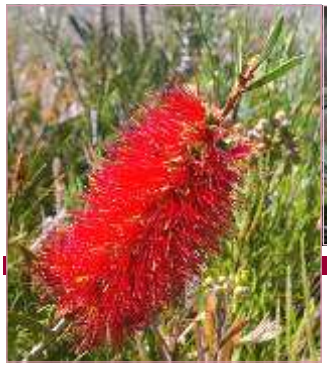

SAPIA NEWS

SOUTHERN AFRICAN PLANT INVADERS ATLAS

October 2009 ARC-Plant Protection Research Institute **No. 13**

ARC • LNR

WORKING FOR WATER

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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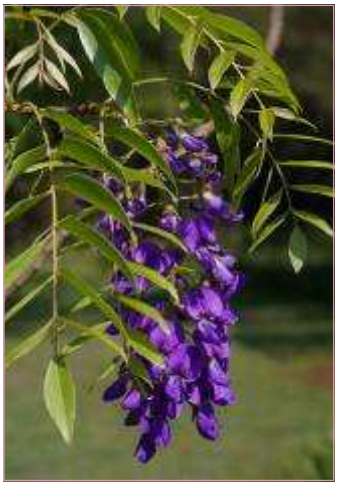
Photos by Lesley Henderson unless otherwise acknowledged

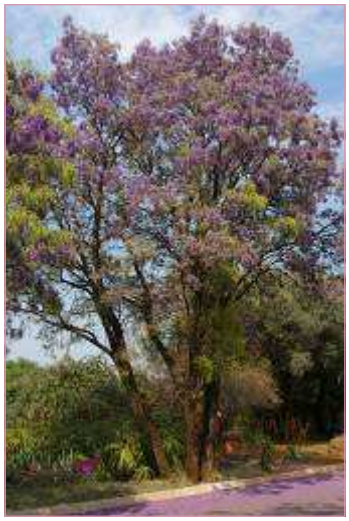
Tree wisteria—proudly South African and non-invasive

Tree wisteria, *Bolusanthus speciosus*, is an indigenous spring-flowering tree, that is drought hardy, compact, very attractive and should be used more in towns and cities as a street and ornamental tree. It has a non-invasive root system and does not shed its branches.



Here it is photographed at the Pretoria National Botanical Garden.

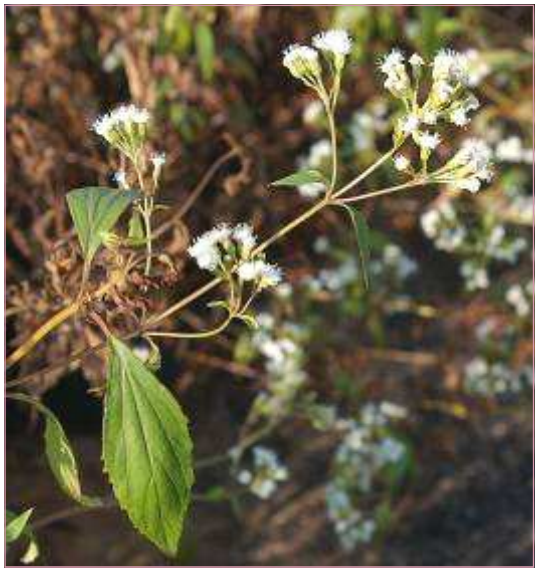
Tree wisteria could replace the South American invasive jacarandas that line the streets of the capital city.



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

Mistflower—have you seen this plant?

Mistflower (*Ageratina* riparia), a close relative of pompom weed, is a weak-stemmed, perennial herb up to 1 m tall. Its stems are purplish, creeping in the lower parts and rooting at the nodes. Leaves are opposite, lanceolate (60 × 20 mm) with serrated margins. The small white flower heads, about 5 mm long are produced from August to December.

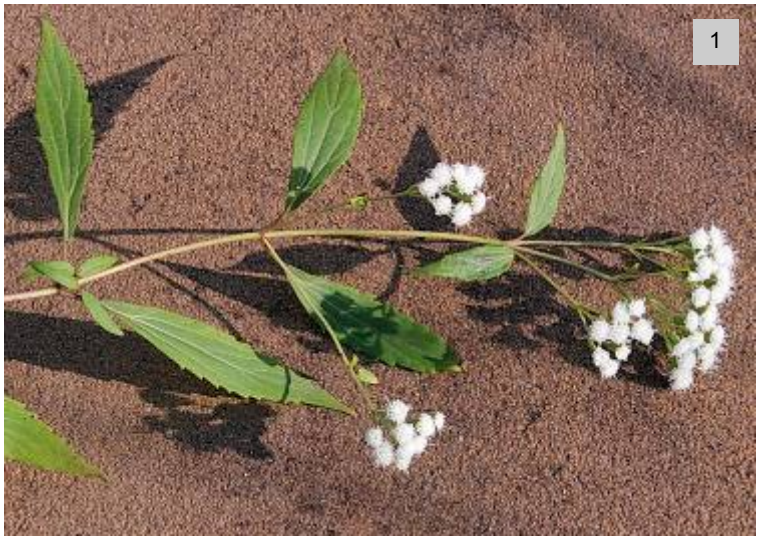


Roadsides, forest margins, or any protected disturbed sites in cool, high rainfall areas may be invaded.

Dr Alan Wood of the ARC-PPRI's Stellenbosch Weeds Research Unit needs your help in finding new localities of this species. See page 2 for more details.

Have you seen this plant? The search is on for mistflower

Mistflower (*Ageratina riparia*, Asteraceae) (**photo 1**), originally from Mexico, was spread around the world as an ornamental plant, and became a serious weed in several countries where cool, wet conditions prevail. A highly successful biological control programme was undertaken in Hawaii during the 1970's using a leaf smut fungus (*Entyloma ageratinae*). This same fungus was introduced into New Zealand in the early 1990's with the same spectacular success.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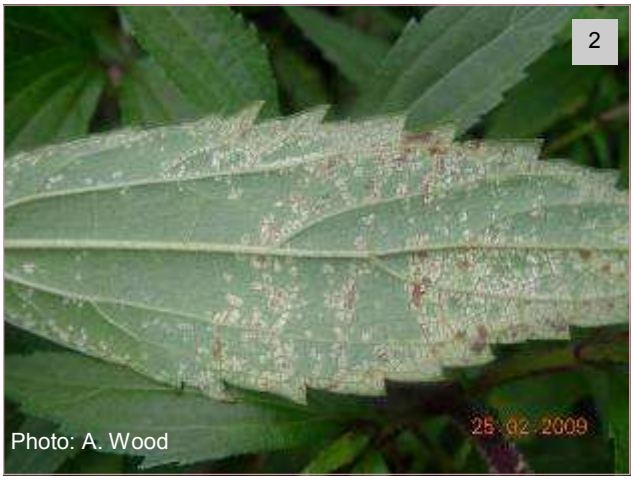
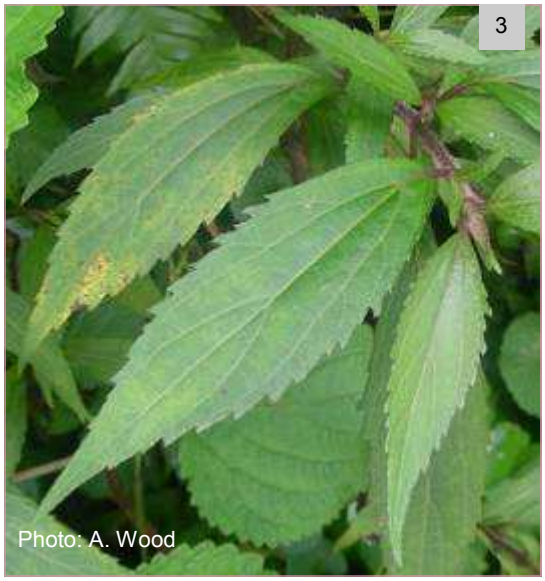
The first record of this plant in South Africa is a herbarium specimen from Chase Valley, Pietermaritzburg, dated 1955. By the 1980's, it was observed that mistflower was becoming well established in the Pietermaritzburg and Hilton area, and therefore the leaf smut fungus (**photo 2 & 3**) was introduced into South Africa (sourced from Hawaii) as a precautionary measure to prevent this plant from becoming a serious weed in the higher rainfall, cool, parts of South Africa. This fungus was released at a single site in Hilton by Mike Morris in November 1989, and was well established at that site by April 1990. Since then neither the further spread of the weed, if any, nor the impact of the fungus have been properly monitored. Attempts are now being made to properly assess this opportunistic biocontrol introduction.

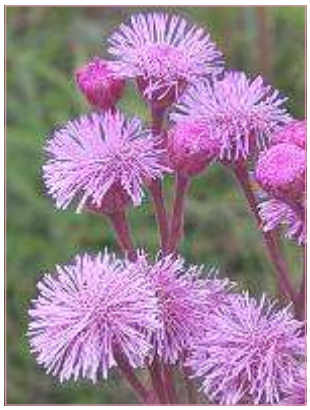


It appears that the strategy of introducing a biocontrol agent very early in the invasion stage of a weed has been highly successful, with the fungus suppressing the growth and flowering of the plant. Although the plant was found in a number of localities during recent roadside surveys in Hilton and Pietermaritzburg, at many localities there were less than 10 plants present.



There is a possibility that this plant may well be established at other localities away from the Hilton and Pietermaritzburg areas, and not be under biocontrol. The participation of the public is therefore requested to help in the search for this plant.

If you find any plants please contact Alan Wood via e-mail (wooda@arc.agric.za), giving full details of locality, date observed and your contact details. Photo's and/or GPS coordinates would be highly appreciated.



Pompom weed alert!

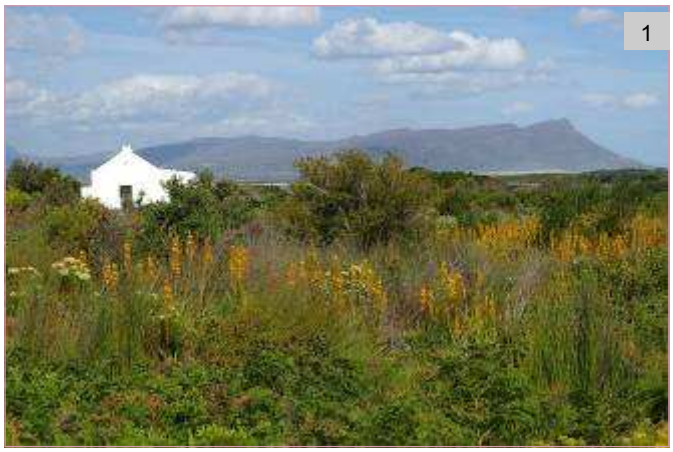
Pompom weed has started flowering in some locations. The window of opportunity to control this pernicious invader is over the next few months. Visit the pompom weed webpage at the ARC homepage: www.arc.agric.za for information on pompom weed and its control.

NEMBA regulations update

The 2nd draft of Alien and Invasive Species Regulations under the National Environmental Management: Biodiversity Act, 2004 (Act No.10 of 2004) as well as draft lists of categories of species were published in April 2009 for public comment. The Department of Environmental Affairs is currently working through the public comments. They have asked SANBI, under the leadership of Prof John Donaldson, to review the lists based on the comments received. The revised lists should be completed by mid-November and the Department will manage the process to finalize the regulations.

Invasive alien plants in the Overstrand District of the SW Cape

The Overstrand District which stretches along the coastline of the SW Cape from Gansbaai in the north to Rooiels in the south, includes the towns of Hermanus, Kleinmond, Betty's Bay and Pringle Bay. This beautiful coastline boasts some of South Africa's most beautiful scenery and irreplaceable fynbos. The biodiversity of the fynbos in this region is threatened by habitat destruction, through the burgeoning development of holiday homes and invasive alien plants.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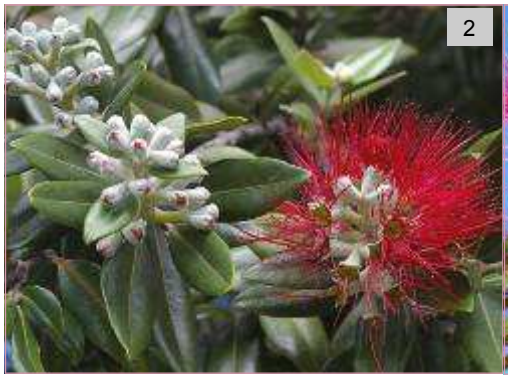
In a single small stretch of wetland in Kleinmond (**photo 1**), 18 species of alien plants were recorded. All had spread from neighbouring gardens. Species include the following:

New Zealand Christmas tree (*Metrosideros excelsa*) (**photo 2**), an ornamental tree, hedge and windbreak plant. It invades and overtops fynbos on moist, peaty soils. This is a proposed category 1 plant under NEMBA in the Overstrand District. It requires urgent control.

Australian bottlebrush (*Callistemon* sp.) (**photo 3**), with its bright red flowers. This species is one of several emerging invasive bottlebrushes in the fynbos.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Australian myrtle (*Leptospermum laevigatum*) (**photo 4**)

New Zealand flax (*Phormium tenax*)(**photo 5)**, stink bean (*Paraserianthes lophantha*) (**photo 6**), willow hakea (*Hakea salicifolia*) (**photo 7**), lantana (*Lantana camara* hort.) (**photo 8**), water cress (*Nasturtium officinale*) (**photo 9**).


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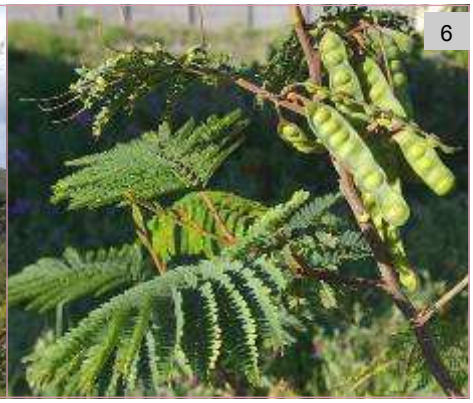
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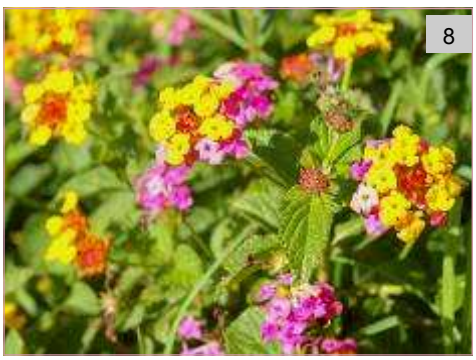
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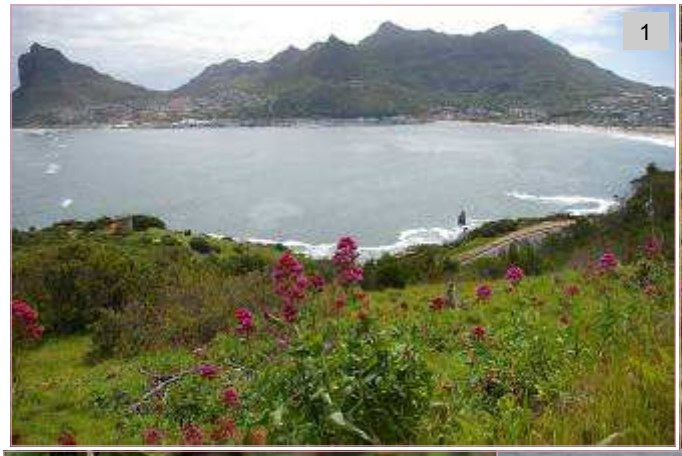
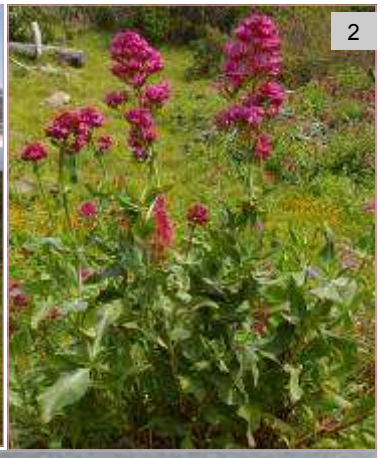
The remaining species were: black wattle (*Acacia mearnsii*), Port Jackson (*Acacia saligna*), long-leaved wattle (*Acacia longifolia*), red sesbania (*Sesbania punicea*), pampas grass (*Cortaderia selloana*), seringa (*Melia azedarach*), manatoka (*Myoporum* sp.), swamp bottlebrush (*Callistemon rugulosus*), cluster pine (*Pinus pinaster*) and bleeding-heart tree (*Homalanthus populifolius*). Kangaroo paws (*Anigozanthos flavidus*) have been cleared from the wetland but cultivated plants in a nearby holiday resort are a source of seed for further invasion (see SAPIA News No. 10 for more information on this species).

More invasive alien plants in the SW Cape

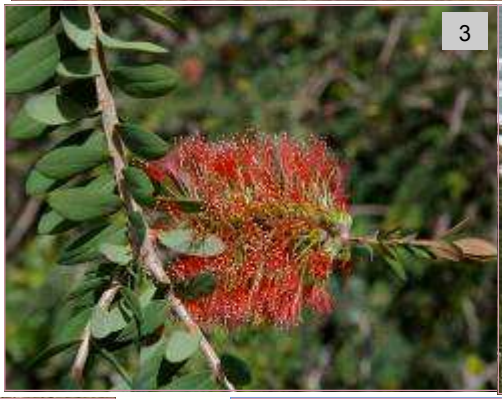
The major invasive alien plants in the SW Cape are generally well known and include several species of acacias, pines and hakeas. This page illustrates some emerging and lesser-known invasive alien plants.

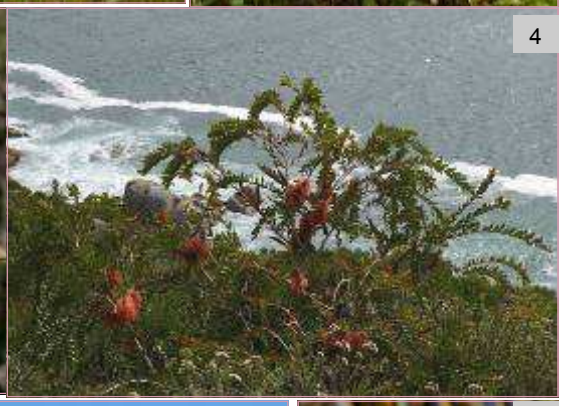




Valerian, *Centranthus ruber,* native to the Mediterranean, is a garden ornamental with pink, white or reddish flowers. **Photo 1 & 2** show it spreading on the lower slopes of Chapman's Peak- overlooking Hout Bay.

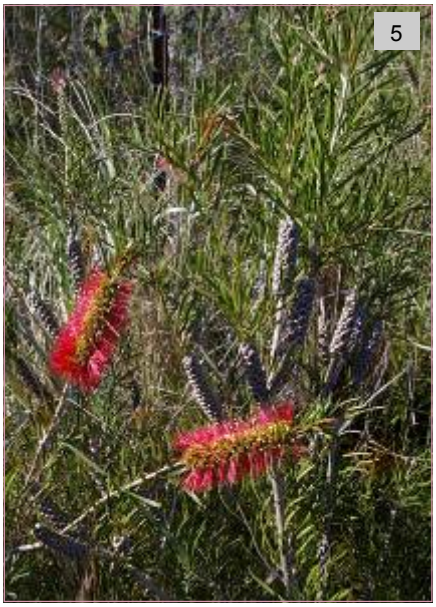
Red-flowering tea tree (*Melaleuca hypericifolia*) (**photos 3 & 4**), is naturalized in the same locality.

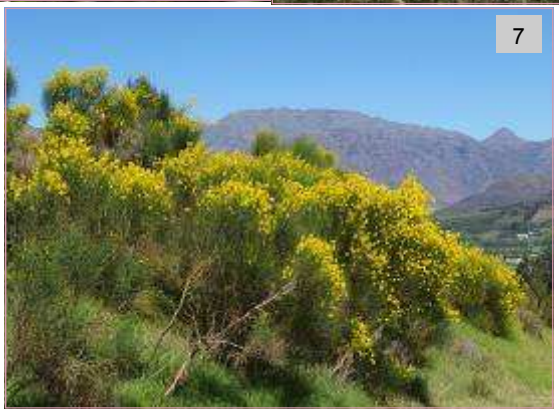


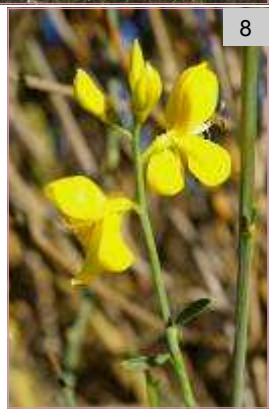


Stiff-leaved bottlebrush (*Callistemon rigidus*) (**photo 5**), and weeping bottlebrush (*C. viminalis*) are invading wetlands.

Mirror bush (*Coprosma repens*) (**photo 6**), native to New Zealand, is a garden escape in coastal districts. It is dispersed by birds.

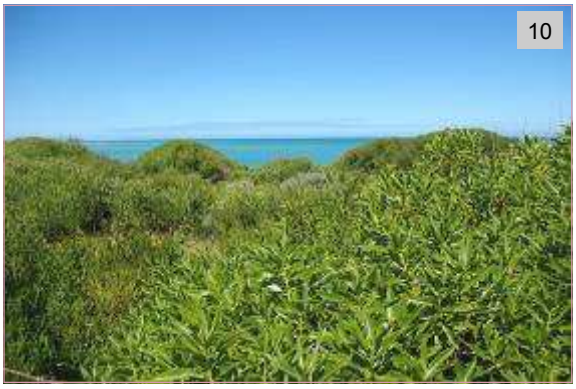






Spanish broom (*Spartium junceum*) (**photos 6 & 7**) is widespread, but still mainly confined to roadsides and should be actively controlled before it invades fynbos on a large scale.

Manatokas (*Myoporum montanum* and *M. insulare*) (**photos 9 & 10**) invade coastal bush. Photo 10 was taken at Cape Agulhas where manatokas and rooikrans (*Acacia cyclops*) form a vegetation mosaic.



Emerging ornamental weeds

Stiff-leaved bottlebrush

Stiff-leaved bottlebrush (*Callistemon rigidus*) is a stiff, erect and compact evergreen shrub which usually grows 2–3 m tall. It is native to New South Wales in eastern Australia and belongs to the eucalyptus family Myrtaceae.

Leaves are usually 30–100 mm long and 2–4 mm wide, thick and rigid, margins thickened, apex tapering to a narrow point; lateral veins generally obscure; lower surface dotted with oil glands. Flowers in crimson bottlebrush-like clusters, 70–100 mm long, anthers dark. Seeds are produced in woody capsules.

Stiff-leaved bottlebrush is cultivated as an ornamental. It is tolerant of dry and waterlogged conditions. It invades wetlands in the SW and E Cape. The photo below is between Rooiels and Pringle Bay in the SW Cape's Kogelberg Biosphere Reserve.

Broadleaf paperbark

Broadleaf paperbark (*Melaleuca quinquenervia*) is an evergreen tree with white, spongy, paper-like bark that can grow up to 20 m high. It is native to coastal eastern Australia, Papua New Guinea and New Caledonia and is in the eucalyptus family Myrtaceae.

Its leaves are evergreen, leathery, dull– to grey-green, 50–100mm long and 5–25 mm wide. The white or cream bottlebrush-like flowers measure 40–80 mm long at the end of the branchlets from late spring to autumn.

Plants reproduce from seed that are produced in small, woody capsules. Seeds are stored till some form of stress (frost, fire, herbicide application) causes the capsules to open and release millions of seeds that are dispersed by wind and water.

Broadleaf paperbark has invaded a wetland near Wolseley in the SW Cape. It is a notoriously aggressive invader of wetlands in the USA, particularly the Everglades in Florida.

Photos: E. van Wyk

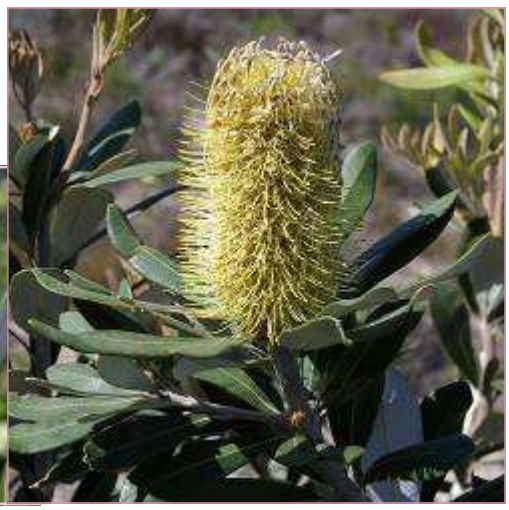
Coastal banksia

Coastal banksia (*Banksia integrifolia*) is an evergreen tall shrub or small tree 6–16 m high. It is native to south eastern Australia and belongs to the family Proteaceae.

Mature leaves are whorled, dull dark green above and silvery-white beneath, stiff, entire, 50–200 mm long. Juvenile leaves are irregularly toothed and shorter than the adult leaves. Flowers are pale yellow, in spikes 70–140 mm long. These are replaced by woody "cones" that release winged, papery seeds as soon as they are mature—and not by fire as in most other banksias.

Coastal banksia is cultivated for ornament in the SW Cape and has been recorded as spreading from cultivation at Honingklip near Kleinmond and at Pringle Bay. It will grow in moist, swampy soils as well as dry, sandy soils.

It has become weedy in W Australia and New Zealand.



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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

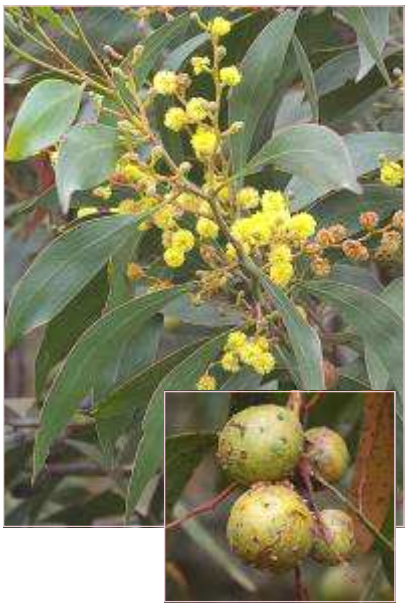
Read PPRI Newsletter No. 81 for the following news from the Weeds Research Division:

- Leaf smut appears to have controlled mistflower (*Ageratina riparia*) in KwaZulu-Natal
- Promising candidate biocontrol agents for Mexican poppies (*Argemone* spp.)

And from Biosystematics:

- The harlequin nobody finds funny—an update of an invasive alien lady beetle (*Harmonia axyridis*)

Biological control of invasive plants



Golden wattle (*Acacia pycnantha)* being controlled biologically by the bud-galling wasp (*Trichilogaster signiventris*)

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.