

Maximising benefits and minimising harm associated with invasive introduced trees: lessons from South Africa

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Early European settlers confronted by
a largely treeless landscape.....





Issues

- Trees introduced for timber, as ornamental plants, and for fodder, firewood, fruit, shade, and windbreaks
- Recently seen as important to sequester carbon.
- Widely perceived as environmentally beneficial.
- Several species can and do become invasive, with negative impacts that can exceed the value of any benefit.
- This often leads to conflict.

Plantations dominate landscapes in some areas



Impacts

- Surface water runoff
- Groundwater depletion
- Reductions in biodiversity
- Reduced grazing capacity
- Increased fire risk
- Decreased quality of life in invaded rural areas

North American and European pines



Australian *Acacia* species



Australian Eucalypts



North American *Prosopis* species



Jacaranda mimosifolia (South America)

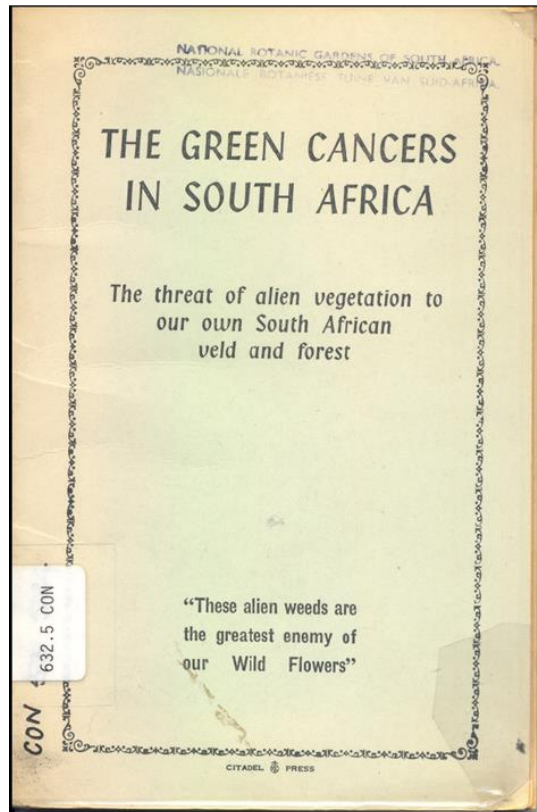


Willows (*Salix* species)



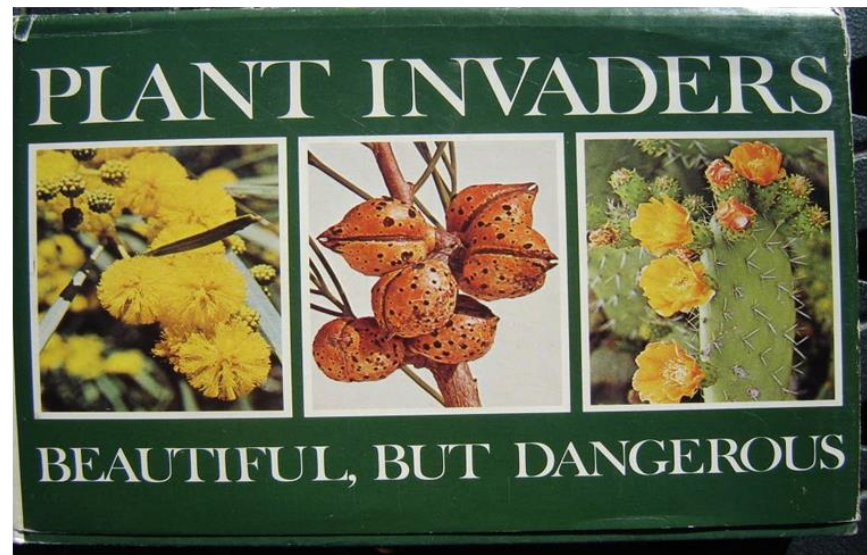
Invasive alien tree management

- Only control those species that are demonstrably harmful
- We have been doing this since the 1960s
- What lessons have we learnt?



← 1959

1978



Control requires long-term, focussed commitment.

2007



2016





Contents lists available at ScienceDirect

Journal of Environmental Management

journal homepage: www.elsevier.com



Research article

An assessment of the effectiveness of a long-term ecosystem restoration project in a fynbos shrubland catchment in South Africa

Jennifer M. Fill^{a,*}, Greg G. Forsyth^b, Suzaan Kritzing-Klopper^a, David C. Le Maitre^b, Brian W. van Wilgen^a

Biological control is safe, and often essential.

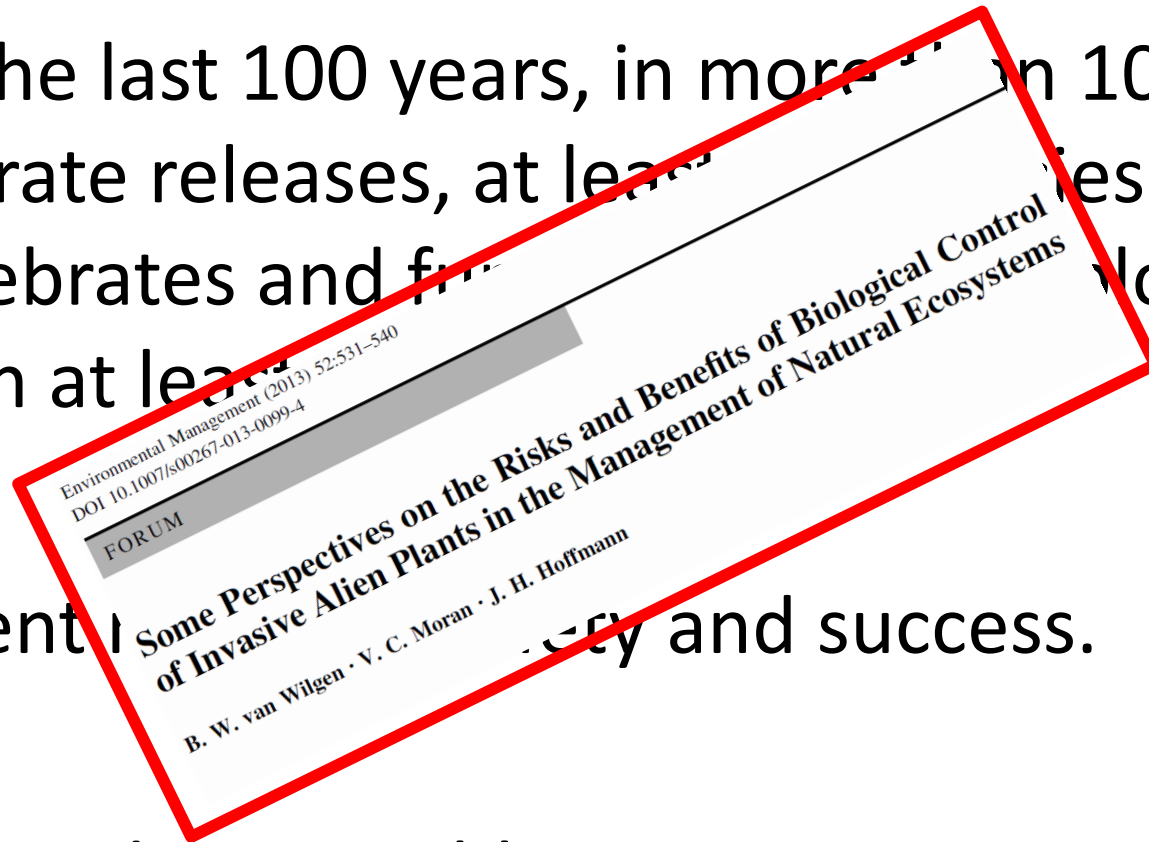


Released 2004

Where it now occurs
100% seed reduction

Extent of weed biological control

- Over the last 100 years, in more than 1050 deliberate releases, at least 100 species of invertebrates and fungi have been employed for WBC in at least 100 countries.
- Excellent record of success.
- Cheap and sustainable



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Conservationists want a 100ha forest in the Helderberg Nature Reserve chopped down, but nature-lovers have baulked at the idea.

Insight, part of a Special Feature on Urban ecological and social-ecological research in the City of Cape Town

Evidence, Perceptions, and Trade-offs Associated with Invasive Alien Plant Control in the Table Mountain National Park, South Africa

Brian W. van Wilgen^{1,2}

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Brian W. W. 2012. Evidence, perceptions, and trade-offs associated with invasive alien plant control
in the Table Mountain National Park, South Africa. Ecology and Society 17(2): 23.

<http://dx.doi.org/10.5751/E5-04590-170223>

On the way out: The pine forest in the Heidelberg Nature Reserve is especially popular with walkers and joggers, many of whom are shocked to hear the trees are on the chopping block.

It's too late to save the trees.

~~shout for shade.~~

WHERE WAS COUNCIL

Many local residents are furious with the City Council for not intervening in the selling process when it became plainly obvious that two of Cape Town's most beautiful recreational areas were being wiped off the map. Were they blind to the consequences? Or did they simply not care?

WE SEEK A COMPROMISE

The heading banner giving for the destruction of the trees wrote last year: "I am sure that only 1% of people support the removal of plantations." Yet, even those involved admit privately that their policy does not have the support of the majority of the public.

Our objective is to enter into a civilised discussion with TNMP and the City Council, with a view to achieving a solution whereby a reasonable part of the mountain is replanted with native trees.

We believe that if the people of Cape Town can live together harmoniously despite diversity of race, colour and creed, then plants can too.

- We call upon **State Mountain National Park** to change the policy of permanent destruction of the shrubs from areas in **Yukon** and **Cecilia**, and to report large shrub stands.
- In the meantime, until this policy is established, we request that the present holding of prices be stopped immediately.
- Finally any satisfactory response, we call upon the **City of Yukon** to take over the management of **Yukon** and **Cecilia** in the interests of the **City of Cape Town**. There are already some in the **City** who are in favour of this, and we shall initiate a campaign to support the **City** in taking over these areas. **Yukon** we believe the **City** will manage these areas in accordance with the deliberate wishes of the majority of the citizens who use the mountain.

If you lived the shade of **Yukon** and **Cecilia** and want to see the shrub stands replanted, join the "Shrub Up Yukon" movement. In 2008 over 1,500 supporters in favour of shrub stands were obtained in just two months. The Park authorities apparently dismissed this expression of heartfelt public feeling.

Let your voice be heard - send an email to: travis@goforit.co.za
Copies of your emails will be forwarded to the Management of
Table Mountain National Park automatically.

SHOUT FOR SHADE

Nick Moulton, Helen and Arnold Moulton, Professor Eugene Moll, Stephen O'Malley, Pamela and Robert Page, F Paul, Subject and George Pearsman, Christopher Reader, Grace Samard, Karen Tate, Jonathan Schrey, Denis and John Scott, Bernie Suppaman, Andrew Sudell, Annette Swan, Kevin Lee Hovsey, R's Shummers, Chels Thomas, Christina Trowbridge, F and J Turner, Mike and Bill Turnley, Mabel Vercammen, Mary and David Vetter, Annette Vetter Landolt, Francis Warren, Alison Webb, Geoffrey Williams

Introductions have often been misguided.



Prosopis trees

Introduced by governments and “Aid” agencies to provide fodder in arid areas



Became invasive, now dominates huge areas with substantial negative impacts on water, grazing, biodiversity and human livelihoods



Prosopis species

Net value

+

0

-

Livestock fodder
benefits grow

Widespread benefits
limits on
biological

road and
from
origins

Biol Invasions (2014) 16:721-734
DOI 10.1007/s10530-013-0615-8
ORIGINAL PAPER

**Challenges and trade-offs in the management of invasive
alien trees**

Brian W. van Wilgen · David M. Richardson

predicts predicted
positive benefits

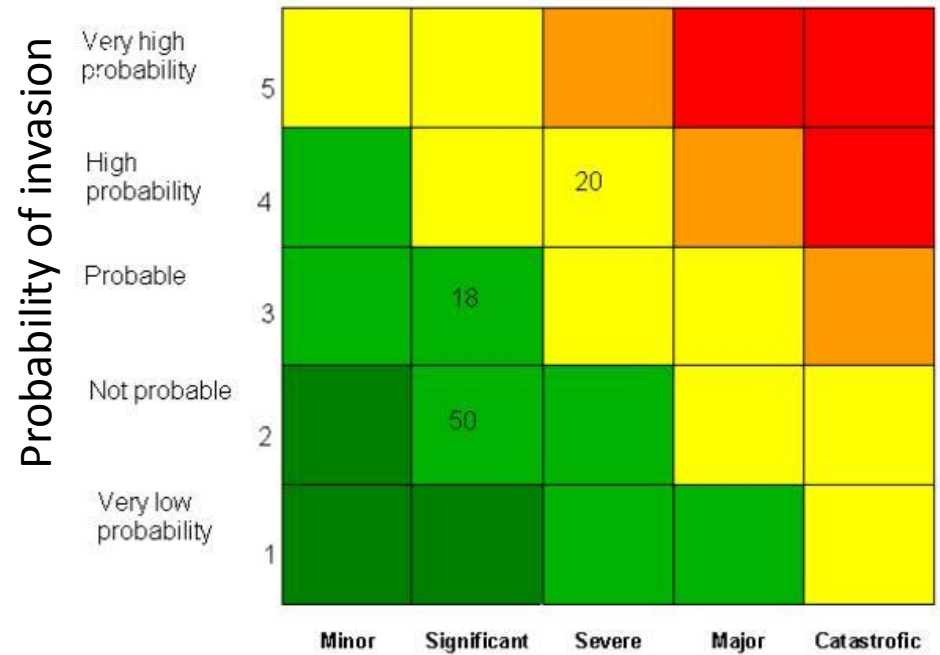
1860

Date

2010

Challenges and trade-offs in the management of invasive
alien trees

Look before you leap.



Consequences of invasion

Develop an innovative regulatory environment.

WANTED: All illegal invader plants and weeds



Every South African citizen has a responsibility to combat invader plants and weeds

Did you know that some of the plants in your garden or on your farm land are illegal and will be declared unwanted in South Africa in the very near future?

These plants cause damage to our natural resources. YOU can help to fight declared weeds and invader plants by eradicating/controlling these plants on your land.

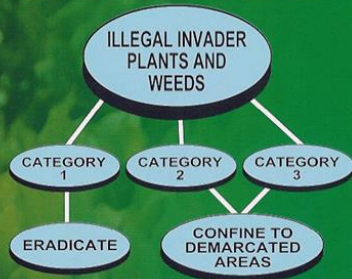
What is Government's position on invader plants?

The National Department of Agriculture recently published new draft regulations on the control of weeds and invader plants. Regulations 15 and 16 of the Act on Conservation of Agricultural Resources, 1983 (Act no 43 of 1983) list the plants which are defined as weeds and invader plants. The regulations allow government to enforce the eradication/control of invader plants and weeds. Since these plants are spreading at an alarming rate, it became increasingly important to revise the regulations.

Proposed amendments to Regulations 15 and 16 dealing with declared weeds and invader species were published for public comment before 31 March 2000, pending promulgation later on this year.

A total of 152 species are to be included in the amended regulations.

Regulations 15 and 16 provide for three categories of invader plants and weeds:



CATEGORY ONE PLANTS (Weeds)

These plants are to be declared as weeds and must be eradicated where they occur. No trading of these plants is to be allowed.



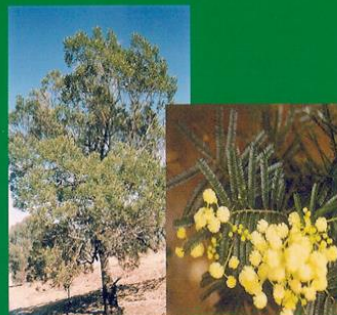
Lantana

Some examples are:

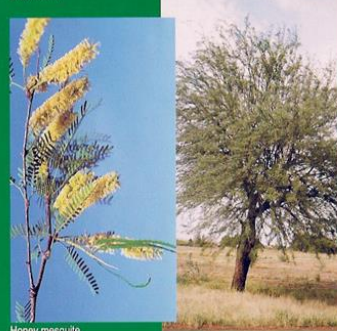
- Bugweed (*Solanum mauritianum*)
- Mauritius thorn (*Caesalpinia decapetala*)
- Trifid weed (*Chromolaena odorata*)
- Lantana (*Lantana camara*)
- Rock hakea (*Hakea gibbosa*)
- Queen of the night (*Cereus jamacaru*)
- Perekia (*Pereskia aculeata*)
- Water hyacinth (*Eichhornia crassipes*)
- Jointed cactus (*Opuntia aurantiaca*)

CATEGORY TWO PLANTS (Commercial invader plants)

These plants have recognised commercial value, provided they are grown under controlled conditions. Trading with these plants and its products is allowed.



Black wattle



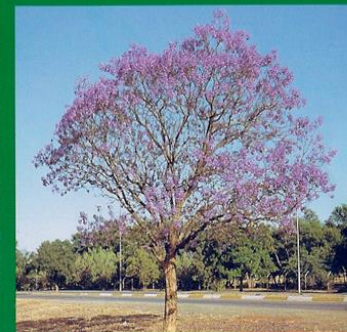
Honey mesquite

Some examples are:

- Black wattle (*Acacia Mearnsii*)
- Honey mesquite (*Prosopis glandulosa*)
- Bluegum (*Eucalyptus spp*)
- Pine spp (*Pinus spp*)
- Poplar spp (*Populus spp*)
- Silver wattle (*Acacia dealbata*)
- Bramble (*Rubus fruticosus*)

CATEGORY THREE PLANTS (Ornamental invader plants)

These plants are mainly used for ornamental purposes in demarcated areas. Trading with these plants will no longer be allowed.



Jacaranda

Some examples are:

- Giant reed (*Arundo donax*)
- Show-berry bushes (*Cotoneaster spp*)
- Syringa (*Melia azedarach*)
- Jacaranda (*Jacaranda mimosifolia*)
- Guava (*Psidium guineense*)

Why are these plants so dangerous?

- Increase fire and erosion risk
- Cause loss of biodiversity
- Use more water than indigenous plants
- Out-compete natural vegetation
- Desertification in arid areas
- Replace valuable grazing and agricultural land

For more information, please contact:

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Provide support for research

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Invasion science for society: A decade of contributions from the Centre for Invasion Biology

South African Journal of Science
<http://www.sajs.co.za>

Biological invasions are a growing problem worldwide. In 2004, the South African Department of Science and Technology, through the National Research Foundation, established a Centre of Excellence for Invasion

- Research investment has provided a considerable contribution to capacity in the field of biological invasions.
- The knowledge generated has been used to inform policy and improve management practices at national and local levels

Raise awareness

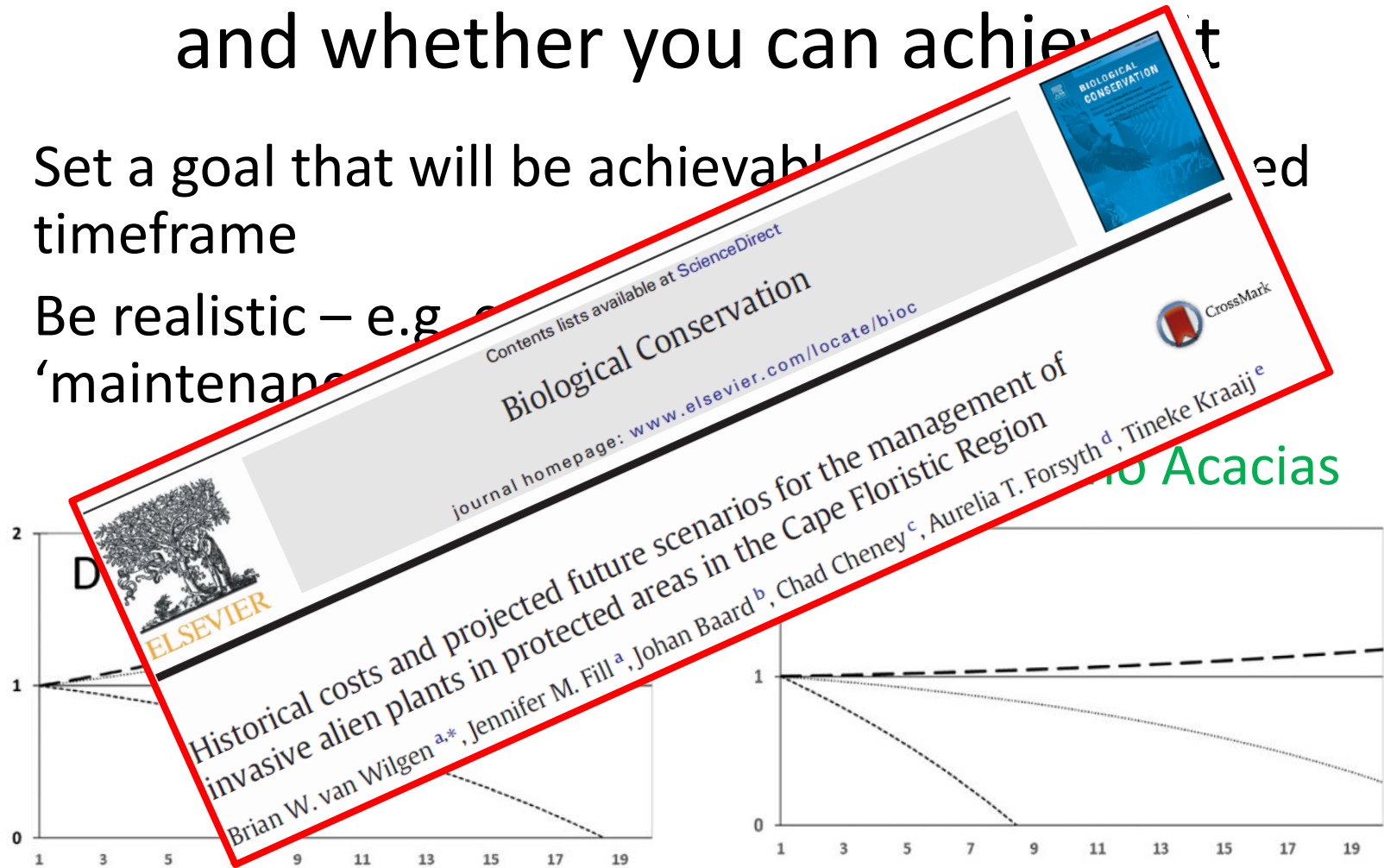
- Target key audiences
 - Nurseries that grow and sell plants
 - Forestry companies
 - Landscape architects
 - Government officials who make decisions to permit or plant trees
 - Gardeners



Yes, but be careful what you plant!

Be clear about what you want to achieve – and whether you can achieve it

- Set a goal that will be achievable within a defined timeframe
- Be realistic – e.g. 'maintenance'



- Practice triage – focus on priority areas, or priority species

Consequences

- Future growth of water-constrained cities and towns
- Biodiversity in a hotspot of global importance
- Fire, erosion and flooding

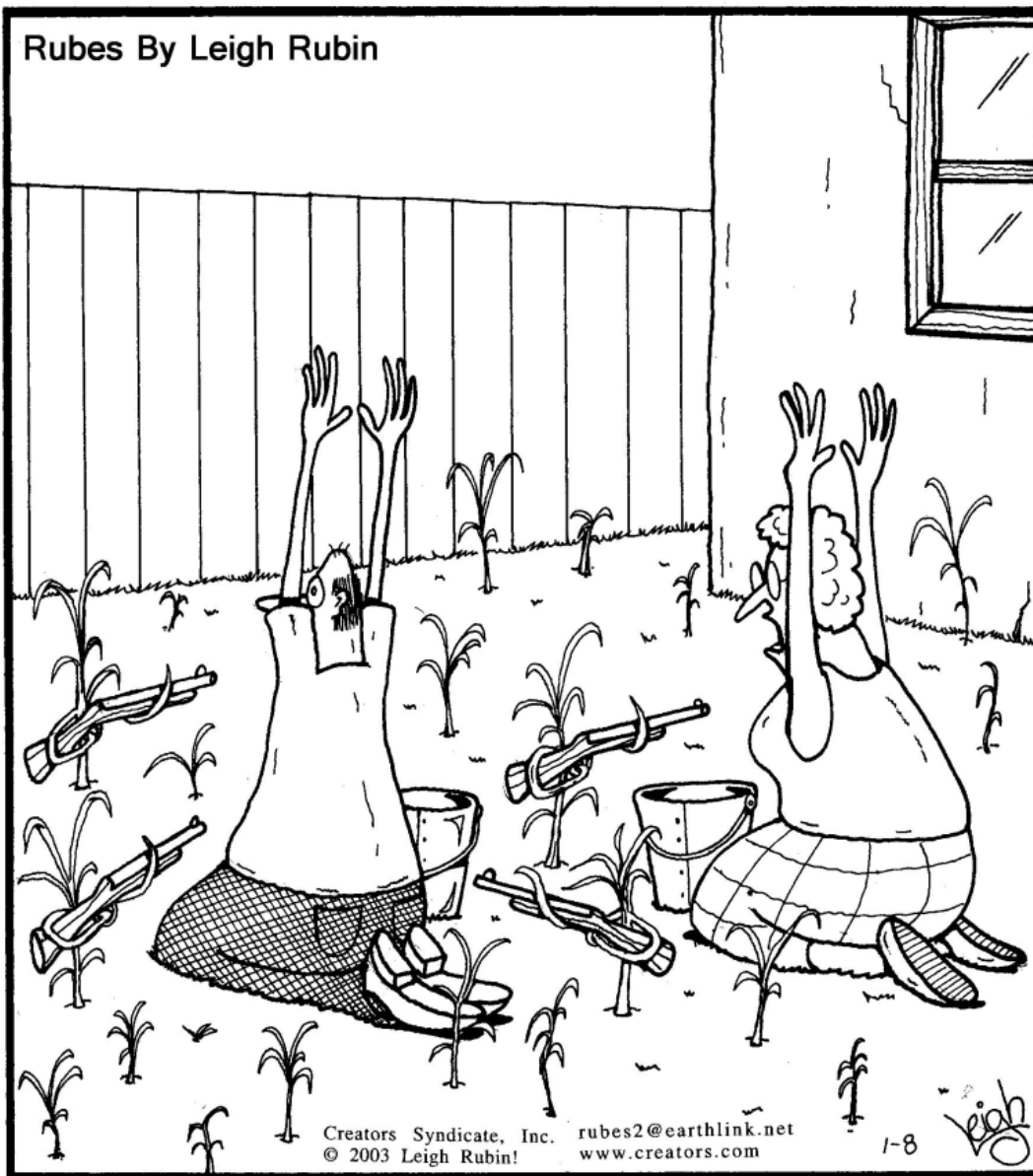


Thank you

- To European Forest Institute for funding my attendance
- Centre for Invasion Biology for other support



Rubes By Leigh Rubin



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1-8

"We never should have waited this long ...
Now the weeds have *completely*
taken over."