



Impacts of IAS on livelihoods in Africa

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Arne Witt
a.witt@cabi.org

www.cabi.org
KNOWLEDGE FOR LIFE

"According to Monday's report by the Intergovernmental Panel on Climate Change, a further warming of two degrees could cause losses equivalent to 0.2 to two per cent of world gross domestic product."



Climate change could cost more
a year

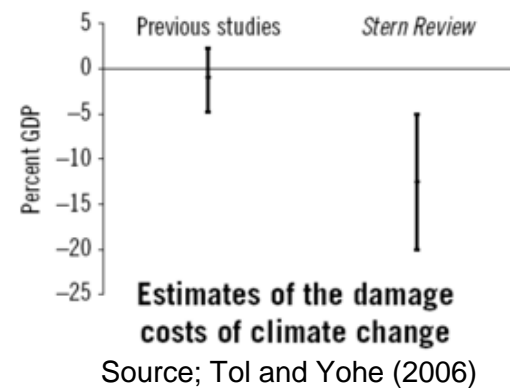
**Global warming is costing
the global economy more
than \$1.2 trillion a year
(DARA and Climate
Vulnerable Forum, 2012)**



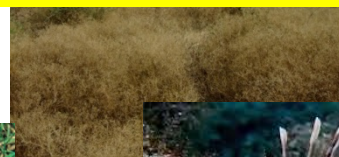
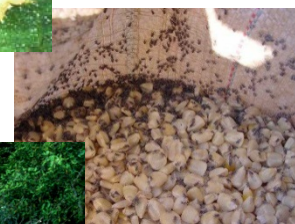
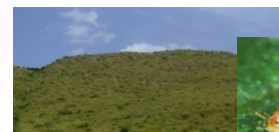
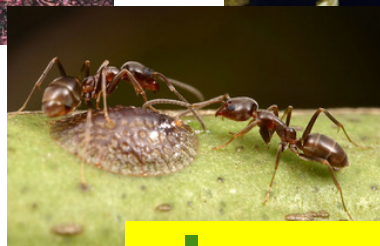
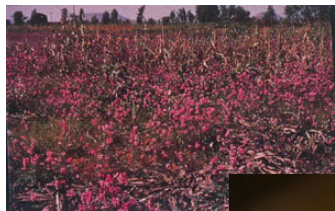
The combined costs of
losses, rising sea levels,
higher temperatures and fresh
water shortages could mount
of to between \$70 and \$100
billion a year, the report said.



A report by the U.N.'s
Intergovernmental Panel on Climate
Change, says that a temperature rise
of 2 degrees Celsius will wipe out up
to 2% of the world's income by 2050.



**Invasive Alien Species
cost the global
economy more than
US\$1.4 trillion/annum
(Pimentel *et al.*, 2001)**

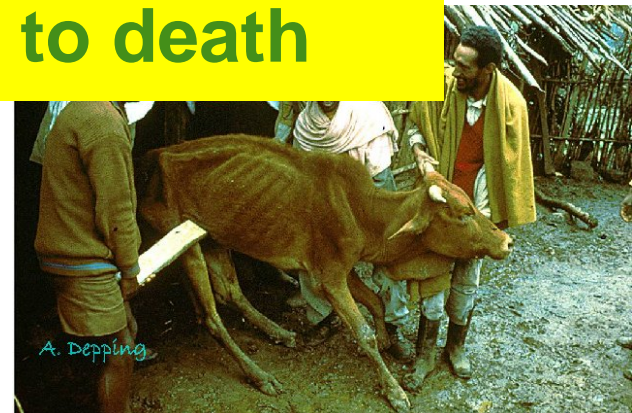




**Rinderpest in Africa in the
late 19th century**

**1/3 of human population of
Ethiopia died**

**2/3 of the Masaai in Kenya and
Tanzania starved to death**





**Invasive Alien Species
reduce crop yields by
more than 90%**



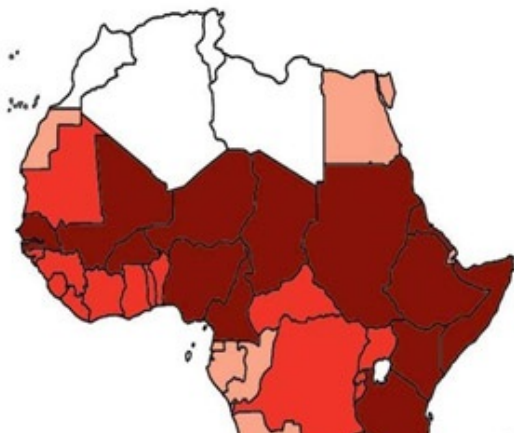
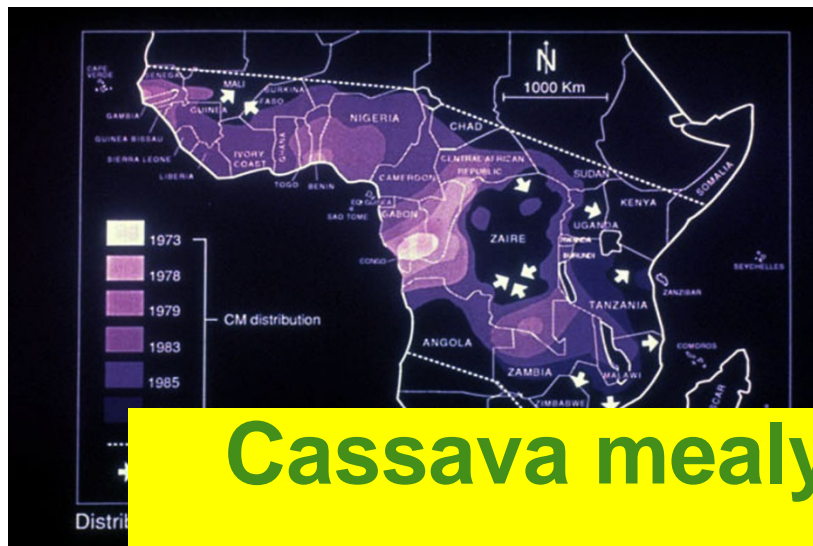


Fig 3. Extent of Striga

Witchweed in Africa
Maize losses of US\$7 billion/annum
Impacts on lives of 300 million people





Cassava mealybug in Africa

Yield losses of 80%

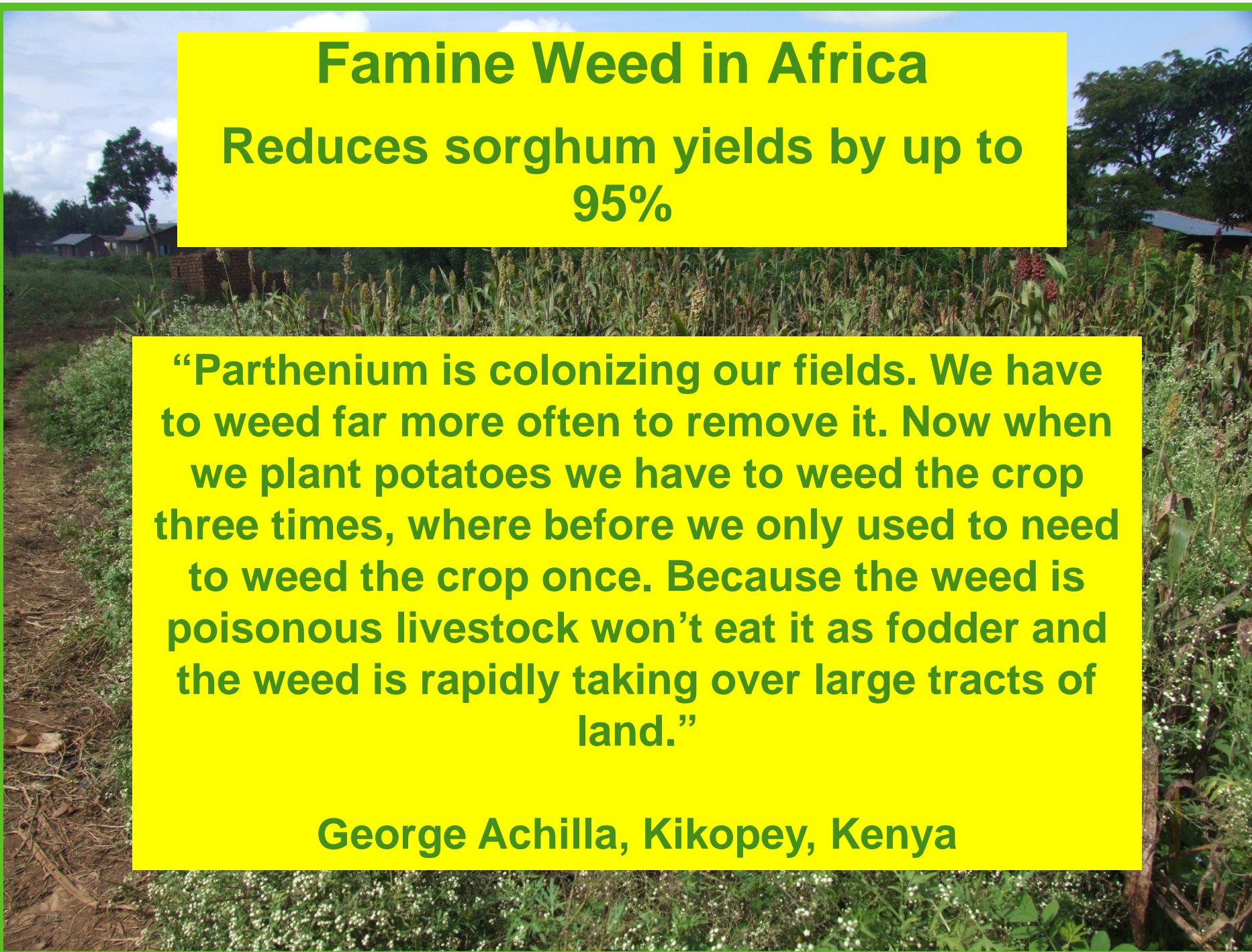


Famine Weed in Africa

Reduces sorghum yields by up to 95%

“Parthenium is colonizing our fields. We have to weed far more often to remove it. Now when we plant potatoes we have to weed the crop three times, where before we only used to need to weed the crop once. Because the weed is poisonous livestock won't eat it as fodder and the weed is rapidly taking over large tracts of land.”

George Achilla, Kikopey, Kenya



In Africa



Weeds in general cause a **yield loss** of about 10% in developed countries and **25- 30%** in least developed countries (Akobundu, 1987).

Women contribute more than **90%** of the hand weeding **labour** for most crops (Ukekje, 2004).

69% of farm **children** between the **ages of 5-14** are forced to leave school and are **used in the agricultural sector** especially at peak period of weeding (Ishaya *et al.*, 2008)

It has been estimated that **100 million women in Africa** spend approximately **20 billion hours weeding** per annum which is probably a gross underestimate but nevertheless an indication of the severity of the problem.



Women and weeding in Africa ...



“Without weeding do not expect any harvest. The back has to ache to conquer the weeds!” Women’s group, Zimbabwe.

“It is weeding that almost kills women!” Men’s discussion group, Uganda.

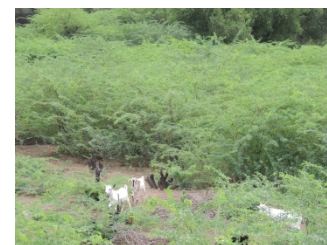
“Hoes with short handles make weeding easier and faster, but they give us back ache. There is nothing we can do about that, because if we just complain and don’t work, we’ll starve” Women’s group, Zambia.

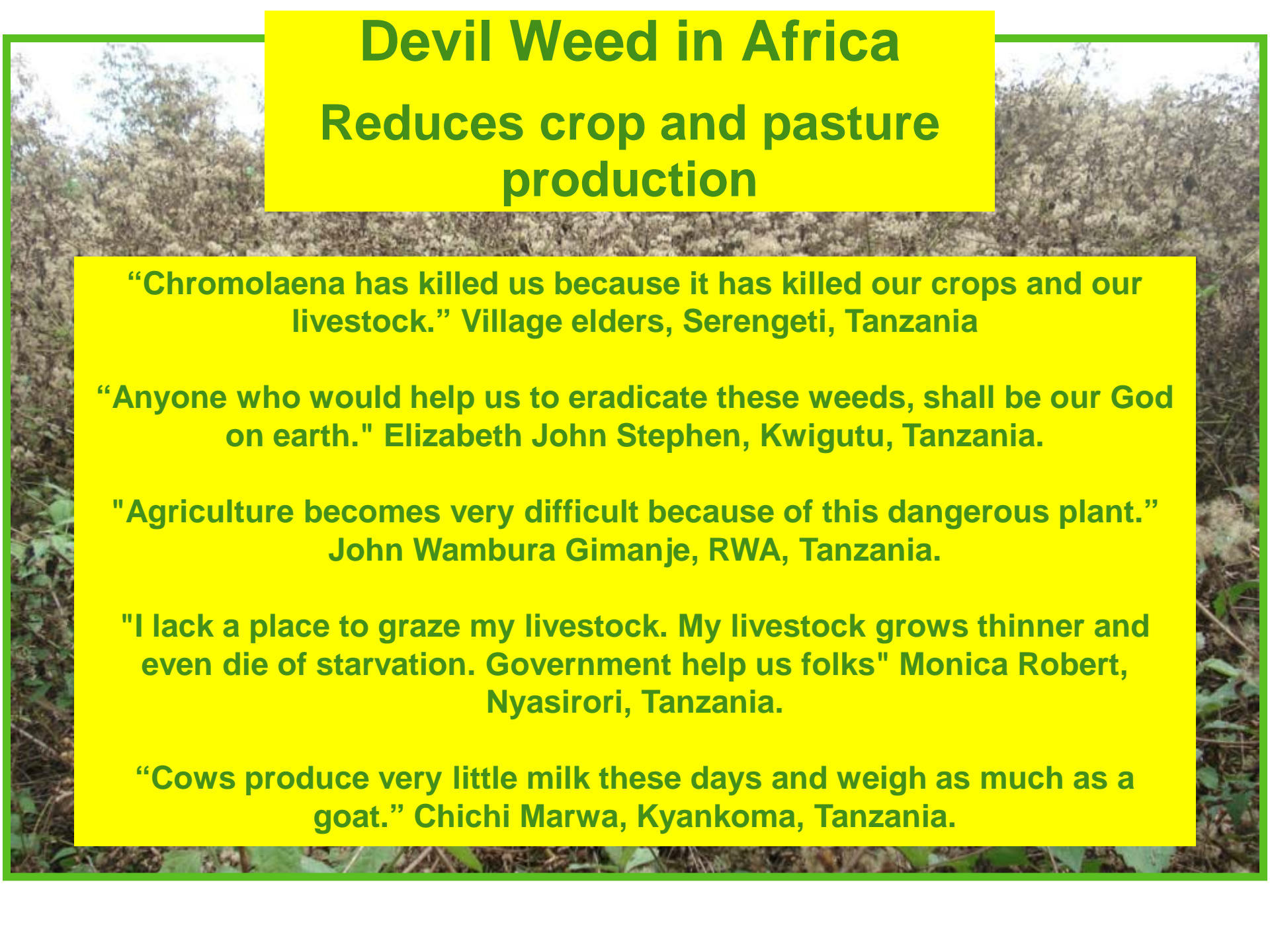
Source: IFAD (1998)





**Invasive plants reduce
pasture carrying
capacities by more than
90%**





Devil Weed in Africa

Reduces crop and pasture production

“Chromolaena has killed us because it has killed our crops and our livestock.” Village elders, Serengeti, Tanzania

“Anyone who would help us to eradicate these weeds, shall be our God on earth.” Elizabeth John Stephen, Kwigutu, Tanzania.

**"Agriculture becomes very difficult because of this dangerous plant."
John Wambura Gimanje, RWA, Tanzania.**

"I lack a place to graze my livestock. My livestock grows thinner and even die of starvation. Government help us folks" Monica Robert, Nyasirori, Tanzania.

“Cows produce very little milk these days and weigh as much as a goat.” Chichi Marwa, Kyankoma, Tanzania.

Mesquite in Africa Reduces pasture production

Views from Eritrea (Bokrezion, 2008):

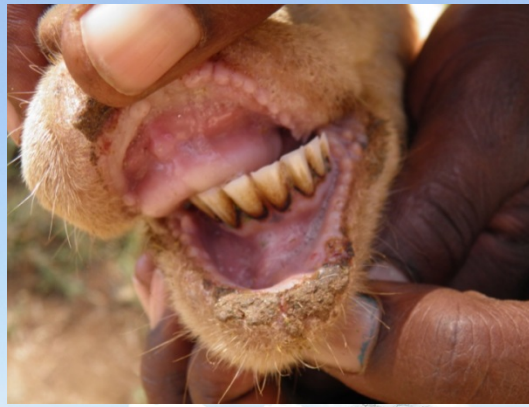
“Prosopis is a colonization without weapons”

“Prosopis can even grow on stone”

“Prosopis grows everywhere, we are sometimes not even sure if it also grows on our brains”

“Anyone who wants (promotes) the utilization of prosopis should be our enemy. We only need its destruction”

“For me the dry trees are better than a green killer”



Pest pear in Africa

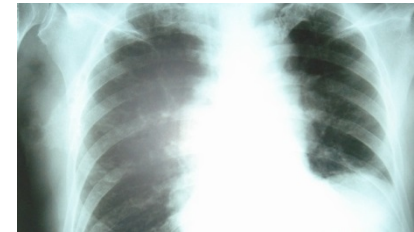
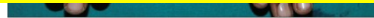
Reduces pasture production

“This used to be a very beautiful environment before Opuntia colonized our grazing fields. So currently we are having this as a major problem, since it has begun claiming livestock, claiming land and forcing us to move from our homes.”

Parsito Kitonga, Laikipia District, Kenya

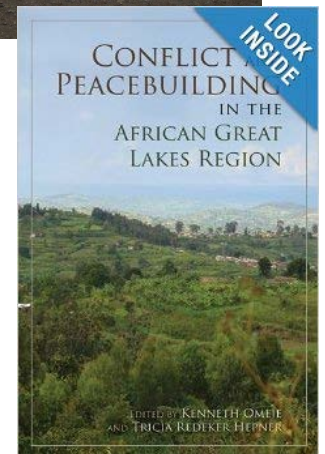


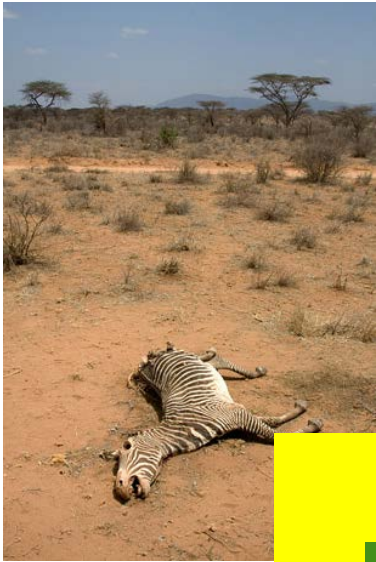
Invasive Alien Species impact on human and animal health





**Invasive plants lead to
the abandonment of
homes and villages and
drive conflict**





IAS and biodiversity
IAS pose the biggest threat to
biodiversity after habitat
destruction





It is obvious – IAS have a dramatic impact on indigenous communities in Africa and as such IAS need to be managed!!

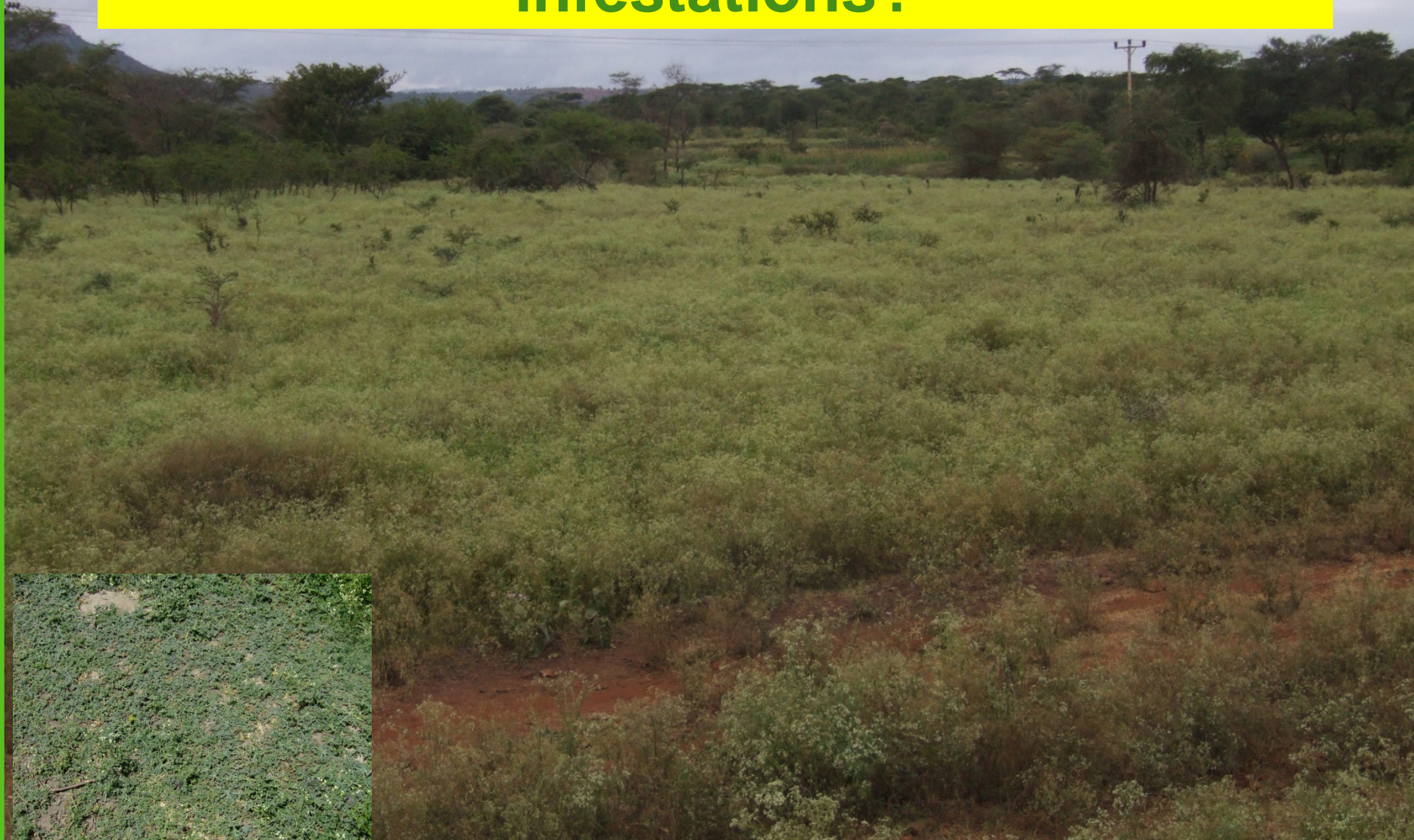
BUT HOW!!!



Is manual control going to be cost-effective for large aquatic infestations?



Is manual control going to be cost-effective for large terrestrial infestations?



Is manual control going to be cost-effective in controlling crop pests?



Is manual control going to be cost-effective in controlling locust swarms?



**Is chemical
control the
answer?**



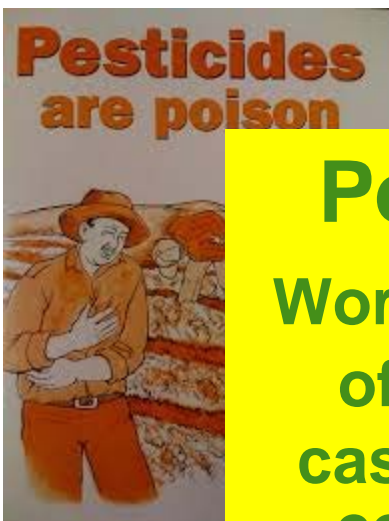


Is chemical control going to be cost-effective?



Yes, but





WARNING:
The use of
pesticides



Pesticides and human health

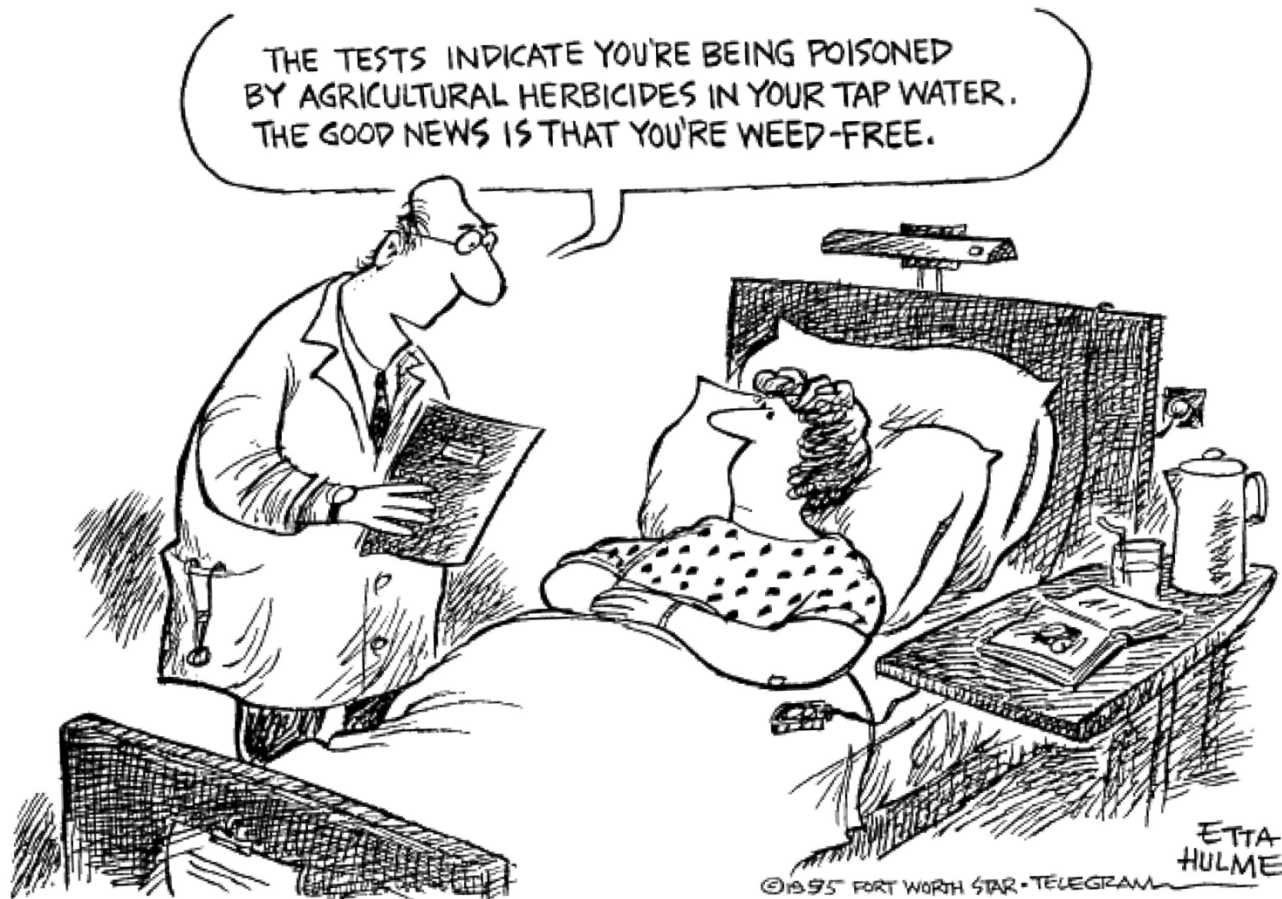
Worldwide more than 3 million metric tons of pesticides applied/year - 26 million cases of non-fatal pesticide poisonings, 220,000 fatalities and 750,000 chronic illnesses/year (Pimentel, 2004)

The **Global Chemicals Outlook** reported that poisonings from industrial and agricultural chemicals are among the top five leading causes of death worldwide, contributing to over 1 million deaths annually

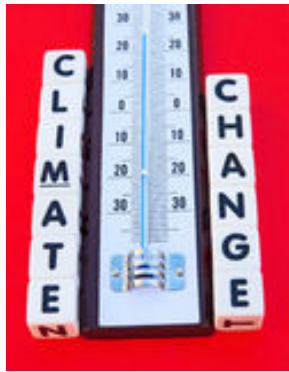


Pesticides and human health

Pesticide-use between 2005 and 2020 could cost SSA US\$90 billion in illness

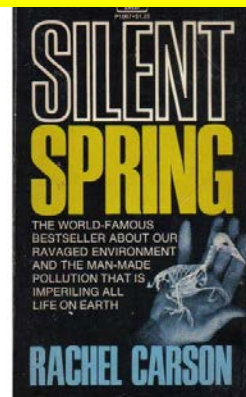


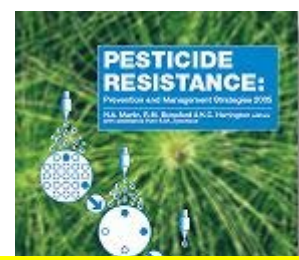
Source: c 1995 Fort Worth (Texas) Star-Telegram. Reprinted by permission
- from Culliney, 2005.



Pesticides and climate change

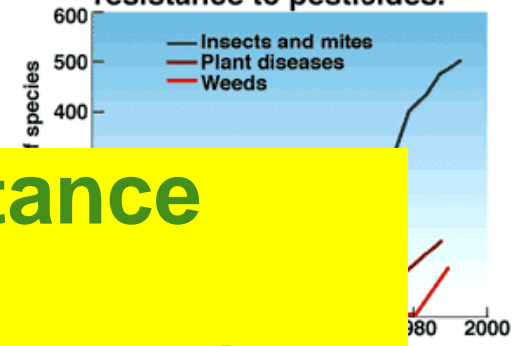
Pesticide manufacture, transport and use contributes to increased carbon emissions





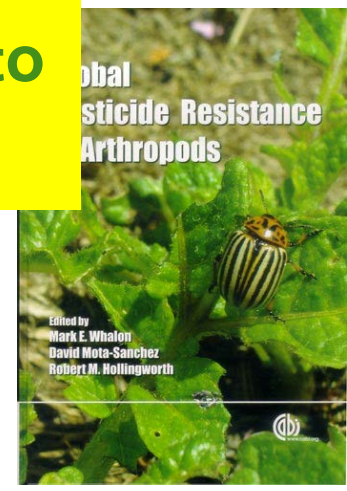
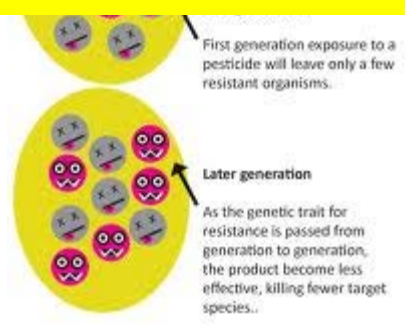
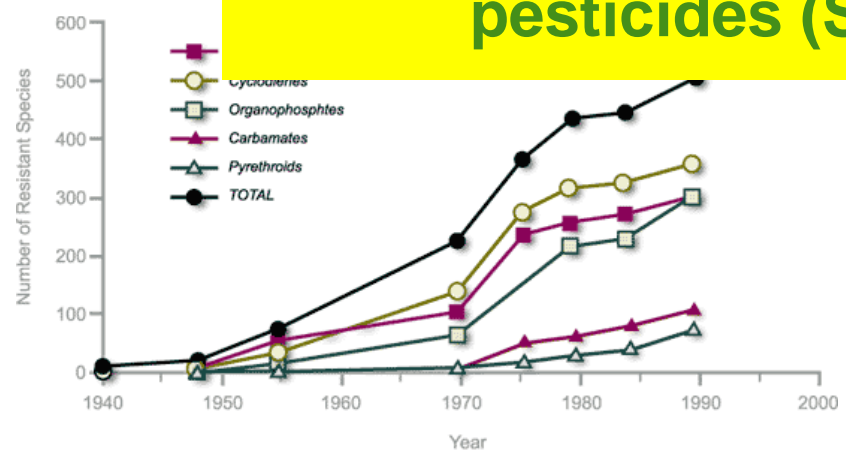
Cunningham/Sciigo, Environmental Science, A Global Concern, 3th ed. © 1999 The McGraw-Hill Companies, Inc. All rights reserved.

Many pests have developed resistance to pesticides.



Pesticide resistance

About 520 insect and mite species, nearly 150 plant pathogens and about 273 weed species are now resistant to pesticides (Stuart, 2003)





Trade and pesticides

EU Border Rejections from 2008-2012 – 584 (40%) rejected due to pesticide residues – aubergines (Thailand, Uganda), beans (India and Kenya), peppers (Chile), tomatoes (Turkey), etc. (Van Boxstael *et al.*, 2013)



Considering all of the barriers can we ensure food security for poor indigenous communities in Africa and elsewhere?



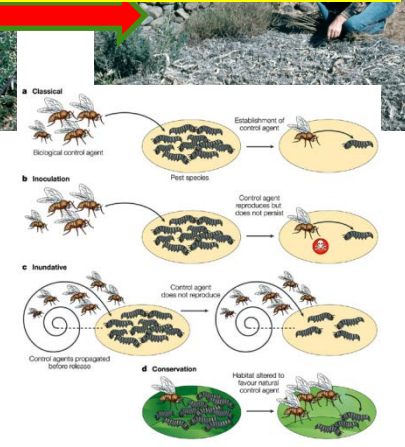
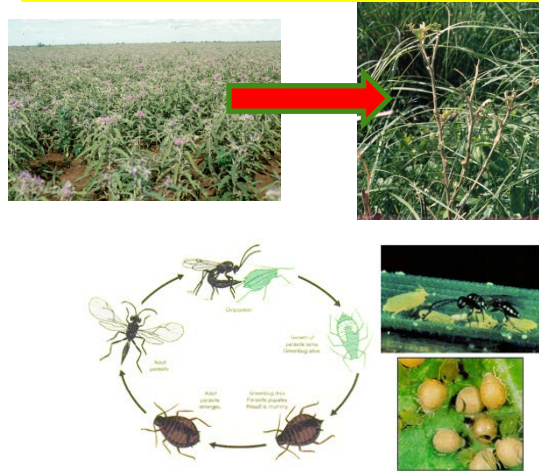
Can we protect biodiversity on which so many poor rural communities depend?

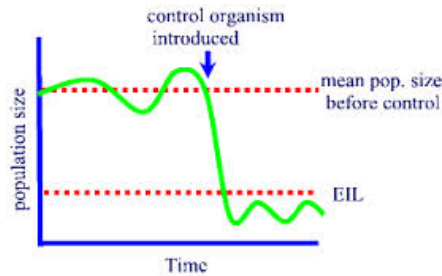


Can IPM and CBC be that solution?



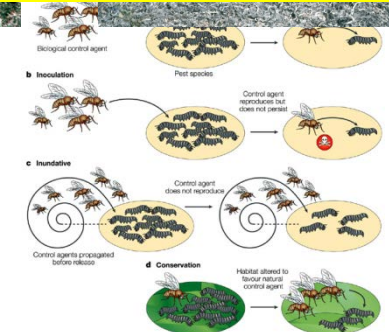
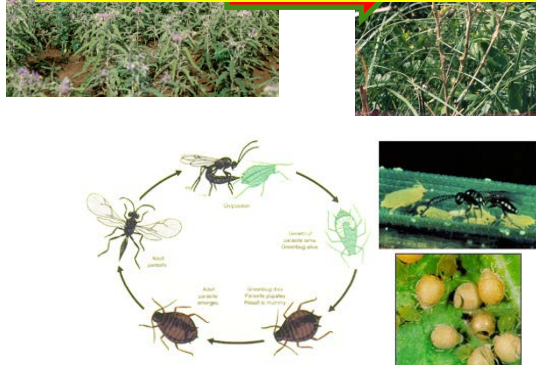
Yes, CBC and IPM can provide long-term sustainable management of IAS (including many pests) for the benefit of communities and biodiversity





Benefits of biocontrol

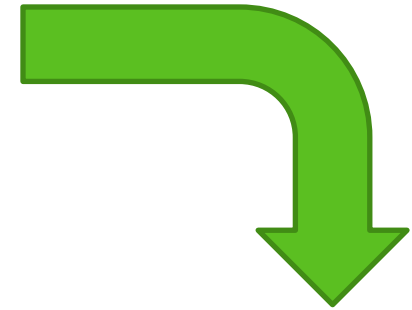
The cost–benefit ratio for classical biological control of crop pests is highly favourable (1:250) and for augmentative control is similar to that of insecticides (1:2–1:5), with much lower development costs. The cost-benefit ratios of weed CBC are equally significant.



Cassava mealybug biocontrol



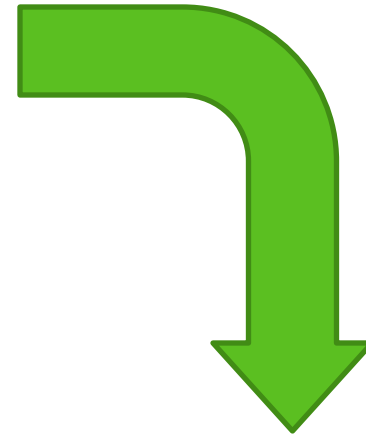
**Improved crop yields by 2 ½ tons/ha.
BC ratio of 149:1**



G. Goergen, IITA



Rubbervine biocontrol



Decline of up to 90% at some sites. Benefits of AUD 295-528 million - BC ratio of 108:1



