Successes and failures in a national campaign to control the invasive pompom weed in South Africa

Pompom weed (*Campuloclinium macrocephalum* DC.) is a South American herb belonging to the Asteraceae family. Its introduction into South Africa, possibly as a garden ornamental, was first recorded in the 1960s, but over the past 20 years it has become a serious threat to the higher rainfall grasslands of South Africa (Henderson, 2007). Where pompom weed invades natural grasslands, it devalues the grazing potential of those grasslands.

High incidences of invasions of alien flora in South Africa have led to the establishment of the Early Detection and Rapid Response (EDRR) programme, which is funded by the Working for Water programme of the Department of Environmental Affairs. One of the EDRR programme's key projects is to manage and contain pompom weed populations in South Africa.

Management of pompom weed

The management plan focused on outlying infestations and targets the eradication of these populations. In 2009, the first chemical control teams focused on clearing small isolated populations. These control operations have been expanded during 2010/11 to cover all known populations in all provinces where the species is still considered to be emerging. These provinces are Mpumalanga (Mp), North West (Nw), Limpopo (L), Free State (Fs) and KwaZulu-Natal (KZN). Over the past three years, rapid response teams were contracted to clear all known plants throughout the flowering season (September–March). Four follow-up operations have been conducted at all previously treated sites. The management strategy includes plans for biological control for the large infestations around Pretoria and Johannesburg (Gauteng), as chemical control of these extensive invasions will be too costly.

The national management strategy for pompom weed

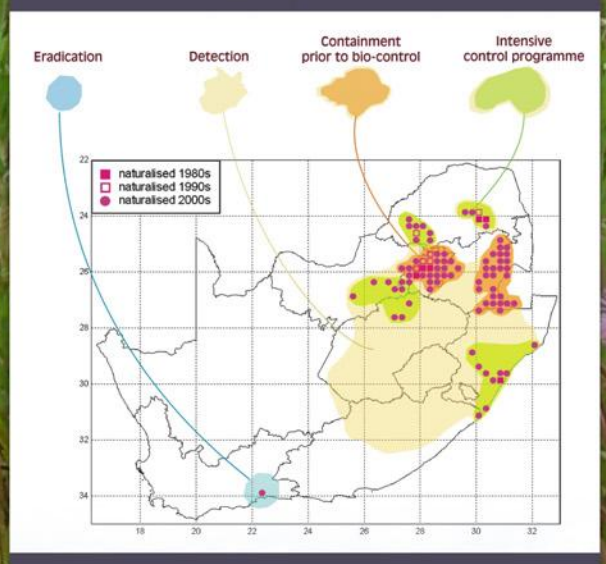

Figure 1. Map showing pompom weed distributions over the past 20 years, and indicating levels of management in accordance to the national management strategy for pompom weed.

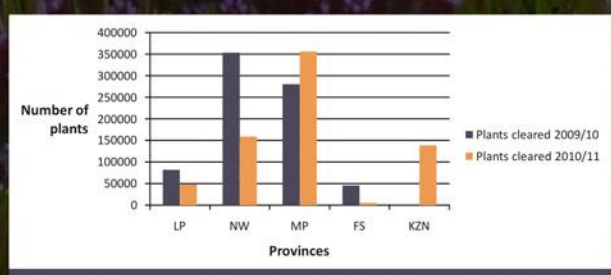

Figure 3: Numbers of pompom weed plants cleared per province during the 2009/10 and 2010/11 flowering seasons.

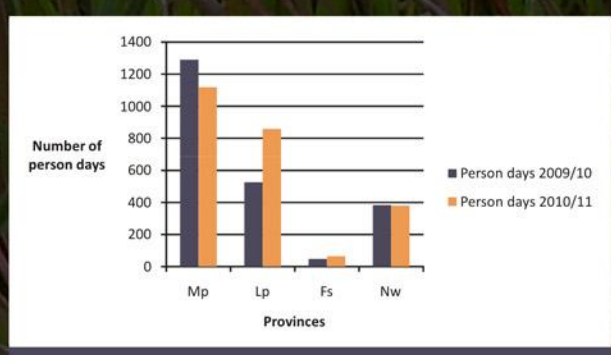

Figure 4. Number of person days achieved per province.

Data collected from 2009/10 and 2010/11 pompom weed control campaigns

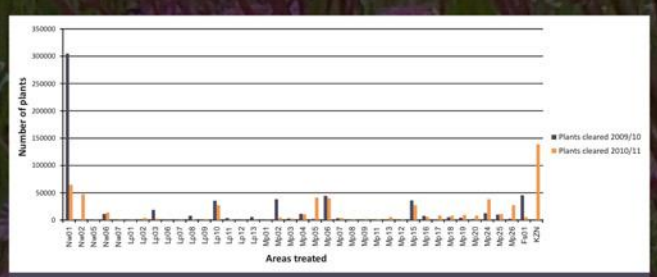

Figure 2. Numbers of pompom weed plants cleared per site during the 2009/10 and 2010/11 flowering seasons.

Sites	Trend	Reasons
Nw01	↓	Limited access into the adjacent private properties as opposed to the previous season.
Mp01, 05, 08, 09, 11, 12, 13, 17, 18, 19, 20, 24, 25, 26.	↑	Teams cleared additional areas along the road reserves inside private properties. High rainfalls between December 2010 and February 2011.
Fs01	↓	Small isolated populations and chances of re-infestation are limited. Four intensive follow up operations conducted during the last two flowering seasons.
Lp02, 06, 07, 09; Nw02; KZN.	◆	First treatment during the 2010/11 flowering season.

Table 1. Trends in numbers of pompom weed plants cleared per site.

Province	Trend	Reasons
Limpopo & Free State	↓	Isolated populations along the road verges which resulted in effective control.
Mpumalanga	↑	Clearing of additional populations on private properties.
North West	↓	Increased effectiveness of the control operations due the well trained chemical control teams. But can also be attributed to the inability of control teams to gain access to adjacent private properties.
KZN	◆	First treatment during the 2010/11 flowering season.

Table 2. Trends in numbers of pompom weed plants cleared per province.

	2009/10	2010/11	Total for 2 seasons
Number of plants cleared in all provinces	760 547 (excluding KZN)	707 300	1.47 million plants
Number of working days created	2 248 (excluding KZN)	6 532	8780

Table 3. Total numbers of plants cleared and working days created for two flowering seasons.

Biological control

The rust fungus, *Puccinia eupatorii* (Pucciniales: Pucciniaceae), was tested under quarantine conditions in South Africa, and was shown to be suitable for release against *pompom weed*. In 2006, *rust fungus* was recorded on field populations of *pompom weed*. Laboratory studies demonstrated that the rust has a significant impact on plant growth. Two insect natural enemies from South America are also under investigation in quarantine. These are the flower-feeding moth, *Cochylis campuloclinium* (Lepidoptera: Tortricidae), and the stem-galling thrip, *Liothrips tractabilis* (Thysanoptera: Thripidae). Approval to release of the latter is anticipated for the summer of 2011 or 2012 (McConnachie *et al.*, 2011).

Conclusion and recommendations

- At the early stages of the clearing project much time was spent preparing supply chain management procurement documentation and developing management plans. This led to the late implementation of the project and thus compromised the effectiveness of the control operations.
- Control efforts in isolated populations have been effective, but the mobility of the clearing teams needs to be increased to allow them to monitor larger areas and to avoid re-infestation of treated sites from the remaining seed bank and from wind dispersed seeds.
- Chemical control teams need to be trained to identify pompom weed seedlings in order to eradicate them before they mature and produce seeds.
- The overall decline in the number of plants treated in the 2010/11 flowering season could be attributed to a number of factors, including effective implementation of the project and/or rain patterns; indicating the need for continuing research on the biology of the species, long term effects of chemical control, seed bank viability, and the effectiveness of biological control.
- The pompom weed project incorporated planning (financial and operational planning), data collection, communications, training of beneficiaries, and stakeholder engagement. This project has demonstrated a multi-departmental approach in dealing with an emerging invasive alien plant species, and lessons learned can enhance management strategies for future projects.

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