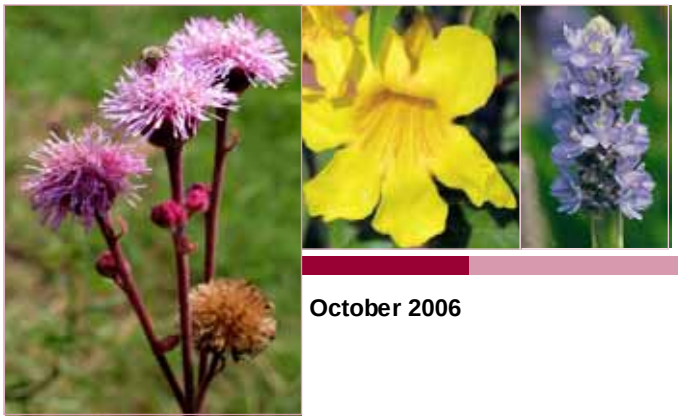

SAPIA NEWS

SOUTHERN AFRICAN PLANT INVADERS ATLAS

October 2006 ARC-Plant Protection Research Institute **No. 1**

ARC • LNR

WORKING FOR WATER
Patron in Chief: Nelson Mandela

Inside this issue:

Special appeal

You are invited to participate in the SAPIA phase II project.

Submit records online at :
Weeds and Invasive Plants website
www.agis.agric.za/wip

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Launch of SAPIA Phase II

PLANT INVADERS—A THREAT TO OUR NATURAL RESOURCES

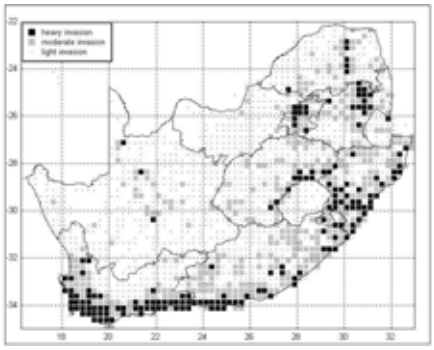
Where do invaders occur? How abundant are they? What habitats do they invade?

You are invited to participate in the SAPIA phase II project.

SAPIA depends on keen observers throughout Southern Africa to record basic information about plant invaders.

The ARC-Plant Protection Research Institute is pleased to announce the launch of a second phase of the SAPIA project from October 2006. The revival of the SAPIA project has been made possible with funding received from the *Working for Water* Programme of the Department of Water Affairs and Forestry.

Particular emphasis will be placed on emerging weeds and proposed weeds and invaders under the Conservation of Agricultural Resources Act (CARA) and National Environmental Management: Biodiversity Act (NEMBA). Read more about these Acts on page 2.



Severity of invasion—data from SAPIA

SAPIA II aims to make all the SAPIA information available to the broad public via the internet at the Weeds and Invasive Plants website (WIP) within AGIS—this includes distribution maps, species descriptions and ID expert, photos, custom and standardized queries.

Persons wanting to participate in SAPIA II can obtain more information from Lesley Henderson at Henderson@sanbi.org or go to WIP (www.agis.agric.za/wip)

Focus on emerging invaders

Prevention is better than cure! South Africa could have saved many millions of Rands on control of invaders if some species, like jointed cactus and triffid weed, had been nipped in the bud when they were first detected.

SAPIA II appeals to the public to report sightings of any alien species that appears to be spreading away from cultivation and could become a problem in the future. SAPIA News will feature articles on these plants, starting in this issue with pompom weed, yellow bells and pickerel weed—which feature in colour on this leading page.

Photo: J.M. Goodall

Pompom weed (*Campuloclinium macrocephalum*)

New and revised legislation

The current legislation on weeds and invasive plants forms part of the Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1983) (CARA). Regulations 15 and 16 under this Act, which concern problem plants, were amended during March 2001.

A lot of useful information on CARA can be found on the website of the *Working for Water* Programme (www.dwaf.gov.za/wfw/legal). Information is also available on the website of the ARC (www.arc.agric.za)—ARC-PPRI, Weeds Division.

CARA is currently in the process of being revised, together with the drafting of new legislation under the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) (NEMBA). For more information go to www.invasive.species@sanbi.org

The proposed categories under the new and revised legislation reflect the importance of preventing new invasions. Six categories are listed. Categories 1, 2 and 3 remain basically the same, except that 1a are high priority emerging species that must be eradicated or strictly controlled. Category 1b species, equivalent to the old category 1, are widespread species that require a management plan. Category 4 lists indigenous species outside of their natural distribution ranges that are a threat to biodiversity. Category 5 includes all species under surveillance and may be listed as invasive after due investigation; this category includes many ornamentals. Category 6 are species known to have very invasive properties and are prohibited entry into South Africa.

CARA
(Department of Agriculture)
and
NEMBA
(Department of Environmental Affairs and Tourism)

Pompom weed

Pompom weed (*Campuloclinium macrocephalum*) is an ornamental South American herb belonging to the daisy family, Asteraceae. It is rapidly becoming the most serious threat to the conservation of grasslands in South Africa.

Infestations become conspicuous when the plants are in flower between December and March, transforming the veld from green to pink. The plant initially establishes itself in disturbed sites such as roadsides, but then invades natural grasslands, open savanna and wetlands.

Pompom weed is a perennial, erect herb up to 1.5 or even 2.0 m high. The stems are covered with rough, bristly hairs. Leaves are scattered along the length of the stem but clustered at the base to form a rosette. The plant has a short woody rootstock that ends in thick tuber-like perennial roots. In spring shoots arise from, and in autumn die back, to the rootstock. The showy pink flowerheads are produced in dense clusters at the ends of the aerial stems. The flowerheads are replaced by brown, fluffy seedheads.


Photo: J.M. Goodall

Pompom weed survives fires and frost during the winter months because all of its living components are in a dormant state underground. Under drought conditions during summer it can revert to a dormant state by withdrawing its nutrients from the shoots back to the roots. It has therefore evolved strategies to survive and multiply in grassland and savanna ecosystems in South Africa.

The earliest record of its establishment in the field is from Fountains Valley in Pretoria in the early 1960s and Westville near Durban in the 1970s. In the 1980s its distribution expanded in the Pretoria area and it was also recorded from Hilton in KwaZulu-Natal and the Wolkberg in Limpopo Province (see photo top right). In the 1990s it spread further to Port St Johns in the Eastern Cape, Rooiberg in Limpopo and Nelspruit in Mpumalanga. From 2000 to 2003 it exploded in Gauteng and was also recorded for the first time in the Free State at Kroonstad. During the same period there was much spread in the Nelspruit, White River and Barberton areas. By 2006 it had spread to the Piet Retief area in south-eastern Mpumalanga and Swaziland.


Photo: H.G. Zimmermann


Photo: J.M. Goodall

Pompom weed tubers and new aerial shoots arising from a short woody rootstock

Pompom weed (cont.)

Legislation:

Pompom weed is a declared weed (category 1 plant) according to CARA. It is illegal to harbour, plant, propagate or sell pompom weed. Landowners are compelled to control pompom weed by whatever means is deemed appropriate.

Management and control:

Management should aim to maintain the natural vegetation in a healthy, productive state as this will help to limit pompom invasion.

So far the only herbicide registered for use on pompom is Brush-Off by DuPont. Physical methods of control include uprooting and burning the plant. However this is only recommended where there are few plants as disturbance of the soil will only encourage further invasion of weeds.

It is not recommended to plough lands as this will damage the rootstock, stimulating further vegetative growth and denser stands.

Investigations into biological control using introduced insects and pests of pompom weed is in progress.

For further information on pompom weed and its control go to the ARC website (www.arc.agric.za) for publications by the Plant Protection Research Institute's Weeds Division.

Drawing: W. Roux

Yellow bells

Yellow bells (*Tecoma stans*) is an ornamental shrub or tree with its origin possibly in Mexico and the southern USA. It is a member of the bignonia family, Bignoniaceae, and is related to the jacaranda and the indigenous Cape honeysuckle (*Tecoma capensis*).

Yellow bells is a popular ornamental plant in the warmer parts of South Africa. It produces very showy sprays of yellow, bell-like flowers from October–May. The flowers are replaced by long, narrow brown capsules that split open to release many papery-winged seeds.

Yellow bells is invading moist and dry savanna in the Eastern Cape, KwaZulu-Natal, Mpumalanga, Gauteng, North West and Limpopo Province.

Legislation:

It is a declared weed (category 1 plant) according to CARA. It is illegal to harbour, plant, propagate or sell the plant. Landowners are compelled to control the plant.

Control:

No herbicide has been registered for the chemical control of yellow bells. Biological control using introduced insects and pests is under investigation.

Photo: L. Henderson

Pickerel weed

Pickerel weed (*Pontederia cordata*) is a perennial rooted aquatic plant indigenous to North, Central and South America. It is a member of the family Pontederiaceae and is closely related to water hyacinth (*Eichhornia crassipes*).

Pickerel weed is a popular ornamental pond plant. Unlike the floating water hyacinth, pickerel weed is rooted with a horizontal subterranean stem or rhizome enabling it to form colonies along the edges of dams, rivers and streams.

Pickerel weed has erect, emergent stems and leaves. The leaves range from heart-shaped to lance-shaped. The showy flowers occur in spikes 50–150 mm long. Individual flowers are blue and the upper petal has a yellow blotch in the centre.

This plant is known to be invasive in KwaZulu-Natal, Mpumalanga and Gauteng.

Legislation:

Pickerel weed is a declared invader (category 3 plant) according to CARA. No further plantings or trade is allowed.

Photo: C.J. Cilliers

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The Weeds Research Division of the Plant Protection Research Institute is responsible for research on the ecology and control of invasive alien plants in South Africa. These plants were introduced either intentionally (e.g. for ornamental use or agroforestry purposes), or accidentally (e.g. in livestock feed) and now threaten biodiversity and agriculture. In addition, they reduce run-off from water catchments, thus diminishing flow in streams, and adversely affect the quality of life of communities.

- Biological control
- Chemical control
- Bioherbicides
- Integrated control
- Monitoring the emergence and spread of invasive alien plants

Biological control of invasive plants

Salvinia (*Salvinia molesta*) before and after biocontrol with the weevil *Cyrtobagous salviniae*
Photos: C.J. Cilliers

Biological weed control is the use of natural enemies to reduce the vigour or reproductive potential of an invasive alien plant. The principle is that plants often become invasive when they are introduced to a new region without any of their natural enemies. The alien plants therefore gain a competitive advantage over the indigenous vegetation, because all indigenous plants have their own natural enemies that feed on them or cause them to develop diseases. Biological control is an attempt to introduce the alien plant's natural enemies to its new habitat, with the assumption that these natural enemies will remove the plant's competitive advantage until its vigour is reduced to a level comparable to that of the natural vegetation. Natural enemies that are used for biological control are called biocontrol agents.

The potential risk posed by a candidate biocontrol agent is determined by biocontrol researchers through extensive host range studies (specificity tests) that are carried out in a quarantine facility. These trials determine the range of plants that a potential biocontrol agent is able to use as host plants throughout its life cycle, as well as its host plant preferences. Permission to release a biocontrol agent will be sought only if the host-specificity tests prove without doubt that the potential agent is sufficiently host-specific for release in this country. To be regarded as sufficiently host-specific, the candidate agent must be either monophagous (i.e. the insect feeds on only one plant species, the target weed in this case) or it could have a slightly wider host range, provided that none of the additional host plants occur in South Africa or surrounding countries, either as indigenous or introduced crop plants.

South Africa is regarded as one of the world leaders in the field of biological control of invasive alien plants. Since the 1930s we have brought 27 invasive alien plant species under biological control. In the process, 99 species or biotypes of natural enemies were released, 74 of which became established. Remarkable successes have been achieved with either controlling or reducing the invasive potential of many invasive plants including cacti, aquatic weeds, Australian wattles, chromolaena and lantana. Seed feeders feature strongly in many of our projects. Tested and safe biocontrol agents are distributed in co-operation with the *Working for Water* Programme of the Department of Water Affairs and Forestry.