

Managing Tasmania's Pampas Grass Problem: A Strategy for Control

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Abstract

Pampas grass has recently surfaced as a major weed threat to Tasmania's forests and parks. An extensive campaign detailing the problem has been undertaken and control measures implemented.

Introduction

Pampas grass (*Cortaderia spp.*) has already caused severe economic damage to forests within New Zealand as well as reducing their conservation and recreational values.

In Tasmania, pampas grass has often been regarded as an attractive garden plant and it has also been recommended for use in agriculture as a source of fodder, a windbreak and a soil stabiliser. These benefits are now

outweighed by the weed potential of recently introduced invasive forms.

Pampas grass has already established in pine plantations, eucalypt regeneration, eucalypt plantations and National Parks, including the World Heritage Area in south-west Tasmania. It has also been discovered invading waste lands such as quarries, roadsides, and disturbed sites adjacent to residential areas throughout the State.

Where larger populations have developed the adverse effects have been:

- weed competition reducing forest growth.
- reduced conservation values through the invasion and replacement of natural plant communities.
- reduced recreational and aesthetic values of forests through its encroachment onto walking tracks, roadsides, landscapes and foreshores.
- increased fire hazard and fire control costs due to the highly flammable nature of pampas grass.
- increased costs of managing Tasmania's forests and parks.



Mature pampas grass in a forest situation

One flowerhead has the capacity to produce 100 000 fertile seeds which are wind borne to a potential distance of 25 km. Due to this seeding potential and its ability to rapidly colonise disturbed sites, pampas grass has been declared a Secondary and Prohibited Weed under Tasmania's Noxious Weeds Act 1964.

If pampas grass populations are allowed to go unchecked the recent trend suggests that serious damage will be caused to Tasmania's Forests and Parks. As a direct consequence of the threat the Forestry Commission and the Department of Parks, Wildlife and Heritage have combined to launch a major campaign against pampas grass within Tasmania. A full time campaign co-ordinator has been appointed to oversee the project.

At the moment no infestation is greater than one hectare and 90 - 95 per cent of the invasive forms are less than two years of age. No infestation is beyond control and a great deal of future expense can be prevented if the community as a whole acts now, preventing pampas grass populations from developing to the uncontrollable levels of other introduced weed species such as gorse, blackberries and ragwort.

The Status of Pampas Grass Species within Tasmania

Currently in Tasmania there are three species which are beginning to spread rapidly. These are the South American species *Cortaderia selloana* and *Cortaderia jubata*, and the New Zealand species *Cortaderia richardii*.

C. selloana (Common White Pampas) in its female form, was introduced to Tasmania in the early 1880s. Propagated through vegetative means it was effectively sterile as there were no pollen sources within the State. Within the last decade imported seed was used for propagation as vegetative methods were too slow in meeting the growing demand for pampas grass in agriculture. Seed propagation resulted in the introduction of the hermaphrodite form (possessing both functional male and female parts) which is pollen bearing and capable of fertilising the already existing female plants as well as having the ability to produce a small quantity of fertile seed itself.

The hermaphrodites are now quite widespread throughout Tasmania providing an increasing pollen source for the larger

female population. The potential exists for a major population explosion as greater quantities of pollen become available for fertilisation. Windbreaks and concentrated plantings of *C. selloana* containing the hermaphrodite form have begun to produce large quantities of fertile seed. The resultant populations are 50 per cent female and 50 per cent hermaphrodite. As an example, a 300 plant windbreak on the north-west coast of Tasmania produced in excess of 12 000 seedlings on roadsides and in table drains after only one flowering season. Seedling densities of over 20 plants per square metre were recorded.

The recent introduction of another species, *C. jubata* (Pink Pampas), resulted from the importation of seed to propagate *C. selloana*. It is not clear whether it was introduced accidentally or deliberately as a pink-flowering variety of pampas. This more recent arrival exhibits an unusual breeding system in that all plants are female and they produce large quantities of seed without the need for fertilisation, through apomixis. Currently *C. jubata* is spreading more rapidly than *C. selloana* as only one individual is



Pampas grass readily colonises waste areas such as this disturbed industrial site

required to set fertile seed. Therefore, *C. jubata* receives the highest priority for control, particularly in the vicinity of State forests and State Reserves.

Both *C. selloana* and *C. jubata* are colonisers of sites where the soils have been disturbed and where there is minimal competition from other plant species. Consequently, areas under threat are those affected by construction, plantation preparation, logging and intense hot fires. Undisturbed sites of any vegetation type are not invaded by either species.

C. richardii (Toetoe or New Zealand Pampas Grass) was introduced to the west coast of Tasmania at the turn of the century and since then cuttings have been established in all major towns on the west coast as ornamental garden plants. Roadside plantings in 1962 have become the source of invasion into the World Heritage Area and higher altitude forests in south-west Tasmania. In 1988 this infestation had extended its range over 70 km of roadsides.

It appears that *C. richardii* is more competitive than either of the other two species in that it can colonise areas where the existing vegetation is only slightly disturbed, eg. on river margins or as a result of a low intensity fire. Swamplands and moorlands are readily invaded and their natural communities are severely affected, thus reducing their conservation value. *C. richardii* successfully competes on a large range of sites extending from coastal areas to the higher (around 700 metres) altitude forest.

Campaign Strategy

The initial step in the campaign was to assign priorities for pampas grass control to different land use areas:

- Within State forests and National Parks the aim is to eradicate and maintain total exclusion of all pampas.
- On all other Crown and government lands, such as road easements and riparian reserves, the aim is to control the spread of pampas grass.
- On all private lands adjacent to State

forests and National Parks the aim is to actively encourage pampas grass removal. Removal can be enforced under the provisions of the Noxious Weeds Act.

- In rural areas where pampas grass removal would cause commercial losses, the long-term objective is to encourage plant removal through the development of an assistance package and replacement with more suitable species.
- In urban areas, total control of all pampas may not be feasible given current available resources and therefore the aim will be to:
 - a) encourage the removal of all larger scale plantings to reduce pollen and seed sources; and
 - b) encourage pampas removal in home gardens through public information and education.

Pampas grass comes under the control of a large cross section of the community ranging from the owners of small residential properties to large government departments. Therefore control can only be achieved through full community participation. The campaign against pampas grass has been based on extensive public information and education.

Pampas grass establishment and supply is now illegal under the provisions of the Noxious Weeds Act and as a direct result all nurseries have been notified of the prohibited weed status of pampas grass. Random checks have been carried out to ensure that the requirements of the Act were fulfilled.

The nurseries are also one of many dissemination points for two information pamphlets:

- a general information leaflet of which 53 000 were distributed; and
- a technical brochure discussing the full pampas grass story of which 3 000 were produced.

The majority of pamphlets were distributed through local and State government agencies involved with land management together with private organisations such as the Wilderness Society and the Society for Growing Australian Plants. Commonwealth funded groups such as the Keep Australia Beautiful Council and Greening Australia were also involved in pamphlet distribution.

To supplement pamphlet distribution, media co-operation was actively sought and the three major media outlets provided excellent coverage. It was also fortunate that the pampas 'story' was newsworthy in that the plants have been present in the State, particularly in home gardens, for over 100 years and have only started to spread and invade within the last decade.

Public participation in the pampas campaign has been encouraged as available government resources are limited making the control of some infestations otherwise impossible. To overcome this, volunteer labour has been sought to remove some pampas infestations within the State. Concerned community groups supplied volunteers who were supervised by experienced personnel. This technique proved to be extremely successful in removing the more difficult infestations - 6 000 plants were removed from areas surrounding and within the World Heritage Area.

The support and co-operation of local government was an essential component in the campaign. To initiate active municipal participation, seminars on the pampas grass problem were provided by the project co-ordinator for all councils. Councils were asked to remove plants from land directly under their control and to encourage rate-payers to remove any offending plants from private property. Seminars were also made available to community organisations, private companies and government agencies. The Department of Main Roads and the Housing Department have implemented their own control measures on land under their control.

Control

The Tasmanian pampas grass problem was only identified in early 1987 and current pampas grass control techniques have been adapted from the New Zealand experience and will be used until such time as more relevant local measures are needed and can be developed.

Machinery such as backhoes and excavators have been used to remove larger plants. However, due to the high cost involved, their use has mostly been limited to councils and government agencies. As the spread of pampas grass is only a recent problem, the majority of invasive plants are relatively small and can easily be removed by manual grubbing.



Mechanical removal of pampas grass. (photo by courtesy of the Clarence City Council)

The most cost effective method of pampas grass control is through the use of the foliar herbicide glyphosate at 360 g per litre or the soil-active hexazinone. It is important to note that hexazinone is a soil residual herbicide which is easily leached through soil profiles with the potential of killing other more desirable plants. Its use is often limited to control within pine plantations.

A combination of fire or slashing at the end of winter, with a follow-up treatment of glyphosate two to three months later, has been successfully employed as a control measure. Burning and slashing encourages the production of fresh, actively growing

shoots which are far more susceptible to glyphosate than older existing vegetation. This method requires far less herbicide.

Campaign Effectiveness and Continuation

Public awareness of the threat posed to Tasmania's forests and parks by pampas grass has increased markedly since the inception of the campaign. As a direct consequence, thousands of plants have been removed and more are being removed throughout the State. All major mature infestations have been treated by the relevant land managers. However, recent evidence indicates the presence of a large number of immature seedlings establishing on disturbed sites around the State. In some cases they are the direct result of seeding prior to the commencement of the campaign. In the majority of cases the new infestations have originated from rural and suburban plantings.

While the public is now generally aware of the threat posed by pampas grass there is still a large number of plants widely distributed throughout residential areas as ornamentals and in the rural sector as windbreaks and fodder sources. These plants are the source for current and future infestations within the State.

The remaining rural and suburban plantings are being countered through the continuation of the public education and information campaign. To ensure that the campaign momentum is maintained, support has been provided through the appointment of weed inspectors within relevant government land management agencies such as the Forestry Commission and the Department of Parks, Wildlife and Heritage to administer the provisions of the Noxious Weeds Act 1964. Under the provisions of the Act the removal of spreading and threatening plants can be enforced.

Conclusion

For pampas grass to be controlled and the threat dissipated, the Tasmanian community as a whole must become involved in the campaign. The campaign was designed to encourage the participation of all sectors and if one section of the community fails to act the potential will always exist for pampas grass to re-infest our State forests and National Parks. Given a united, sustained effort pampas grass can be reduced to manageable levels within Tasmania.

