



Ecosystems & livelihoods under attack: the threat of invasives

Presentation to CABI Regional Consultation

Dick Shaw

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Invasive species

plants, animals, fungi or bacteria
that aren't native

and have negative effects on
an **economy, environment and health.**

THE PROBLEM

Coffee berry borer

Coffee leaf rust

European wood wasp

Devil's claw

THE PROBLEM

A close-up photograph of a banana leaf showing significant damage from black sigatoka. The leaf is covered in numerous dark, elongated lesions and has a brown, necrotic area where the tissue has died.

Black sigatoka

A close-up photograph of a cluster of green papaya fruits. The fruits are heavily infested with small, white, waxy mealybugs, which are visible as numerous tiny white dots on the surface of the fruit.

Papaya mealybug

A photograph of a lionfish swimming in clear, turquoise water. The fish has a distinctive red and white striped pattern and long, flowing, venomous spines that fan out behind its head.

Lion fish

A wide-angle photograph of a lush green field. In the foreground, there is a dense patch of yellow-flowered leafy spurge plants. The field extends to a line of trees in the distance under a bright sky.

Leafy spurge

The costs: A global problem...

Loss to the world economy as a result of invasive non-native species is estimated at 5% of annual production

A large, three-dimensional green cylinder is centered on the slide. It has a lighter green top face and a darker green body. The text "Global costs estimated at > \$1.4 trillion" is written in white across the middle of the cylinder. The cylinder is positioned over a faint, grey silhouette of a world map.

Global costs estimated at > \$1.4 trillion

....a local tragedy



Annual losses to countries, sectors & biodiversity:

- **Brazil:** to crop production and forestry from invasive insects, pathogens and weeds - \$50bn;
- **USA:** to agriculture, livestock and the environment from all invasive spp. - \$120bn;
e.g. Florida spends \$56m/year controlling the water weed hydrilla
- **Canada:** to crop production and forestry from plant pests - \$5.4bn
- **Colombia:** the coffee berry borer causes an average 18% loss of production of berries affecting thousands of smallholders and trade opportunities
- **Caribbean & South America:** growers' report that the red palm mite has caused 70% drop in coconut production since it was first reported in 2004



Invasive species invasion: Robinson Crusoe Island, Chile

Dr Peter Hodum, Director, Chile Programs, Oikonos
Ecosystem Knowledge

“It is estimated that only about 10-15% of the original extent of native plant communities remain, with invasive plant mammal species, fragmentation and erosion continuing to pose a significant threat to their long-term viability”



Impact of Red Palm Mite on Coconut industry of Trinidad

Phillippe Agostini, manager of the Coconut Growers' Association (CGA)

“Following the introduction of Red Palm Mite in Trinidad it resulted in drop of copra production levels at CGA’s coconut estates by 75 to 80 percent and the consequent increase in the price of oils by 200%. The price of the popular coconut water also increased by 100%”.

The solution

Invasive species can be dealt with:

- Prevention
- Early Detection and rapid response (eradication)
- Control (long term)



CABI and invasives

- GEF project in 5 Caribbean countries coordinated by CABI - 'Mitigating the threat of invasive alien species in the insular Caribbean'. Regional IAS strategy and action plans developed and placed on Caricom's agenda for implementation.
- Prevention and early detection: Frosty Pod Rot and major cocoa diseases, keeping the Maria Island Reserve in St. Lucia free of predator invasives
- Eradication of vertebrate predators and herbivores from Cabritos Island Dominican Republic
- Management and control: Lionfish; paper bark tree; red palm mite

Controls...



- Pink hibiscus mealybug biocontrol in the Caribbean saving crops and trade with a cost: benefit 1:8; biological control was implemented as soon as the mealybug reached the USA, and the estimated potential annual cost of US\$700M almost entirely averted
- Leafy spurge biocontrol in the northern Great Plains of the U.S.A. (Montana, North Dakota, South Dakota and Wyoming) with a cost : benefit of approx. 1:32. This does not include the benefits achieved in Canada

Invasive species compendium (knowledge)

- An encyclopaedic reference tool of invasive plants and animals
- Over **1,500** datasheets
- Bibliographic database of nearly **75,000** records
- Extensive glossary, a taxonomic framework and access to statistics
- Library of over **1000** full text documents and links



●35% Plants



30% plant and environmental pests (terrestrial)



15% aquatic animals



15% animal pathogens



5% terrestrial vertebrates

Sentinel nurseries in China

(Prevention/ Horizon Scanning)



Beijing suburban area
Continental conditions



Fuyang, nr. Hangzhou
Forest area
Warm and humid climate

Plant species:
Acer palmatum
Ilex cornuta
Buxus microphyllus





Coffee berry borer Papua New Guinea Early detection and rapid response



Saving a species from extinction (Control)


- Scale insect
- *Orthezia insignis*
- Massive populations
- Sooty mould
- Killing gumwoods
- Out of control





Insect biocontrol

- The hero: *Hyperaspis pantherina*
- Host specific coccinellid
- Successful elsewhere, so called “off-the-shelf”
- Spectacular success

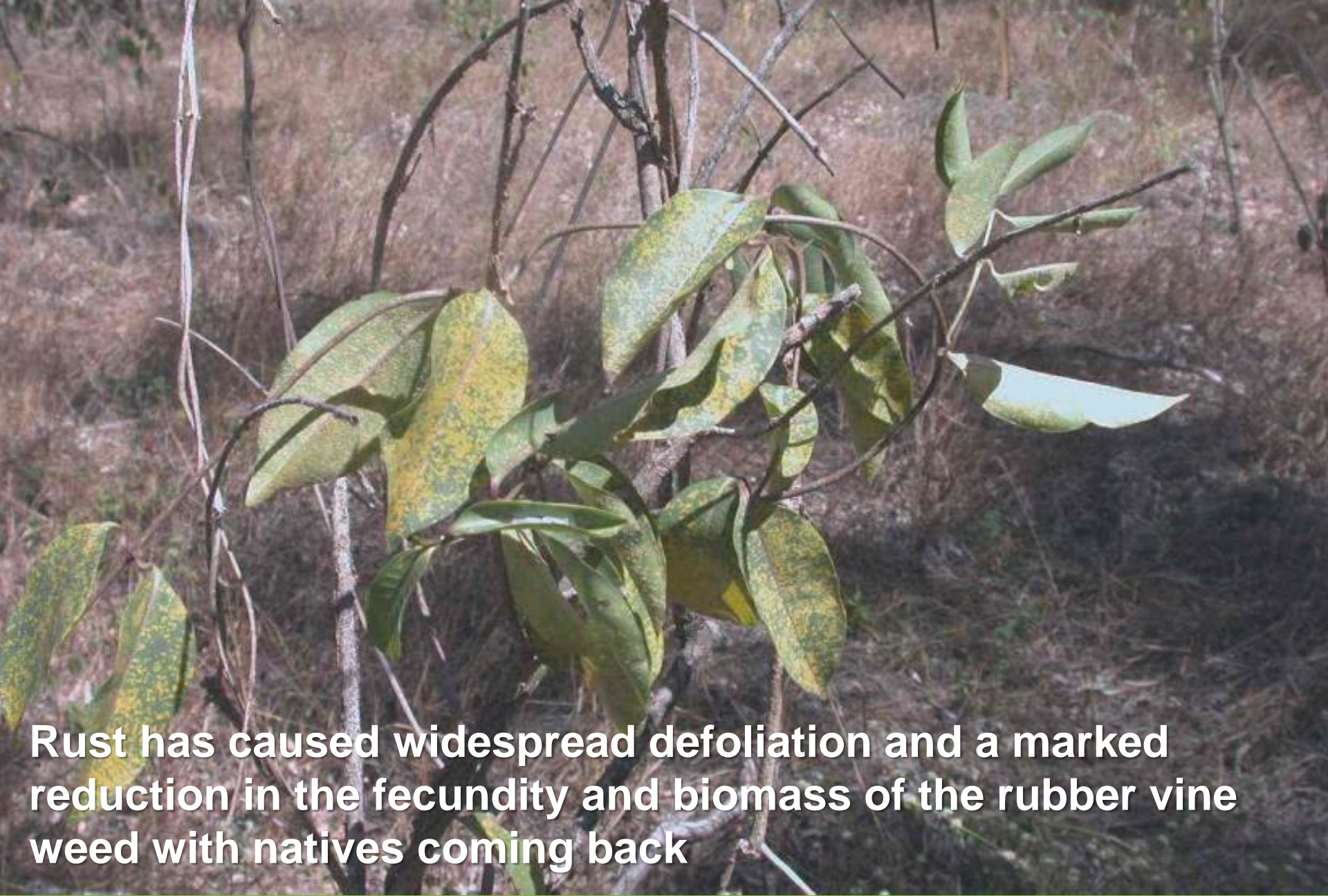


**40,000 km square Invasion by rubber vine
weed of native Eucalyptus forest,
Northern Queensland, Australia**





Rubber vine rust *Maravalia cryptostegiae*



Rust has caused widespread defoliation and a marked reduction in the fecundity and biomass of the rubber vine weed with natives coming back



Rubbervine weed in Brazil



CABI and invasives - going forward

We propose seeking donor investment to improve livelihoods by implementing a programme which will:

- Develop national and regional linkages to facilitate a **systematic approach** to Invasive species management
- **Create and share knowledge** to enable countries to identify, prevent and control threats

CABI Invasive Species Strategy: Building the case

- Engage with Member Countries to secure your mandate and active support – starts today!
- Evidence: quantify the spread and impact
- Convene stakeholders to agree action plans
- Assign institutional roles and responsibilities to ensure a ***systematic approach*** to invasive species management (at a national and regional level)
- Utilise the proven Plantwise approach

CABI Invasive Species Strategy: Action plan, stage 1 – *Prevention*

- Define key users and stakeholders (Institutions, front-line personnel)
- What are their skills set and needs - gaps?
- What tools should CABI develop in support? – PRA, horizon scanning?
- How can they be coordinated regionally to stop invasive species from arriving?

The action plan, stage 2: *Early detection and eradication*

Providing a system which enables detection and rapid response to new invaders, e.g.

- Sentinel systems: Plantwise, plus other national mechanisms?
- Mobile messages to raise awareness
- Extension materials and support – what's needed?
- Consultancy and networks: Role for a CABI centre of excellence?
- Image bank, for in-field identifications
- Crowd sourcing as method of local reporting?
- Strengthen/build rapid response mechanisms?

The action plan, stage 3:

Control & Mitigation

Addressing established invasives, e.g.

- Expert advice, support (& information; e.g. discussion documents) on control and mitigation options: costs, risks and benefits, drawing on case studies from elsewhere. Anything else?
- CABI Consultancy service to roll out implementation of selected management strategies?
- Information materials to support implementation of appropriate controls

Starting the debate

- **To discuss:** What are the key issues to address: What are the gaps, nationally and regionally, and which Invasives are your main concern?
- **To agree:** How can we work together to have an impact?
- **Up next:** How have invasive species impacted us?



Assalamualikum शुक्रिया xie-xie efharistó
mercí zikomo
ありがとう
obrigada
urakoze
danke
thank you
tak
gracias
ke itumetse
zikomo
terima kasih
dhanyawaad
asante

Dick Shaw
r.shaw@cabi.org