURING PERENNIAL PASTURE ESTABLISHMENT AND MANAGEMENT**

### **3.1 Pasture resown rates**

#### **3.1.1 Australian Bureau of Statistics**

The questions on the ABS census from 1984 to 1990 asked farmers for total pasture areas and areas sown or resown with pastures during that particular year. The pasture resown area could be used to compare the pasture resown rates. However, these questions do not distinguish between perennial and annual pastures. Local knowledge suggests that the absolute rate of pasture resowing may be a reasonable indicator of measuring adoption of perennial pastures.

Pasture questions in 1991 to 1993 included only the total pasture area, and did not measure the pasture resown area, making the information useless for measuring the adoption rates. Research in NSW and Victoria shows there is tremendous variation in the quality of pastures described as 'perennial' by farmers.

The questions included in 1993/94 provide the most valuable information on perennial pasture resown rates. This separates the total area of pasture and the pasture resown during that year, allowing the calculation of the pasture resown rate. A major advantage of this set of questions is that it separates lucerne, other perennial pasture and annual pastures in pasture mixtures.

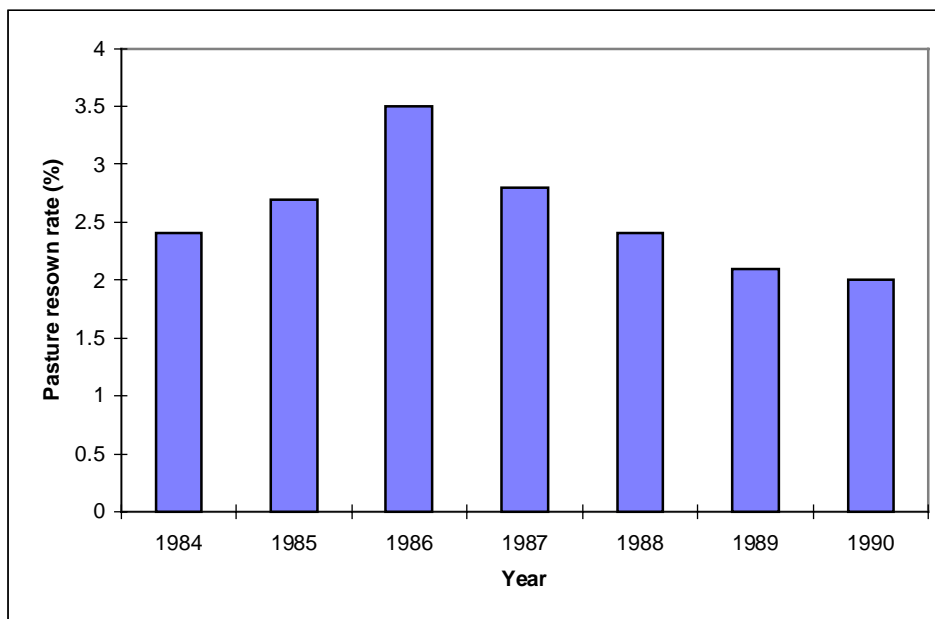
The question in the 1994/95 census only asked for the pasture areas sown or resown during that year and did not include the total pasture area. This difference between the two sets of questions during 1993/94 and 1994/95 has led to unreliable responses to the 1994/95 question with many farmers filling in the total area of pasture rather than sown area. Hence, these results are not included in this report.

A pasture question similar to 1993/94 format was repeated in 1995/96 and 1996/97 and could be used as a measure of change in lucerne and perennial pasture adoption rates.

The pasture questions on the census in different years are shown in Appendix 1. The inconsistency of pasture questions in ABS census data during the last decade limits their role in determining a trend in perennial pasture and lucerne adoption rates.

Total pasture resown rates from 1984 to 1990 in the region are shown in Figure 2. Figures for the total region shows a relationship between wool prices and pasture resowing rates. With high wool prices in the mid 1980s there was an increase in resown rates, followed by a continuous drop in the latter part of the 1980s associated with low wool prices. As mentioned earlier, this measure does not distinguish between the perennial and annual pastures resown but is still an indicator of resowing rate changes for perennial pasture.

The 1993/94 ABS farm census data shows that only 21 percent of the existing pasture in the Port Phillip Region was described as perennial pastures, while another 4.6 percent was under lucerne pastures. However, field surveys suggest the quality of much of this existing perennial pasture may be low (Quigley & Morgan 1990).



Source: Australian Bureau of Statistics (1984-1990)

**Figure 2** Total pasture resown rate in Port Phillip Region (1984-1990)

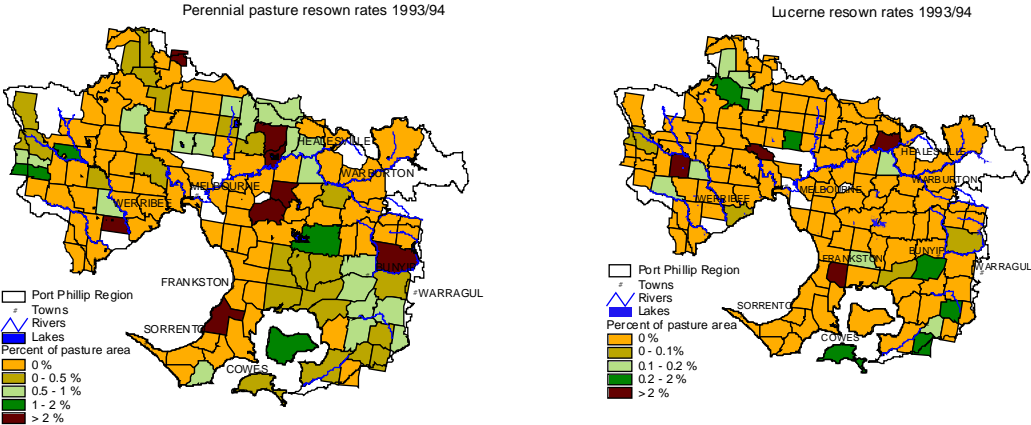
For 1993/94, lucerne resowing rates were calculated considering pure lucerne resown during the season, together with mixture of lucerne and other pasture species, as a percentage of total pasture area. Similarly the perennial pasture resown rates included a mixture of perennial grasses and legumes excluding lucerne. Of the total pasture area in the region, 0.46 percent was sown or resown with perennial pastures during this season, while only 0.21 percent was resown to lucerne (Table 1). Perennial pasture and lucerne pasture resown rates in 1993/94 in the Port Phillip Region are mapped in Figure 3.

The 1995/96 farm census data shows that the percentage of existing pasture reported as perennial pastures significantly increased during the two years from 1994 to 1996. This is a result of both the increase in total perennial pasture area and the drop in the reported total pasture area in the region. In contrast, the percentage of lucerne pasture declined during the two years. The perennial pasture resown area significantly increased, resulting in a higher resown rate compared to 1994, while lucerne resown rate remained almost unchanged (Table 1). These measures for perennial pasture and lucerne showed a marginal drop in 1997. Perennial pasture and lucerne pasture resown rates in 1995/96 and 1996/97 in the Port Phillip Region are mapped in Figures 4 and 5 respectively.

**Table 1** Pasture resown areas in Port Phillip Region (1993/94-1996/97)

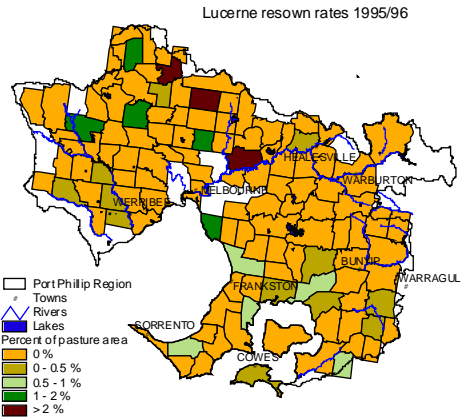
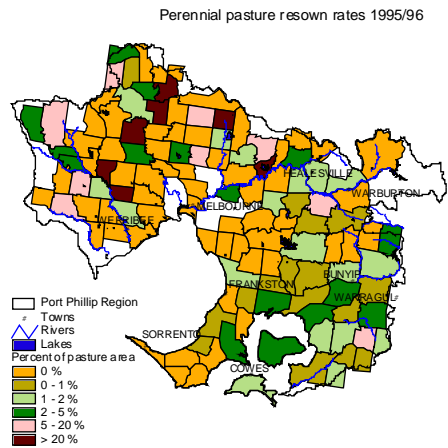
Measure	1993/94	1995/96	1996/97
Total pasture area (ha)	346234	235330	255084
Total pasture resown area (ha)	6488	12643	14918
Total perennial pasture area (ha)	73323	90253	94543
Total lucerne area (ha)	16016	5630	4209
Perennial pasture resown area (ha)	1588	7646	8080
Lucerne resown area (ha)	711	647	496
Percent of perennial pastures (%)	21.2	38.4	37.1
Percent of lucerne (%)	4.6	2.4	1.7
Total pasture resown rate (%)	1.87	5.37	5.85
Lucerne resown rate (%)	0.21	0.27	0.19
Perennial pasture resown rate (%)	0.46	3.25	3.17

Source: Australian Bureau of Statistics (1993/94-1996/97)



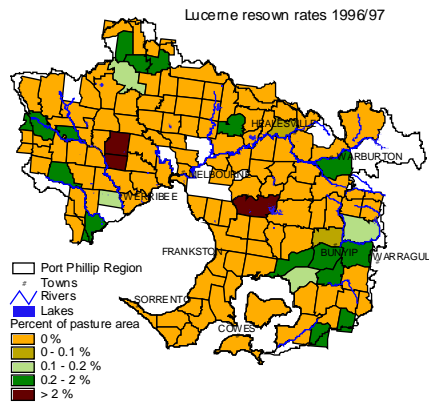
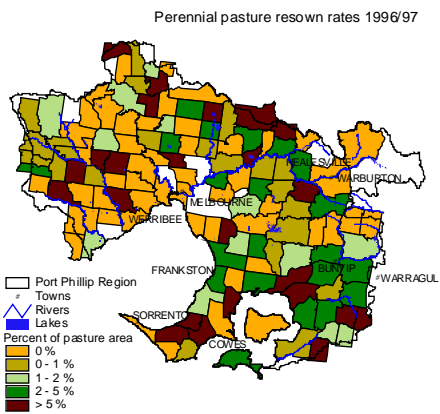
Source: Australian Bureau of Statistics (1993/94)

**Figure 3** Pasture resown rate in the Port Phillip Region (1993/94)



Source: Australian Bureau of Statistics (1995/96)

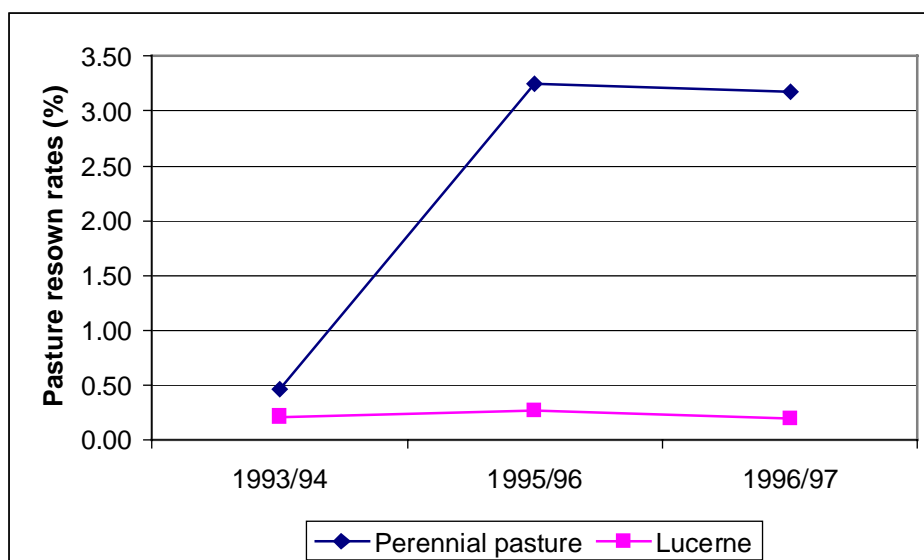
**Figure 4** Pasture resown rate in the Port Phillip Region (1995/96)



Source: Australian Bureau of Statistics (1996/97)

**Figure 5** Pasture resown rate in the Port Phillip Region (1996/97)

Figure 6 shows the overall trends in pasture resowing rates in the Port Phillip Region from 1993/94 to 1996/97. There was a marked increase in perennial pasture resown rates in 1995/96 while lucerne resown rates show marginal changes.



Source: Australian Bureau of Statistics (1993/94-1996/97)

**Figure 6** Trends in pasture resown rates in the Port Phillip Region (1993/94-1996/97)

### 3.2 Fertiliser applications on pasture

Fertiliser rates and frequencies of applications play an important role in maintaining stable perennial pasture growth, free of weeds and inferior grasses. Poorly managed perennial pastures will have no greater impact on watertable control than will annual pastures. Hence, application of fertiliser on pastures is used as a proxy for measuring the level of pasture management undertaken by farmers in the region.

#### 3.2.1 Australian Bureau of Statistics

In the 1987/88 agricultural census, farmers were asked for the areas of pure lucerne, other pastures and crops fertilised, and the type and quantity of fertiliser applied. The 1988/89 and 1989/90 questions collected the same information for total pasture areas but did not separate pure lucerne from other pastures. A similar question was asked again in the 1994/95 season on the use of selected fertilisers on established pastures. These sets of questions are shown in Appendix 2.

A little over a third of pasture growers fertilised 39 percent of their pasture area during 1988. Both the number of farmers using fertiliser and the area of pasture fertilised increased during 1989. The area fertilised in 1990 dropped slightly, while the number of farmers using fertiliser remained the same, indicating lower average areas fertilised per farm. There was a huge drop in fertiliser usage during the five years from 1990 to 1995. Both the area and the number of farmers using fertiliser decreased, with only 27 percent of farmers using fertiliser on 29 percent of the pasture area (Table 2). However, more farmers reported using fertiliser on a larger area in 1996. The decline in the percentage of farmers using fertiliser in 1996 is a result of a higher rate of increase in the number of total farms submitting census data in 1996 than the rate of increase in number of farmers using fertilisers between the two years. The use of fertiliser has not significantly changed in 1996/97. The reduction in use of fertiliser is clearly related to the prolonged period of poor wool prices.

**Table 2** Measure of fertiliser application on pastures in the Port Phillip Region (1988-1997).

Measure	1987/88	1988/89	1989/90	1994/95	1995/96	1996/97
Pasture fertilised, as a proportion of total farm area (%)	29.4	34.9	32.0	22.3	21.3	22.2
Proportion of pasture area fertilised (%)	38.5	44.4	42.0	28.7	38.3	38.1
Percentage of farmers using fertiliser on pastures (%)	35.1	41.8	39.7	27.0	25.0	24.5
Percentage of lucerne area fertilised (%)	40.8	*	*	*	*	*
Percentage of farmers using fertiliser on lucerne (%)	26.2	*	*	*	*	*

Source: Australian Bureau of Statistics (1988-1997)

\*Information for lucerne was not collected during these seasons

The rate of application of superphosphate (kilograms per hectare) over the pasture area fertilised and the entire pasture area is shown in Table 3. The rate of superphosphate per area fertilised dropped from 1988 to 1995 (Table 3).

**Table 3** Rate of application of superphosphate (kg/ha)

Measure	1988	1989	1990	1995
Rate per area fertilised	99	97	94.5	92.9
Rate per entire pasture area	38	43	40	26.6
Rate on lucerne pastures	161	*	*	*

Source: Australian Bureau of Statistics (1988-1995)

\*Information for lucerne was not collected during these seasons

#### 4 UNDERSTANDING LOW RATES OF ADOPTION

In promoting the adoption of perennial pastures and improved pasture management practices it is important to understand the factors influencing and/or limiting the use of these practices. These factors have not been researched in detail in the Port Phillip Region. However, Richard's (1996) survey in the region identified some constraints to the adoption of these practices by small rural property owners in the region.

##### 4.1 Achieving sustainable land management on small rural properties in the Port Phillip Landcare Region (Richards 1996)

The large diversity in the characteristics of small rural property owners in the region is one of the main problems identified in providing information and promoting sustainable land management practices. The study revealed that the small rural property owners in the Port Phillip Region are very diverse in their characteristics and have varied levels of awareness and knowledge of land management issues. There is also a great disparity in their motivations for seeking land management information and implementing on-ground works. The study grouped the property owners into four categories according to these characteristics and recommends a diverse range of extension mechanisms to reach these groups.

The first group of property owners (*unaware*) has a very low awareness and knowledge of land management issues and catchment processes. These farmers have very low, or no, motivation to seek information and to learn from others, or to undertake on-ground works.

The second group are *non-active seekers*. They have a low level of awareness and knowledge with a low motivation to seek information and learn from others.

The third group are *active seekers*. They have high awareness and knowledge of sustainable land management issues and catchment processes and are highly motivated to seek information and undertake on-ground works.

The last group of property owners identified (*active implementers*) have very high awareness and knowledge and had a very high motivation to seek information and undertake on-ground works.

Lack of time, finances and expertise were the major constraints to undertaking on-ground works. For most of the property owners their motivations for buying the properties are dominated by the desire for a rural lifestyle and agricultural production was a secondary goal for managing their properties. This, and the involvement of both partners in paid employment, was also identified as constraints to on-ground works.

The majority of respondents needed information on pasture management, weed identification and control, and revegetation, but did not know where to access it. The most preferred method of receiving information was through practical methods such as field days and through written material that is relevant to their local area.

## 5 RECOMMENDATIONS

The aim of this report is to provide baseline information and establish trends in adoption of pasture management practices in the Port Phillip Region. The information in this report is based on ABS census data and provides reasonable trends in adoption of these practices in the region. Accurate long-term measures of the area of phalaris pastures sown in the region will be need to be obtained by continued use of the ABS farm census. One of the limitations to using ABS data in determining the adoption trends is the changing format of the question each year. The consistency of the format of questions is important in getting reliable information to measure trends in adoption rates. The adoption rates estimated from 1993/94 ABS data provide a reasonably reliable baseline and can be used to monitor future adoption of these practices. A question similar to 1993/94 format was repeated in 1995/96 which provides necessary information to monitor the adoption rates of these practices. Hence, the same format can be used in future to estimate the adoption of perennial pastures.

The 1994/95 fertiliser question provides data to measure the use of selected fertilisers on established pastures. This question appears to be an acceptably accurate measure to use as a measure of pasture maintenance by top dressing. This does not provide information on other maintenance practices important in pasture management, particularly rotational grazing. The 1995/96 ABS census included a question on maintenance and management of established pastures which provides suitable continuity in data. This however, does not include information on rotational grazing. To determine the adoption of improved grazing management techniques, it will be necessary to collect more data on grazing management practices.

The format of this question is as follows:

### ABS Pasture maintenance question in 1995/96

<b>Maintenance and management of established pastures between 1 April 1995 and 31 March 1996</b>	
<b>Area of established pasture over which the following maintenance or management operations were carried out:</b>	<b>Hectares</b>
<i>Top dressing of fertiliser .....</i>	<div style="border: 1px solid black; width: 80px; height: 100px; margin: 0 auto;"></div>
<i>Weed control or spraying .....</i>	
<i>Pest and disease control or spraying .....</i>	
<i>Slashing or burning (other than prior to sowing the paddock).....</i>	



## 6 REFERENCES AND DATA SOURCES

- Australian Bureau of Statistics (1994-1997) Parish aggregated farm census data supplied to Agriculture Victoria.
- Port Phillip Catchment and Land Protection Board (1997) Port Phillip and Westernport Regional Catchment Strategy.
- Port Phillip Regional Landcare Plan Reference Group (1993) Port Phillip and Westernport Regional Landcare Plan, Landcare Victoria.
- Quigley, P.E. & Morgan, T. (1990) Survey of Pastures in Victoria. Research Review 1989-90, Pastoral Research Institute, Department of Agriculture, Hamilton.
- Richards, P. (1996) Achieving Sustainable Land Management on Small Rural Properties in the Port Phillip Landcare Region, Department of Conservation and Natural Resources.
- Ridley, A.M., Slattery, W.J., Helyar, K.R. & Cowling, A. (1990) Acidification Under Grazed Annual and Perennial Grass Based Pastures, Australian Journal of Experimental Agriculture.



**7 APPENDICES AUSTRALIAN BUREAU OF STATISTICS FARM CENSUS QUESTIONS**

**Appendix 1 ABS pasture questions**

**ABS pasture question 1984-1990**

<b>Pastures (including lucerne, clovers and grasses) for all purposes</b>		<b>PASTURE AREA AT 31 MARCH 1985</b>	<b>PASTURE SOWN OR RESOWN 1984-85</b>
<p><i>Exclude</i></p> <ul style="list-style-type: none"> <li>Crops (e.g. oats) grazed or cut. <i>Include</i> these with crops in section 5 below</li> </ul>			
<p><i>Include</i></p> <ul style="list-style-type: none"> <li>Areas oversown into native pasture or crops</li> </ul>	Pure Lucerne .....		
	Other pasture legumes only .....		
	-Clovers and/or medics .....		
<p><i>Include</i></p> <ul style="list-style-type: none"> <li>Lucerne sown with grasses</li> </ul>	-Other pasture legumes .....		
	Sown grasses only .....		
	Mixture of grasses, legumes, etc .....		
	Native pasture .....		

**ABS pasture question from 1991-1993**

<b>Pastures for all purposes at 31 March 1993</b>		<b>Total area of pastures at 31 March 1993 Hectares</b>
<p><i>Exclude</i></p> <p>Crops (e.g. oats) grazed or cut. <i>Include</i> these with crops in Section 6 below</p>		
<p><i>Include</i></p> <ul style="list-style-type: none"> <li>Areas oversown into native pasture or crops</li> </ul>	Pure lucerne .....	
	Other pasture legumes .....	
	Sown grasses only .....	
	Mixture of grasses, legumes etc. ....	
	Other pastures (native and naturalised) .....	

**ABS pasture question 1993/94**

<b>Pastures for all purposes at 31 March 1994</b>		Total area of pasture at 31 March 1994 Hectares	Pasture sown or resown during year ended 31 March 1994 Hectares
<p><i>Exclude</i></p> <ul style="list-style-type: none"> <li>Crops (e.g. oats) grazed or cut. Include these with crops in Part 1c below</li> </ul>			
	Pure lucerne .....		
	Other pasture legumes .....		
	Sown grasses only .....		
	Mixture of lucerne and other pasture species.....		
	Mixture of perennial grasses and legumes excluding lucerne .....		
	Mixture of annual grasses and legumes excluding lucerne .....		
	Other pastures (native and naturalised) .....		
<p><i>Include</i></p> <ul style="list-style-type: none"> <li>Areas oversown into native pasture or crops</li> </ul>			
<p>Perennial grasses include phalaris, cocksfoot and perennial ryegrass</p>			

**ABS pasture question 1994/95-1996/97**

<b>Pastures sown or resown for all purposes during year ended 31 March 1997</b>		Total area of pasture at 31 March 1997 Hectares	Pasture sown or resown during year ended 31 March 1997 Hectares
<p><i>Include</i></p> <ul style="list-style-type: none"> <li>Areas oversown into native pasture or crops</li> </ul>			
	<ul style="list-style-type: none"> <li><b>Sowings including lucerne:</b></li> <li>Pure lucerne .....</li> <li>Mixture of lucerne and other pasture species .....</li> </ul>		
	<ul style="list-style-type: none"> <li><b>Sowings excluding lucerne:</b></li> <li>Pasture legumes only .....</li> <li>Mixture of perennial grasses and legumes .....</li> <li>Mixture of annual grasses and legumes .....</li> <li>Sown grasses only .....</li> </ul>		
<p>Perennial grasses include phalaris, cocksfoot and perennial ryegrass.</p>			
<p>Legumes include clovers, medics and vetch.</p>			
<p>Annual grasses include Wimmera rye grass.</p>			

**Appendix 2 ABS fertiliser questions**

**ABS fertiliser question in 1987/88**

**Artificial fertiliser used (whether applied by you, by contractors, or others)  
Season 1987-88**

*Exclude lime, gypsum and dolomite*  
*Enter double and triple strength superphosphate as single strength equivalent,*

**Pastures and Crops Fertilised**

Area Fertilised	Quantity and Type of Fertiliser Used				
	Super-phosphate (including super with trace elements)	Straight nitrogenous types (e.g. urea, sulphate of ammonia)	Straight Potash	Mixtures of super, and potash	Other artificial fertilisers including complex mixtures and mixtures containing nitrogen
Hectares	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes
Pure lucerne .....					
Other pastures (sown or native) .....					
Wheat .....					
Oats .....					
Barley .....					
Field peas .....					
Other cereals .....					
Oilseeds .....					
Vegetables for human consumption .....					
Fruit (including nuts) .....					
Grape vines .....					
Other (please specify) .....					

**ABS fertiliser question in 1988/89 and 1989/90**

**Artificial fertiliser used (whether applied by you, by contractors, or others) Season 1988-89**

*Exclude* lime, gypsum and dolomite

*Enter* double and triple strength superphosphate as single strength equivalent,

**Pastures and Crops Fertilised**

Area Fertilised	Quantity and Type of Fertiliser Used				
	Super-phosphate (including super with trace elements)	Straight nitrogenous types (eg. urea, sulphate of ammonia)	Straight Potash	Mixtures of super, and potash	Other artificial fertilisers including complex mixtures and mixtures containing nitrogen
Hectares	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes

Pastures sown or native .....

Wheat .....

All other crops .....


**ABS fertiliser question in 1994/95**

**Use of selected fertilisers on established pastures (whether applied by you, by contractors or by others) - Season 1994-95**

**Exclude**

- Pastures sown during the 1994-95 season

Area of existing pasture top-dressed with fertilisers specified below .....

Hectares

**Note**

- Use total fertiliser weight not weight of active constituents.

**Single superphosphate** used for top dressing existing pastures .....

Tonnes

**High analysis fertilisers** used for top dressing existing pastures .....

**Super-potash blends** used for top dressing existing pastures .....

**Include**

- Double and triple super-phosphate, MAP or DAP