

20. PASTURE DEGRADATION AND WEEDS

20.1 PROCESSES

20.1.1 Cause

Pasture degradation occurs as a result of poor land management practices. Set stocking systems, based on continuous grazing, often show the highest returns per hectare but have led to soil compaction, reduced fertility and the invasion of undesirable species. Grazing of the more palatable improved species in set stocking regimes leaves the ground bare and more susceptible to erosion and weed invasion (57). Pasture degradation can also occur as a result of soil acidity and salinity. Fertiliser applications on leguminous pastures can lead to acidity on certain soil types and the removal of livestock products depletes fertility levels.

Weeds are generally a result of overgrazing of pastures, which leaves bare ground susceptible to invasion by less edible plant species. Weeds are "plants out of place", and many were introduced from other countries, as food sources, for aesthetic and medicinal values or by accident. Natural competitors of the weeds, and herbivores, which ate the species in their native country, are not present, so there is no pressure on these weed species. However, the majority of plants only become problems where pastures are degraded and they can establish on bare ground (38).

Weeds in crops are a result of lack of seasonal rotations, minimal competition in monoculture crops, allowing the lucerne phase to become weed infested, herbicide resistance, or inefficient chemical applications.

20.1.2 Upstream/Downstream Inter-Relationships

Pasture degradation and soil compaction can lead to increased runoff, erosion, low fertility, invasion of weeds and woody weeds, scalds, and loss of biodiversity. The difficult establishment of improved pastures has been shown to be related to chemical or physical problems such as salinity, acidity and fertility decline, chemical imbalance or soil structure decline (13).

Weeds are spread by water, air, domestic and native animals and vehicles. These dispersal methods have the potential to spread weed populations over a large area. Flooding and overland flows move enormous populations of weeds downstream. This is exacerbated by the difficulty of controlling weeds in rivers and creeks.

Most weeds are annuals, and consequently leave bare ground after their growth cycle. It also means that there is minimal soil moisture use during the non-growing season (usually winter) and deep drainage and rising watertables may be the eventual result.

20.2 PRESENT CONDITIONS

20.2.1 Extent and Distribution

Weeds are found all over the catchment. Blackberry is a problem in gullies and depressions, along streambanks and on lightly grazed slopes and is reported in most areas. Other weeds are problems in crops and pasture areas. St Barnaby's Thistle and Saffron Thistle are very common weeds across the catchment, and provide an indication that pasture degradation in the Little River Catchment is widespread.

All subcatchment workshops identified weeds as a major concern. *Vulpia* is a problem around the Hervey Ranges and river weeds are widespread, particularly around Arthurville and Yeoval. Despite the landholder survey indicating that weeds in crops are widespread, there seems to be little concern about these, as landholders see weeds as part of farming systems.

Wellington Shire Council is particularly concerned with the spread of weeds, such as golden dodder and noogoora burr, downstream of the Buckinbah Creek confluence with Little River, and the lack of coordinated weed control programs in the area.

20.2.2 Severity

The severity of weed infestation varies across the catchment. In some areas noxious weeds such as blackberry are a problem for landholders. Most landholder survey respondents claim weeds are a constant problem in most areas with some particular weeds increasing in numbers and others decreasing.

In mixed farming and grazing country on lighter duplex soils, poor pasture production is associated with lack of improvement to native pastures ie. legumes and fertiliser, and continuous stocking. Native pastures are not well adapted to continuous grazing and palatable perennial grasses die out. Pasture degradation can also lead to weed infestations, particularly when land is in a crop/pasture (lucerne) rotation and the lucerne is allowed to be overgrazed and degraded. This allows weeds to invade the pastures and subsequent crops.

20.2.3 Environmental Impacts

Blackberry and Sweet Briar are known to provide shelter for rabbits. Noxious weeds tend to grow in most areas; in particular, disturbed areas (13). Pasture degradation can result in weed invasions, erosion, and soil compaction. Loss of soil fertility and soil structure decline is another result of pasture degradation. Increased competition in pastures can lead to a loss of native species (both flora and fauna) and loss of biodiversity.

20.2.4 Social and Economic Impacts

Weeds have the potential to cause a significant economic impact. Control of weeds can be a large expense depending on the size of the infestation and the control methods used. Weeds can also cause production losses in grazing or cropping. Other expenses include loss of stock due to poisoning and very large losses through quality losses eg. contamination of wool and hides, and downgrading of grain. Social impacts include health problems from toxic weeds and the potential health risks associated with chemical use.

20.3 THE FUTURE

20.3.1 Trends

According to respondents of the landholder survey, weed populations are either constant or declining at present. Landholders in the Cumnock and Yeoval subcatchments identified pasture degradation as an important physical issue. Weeds can be expected to spread downstream if cooperative action between landholders and all local councils is not achieved.

20.3.2 Projected Social and Economic Impacts

If weeds are not managed, future economic impacts may be severe. Combined control efforts are necessary to manage weed numbers. It is often best to control weeds using a number of control methods (eg. chemical, mechanical and management control methods) (38).

20.4 CURRENT ACTIVITIES

20.4.1 Planning

The Macquarie Weeds Advisory Council, including Cabonne, Wellington and Dubbo Shires, wants to develop a strategy for coordinated weed control. A management plan has been developed for Blue Heliotrope; however, there is a need for plans to manage other significant weeds.

20.4.2 Research and Development

Research projects on pasture management and grazing systems are funded by Meat and Livestock Australia, Wool Research & Development Corporation, and the Beef Collaborative Research Centre. Meat and Livestock Australia has established the Sustainable Grazing Systems Program (SGS) in the Central West region, which includes a major research program at Carcoar and numerous paddock scale demonstration sites. MLA has small amounts of money available for producers to establish a Producer Initiated Research Development (PIRD) group. The Weeds Cooperative Research Centre (CRC) also undertakes research into weed management and control.

20.4.3 Implementation

NSW Agriculture and other groups such as Sustainable Grazing Systems run programs on pasture degradation and provide advice about the improvement of native and improved pastures and their ongoing maintenance. SGS have a demonstration site within the Little River Catchment near Cumnock. NSW Agriculture run PROGRAZE courses to help graziers understand the complex interactions between animals, plants and soils. PROGRAZE FarmWalk builds on and develops the skills and knowledge from PROGRAZE, while PROGRAZE Plus is a software program to assist in developing an annual farm grazing plan.

Demonstrations in the Weddin Catchment have shown that improvements in pasture production can be achieved with the establishment of deep rooted legume pastures (with lime and fertiliser applications). The demonstration has also shown that lands affected by acidity and salinity can be treated using this approach (54).

20.4.4 Monitoring and Evaluation

Weeds Officers with the Local councils are responsible for determining the extent and location of weeds and what action needs to be taken. Some councils are using helicopters with Global Positioning Systems (GPS) to accurately locate weed infestations. The RLPB also controls weeds on Crown Land. Under the Noxious Weeds Act, the occupier of the land is responsible for the control of weeds, and they should be regularly checking for the invasion and spread of noxious weeds and weeds of economic consequence. Sustainable Grazing Systems (SGS) run field days in order to raise landholders' awareness of pasture degradation and teach skills in pasture monitoring.

20.4.5 Best Management Options (BMOs)

Much is already known about best practice grazing. The SGS program will refine the following:

- Determine the principles behind profitable and sustainable grazing systems
- Find practical indicators to help graziers assess their pastures
- Identify 'best bet' grazing management practices
- Develop guidelines to help graziers adopt 'best bet' practice

Landholders need to adopt practices that focus on improving the pastures rather than focussing on the weeds. This includes rotational or strategic grazing, fertiliser application and improved soil health. Cooperative action by all land managers is required to manage difficult weeds such as dodder.

20.4.6 Identified or Perceived Barriers

There may be some problems with controlling noxious weeds due to the expense, and difficult access to rivers for regular control and inspection of sites. It appears in many areas that control of these weeds is not strictly enforced. Improved cooperation is required between landholders and weeds councils, and there needs to be consistent enforcement across all shires. There is also widespread concern about the dependence on chemicals for weed control.

Some existing high input management systems appear to be failing on some properties. The environment and production, as well as non conventional methods of pasture management should be considered when making decisions.

20.4.7 Institutional

The Noxious Weeds Act 1993 requires that the occupier of the land must control the noxious weeds on their land. Each noxious weed has been placed into a control category and must be controlled accordingly. Failure to control the weeds may result in fines of up to \$10 000. The Noxious Weeds Act is the responsibility of Local Government (38). The Rural Lands Protection Board is also responsible for the control of weeds on Crown Land such as Travelling Stock Routes.

20.4.8 Investment

Each year, councils make submissions to the Noxious Plants Advisory Committee for a State Government grant to supplement council funds for the eradication and control of noxious plants. All money is granted on a dollar for dollar basis. Property planning assistance is also available through Farming for the Future. Meat and Livestock Australia fund Sustainable Grazing Systems through grower levies. The vast majority of weed control is funded by landholders.

20.4.9 Cost Sharing

Landholders, councils and RLPB share the cost of controlling weeds. All parties should be responsible for ensuring that noxious weeds do not spread to new areas.

20.5 ANALYSIS

20.5.1 Identified or Perceived Gaps

Increased awareness of the link between weeds and pasture and crop management is required if the dependence on chemical control is to be reduced. The widely held view that weeds are an issue, and not a symptom of inappropriate land management, hinders their control. A lack of uniform policy and administration amongst the Local Government Weeds Councils is hindering a coordinated approach to weed control, with downstream implications.

20.5.2 Key Stakeholders and Contacts

Bob Stewart - Director Environment and Planning, Cabonne Shire Council
Norm Townsend - Cabonne Council Weeds Officer
Owen Jones - Director Technical Services, Wellington Shire Council
Andrew Cosie and Bryson Rees - Weeds Officers, Wellington Shire Council
Ken Rodgers - Director of Parks and Landcare, Dubbo City Council
Mary Goodacre - Conservation Grazing Officer, DLWC, Mudgee
Richard Ingham - SGS Regional Facilitator, "Bairstow", Belgravia Road, Orange

References

- (13) S. Taylor (1994) *Macquarie River Catchment - Land management proposals for the integrated treatment and prevention of land degradation*
- (38) Dubbo City Council (1999) *Noxious Weeds Guide*
- (39) Cabonne Shire Council (1999) *Noxious Weeds Guide*
- (54) Hassall and Associates (1999) *Weddin Catchment Action Plan*
- (57) S. Donaldson & T. Heath (1997) *Namoi River Catchment - Report on Land Degradation and Proposals for Integrated Management*
- (80) Wellington Shire Council (1999) *Noxious Weeds Guide*