SAPIA NEWS

SOUTHERN AFRICAN PLANT INVADERS ATLAS

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ARC • LNR

WORKING FOR WATER

Patron in Chief: Nelson Mandela

Inside this issue:

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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Are we fighting a losing battle against invasive alien plants?

Yes—unless we take steps to prevent further invasions! Existing invasive alien species must be prevented from invading new areas and potentially new invasive alien species must be stopped in their tracks before they become a problem. Even if we could shut the doors to any new imported species we would still be facing an increase in invasive alien species because many species are still in the 'sleeper' phase. Pom-pom weed was confined to a small patch in the Fountains Valley in Pretoria for about 30 years before it suddenly exploded and now it is beyond eradication.

The great majority of invasive alien species in South Africa have been used for ornamental purposes. Some of these species have been declared as weeds and invaders and by law may no longer be cultivated. However, many more species than are listed, are invasive and potentially invasive—and the only way forward is for the South African horticultural and related industries and the general public to become more environmentally responsible in their choice of plants, and to make more use of our vast natural resource of indigenous plants.

SAPIA needs your support!

Please submit records to the Weeds and Invasive Plants website www.agis.agric.za/wip

All the SAPIA Newsletters are posted at WIP and can be downloaded free of charge

Pompom weed control

Pompom weed (*Campuloclinium macrocephalum*) is in full growth and visible as bright pink patches in grass-lands, wetlands, on road verges and other disturbed sites. Many plants are already setting seed and millions of seeds are being dispersed by the wind and passing vehicles. Good news is that the rust fungus which causes die-back of the plants and is lethal to seedlings, is evident almost everywhere—look out for yellowing leaves and the formation of brown spots on the leaves.

Pompom weed is under control in KwaZulu-Natal where six teams have treated plants at all known sites—well done to Michael Braack and his teams from Department of Agriculture and Environment. A programme is in place in the Barberton area of Mpumalanga. In Gauteng promises have been made to spray pompom weed along major roads in an attempt to prevent it from being spread to other provinces.

In the Free State it is hoped that all known sites will be treated for the first time this season.

Gardener's guide to selecting non-invasive alien plants

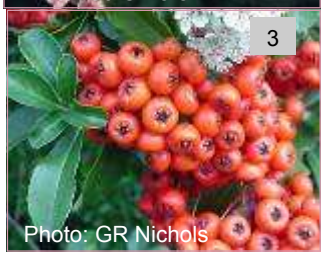
Do you want to make an environmentally responsible choice of plants for ornament, hedging, landscaping etc? Then consider the following guidelines in selecting species:

- **DO select indigenous species** (**photo 1**). Locally indigenous species are even better and should be mandatory for National Parks and other priority conservation areas.
  Visit the National Botanical Gardens and the SANBI website www.sanbi.org for information on indigenous plants and where to obtain them.

- **DO'NT select declared alien species** e.g. lantana (*Lantana camara* hort.) (**photo 2**) listed under the Conservation of Agricultural Resources Act (CARA) (see WIP website for currently listed species). The draft revised list contains many more species and this list should be available soon.

- **AVOID alien species that are similar to declared species**—e.g. treat ALL species of alien acacias, inkberries (*Cestrum* spp.), cotoneasters, firethorns (*Pyracantha* spp.) (**photo 3**), lantanas etc. as potentially invasive. Substitution of a declared plant with another having similar attributes will negate the legislation and efforts to prevent further invasions.

- **AVOID alien species that have fleshy fruits**—many of the most troublesome invaders are spread by frugivorous birds, bats and other animals e.g. lantana, mulberry, guavas, privets, bugweed, seringa, prickly pears, queen of the night cactus, firethorns, cotoneasters, eglantine rose, brambles, ginger-lilies. Australian brush-cherry (*Syzygium paniculatum* (**photo 4**) is often sold as a 'good bird plant' - and is on its way to becoming invasive!



- **AVOID alien aquatic species**—all alien species that are climatically adapted have the potential to become invasive e.g. sword plant (*Echinodorus* sp.) (**photo 5**)

- **AVOID alien grasses**—which are amongst the most invasive species in the world. Many spread prolifically from seed, undergound stems (rhizomes) and runners (stolons). Fountain grass (*Pennisteum setaceum*) is becoming increasingly invasive and is a category 1 invader under CARA (**photo 6**)

- **AVOID alien climbers**—which have a devastating effect by smothering the native vegetation; they are extremely difficult to control e.g. English Ivy (*Hedera helix*), proposed invader under CARA (**photo 7**)

- **Avoid alien succulents**—some of which have become the most costly and troublesome invasive species in South Africa e.g. sour prickly pear (*Opuntia stricta*) (**photo 8**). Cacti are ALL alien in South Africa (with the exception of a small epiphytic forest species of *Rhipsalis*). The alien cacti are often confused with the indigenous euphorbias—don't be fooled into purchasing a cactus that has been incorrectly labelled as an euphorbia. Cacti have spines arising from specialized structures called areoles and the spines usually occur in clusters (**photo 9**); they do not have a milky latex like the euphorbias. Agaves or American "aloes" with their tall flowering poles (**photo 10**) should not be confused with indigenous *Aloe* species (**photo 11**) with their showy, orange, red or yellow flowers. South Africa has an exceptionally rich diversity of succulent plants and these should be proudly used.

Common misconceptions: cultivars & sterile plants

- **Cultivars** are OK because they can only be reproduced by cuttings, tissue culture etc. WRONG!—many cultivars e.g. variegated forms are able to reproduce by seed and their progeny reverts to the original form e.g. Chinese wax-leaved privet (*Ligustrum lucidum*) (normal form **photo 12**) and variegated form (**photo 13**). Queen of the night (*Cereus jamacaru*) (normal form **photo 14**) has a monstrous form (**photo 15**) that sets seed which develops into the normal form.
  THIS IMPLIES that if a species is listed under CARA then all its cultivars are included unless they have been exempted


12
Photo: GR Nichols

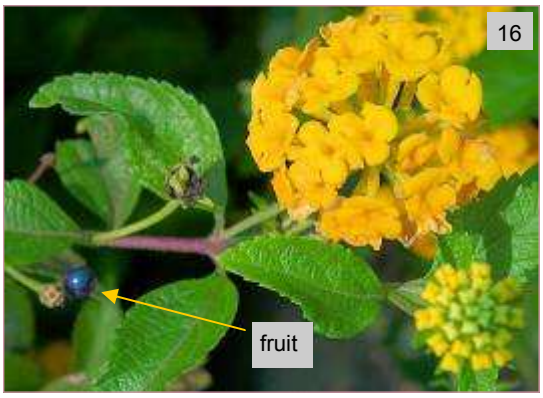

13


14
Photo: S Neser


15
Photo: GR Nichols

- **"Sterile"** plants are OK because they do not reproduce from seed. WRONG!—some so-called "sterile" plants e.g. pure yellow– and pure white-flowered, bushy lantana (*Lantana camara* hort.) produce fertile pollen that can cross-pollinate the normal fertile plants, as well as fertile embryo sacs that occasionally produce seed. These cultivars are category 1 declared plants under CARA.

- The creeping, yellow *Lantana* cultivar Sundancer (**photo 16**) is marketed as "*Lantana montevidensis*", "sterile" and "non-invasive", however studies in South Africa and Australia indicate that it is partly *L. camara*, only sterile if planted in isolation, and inter-fertile with *L. camara*. Research in America indicates that a very similar cultivar, Goldrush, is probably a hybrid derived from the invasive *Lantana camara* complex and North American *Lantana depressa*. While there is no evidence that Sundancer and other yellow-flowered creeping lantanas are invasive, they are probably harmful in a much more subtle way—by swapping genes with the invasive lantana and adding the genes of *L. depressa* and possibly other *Lantana* species to the gene pool of the invasive, alien lantana complex, almost certainly increasing its genetic heterogeneity, hybrid vigour, resistance to biocontrol agents, invasiveness and suppression of indigenous biodiversity. Because Sundancer, and other pure-yellow-flowered lantanas, do occasionally produce seed, it is illegal (in terms of CARA) to grow, propagate or sell them in South Africa. The full CARA regulations are available from the SAPIA editor. We therefore urge all nurserymen, landscapers and the public to voluntarily stop growing these plants, and to replace them with indigenous species.


16
fruit


17

- Many sterile plants can reproduce vegetatively—from plant fragments e.g. jointed cactus, weeping willow, salvinia; others reproduce by suckering from the roots e.g. white and grey poplars; others from underground stems or rhizomes e.g. giant reed, and from aerial tubers e.g Madeira vine (*Anredera cordifolia*) (**photo 17**)

- Plants with only one sex present in the country are OK because they can't produce seed. WRONG!— e.g. purple pampas grass (*Cortaderia jubata*) can produce seed without pollination (apomictic reproduction) (**photo 18**)


18
Photo: H Klein

Be environmentally responsible—
select indigenous species first!
obtain plants from a reputable supplier!
help conserve wild populations!

Emerging ornamental weeds

Coreopsis

Coreopsis (*Coreopsis lanceolata*) is a perennial rhizomatous herb with flowering stems 300–500 mm high. It is native to the Eastern USA and is a member of the daisy family Asteraceae.

Its stems are longitudinally ridged and sparingly branched. Leaves are dull green, long and narrow, the lower leaves usually deeply lobed. The flowers are bright yellow and showy, to 60 mm across, solitary, on long stalks from October to December. The petals (ray florets) are two to three-toothed. It reproduces from seed and vegetatively by offsets from the short rhizome.

Coreopsis is cultivated as an ornamental. It invades grassland and roadsides usually close to human habitation. It is an emerging weed in Gauteng, Limpopo, Mpumalanga and KwaZulu-Natal.

Legislation: It is a proposed category 1b (prohibited) invader under the revised CARA.

Several other species of Coreopsis are recognized weeds in other parts of the world.

Yellow flag

Photos: H Klein

Yellow flag (*Iris pseudacorus*) is a perennial, rhizomatous, clump-forming aquatic plant up to 1 m high. It is a native of North Africa and Eurasia and is in the family Iridaceae.

Its leaves are sword-shaped, green to blue-green, erect, flattened with a raised midrib, to 1 m long and 30 mm wide. The flowers are yellow, showy and large, up to 75 mm long and 40 mm wide. Flowering stalks are 4–12 flowered.

Yellow flag has been cultivated as an ornamental pond plant. It is fast-growing, spreading from rhizomes and possibly also from seed. It has been recorded from the Vaal River in South Africa and has become invasive in many temperate parts of the world. It can form dense stands that outcompete other wetland plants—in much the same way as bullrushes (*Typha* species). Dense clumps may even break away from the edges of rivers and become floating rafts of vegetation.

The plants contain glycosides and are poisonous if ingested and may cause skin irritation if handled.

Legislation: It is a proposed category 1b (prohibited) invader under the revised CARA.

Bilberry cactus

Photos: N. Bosman

Bilberry cactus (*Myrtillocactus geometrizans*) is a large columnar tree-like cactus growing to a height of about 4 m and a spread of 5 m. It is native to Mexico and belongs to the family Cactaceae.

Stems are blue-green, to 100 mm thick and 5–6 ribbed. Young plants remain unbranched for many years. Mature plants have a candelabra-like branching pattern similar to some of our indigenous euphorbias. It can be distinguished from the euphorbias by its clusters of 3–5(–9) spines (the central spine dagger-like, 10–70 mm long), and the absence of a milky latex.

The flowers are greenish-white, about 25 mm across, with as many as 5–9 flowers in a cluster. The fruit is an edible dark purple berry about 20 mm across.

This cactus is cultivated as an ornamental. It has recently been found in the natural veld in the Addo Elephant National Park in the Eastern Cape.

Legislation: None but should be proposed for listing under CARA.

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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

We are on the Web:

www.arc.agric.za

see PPRI Newsletter

for current news from the Weeds Research Division

Read PPRI Newsletter No. 78 for the following news from the Weeds Research Division:

Early indications of establishment of biocontrol agent on cat's claw (*Macfadyena unguis-cati*)

First releases of biocontrol agents against problem cactus (*Opuntia fulgida*)

Water hyacinth grasshopper (*Cornops aquaticum*) shows promise as a biocontrol agent for water hyacinth (*Eichhornia crassipes*)

Optimism prevails in South Africa for biological control of two emerging weeds, red and Mexican sunflowers (*Tithonia rotundifolia* & *T. diversifolia*)

Biological control of invasive plants

Red sesbania (*Sesbania punicea)* and the stem borer (*Neodiplogrammus quadrivittatus)*
Photos: L. Henderson and J.H. Hoffmann

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.