The global project to build the

The Invasive Species Compendium

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www.cabi.org

KNOWLEDGE FOR LIFE

What is an Invasive (Alien) Species?

An (alien) species whose establishment and spread threaten ecosystems, habitats or species with economic or environmental harm

The global challenge of Invasive Species

- Recognized in North and South America, Europe, Africa, Asia, Australasia, Antarctica
- Aggravated by globalization, trade, mobility, climate change
- Impact on:
  - productive use of land and water: food security
  - environmental quality and biodiversity

Knowledge is the key

Knowledge on invasive Species

- Sparse, uncoordinated and poorly integrated
- Developing countries have a special need
- Climate change makes this more acute
- Goal is to create a tool that gets invasive species knowledge into use, so people can make an impact with their efforts
- Need to join up national, regional and global initiatives, e.g.:
  - GISP, I3N, NOBANIS, GISD, DAISIE …

US National Invasive Species Management Plan

Action Item 53

- "The National Invasive Species Council, led by USDA, will produce an *Invasive Species Compendium* for North America. The Compendium . . . will include a broad array of searchable information relevant to the biology, distribution, and management of invasive species. . . . . The project will be undertaken in close cooperation with CABI."

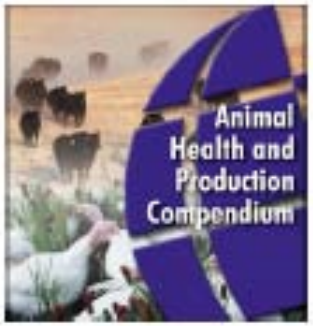
CAB International

- International organization: 45 Member Countries
- Science-based development
- Scientific knowledge for agriculture, forestry, aquaculture, health and environment
- Not for profit
- Not funded

“ Drowning in information
but starved for knowledge ”

… a problem addressed by CABI’s Compendium Programme

Compendium Programme



Compendium Programme

Interactive encyclopedias

- **Crop Protection**
  - 1999, 4 years, $3.9M
- **Forestry**
  - 2000, 3 years, $2.2M
- **Animal Health and Production**
  - 2002, 2.25 years, $1.9M
- **Aquaculture**
  - 2006, 2.5 years, $0.9M
- **Invasive Species …**
  - Ongoing, $4.75M

Invasive Species Compendium

New Business Model

- **Development / sustainability / enhancement:** funded by a Consortium
- **Open access:** free to users

Development Consortium Workshop

Development Consortium

Example: Crop Protection Compendium

AAFC, Canada
ACIAR
ADB
Bayer Crop Science
Bioversity
CABI
CFIA, Canada
CIAT
CIDA
CIMMYT
CIP
COSTECH, Tanzania
CSL, UK
DAFF, Australia
Deere & Company
DFID
DGISP/DANIDA
Dow Agrosciences
DuPont
GRDC, Australia
Horticulture Australia
IDRC
GTZ
IITA
IRRI
ICAR, India
KARI, Kenya
MAFF, Japan
MARDI, Malaysia
Monsanto
NDA & ARC, South Africa
NZ Aid
Pioneer Hi-Bred
Rockefeller Foundation
Seminis Vegetable Seeds
Sumitomo
Syngenta (Novartis & Zeneca)
SDC
UNDP
USAID
USDA-APHIS
USDA-ARS
USDA-CSREES
USDA-FAS
WARDA
World Bank
Zamorano

KEY

Public sector
Private sector
Development assistance

Key issues addressed by the ISC

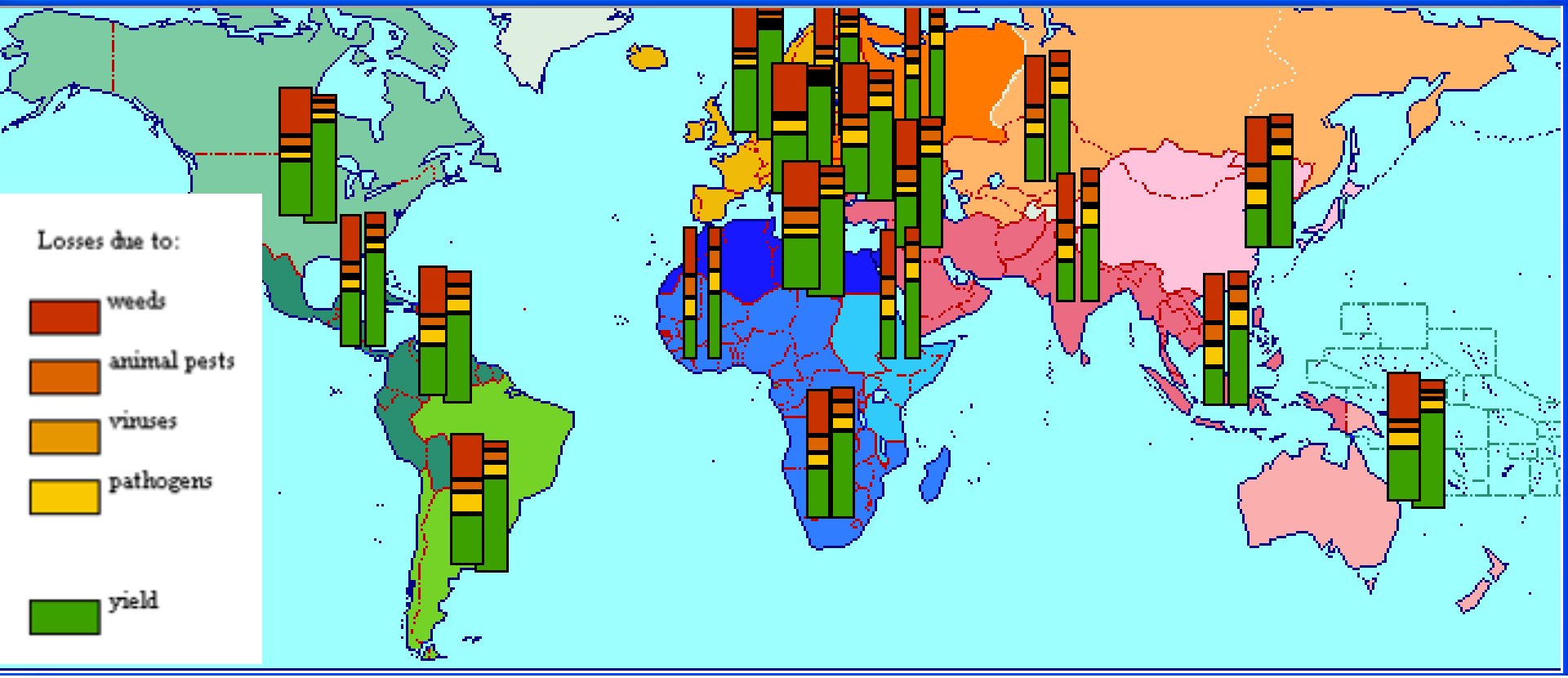
- Assess / mitigate impact of invasives under climate change
- Increase food production for food security
- Assess / minimize use of invasives for bioenergy production
- Facilitate agricultural trade
- Avoid extinctions and protect biodiversity

Climate change

- As climate changes (warming or cooling), invasive species will move
- ISC has unique data on climatic requirements of invasives, essential to predict their movement
- ISC will help to assess / mitigate impact of invasives under climate change
- ISC provides a science base for predicting movement of invasive species

Food security

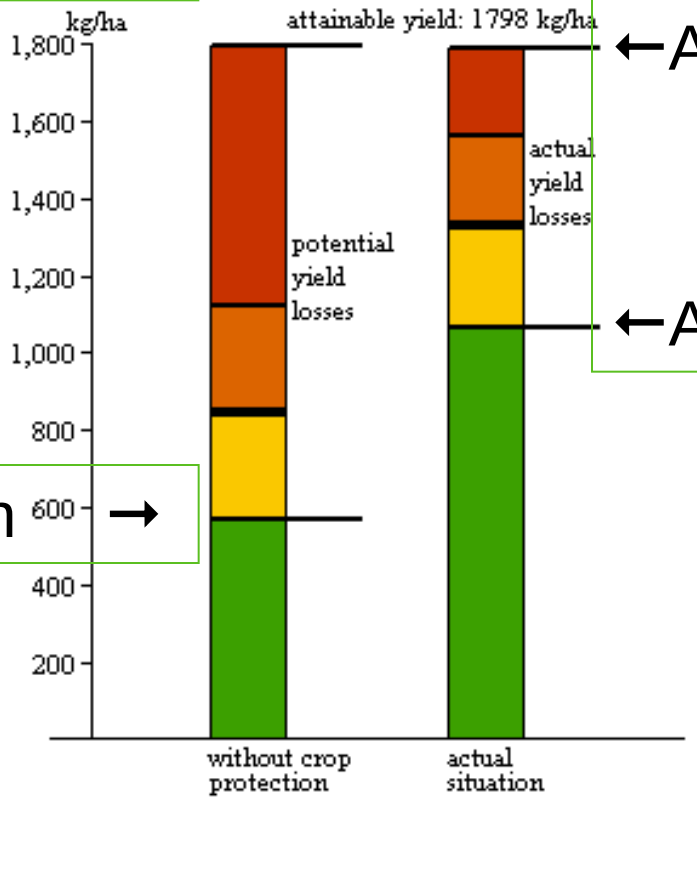
Estimated crop losses for soybean due to weeds, pests and diseases



Food security

ISC addresses crop pests to increase production and maximize food security

World soybean production



←Attainable yield

←After loss to pests

Without crop protection →

Losses due to:

- weeds
- animal pests
- viruses
- pathogens
- yield

Bioenergy

- Use of bioenergy - as a renewable resource - is certain to increase
- Some candidate biofuel crops are invasive
- ISC provides authoritative data on invasiveness, to help choose harmless species as biofuels
- ISC helps to assess / minimize use of invasives for bioenergy production

Trade

- Invasive species require quarantine procedures, which present a trade barrier
- ISC provides authoritative data on geographic distribution, pathways of movement, invasiveness
- Offers a rational basis for quarantine decisions
- Facilitates agricultural trade without invasives

Biodiversity

- Invasive species threaten biodiversity . . .
- . . . and degrade ecosystem services
- They are the second most important cause of species extinction
- ISC provides science-based information on their identity, distribution, impact, leading to . . .
- . . . sound management and control of invasives, relieving pressure on imperiled species facing extinction

Crop Protection Compendium

is used in:

Developed countries (32):

Australia, Austria, Belgium, Canada, Croatia, Cyprus, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Israel, Italy, Japan, Jersey, Netherlands, New Zealand, Norway, Oman, Portugal, Saudi Arabia, Singapore, Spain, Sweden, Switzerland, Taiwan, UK, USA

IFD qualifying countries (90):

Argentina, Azores, Bangladesh, Benin, Bhutan, Bolivia, Botswana, Brazil, Bulgaria, Burkina Faso, Cambodia, Cameroon, Chile, China, Colombia, Costa Rica, Cote d'Ivoire, Croatia, Czech Republic, Dominican Republic, Egypt, El Salvador, Estonia, Ethiopia, Fiji, Ghana, Guyana, Honduras, Hungary, India, Indonesia, Iran, Jamaica, Jordan, Kenya, Latvia, Lebanon, Libya, Lithuania, Macau, Madagascar, Malaysia, Malawi, Malta, Marshall Islands, Mauritius, Mexico, Micronesia, Mozambique, Namibia, Nauru, Nicaragua, Niger, Nigeria, Pakistan, Palau, Paraguay, Peru, Philippines, Papua New Guinea, Poland, Puerto Rico, Romania, Russia, Senegal, Serbia & Montenegro, Slovakia, Slovenia, Solomon Islands, South Africa, South Korea, Sri Lanka, St Helena, Sudan, Suriname, Syria, Tanzania, Thailand, Trinidad, Turkey, Uganda, Uruguay, Vanuatu, Venezuela, Vietnam, Western Samoa, Zambia, Zimbabwe

Compendium Technology

Some screen shots of the new web-based technology developed for the ISC

Welcome to Invasive Species Compendium (Alpha):

Log-out

Invasive Species Compendium (Alpha)

www.cabi.org

Home | Datasheets | Abstracts Database | Library | Search | Subscribe

Main Menu

- About the ISC
- Detailed Description
- Development Consortium
- Production Team
- Contributors
- ISC Browse
  - Invasive species
  - Animal diseases
  - Habitats
  - Pathway causes
  - Pathway vectors
  - Taxonomic groups
  - Topics

Cover | Images | Identity | Distribution | Biology & Ecology | Impacts | Management | Further Information | Report

Last modified: 02/10/2008

Datasheet Type(s): Invasive Species

Preferred Scientific name

Hydrocotyle ranunculoides

Preferred Common name

floating pennywort

Summary of Invasiveness

The characteristics that indicate its invasiveness are typical of many aquatic weeds: high growth rates, adaptability to prevailing nutrient conditions, very effective vegetative propagation, plasticity in growth response, overwintering to avoid low ...

More...

Impact Summary

Biodiversity (generally)
Environment (generally)
Livestock production
Fisheries / aquaculture
Rare/protected species

Picture

click on the picture or on the map for further information

Distribution map

Done

Weeds of agriculture, forestry, natural environments

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Last modified: 15/05/2008

Datasheet Type(s): Invasive Species

Preferred Scientific name
Aeolesthes sarta

Preferred Common name
city longhorn beetle

Impact Summary
Forestry production

More...

Picture

click on the picture or on the map for further information

Distribution map

Done

Plant pests/diseases of agriculture, forestry, natural environments

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Cover | Images | Distribution | Identity | Signs & Pathology | Epidemiol. & Impact | Management | Further Info. | Report

Last modified: 20/12/2008

Datasheet Type(s): Animal Disease

Preferred Scientific name

Aujeszky's disease

Picture

click on the picture or on the map for further information

Distribution map

Done

Animal diseases; Zoonotic diseases

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Log-out

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Cover | Images | Identity | Distribution | Biology & Ecology | Impacts | Further Information | Report

Last modified: 15/05/2008

Datasheet Type(s): Invasive Species, Host Animal

Preferred Scientific name
Perna viridis

Preferred Common name
Asian green mussel

Impact Summary
Native fauna
Transport/travel
Biodiversity (generally)
Human health
Fisheries / aquaculture

More...

Picture

click on the picture or on the map for further information

Distribution map

Done

Aquaculture; Rivers, lakes, coastal waters

Invasive Species Compendium

Inception Workshop, November 2006

Invasive Species Compendium

Inception Workshop, November 2006

User profiles identified

- Environmental management
- Agriculture, forest, rangeland, water & urban land management
- Trade and quarantine
- Policy making
- Extension; field schools
- Training
- R&D
- Technical development
- The land- & water-related industries
- Market research & Marketing

Invasive Species Compendium

Inception Workshop, November 2006

Proposed coverage

- Global
- All natural and managed ecosystems (not human pathogens)
- All taxa
- Focus on species with highest invasiveness and impact
  - *c.* 35% plants
  - *c.* 30% pests and pathogens of crops and environment
  - *c.* 15% pests and pathogens of animals
  - *c.* 15% aquatic animals
  - *c.* 5% terrestrial vertebrates

Invasive Species Compendium

Inception Workshop, November 2006

Proposed components

- Database and datasheets of 1000s of species, hosts, countries, environments etc.
- Text prepared by expert scientists and peer-reviewed
- Taxonomic database and framework
- Geographic distribution database; GIS facilities, e.g. dynamic distribution maps with climate overlay
- Statistical database
- Bibliographic database; facility to link to full text
- Image database
- Climatic database
- Glossary
- Decision-support tools: diagnostic keys, risk analysis aid

Elements of a species datasheet

- Identity
  - Names, scientific and vernacular; notes on taxonomy
- Geographic distribution
  - History of introduction and spread; phytosanitary risk
- Biology and ecology
  - Habitat; genetics; reproduction; physiology; nutrition; associations; environmental requirements (climate tolerance, soil tolerance, water tolerance); dispersal (pathways, trade, vectors); natural enemies
- Impact
  - Economic; social; environmental; threatened species
  - Summary of invasiveness
- Management
  - Prevention; control (cultural, mechanical, biological, chemical, genetic, utilization); eradication; containment; surveillance; ecosystem restoration
- Gaps in knowledge / Research needs
- References
- Illustrations

Invasive Species Compendium

Outline of the development project

Phase 1 (2007-2008)

- 1000 datasheets
- Engage specialists to build new content, edit, verify
- Identify and obtain content from existing sources
- Develop new IT web platform; deliver ISC Alpha version

Phase 2 (2008-2010)

- More datasheets
- More IT development
- Development of decision-support tools
- Deliver ISC Beta version

Phase 3 (2011-2015)

- Unveil ISC on the Web for public use
- ISC sustained, through continual updating and enhancement
- Response to feedback

Total resources for the project

- 8 years. US$ 4.75 M

Invasive Species Compendium

Development Consortium Membership

BENEFITS

- Achieving completion of a key resource for invasive species management
- A seat at the table: to influence the direction of the project, and to interact with other Consortium Members
- Financial leverage: a modest investment secures the benefit of a multi-million dollar development
- Certainty of delivery: CABI will complete on time, within budget; and will ensure sustainability of the product
- Visibility: Consortium Members are seen to be the participants in a cutting-edge project
- Accessibility: Access to the Compendium during development; Continuous updating; Participation in planning sustainability and enhancement
- Interaction: Opportunity for discussion of common interests in an international forum of like-minded representatives

Invasive Species Compendium

Development Consortium Membership

COMMITMENT REQUESTED

- Single contribution of $175,000 [Developing Countries $130,000]

May be made as two contributions:

- First contribution $95,000 [Developing Countries $70,000]
- Second contribution $80,000 [$60,000]

ISC: Development Consortium Members to date

- Australia, Group Membership (CRCNPB, GRDC, HAL, IACRC)
- Canadian Food Inspection Agency
- Canadian Forest Service
- Canadian International Development Agency
- India, Ministry of Agriculture
- Malaysian Agricultural Research and Development Institute
- Mexico, National Health, Safety and Quality Service for Agri-Food
- Monsanto
- Netherlands Ministry of Agriculture, Nature and Food Quality
- Secretariat of the Pacific Community
- Swiss Agency for Development and Cooperation
- Syngenta Crop Protection
- UK Department for Environment, Food and Rural Affairs (Defra)
- UK Department for International Development (DFID) / CABI / FARA
- US Agency for International Development
- USDA Agricultural Research Service
- USDA Animal and Plant Health Inspection Service
- USDA Foreign Agricultural Service
- USDA Forest Service
- USDA Invasive Species Coordination Program
- USDA Natural Resources Conservation Service
- USDA Rural Development
- USDOC NOAA's National Ocean Service
- USDOI Fish and Wildlife Service

ISC:

Development Consortium Members in prospect …

… from agricultural and environmental interests in:

- Argentina, Brazil, Chile, Mexico
- China, India, Malaysia, Japan
- Australia, New Zealand
- European Commission
- European countries
- North America (additional organizations)

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