



Final edition  
**SAPIA NEWS**

SOUTHERN AFRICAN PLANT INVADERS ATLAS

Newsletter of the Southern African Plant Invaders Atlas, an initiative of the Weeds Research Division, Agricultural Research Council, Plant Health and Protection (ARC-PHP)

**40 years of SAPIA**

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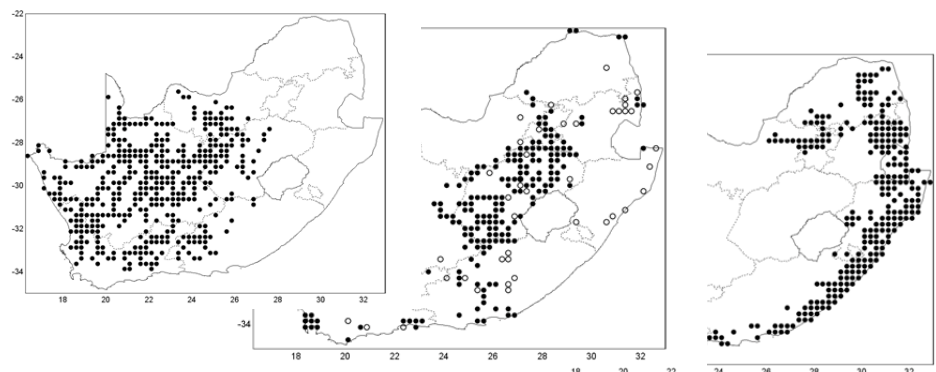
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The Southern African Plant Invaders Atlas (SAPIA), an initiative of the Weeds Research Division of the ARC-PHP was launched in 1994 but has its roots in the roadside surveys by Lesley Henderson dating back to 1979. The SAPIA database currently holds 96 000 georeferenced records of ~850 alien plant taxa growing outside of cultivation. SAPIA, under the auspices of the ARC, comes to an end in March 2020 following the retirement of the SAPIA co-ordinator, Lesley Henderson. Funding for SAPIA from the Department of Environmental Affairs has been transferred from ARC to the South African National Biodiversity Institute who is responsible for the future direction and management of the project.

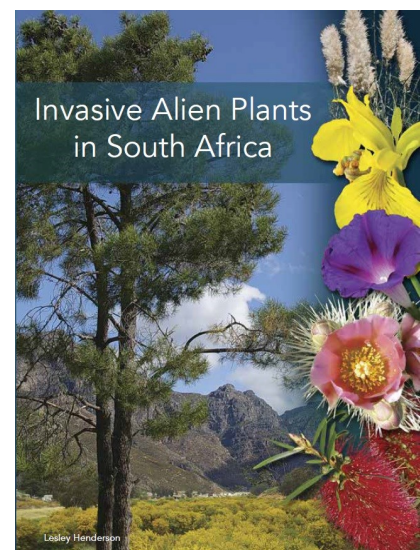
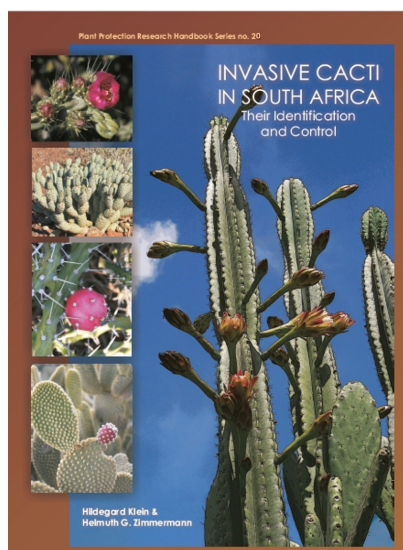
**New ARC-PPRI Handbooks**

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Articles and photos by Lesley Henderson unless otherwise acknowledged

SAPIA newsletters are posted at  
ARC website: [www.arc.agric.za](http://www.arc.agric.za) and  
Invasive Species Website:  
[invasives.co.za](http://invasives.co.za)



These books aim to create awareness of invasive alien plants in South Africa and to encourage landowners to implement measures for their control and prevention of further invasions.

## 40 years of SAPIA: a brief history

### Overview

The Southern African Plant Invaders Atlas (SAPIA) was launched in January 1994 to collate data on the distribution, abundance and habitat types of alien plants growing outside of cultivation in southern Africa. The atlas region covers primarily South Africa, and to a much lesser extent, neighbouring countries. The SAPIA database incorporates georeferenced records gathered by 710 participants since 1994, along with roadside surveys by Lesley Henderson since 1979. The species lists and distribution data in the SAPIA database have provided baseline information for national projects on invasive alien plants, such as the Natural Resources Management Programmes (NRMP) of the Department of Environmental Affairs (DEA). It has also directly contributed to the listing of invasive plants under the *Alien and Invasive Species Regulations of the National Environmental Management: Biodiversity Act*, Act 10 of 2004 (NEM:BA A&S Regulations). The SAPIA database is a useful and functioning resource for the storage, management and verification of data and as such provides support to a number of applied initiatives, including biological control and work on incursion response planning by the South African National Biodiversity Institute's Biological Invasions Directorate.

### History of roadside surveys in South Africa

Roadside surveys of invasive plants in South Africa were pioneered by Henderson and Musil (née Duggan) starting in 1979 in the central Transvaal, now Gauteng, with the remainder of the Transvaal surveyed in 1982 and 1983. Surveys of the rest of South Africa were conducted by Henderson from 1986, starting with Natal, followed by the Orange Free State, northern Cape, eastern Cape, western and central Cape, and southern and southwestern Cape being completed in May 1993.

The method used in these surveys was designed initially to make use of otherwise unproductive travelling time whilst engaged in other research projects. The method was refined as the surveys progressed until a standardized method was developed. The presence and abundance of all alien trees, large shrubs and conspicuous climbers which appeared to be naturalized or occurring outside of cultivation were recorded for each Acocks veld type category, habitat type (roadsides and adjoining veld, and streambanks) and quarter-degree (= 15 minute) square traversed by road.

Recordings of species on roadsides and in the adjacent veld were made from a moving vehicle along road transects of between 5 and 10 km long. Recordings of streambank species were made at virtually all watercourse crossings on the survey route.

From 1994 roadside surveys were adapted to meet the requirements of the Southern African Plant Invaders Atlas (SAPIA) project. Recordings were made per 5 minute square and conspicuous herbaceous species were included. Abundance ratings were estimated per 5 minute square.

### Literature on roadside surveys prior to SAPIA

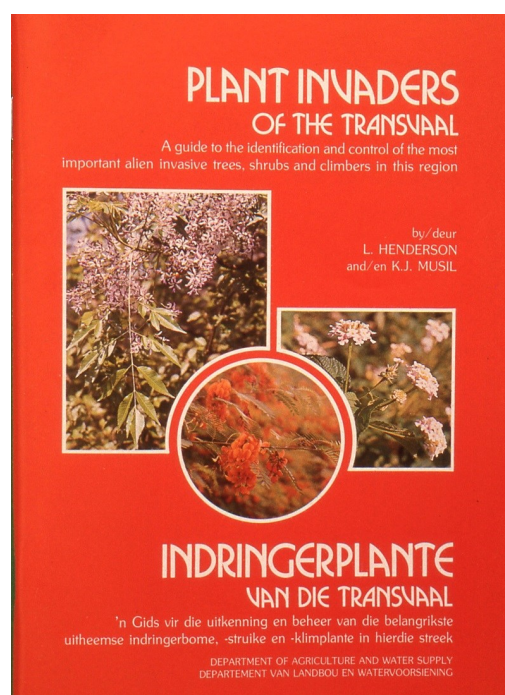
- Wells, M.J., Duggan, K.J. & Henderson, L. 1980. Woody plant invaders of the central Transvaal. *Proceedings of the third National Weeds Conference of South Africa, 1979*. Balkema, Cape Town.
- Henderson, L. & Musil, K.J. 1984. Exotic woody plant invaders of the Transvaal. *Bothalia* 15: 297–313.
- Henderson, L. & Musil, K.J. 1987. *Plant invaders of the Transvaal*. Bulletin 412, Department of Agriculture and Water Supply, Pretoria, 71pp.
- Henderson, L. 1989. Invasive alien woody plants of Natal and the north-eastern Orange Free State. *Bothalia* 19: 237–261.
- Henderson, L. 1991a. Invasive alien plants of the Orange Free State. *Bothalia* 21: 73–89.
- Henderson, L. 1991b. Invasive alien woody plants of the northern Cape. *Bothalia* 21: 177–189.
- Henderson, L. 1992. Invasive alien woody plants of the eastern Cape. *Bothalia* 22: 119–143.
- Henderson, L. 1998. Invasive alien woody plants of the southern and southwestern Cape region, South Africa. *Bothalia* 28: 91–112.

“SAPIA is one of the best atlas projects for alien plant species anywhere in the world and a major national asset for monitoring biodiversity threats.”

“Long-term sustainable funding and hosting of SAPIA is a priority.”

Wilson, J.R.U., Gaertner, M., Richardson, D.M. & van Wilgen, B.W. 2017. Contributions to the National Status Report on Biological Invasions in South Africa.

*Bothalia* 47(2), a2207. <https://doi.org/10.4102/abc.v47i2.2207>



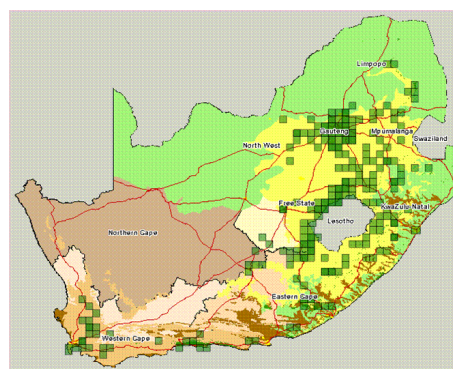
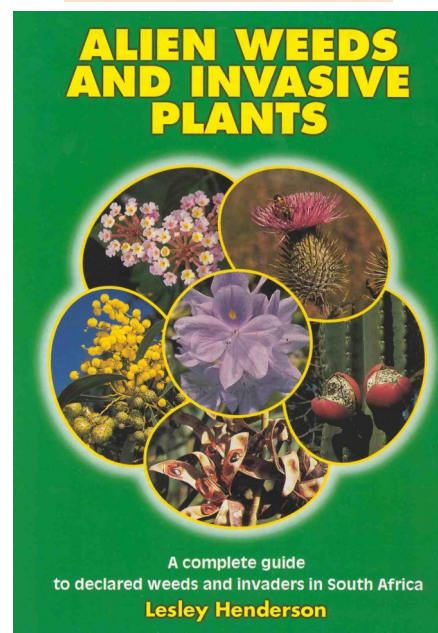
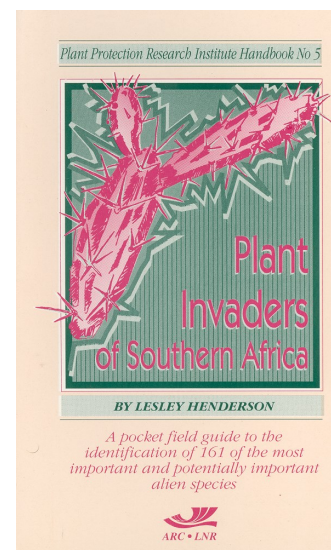
## 40 years of SAPIA: a brief history

### The Southern African Plant Invaders Atlas mapping project (SAPIA)

SAPIA was modelled on the very successful South African Bird Atlas Project (SABAP) which was launched in 1986. SAPIA was launched in January 1994 and its aim was to collate information on the distribution, abundance and habitat types of invasive and naturalized alien plants in southern Africa. The first phase of SAPIA, involving volunteer participants, was scheduled for a five-year period, ending in December 1998. A pocket field guide, "Plant invaders of southern Africa", was compiled to help with the identification of all listed species. SAPIA Newsletters were posted to all participants on a quarterly basis.

The atlas region covered South Africa, Lesotho and Swaziland. Information was recorded on two standardized atlas sheets, with slightly different species lists, covering the western and eastern halves of the atlas region. One hundred plant taxa were listed on each sheet, with a combined total of 161 species.

SOUTHERN AFRICAN PLANT INVADERS ATLAS S A P I A		SOUTHERN AFRICAN PLANT INVADERS ATLAS S A P I A		Codes	ABUNDANCE (maximum)
Please return this sheet to S A P I A Co-ordinator Private Bag X101 Pretoria 0001		Please return this sheet to S A P I A Co-ordinator Private Bag X101 Pretoria 0001		more than one code per line is acceptable	<b>P Present</b> abundance uncertain <b>R Rare</b> /one sighting of one or a few plants <b>O Occasional</b> /a few sightings of one or a few plants
To be filled in by observer		To be filled in by observer		<b>HERBACEOUS</b>	Circle codes e.g. (P)
To be filled in by observer		To be filled in by observer		<i>Ageratina adenophora</i> (= <i>Eupatorium adenophorum</i> ) crofton-weed 09901	P R O F A V Fo Sa Gr Ka Fy Tr Rr Ha Pl Ar Pa Ws Wc Wt Dr Kl Ro Ds
To be filled in by observer		To be filled in by observer		<i>Ageratum</i> † ‡ <i>conyzoides</i> ‡ <i>houstonianum</i>	P R O F A V Fo Sa Gr Ka Fy Tr



After phase one the SAPIA project lost momentum due to lack of funding. However, publication of the updated field guide, "Alien weeds and invasive plants", helped stimulate participation in the project and participants continued to submit records to SAPIA.

### Weeds and Invasive Plants website (WIP)

In 1998 the SAPIA database was identified at a workshop commissioned by the Department of Agriculture as the starting point for the development of a national information system for the management of invasive alien plants. It was incorporated into **AGIS (Agricultural Georeferenced Information System)** in 2000 but only a limited amount of information could be accessed at the **Weeds and Invasive Plants website**.

The SAPIA project was revived in 2005 with funding from the Department of Water Affairs and Forestry's Working for Water Programme. One of its main objectives was to make all the SAPIA data available online at WIP. From 2005 to 2010 the functionality of the SAPIA database was improved and access to data was made possible at the WIP website. The following information was made available:

Distribution data (at the ¼ degree (15 minute) square level) for all species

Six standardized reports:

Species lists per southern African country (RSA, Lesotho, Swaziland, Namibia, Botswana, Zimbabwe, Zambia, Mozambique, Malawi),

Species lists per province in South Africa

Species lists per ¼ degree square

Lists of ¼ degree squares per species

Mini reports for all species

Mini reports for all ¼ degree squares

Virtual herbarium with fact sheets, photographs and line drawings of 260 species

Distribution maps in relation to various environmental variables

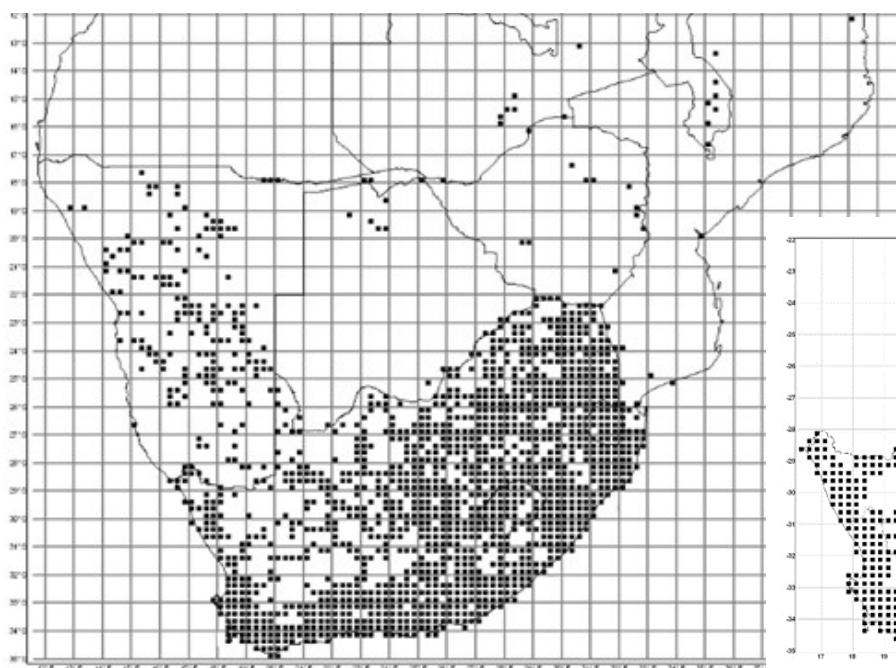
WIP provided a user-friendly template for online public submission of records (these records would be held in a holding file until verified by Lesley Henderson). A template for submission of batches of records was also made available. Lesley Henderson had direct access to the SAPIA data at WIP where the records could be managed online. By March 2010 the Weeds and Invasive Plants (WIP) website [www.agis.agric.za/wip/](http://www.agis.agric.za/wip/) was the most frequently visited website on AGIS.

Operational problems within AGIS eventually led to the complete cessation of all activities and closure of WIP by 2013.

## 40 years of SAPIA: a brief history

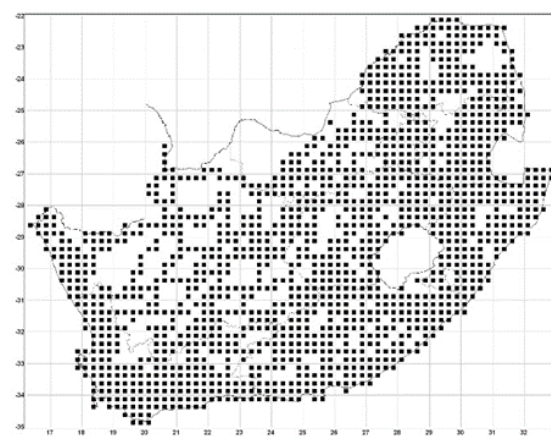
Following the demise of WIP, SAPIA phase two records proceeded with the electronic submission of records by e-mail. A standardized recording form was designed for submission of records. However records were also received in various formats. Quarterly SAPIA Newsletters were sent by e-mail to participants and posted at the ARC and Invasive Species South Africa websites.

SAPIA phase two continued until 2016 with funding from DWAF and thereafter funding was received from the National Resource Management Programmes (NRMP) of the Department of Environment Affairs with the decision to channel funds through the South African National Biodiversity Institute (SANBI) from April 2018.



SAPIA participants 1994 – 2019; ~33 500 records in 1 519 QDS

Up to December 2019 SAPIA had received ~ 33 500 records from 710 participants. Henderson surveys contributed ~ 62 500 records.



Henderson surveys from 1979 – 2018; ~62 500 records in 1 427 QDS

### What is the future of SAPIA?

A SAPIA strategic planning meeting was held from 22–24 May 2018 at SANBI in Pretoria to develop proposals for the future of SAPIA and how it can continue to contribute to efforts to monitor and report on the state of plant invasions, and ultimately to assist management. Twenty seven people from nine different organizations attended. Key issues for discussion at the meeting were: current and potential users of SAPIA; products and services which can be provided; issues to be resolved; potential areas for growth; scenarios to achieve the above.

Further discussions and negotiations about the future of SAPIA are yet to occur.

### Some literature relating to SAPIA

Henderson, L. 1998. Southern African Plant Invaders Atlas (SAPIA). *Applied Plant Sciences* 12: 31,32.

Henderson, L. 1999. The Southern African Plant Invaders Atlas (SAPIA) and its contribution to biological weed control. *African Entomology Memoir* 1:159–163.

Henderson, L. 2001. *Alien weeds and invasive plants*. Plant Protection Research Institute Handbook No. 12. Agricultural Research Council, Pretoria.

Henderson, L. 2006. Comparisons of invasive plants in southern Africa originating from southern temperate, northern temperate and tropical regions. *Bothalia* 36: 201–222.

Henderson, L. 2007. Invasive, naturalized and casual alien plants in southern Africa: a summary based on the Southern African Plant Invaders Atlas (SAPIA). *Bothalia* 37,2: 215–248.

Henderson, L. 2011. Mapping of invasive alien plants: The contribution of the Southern African Plant Invaders Atlas (SAPIA) to biological weed control. *African Entomology* 19(2): 498–503.

Henderson, L. & Wilson, J.R.U., 2017, 'Changes in the composition and distribution of alien plants in South Africa: An update from the Southern African Plant Invaders Atlas', *Bothalia* 47(2), a2172. <https://doi.org/10.4102/abc.v47i2.2172>

## ARC-PPRI Handbooks No. 20 and 21

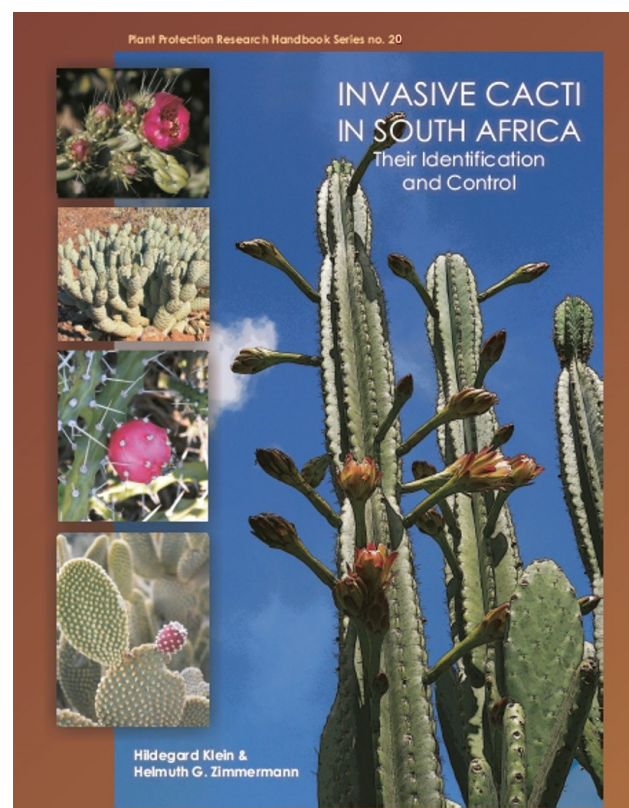
### ARC-PPRI Handbook No. 20

#### **Invasive cacti in South Africa: Their identification and control.**

Authors: Hildegard Klein & Helmuth Zimmermann

This book will enable landowners to identify the currently known invasive cacti in South Africa, using ample colour photographs and language appropriate to non-scientists. It discusses in detail 33 species covered by the Alien and Invasive Species Regulations of the National Environmental Management: Biodiversity Act (NEM:BA), as well as briefly illustrating 6 emerging invaders. The most important groups of indigenous plants that are sometimes mistaken for cacti, are also illustrated.

The best management strategy is recommended for each of the invasive cactus species. It also explains the science of biological control in simple terms, indicating which biocontrol agents are available for use against each cactus species, and with enough details to enable landowners to employ them successfully against their own cactus weeds. A supplementary reading list, as well as a list of useful contact details, is included.



### ARC-PPRI Handbook No. 21

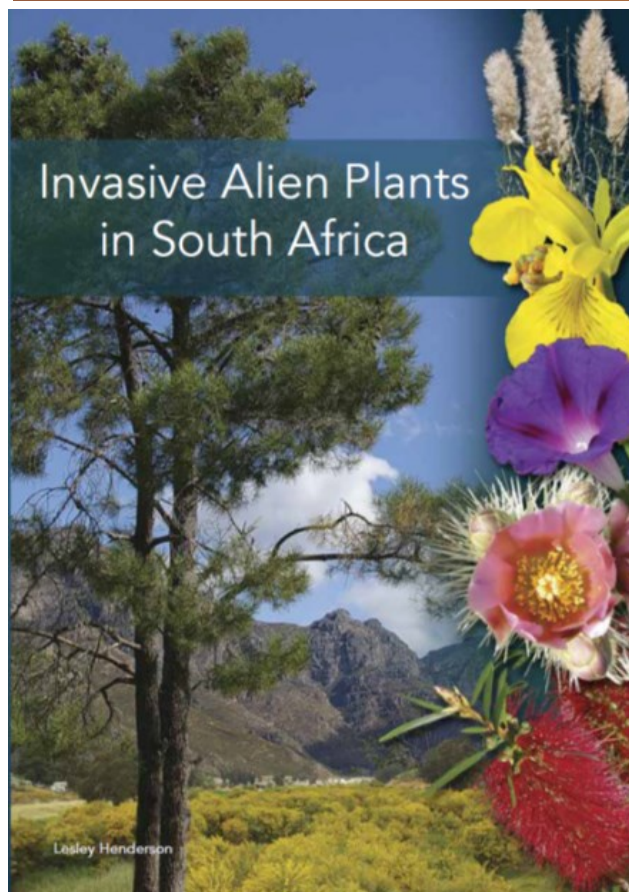
#### **Invasive alien plants in South Africa**

Author: Lesley Henderson

This book provides descriptions, distributions and illustrations of more than 400 species and includes all listed invasive plant species that are covered by the Alien and Invasive Species Regulations of the National Environmental Management: Biodiversity Act (NEM:BA) (10/2004).

Each species account includes its legal and invasive status, biological control if available, region of origin, cultivated uses, habitats invaded, potential threats or impacts and other harmful properties.

A quick guide to identification is provided inside the back cover for the following major groups of plants: Grasses, Reeds & Grass-like plants; Aquatic & Wetland plants; Marine plants; Herbs; Climbers & Scramblers; Trees & Shrubs.



The books should be available from March 2020.

For these and other ARC-PPRI publications contact:

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Tel: 012 808 8000/8118 or  
[Booksales@arc.agric.za](mailto:Booksales@arc.agric.za)

<http://www.arc.agric.za/arc-ppri/Documents/Products%20and%20Services/PHP%20Booklist.pdf>

## Summary of contents of 55 editions of SAPIA News

### SAPIA phase II:

Launch (1), achievements of first 5 years and plans for next 5 years (15), Forty years of SAPIA (55)

### Weeds and Invasive Plants (WIP) website:

Progress and available information (4), more reports available (8), extension to rest of Africa (8), problems (17), factsheets and photos of about 600 plant species can be found at this website: [www.agis.agric.za/wip](http://www.agis.agric.za/wip) (31, 32), AGIS/WIP website no longer functional (33)

### Legislation:

New and revised (1), CARA revised regulations almost ready for public comment: new categories—1a,1b, 2, 3, surveillance, prohibited (4), progress with NEMBA and CARA (7), NEMBA regulations published for public comment (11), NEMBA regulations update (13), High Court action against Government (27), interim regulations and invasive species lists published under NEMBA in July 2013 (30)

### Legislation (NEMBA: alien and invasive species):

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### Regional invasions:

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### Guides to identification:

Acacias (8), aquatics (17), cacti (25), eucalypts (12), *Rubus* (brambles, blackberries) (19), Solanaceae—invasive, berry-producing *Cestrum* and *Solanum* spp. (20), comparison of rubber vines (*Cryptostegia grandiflora* & *C. madagascariensis*) (32), mother-in-law's tongue (*Sansevieria* species) (37), weedy alien melastomes (*Heterocentron subtriplinervium*, *Melastoma candidum*, *Tibouchina mutabilis*, *Tibouchina urvilleana*) (39), varieties of small round-leaved prickly pear (*Opuntia engelmannii*) (author: Nic Venter) (54)

### Pompom weed (*Campuloclinium macrocephalum*):

Description (1), killed by rust fungus (2), threats to Waterberg (2), more threats to grasslands (3), webpage (4), updates (4, 5, 6, 7, 11), distribution update (7), chemical and biological control (7), herbicides registered (9), progress with control (10), in KZN Drakensberg (14), swift action against pompom weed in KZN (15), national plan of action by SANBI's EDRR programme (15), release of first biological control agent (author: Andrew McConnachie) (31), progress with biological control (author: Liamé van der Westhuizen) (35), spread from 2000 to 2016 (41), an update on biological control (author: Liamé van der Westhuizen) (39 and 52)

### Ornamentals and gardening:

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### Biological control:

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### New ARC-PPRI handbooks:

*Invasive cacti in South Africa: Their identification and control*. Plant Protection Research Institute Handbook No. 20 (authors: H. Klein & H.G. Zimmermann) (55)

*Invasive alien plants in South Africa*. Plant Protection Research Institute Handbook No. 21 (author: L Henderson) (55)

## Summary of contents of 55 editions of SAPIA News

### SANBI'S Invasive Species Programme (EDRR)/Biological Invasions Directorate (BID) news and alerts:

- Launch (9), Cactus Working Group (25),
- Ant tree (*Triplaris americana*) (author: R. Lalla) (15)
- Silver vine (*Epipremnum aureum*) (author: H. Sithole) (23)
- Water poppy (*Hydrocleys nymphoides*) (author: H. Sithole) (27)
- Mauritius hemp (*Furcraea foetida*) (author: R. Lalla) (27)
- Yellow Himalayan raspberry (*Rubus ellipticus*) (authors: Reshnee Lalla & Michael Cheek) (31)
- Fringed wattle (*Acacia fimbriata*) (author: Kanyisa Jama) (31)
- Velvet bur cactus (*Opuntia pubescens*) (author: Dan'sile Cindi) (32)
- SANBI's invasive species programme: winter rainfall region, Western Cape (author: Ernita van Wyk) (33)
- Goldenrods (*Solidago* spp.) in KwaZulu-Natal (authors: Jesse Kalwij and Michael Cheek) (34)
- Kudzu vine (*Pueraria montana* var. *lobata*) (author: Bongani Mashele) (36)
- Strangler cactus (*Harrisia balansae*) (author: Peter Shisani) (36)
- Bilberry cactus (*Myrtillocactus geometrizans*) (author: Peter Shisani) (36)
- Skeleton weed (*Chondrilla juncea*) (author: Sihle Manzama) (37)
- Snake cactus (*Peniocereus serpentinus*) (author: Peter Shisani) (38)
- Yellow flag (*Iris pseudacorus*) (author: Thuli Jaca) (40)
- Clusia rosea* (pitch apple, autograph tree) Family Clusiaceae (authors: Reshnee Lalla & Michael Cheek) (42)
- Hypericum pseudohenryi* (Henry's St. John's wort) Family Clusiaceae (authors: Reshnee Lalla & Michael Cheek) (42)
- Paulownia tomentosa* (empress tree, princess tree) Family Scrophulariaceae (authors: Reshnee Lalla & Michael Cheek) (42)
- Red-flowering tea tree (*Melaleuca hypericifolia*) (authors: Nolwethu Jubase & Ernita van Wyk) (43)
- Beautiful, but invasive European gorse (*Ulex europaeus*) (author: Kanyisa Jama) (44)
- Chinese hollygrape (*Mahonia oiwakensis*): newly detected weed (author: Thulisile Jaca) (45)
- Coral cactus (Afr. wolkactus) (*Austrocylindropuntia vestita*): first record in the Eastern Cape, South Africa (author: Kanyisa Jama) (45)
- Blueberry ash (*Elaeocarpus angustifolius*): is it another water-guzzling invasive tree? (authors: Moleseng Claude Moshobane, Nyiko Mthembi & Mukundi Mukundamago) (46)
- Mexican sunflower (*Tithonia tubaeformis*): a new threat to food security in South Africa (authors: Bongani Mashele, Constance Mafuwane, Moleseng Claude Moshobane & David Simelane) (46)
- See it! Report it! Charm is deceitful. Behold a potential invader, red sage (*Salvia coccinea*) (authors: Moleseng Claude Moshobane & Nyiko Gift Mutileni) (47)
- Beyond the looks. Bear's breeches (*Acanthus polystachius*), a potential invader (authors: Mukundi Mukundamago, Samuel Adu-Acheampong, Moleseng Claude Moshobane & Daisy Ramantshwane) (47)
- Thank you for reporting alien species SANBI DBI (inland) appreciates your efforts (author: Moleseng Claude Moshobane) (48)
- Green honey myrtle (*Melaleuca diosmifolia*) (authors: Siviwe Lamani & Nolwethu Jubase Tshali) (53)
- Port Jackson pine or Oyster Bay pine (*Callitris rhomboidea*) (SANBI BID W Cape) (53)
- Prickly paperbark or paperbark myrtle (*Melaleuca styphelioides*) (SANBI BID W Cape) (53)
- Spiral ginger (*Costus afer*) (SANBI BID KZN) (53)
- An innovative approach to achieve extirpation of bur cactus (*Opuntia salmiana*) in South Africa (author: Nkhangweleni Sikhauli) (54)
- Have you seen the ivy-leaf morning glory (*Ipomoea hederifolia*)? (author: Moleseng Moshobane) (54)

## Summary of contents of 55 editions of SAPIA News

### More alerts:

Nassella tussock threatens you! (*Nassella trichotoma*) (16)

Small salvinia (*Salvinia minima*)—a new aquatic invader (24)

The search is on for mistflower (*Ageratina riparia*) (author: A. Wood) (13)

Invasive fountain grass (*Pennisetum setaceum*) (30)

Rubber vine (*Cryptostegia grandiflora*) (32)

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Needle bush, *Vachellia farnesiana* (= *Acacia farnesiana*) naturalized in central KwaZulu-Natal (author: Richard Boon) (43)

More newly recorded species in the SAPIA database —elephant's foot (*Elephantopus mollis*), Himalayan knotweed (*Persicaria wallichii*), bracelet honey myrtle (*Melaleuca armillaris*), bridal bouquet (*Poranopsis paniculata*) (45)

Invasive torch cactus (*Trichocereus spachianus*) and look-alikes in South Africa —snake cactus (*Nyctocereus serpentinus* (= *Peniocereus serpentinus*)), Argentine giant cactus (*Trichocereus candicans*), red torch cactus (*Trichocereus huascha*), Easter lily cactus (*Echinopsis oxygona*) (47)

Kikuyu grass (*Pennisetum clandestinum*), teddy bear cactus (*Opuntia microdasys*), sword fern (*Nephrolepis cordifolia*), starwort/white wandering Jew (*Tradescantia fluminensis*), blue periwinkle (*Vinca major*) (48)

Invasive water lilies and look-alikes in South Africa —yellow water lilies (*Nymphaea mexicana* and hybrids), water poppy (*Hydrocleys nymphoides*), fringed water lily (*Nymphoides peltata*) (49)

Ox-eye daisy (*Leucanthemum vulgare*) is a potential threat to agriculture and biodiversity (52)

Blueberry ash (*Elaeocarpus angustifolius*) control at Westfalia Estate, Modjajiskloof, Limpopo Province (author: H.G. Zimmermann) (52)

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