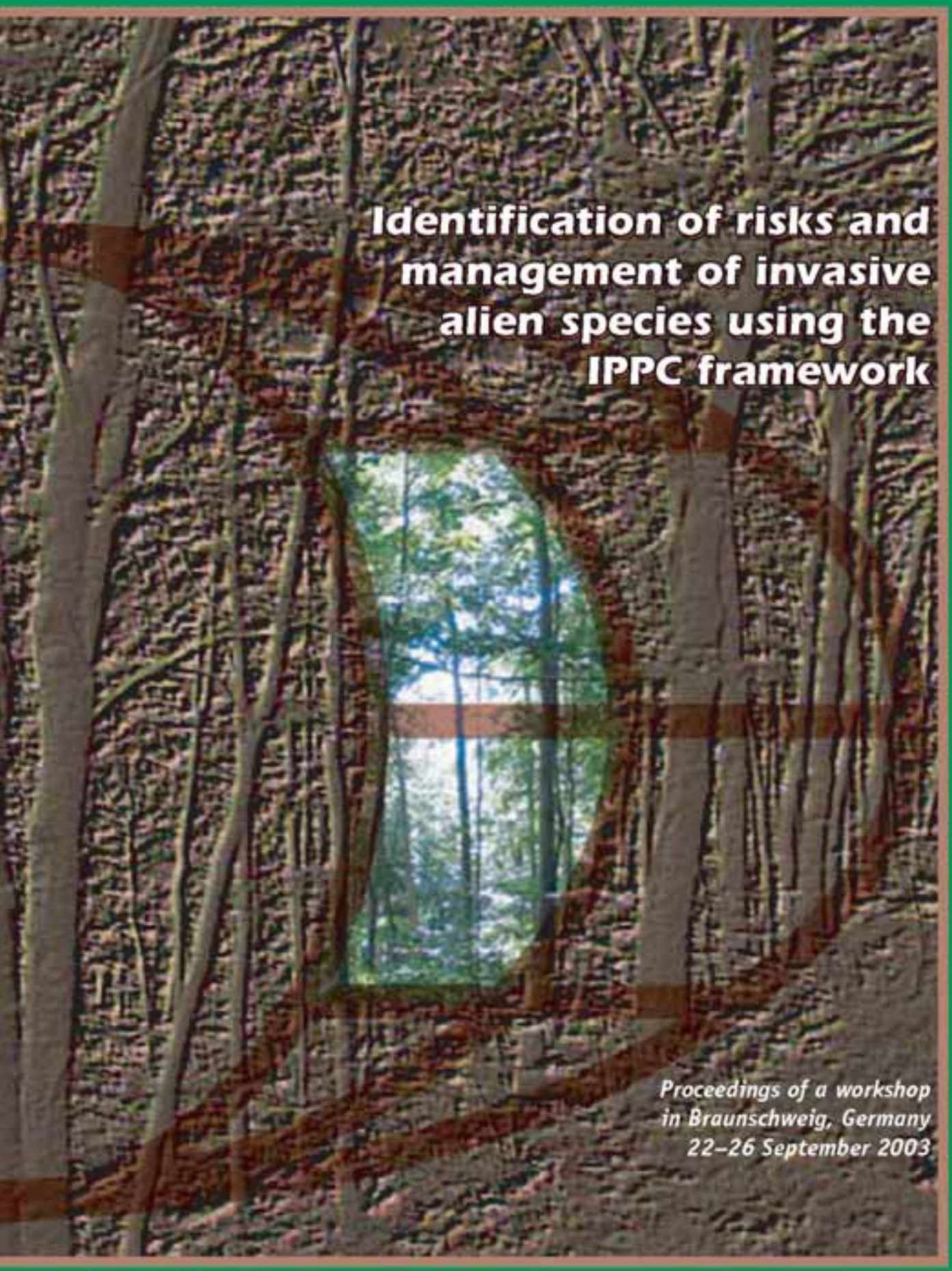

Identification of risks and management of invasive alien species using the IPPC framework

Proceedings of a workshop in Braunschweig, Germany 22–26 September 2003

Secretariat of the International Plant Protection Convention

Identification of risks and management of invasive alien species using the IPPC framework

Proceedings of a workshop
in Braunschweig, Germany
22–26 September 2003

Secretariat of the International Plant Protection Convention
Food and Agriculture Organization of the United Nations

Food and Agriculture Organization of the United Nations

International Plant Protection Convention

Biologische Bundesanstalt für Land- und Forstwirtschaft (Federal Biological Research Centre for Agriculture and Forestry)

Convention on Biological Diversity

The workshop entitled "Invasive alien species and the International Plant Protection Convention" was held in Braunschweig, Germany, 22–26 September 2003. Papers from this workshop have been prepared for publication by the Secretariat of the International Plant Protection Convention, FAO. Editing, supplementary text, page layout and cover design by Barbara Hedley, Byword Pacific Ltd, New Zealand.

Recommended citation:
IPPC Secretariat. 2005. *Identification of risks and management of invasive alien species using the IPPC framework*. Proceedings of the workshop on invasive alien species and the International Plant Protection Convention, Braunschweig, Germany, 22–26 September 2003. Rome, Italy, FAO. xii + 301 pp.

ISBN: XX XXXX XXXX

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

All rights reserved. Reproduction and dissemination of material in this information product for educational or other non-commercial purposes are authorized without any prior written permission from the copyright holders provided the source is fully acknowledged. Reproduction of material in this information product for resale or other commercial purposes is prohibited without written permission of the copyright holders. Applications for such permission should be addressed to the Chief, Publishing Management Service, Information Division, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy or by e-mail to copyright@fao.org.

© FAO 2005

To contact the IPPC Secretariat:
IPPC Secretariat, Plant Protection Service, Food and Agriculture Organization of the United Nations,
Viale delle Terme di Caracalla, 00100 Rome, ITALY
Tel.: (+39) 06 5705 4812
Fax: (+39) 06 5705 6347
E-mail: ippc@fao.org
Web site: www.ippc.int

Contents

Abbreviations ... viii
Foreword ... x
Welcoming address to the workshop ... xii

Section 1: Global overview of the management of invasive alien species

Information digest of section 1 ... **1**

1 The International Plant Protection Convention and invasive alien species
Ralf Lopian
Introduction ... **6**
Relationship between invasive alien species and quarantine pests ... 7
Overlapping mandates of international and regional organizations ... 8
IPPC activities in relation to invasive alien species ... 8
The CBD's guiding principles on invasive alien species and the IPPC ... 10
Discussion ... 15
Future activities ... 16

2 The Convention on Biological Diversity's programme of work on invasive alien species
Robert Höft
Introduction ... **17**
Collaborative initiatives ... 17
Programme of work on invasive alien species ... 18

3 Overview of the management of invasive alien species from the environmental perspective
Clare Shine
Outline ... **20**
Why are invasive alien species an international environmental issue? ... 20
What instruments and tools have been developed? ... 22
What are the main gaps and constraints from the environmental perspective? ... 29
How should we move forward at the global, regional and national levels? ... 34

Section 2: Regional management of invasive alien species

Information digest of section 2 ... **39**

4 EPPO's regional approach to invasive alien species
Ian M. Smith
Introduction ... **45**
Quarantine pest concept ... 46
EPPO regional approach ... 47
Origins and pathways ... 47
Application of EPPO regional standards ... 48
EPPO's future programme ... 48

5 Developing the European Strategy on Invasive Alien Species
Clare Shine and Piero Genovesi
Why does Europe need a strategy on invasive alien species? ... **49**
Why develop the strategy under the Bern Convention? ... 50

Process for development of the strategy ... 51
Who is the strategy for? ... 51
Summary of content ... 52

6 The EU phytosanitary system and the CBD guiding principles on invasive alien species
Jens-Georg Unger
Introduction ... **56**
Border control of imports and other pathways from non-EU countries ... 57
Measures between and within EU member states ... 59
Information exchange, monitoring and research ... 60
Regulated organisms, the precautionary principle and pest risk analysis ... 61
Other elements referred to in the guiding principles ... 62

Section 3: Legislative frameworks for phytosanitary measures

Information digest of section 3... **65**

7 Methodology for assessing the legal regime for phytosanitary control of invasive alien species
George Agyemang Sarpong
Introduction ... **69**
Outline of the methodology ... 69
Nature and sources of introduction of invasive alien species ... 70
Applicable global and regional instruments ... 70
Ratification status of applicable instruments... 71
Existing relevant legislation and institutions... 71
Conformity of existing legislation with international instruments ... 72
Determination of form and content of legislation ... 72
Capacity for implementation ... 74

8 Harmonization of national phytosanitary regulations in China
Wang Chunlin, Zhang Zongyi and Huang Youling
Introduction ... **76**
Impacts of invasive alien species in China ... 76
Reasons for alien species invading China... 77
The existing phytosanitary system... 78
Developing harmonization of national regulations with international agreements ... 78
Harmonization of national phytosanitary standards with the IPPC... 79
Achievements and future direction ... 80
Invasive alien species and international cooperation ... 80

9 The plant quarantine order in India
Amand Shah
Plant quarantine structure and policy in India ... **81**
Why a new plant quarantine regulation? ... 82
Salient features of the new Order ... 83
Harmony with the IPPC ... 83
Issue of import permits ... 83
Enhancement of plant quarantine facilities ... 84
Action plan for pest risk analysis ... 85
Policy for the control of invasive alien species in India and related policy initiatives ... 85

Section 4: Pest risk analysis, including analysis of environmental risk

Information digest of section 4... **87**

10 Pest risk analysis: global harmonization benefits biodiversity
Bram de Hoop
Introduction ... **94**
Pest risk analysis ... 94
Phytosanitary measures ... 95
More specific standards ... 95
New developments ... 96
Dispute settlement and jurisprudence ... 96

11 Assessing environmental risks of invasive species using ISPM 11: where to start
Mary Megan Quinlan, Nick M. Pasiecznik and Soetikno S. Sastroutomo
Introduction ... **98**
Current guidelines for pest risk analysis ... 99
Identifying species or pathways that pose an environmental risk... 100
Pest risk analysis for pests causing indirect injury to plants ... 103
Uncertainty in environmental risk analysis ... 103
Conclusions and recommendations ... 104

12 Pest risk assessments: tools, resources and key challenges
Richard Baker and Alan MacLeod
Introduction ... **106**
National and international data sources ... 106
Assessing entry potential ... 107
Assessing establishment potential ... 107
Assessing economic, environmental and social impacts ... 107
Conclusions ... 108

13 Adaptation of regional pest risk assessment to the revised ISPM 11
Gritta Schrader
Introduction ... **110**
Analysis of environmental risks ... 111
The EPPO pest risk assessment scheme ... 111
Structure of the EPPO PRA scheme ... 111
Adaptations to the revised ISPM 11 ... 112
Applicability of the EPPO scheme to plants as pests ... 113
Outlook and conclusions ... 113

14 Use of the weed risk assessment tool in Australia's approach to pest risk analysis
Paul Pheloung
Introduction ... **115**
The WRA system in operation... 115

15 Experiences and limitations with pest risk analysis in the Galapagos Islands
Helmuth Rogg, Chris Buddenhagen and Charlotte Causton
Introduction to Galapagos ... **117**
The problem of alien species ... 118
Development of regulations and control systems ... 118
Adapting the weed risk assessment model ... 120
Measures for invertebrate species ... 124

16 Science and regulation: a Canadian approach to invasive alien species
Eric Allen and Lesley Cree
Introduction to the Canadian Food Inspection Agency ... **127**
Pest risk assessment within the CFIA ... 127
Traditional pest risk assessments ... 128

The *Phytophthora ramorum* example ... 129
Other non-traditional pest risk assessments ... 129
Canadian Forest Service invasive alien species programme ... 130
Canadian Forest Service and the international community ... 131
Benefits and challenges of the partnership approach ... 132

Section 5: National perspectives on invasive alien species

Information digest of section 5... **133**

17 Invasive alien species from a nature conservation point of view in Germany
Frank Klingenstein and Thuweba Diwani
Evaluating the problem of invasive alien species ... **137**
What does "invasive" mean for nature conservation? ... 139
Conditions and measures ... 140
Nature conservation activities in Germany ... 143
Conclusions ... 145

18 Development of a German national strategy on invasive alien species
Christiane Hubo and Arthur Steinmann
Introduction ... **146**
The political background ... 147
Elements of the German national strategy ... 148
Focal points of legal problems ... 149

19 Invasive alien species: toward a national plan for Canada
Mark Hovorka
Context... **151**
Progress to date ... 152
Toward a national plan: a discussion document... 153
A focus on plants ... 155
Invasive alien species and the IPPC: an environment perspective ... 156

Section 6: Policies for pest risk management

Information digest of section 6... **157**

20 Translating pest risk analysis into policy: the CFIA approach
Gregory Wolff
Introduction ... **162**
Mandate and legal authority of the CFIA's Plant Health Division ... 163
Pest risk analysis ... 163
International obligations and principles ... 163
Plant protection strategies ... 164
International standards ... 164
Dialogue and communications... 164
Conclusion... 165

21 Contingency planning for plant pest incursions in Australia
Paul Pheloung
Introduction ... **166**
Planning for pest incursions ... 167
Offshore activities ... 167
Surveillance ... 167
Northern Australia Quarantine Strategy ... 168
Diagnostics and biology of pests ... 169

Legislative and administrative aspects ... 170
Preparedness and response planning ... 171
Case studies of incursion preparedness and responses for specific pests ... 172

22 Contingency planning in the Netherlands
Maarten Steeghs
General aspects of contingency planning ... **175**
Results of the planning process ... 176
Conclusions ... 177

Section 7: Implementation and national delivery capacity

Information digest of section 7 ... **179**

23 Phytosanitary capacity evaluation: the tool, its results and its relation to invasive alien species
Felipe Canale
Introduction ... **186**
PCE aims ... 186
PCE rationale ... 186
PCE strategy ... 187
PCE outcomes ... 187
PCE conclusions ... 189
PCE results in relation to invasive alien species ... 190

24 Biological control in invasive species management: experiences and lessons of using ISPM 3
Moses Kairo, Matthew J.W. Cock and Mary Megan Quinlan
Introduction ... **192**
Main provisions of ISPM 3 ... 193
Approach to assessing use of ISPM 3 ... 193
Key findings ... 193
Conclusions on the use of ISPM 3 ... 194

25 Speed detection of pests in China
Ning Hong
Introduction ... **196**
General pest detection measures and methods in China ... 196
Researching speed detection methods for phytosanitary use ... 196
Rapid detection methods for pests of citrus ... 197
Application of the speed detection methods in China ... 197

26 Invasive alien species in Kenya: status and management
Chagema Kedera and Benson Kuria
Introduction ... **199**
Quarantine measures to prevent unintentional introductions ... 199
Quarantine measures taken during intentional introduction of alien species ... 202
Eradication, containment and control ... 202
Research and monitoring of alien invasive species ... 203
Regional and international cooperation ... 203
Capacity building ... 203
Education and public awareness ... 203
Conclusion ... 204

27 Phytosanitary programmes in Germany
Reiner Schrage
Organization of the plant protection service in Germany ... **205**
Phytosanitary operations in North Rhine-Westphalia ... 205

28 Monitoring the delivery of plant health controls in the EU
Lars Christoffersen
Background ... **208**
Organization ... 209
Implementation of the work ... 210
Conclusions ... 212

29 Invasive species and the Working for Water programme in South Africa
Jan Hendrik Venter
Introduction ... **213**
The Working for Water programme ... 214
Removal or eradication of invasive plants ... 215
Auditing ... 216
Legislation ... 216
Implementation of the programme ... 218
Research ... 219
Sustainable development ... 219
Other key components of the programme ... 220
Conclusion... 221

30 Combining CBD and IPPC implementation: dealing with ecological complexity in pest risk assessment
Maj De Poorter
Introduction to the threat to biodiversity ... **222**
Implications for pest risk analysis ... 223
The way forward ... 224
How the Invasive Species Specialist Group can help ... 224

31 Web tools to identify, report and map invasive species in North America
John Pickering
Introduction to Discover Life ... **227**
Web tools relating to invasive alien species ... 227

32 BioNET: a regional approach to capacity building in taxonomy for sustainable development
Richard Smith
The taxonomic impediment ... **229**
BioNET and the LOOPs ... 231
LOOPs, the IPPC and invasive alien species... 232
BioNET, the CBD and the IPPC ... 233

33 Identification of capacity-building needs in ASEAN for the management of invasive alien species
Soetikno S. Sastroutomo, Keng-Yeang Lum and Wai-Hong Loke
Introduction ... **235**
Survey objectives ... 236
Results ... 236
Recommendations ... 238

34 SAFRINET strategy and the International Plant Protection Convention
Arundel Sakala
Introduction ... **240**

SAFRINET strategy ... 241
SAFRINET achievements ... 241
SAFRINET, IPPC and technology developers partnerships ... 242

Section 8: Information exchange

Information digest of section 8... **243**

35 Information exchange and the International Phytosanitary Portal
Brent Larson
IPPC obligations for information exchange ... **246**
Development of the International Phytosanitary Portal ... 246

36 EPPO information exchange
Ian M. Smith
Introduction ... **248**
EPPO information sources on paper ... 248
EPPO electronic information sources... 249

37 NAPPO and exotic pest information
Woodward D. Bailey
Introduction ... **250**
Response to exotic pests by the United States ... 250
Cooperative action through NAPPO ... 251
The Phytosanitary Alert System Panel ... 251

38 Sources of invasive species information in the South Pacific
Maj De Poorter
Introduction ... **253**
List of information sources ... 253

39 Invasive alien species and the IPPC: the role of CAB International
Roger Day
Introduction ... **256**
Development and publication of information products ... 257
Taxonomy and pest identification ... 259
Networking and coordination ... 259
Support for standard setting ... 260
Global Invasive Species Programme ... 260

Recommendations arising from the workshop

Appendices

Appendix 1: List of international standards for phytosanitary measures **265**

Appendix 2: Workshop exercises and discussion **266**
Introduction to the exercises ... 266
Exercise 1: Methodology for review of a legal regime for the phytosanitary control of invasive alien species ... 266
Exercise 2: Pest risk analysis... 269
Exercise 3: Weed risk assessment ... 274

Appendix 3: List of workshop participants and workshop programme **282**

Appendix 4: Collected references **292**

Abbreviations

APPPC	Asia and Pacific Plant Protection Commission
AQIS	Australian Quarantine and Inspection Service
AQSIQC	General Administration of Quality Supervision, Inspection and Quarantine of China
ASEAN	Association of Southeast Asian Nations
AVH	Australia's Virtual Herbarium
BBA	Biologische Bundesanstalt für Land- und Forstwirtschaft
Bern Convention	Convention on the Conservation of European Wildlife and Natural Resources
BfN	Bundesamt für Naturschutz [German Federal Agency for Nature Conservation]
BNatSchG	Bundesnaturschutzgesetz [German Federal Nature Conservation Act]
CABI	CAB International
CARICOM	Caribbean Community
CBD	Convention on Biological Diversity
CDF	Charles Darwin Foundation
CFIA	Canadian Food Inspection Agency
CFS	Canadian Forest Service
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COMESA	Common Market for Eastern and Southern Africa
COP	Conference of the Parties
CPC	Crop Protection Compendium [of CABI]
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DEFRA	Department for Environment, Food and Rural Affairs [of the UK]
EC	European Community
EU	European Union
ELISA	enzyme-linked immunosorbent assay
EPPO	European and Mediterranean Plant Protection Organization
FAO	Food and Agriculture Organization of the United Nations
FVO	Food and Veterinary Office
GEF	Global Environment Facility
GIS	geographic information system
GISP	Global Invasive Species Programme
GMO	genetically modified organism
GTI	Global Taxonomy Initiative
IAPSC	Inter-African Phytosanitary Council
IAS	invasive alien species
ICAO	International Civil Aviation Organization
ICES	International Council for the Exploration of the Sea
ICPM	Interim Commission on Phytosanitary Measures [of the IPPC]
IFQRG	International Forestry Quarantine Research Group
IMO	International Maritime Organization
IOC	International Oceans Commission
IPM	integrated pest management
IPP	International Phytosanitary Portal
IPPC	International Plant Protection Convention
ISPM	international standard for phytosanitary measures
ISSG	Invasive Species Specialist Group
IUCN	World Conservation Union
KEPHIS	Kenya Plant Health Inspectorate
LOOP	locally organized and operated partnership [of BioNET-International]
NGO	non-governmental organization
NAPPO	North American Plant Protection Organization

NAQS	Northern Australia Quarantine Strategy
NPPO	national plant protection organization
OECD	Organisation for Economic Co-operation and Development
OIE	Office International des Épizooties
PAS	Phytosanitary Alert System [of NAPPO]
PCE	Phytosanitary Capacity Evaluation
PCR	polymerase chain reaction
PHA	Plant Health Australia
PHRA	Plant Health Risk Assessment [Unit of the CFIA]
PNRSV	*Prunus necrotic ring spot virus*
PRA	pest risk analysis
RA	risk assessment
RPPO	regional plant protection organization
SADC	Southern African Development Community
SBSTTA	Subsidiary Body on Scientific, Technical and Technological Advice [of the CBD]
SESA	Servicio Ecuatoriano de Sanidad Agropecuaria
SICGAL	Sistema de Inspección y Cuarentena para las Islas Galapagos
SPC	Secretariat for the Pacific Community
SPREP	South Pacific Regional Environment Programme
SPS Agreement	Agreement on the Application of Sanitary and Phytosanitary Measures [of the WTO]
SSC	Species Survival Commission
TRSV	*Tobacco ring spot virus*
UNCCD	United Nations Convention to Combat Desertification
UNCED	United Nations Conference on Environment and Development
UNCLOS	United Nations Convention on the Law of the Sea
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
WHO	World Health Organization
WRA	weed risk assessment
WTO	World Trade Organization
WWF	World Wide Fund for Nature [also known as World Wildlife Fund]

Foreword

Invasive alien species pose major threats to agriculture, food security and biological diversity. The International Plant Protection Convention (IPPC) aims to ensure common and effective action for preventing the spread and introduction of pests of plants and plant products, and promoting measures for their control. The IPPC therefore is of immediate relevance to countries that are parties to the Convention on Biological Diversity (CBD) and that are striving to devise policies and programmes to implement Article 8(h) of the CBD, namely to "Prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species". Indeed, the Conference of the Parties of CBD has acknowledged the contribution of the IPPC to the implementation of article 8(h) of the CBD and invited the IPPC to consider incorporating criteria related to threats to biodiversity posed by invasive species into its work on standards and other matters.

Many countries, especially developing countries with limited resources, are uncertain of how to establish cost-effective systems to identify the risks associated with invasive alien species and to manage those risks. The difficulties faced are diverse and numerous. They include: the high level of complexity in ecosystems; a lack of knowledge about ecological threats; the pressure of globalized trade and international travel, with the associated movement of organisms; and fragmented national authority for risk analysis and control measures. However, countries that are contracting parties to the IPPC enjoy the benefit of well-developed structures to prevent the introduction and spread of plant pests that have been established over a period of several decades.

There is increasingly close cooperation between the CBD and IPPC: the two Conventions encourage the presence of observers at relevant meetings; issues of biodiversity are being addressed in the development and revision of applicable international standards under the IPPC.

As part of this cooperative endeavour, a major workshop on invasive alien species and the IPPC framework was held in Braunschweig, Germany, in September 2003. The workshop was funded by Germany's Federal Ministry for Consumer Protection, Food and Agriculture and organized jointly by the Federal Biological Research Centre for Agriculture and Forestry and the IPPC Secretariat. It brought together national representatives from phytosanitary and environmental protection agencies from 58 countries, as well as international experts and agency representatives.

We are pleased to make the proceedings of this week-long workshop available to those with an interest in the management of invasive alien species. This publication contains the 39 technical papers presented at the workshop and a report of the practical exercises. A short "information digest" for each of the eight subject areas covered in the workshop is provided.

In recent years, both Conventions have taken steps to address the significant problems of invasive alien species, and recognize that much still remains to be done. The publication of the proceedings of this workshop signals a number of opportunities in this regard. We hope the publication will prove useful and wish to thank all those who contributed to and participated in the workshop.

Niek van der Graaff

Secretary, International Plant Protection Convention

Hamdallah Zedan

Executive Secretary, Secretariat of the Convention on Biological Diversity

Gerald Thalheim

Parliamentary State Secretary, Germany

Welcoming address to the workshop

by Dr. Gerald Thalheim
Parliamentary State Secretary at the Federal Ministry of Consumer Protection, Food and Agriculture

Given on the occasion of the International Workshop "Invasive Alien Species and the IPPC" at the Forum of the Federal Agricultural Research Centre (FAL) in Braunschweig on Monday, 22 September 2003.

Ladies and Gentlemen,

Our lives and well-being are based on plant growth and cultivation, plant products, the availability of natural resources and sustainable use of biodiversity.

Invasive alien species greatly endanger our food production, medication, renewable resources, living environment and ecosystems. This problem is aggravated by a lack of resources and coordination, plus great poverty.

Expanding global trade, tourism and climate change also increase the dangers. The impact of invasive alien species has serious implications for the economy and ecology. Hence, protective measures are needed to address this problem.

My Ministry is, therefore, delighted to open and to support this Workshop. We regard "invasive alien species" as an important topic in farming, the economy and the environment. We feel responsible if invasive alien species impair our ecosystems or the trade in plants or plant products. We also recognize that the IPPC – together with the CBD – is meeting its mandate of plant protection without any specific limitations.

More than 55 countries take part in this workshop. This highlights the global role of the issue of invasive alien species. I am delighted about the attendance of many developing countries. It is true that countries are not equally aware of the dangers posed by invasive alien species.

They differ in their priorities in control, practical experience and resources to solve the problem. However, invasive alien species are a danger in every country, ecologically and economically. Global solutions are needed to control invasive alien species.

The historical disaster of the Irish Potato Famine shows that we have to prevent the introduction of crop pests and take precautionary measures. We face a difficult task, indeed: the recent spread of the Western corn rootworm and the Asian longhorned beetle in Europe underlines the need for protective measures. They still have to be improved.

On a global scale, the protection of plants as a food source and as a pool of biological diversity is a key element of our policy. We aim at sustainability and economic and social fairness at national, regional and global level.

Good coordination and cooperation of all actors is essential to control invasive alien species or quarantine pests effectively. This process is currently underway in Germany. Based on the recent IPPC work on invasive alien species, we are defining our role in a national strategy as part of the action against invasive alien species.

Your Workshop applies the guiding principles by promoting capacity-building programmes to prevent and control invasive alien species in countries needing know-how and resources. You can support these countries in assessing and reducing the dangers. This will mitigate the impact of invasive alien species and help those countries to develop sustainably.

This Workshop unites experts of farming, forestry and biodiversity and enables a dialogue between developed and developing countries. The workshop offers all of us an excellent chance to share experience and exchange information and know-how.

I wish to encourage you to seize this chance to cooperate successfully and develop options for action.

I wish you every success and fruitful results.