Biological Control in Invasive Species Management: Experiences and Lessons of Using ISPM3

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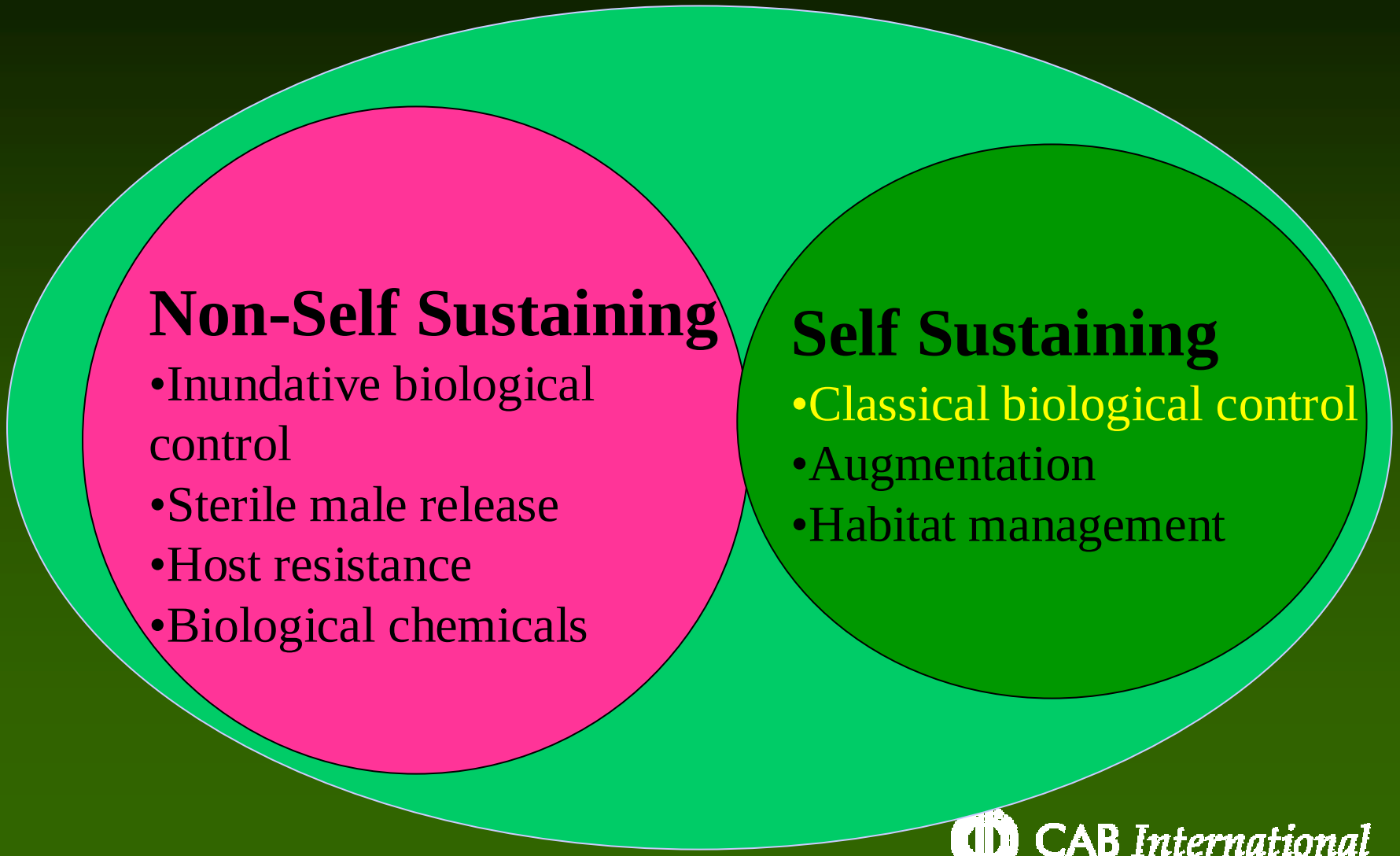
Biological control - Widest view

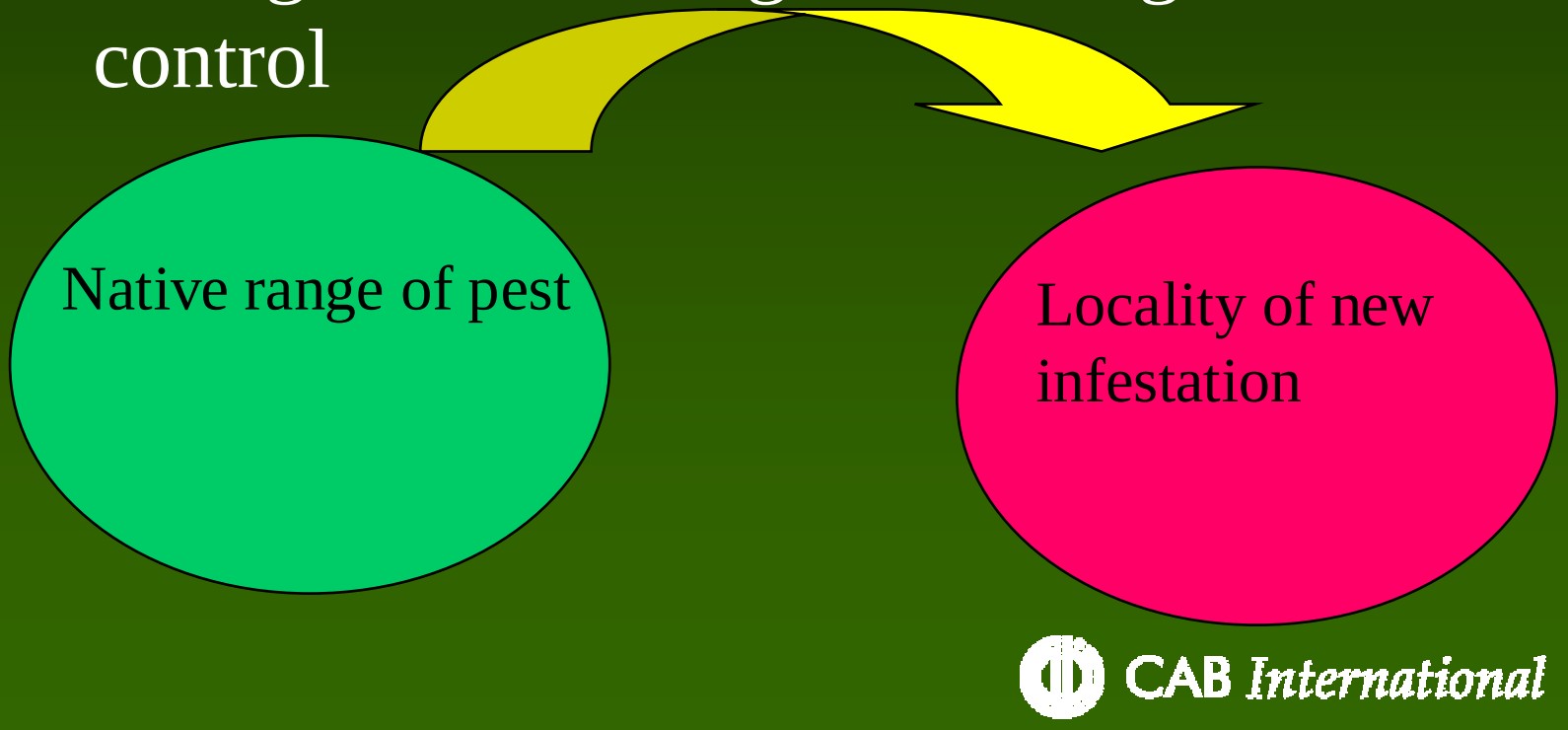


Biological control

- IPPC - A pest control strategy making use of living natural enemies, antagonists or competitors and other self replicating biotic entities

Classical biological control

IPPC - Intentional introduction and permanent establishment of an exotic biological control agent for long-term control



Growing need and use of biological control

- Spurred by successes
- To deal with the growing number of IAS
- ….and the increased need for IPM and and growth of the organic sector

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Successes

- Numerous success since Koebele introduced the vedalia beetle to control the cottony cushion scale over 100 years ago

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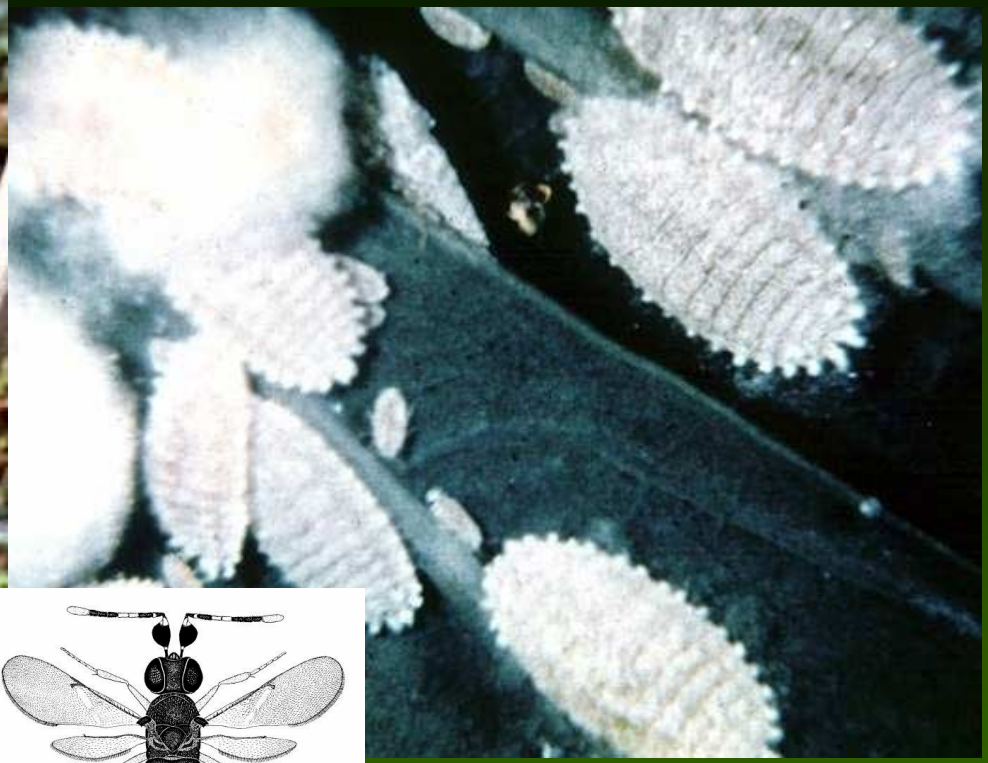
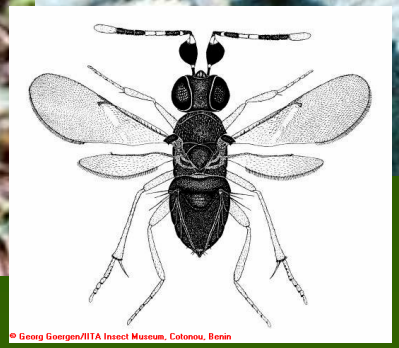
Cassava mealybug





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Salvinia

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Pink hibiscus mealybug

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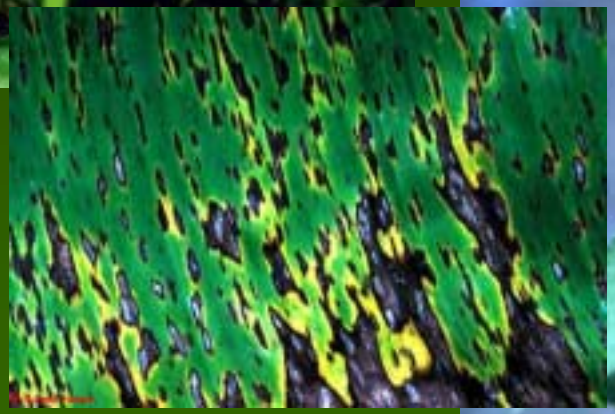
The challenges continue..



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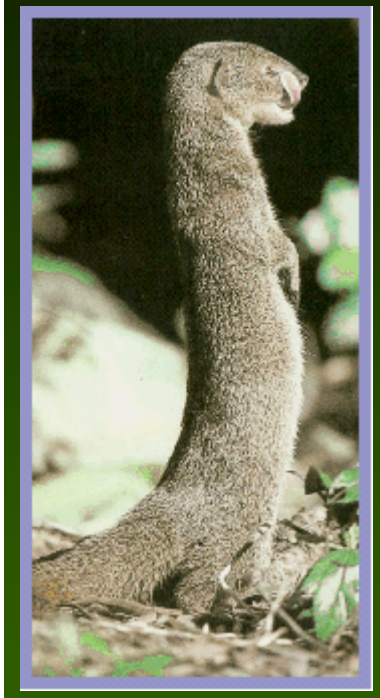
Concerns have increased



- Disastrous introduction of vertebrates predators over a century ago continue to hound CBC
- The very permanent nature of CBC has also led to concerns over impact of introduced agents on non-target organisms and local communities
- ….but on the whole over the last 50 years or so CBC has been relatively safe due to greater care

Development of ISPM3

- IIBC now part of CAB International and IOBC approached FAO in 1989 to initiate discussions to determine the need for a code.
- ISPM3 was developed in the ensuing years and was endorsed by FAO member countries in 1995, and formally published in 1996

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Objectives of ISPM3

- To facilitate the safe importation of exotic biological control agents for research and/or release into the environment.

By

- Defining the responsibilities of government authorities and other bodies involved

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Beneficiaries

- Some countries already had comparable procedures in place: e.g. Australia, Canada, New Zealand, South Africa, USA
- Less experienced countries the main beneficiaries

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Key elements of ISPM3

- Formation of a national body to administer the regulatory process.
- For each new introduction, dossiers should be prepared:
  - On the pest (identification, importance and known n.e)
  - Natural enemy (ident., biology and ecology, host specificity and impact on ntos, n.e or contaminants and procedures for elimination)
  - Potential hazards
- The responsibilities of exporters and importers

How are dossiers developed?

- Dossiers prepared on basis of:
  - Literature and inputs from biosystematists
  - Laboratory and field data on host range, biology/ecology
  - Practical experience from laboratory rearing

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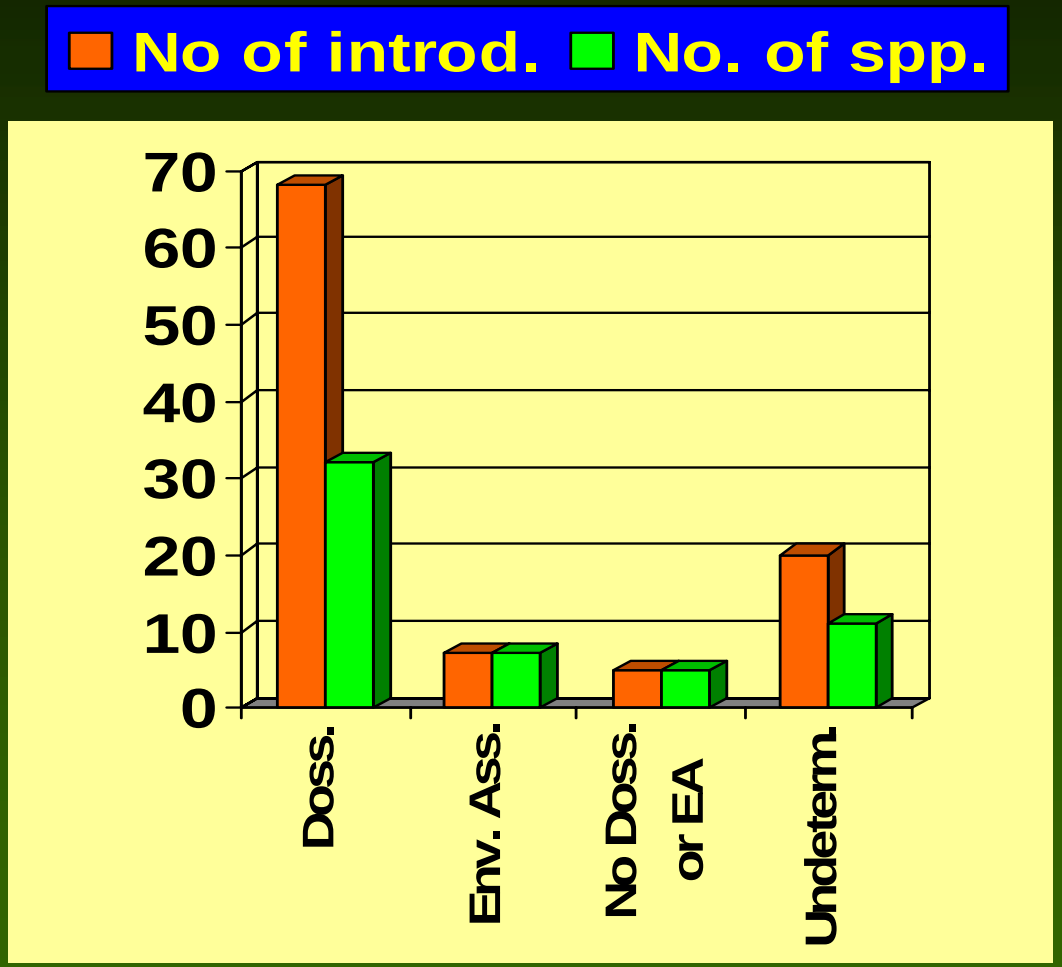
Use of Dossiers or Environmental Assessments (1996-2001)

- 104 introductions
- 42 countries
- 28 pest species
- 43 biological control agents



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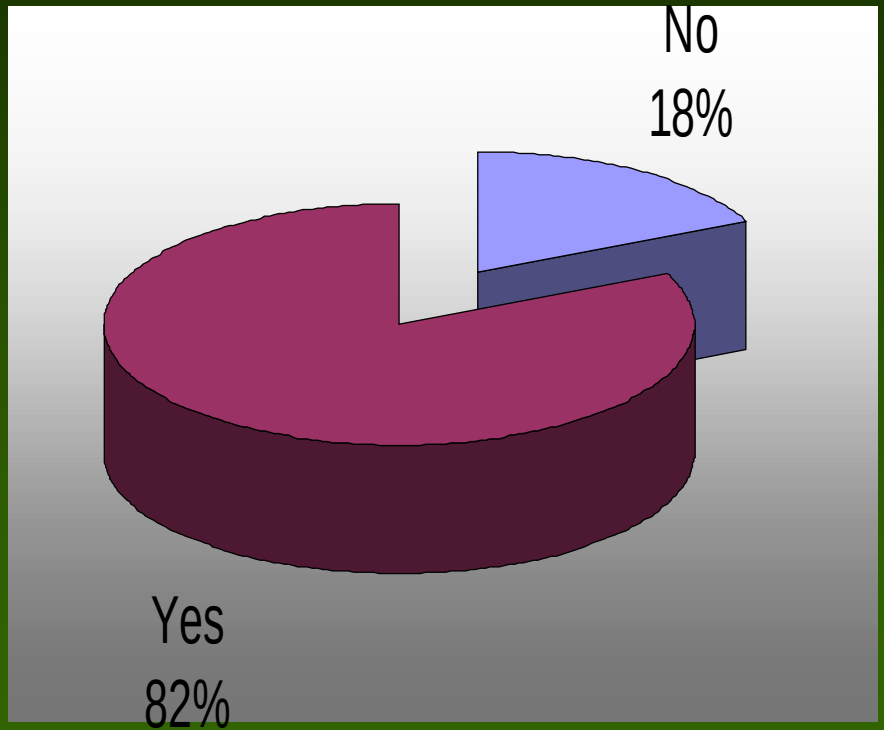
Awareness of the ISPM3

Were you/the country aware of ISPM3 when introductions were made?



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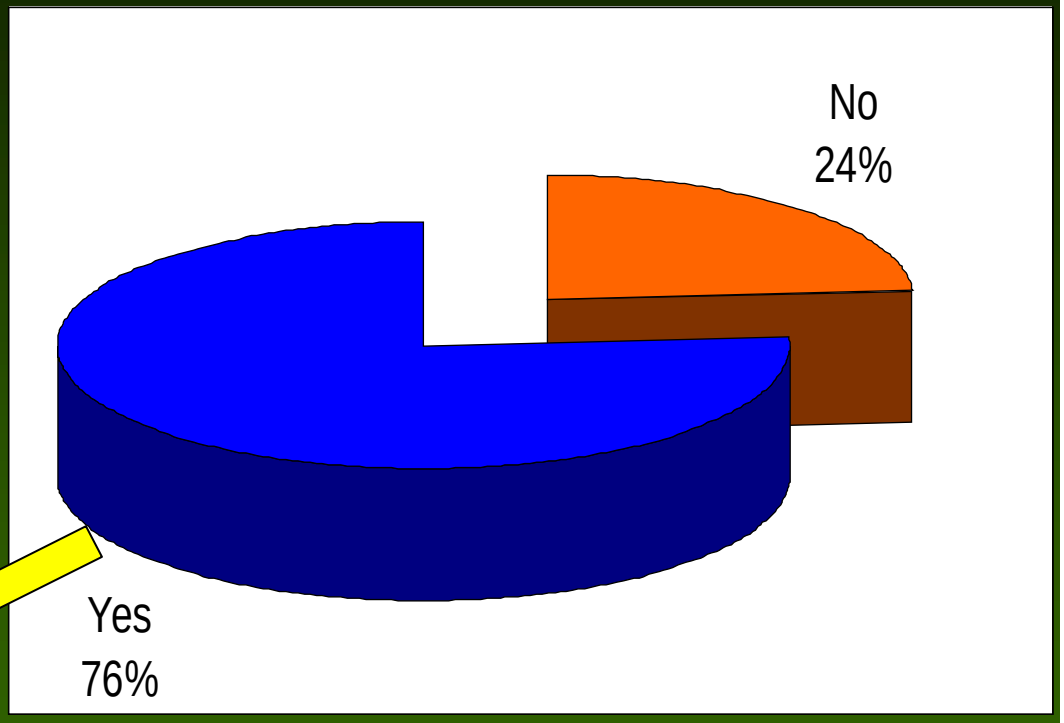
Use of ISPM3

Have you used ISPM3?



50% followed provisions of ISPM3 mostly/completely while the other 50% did so partially

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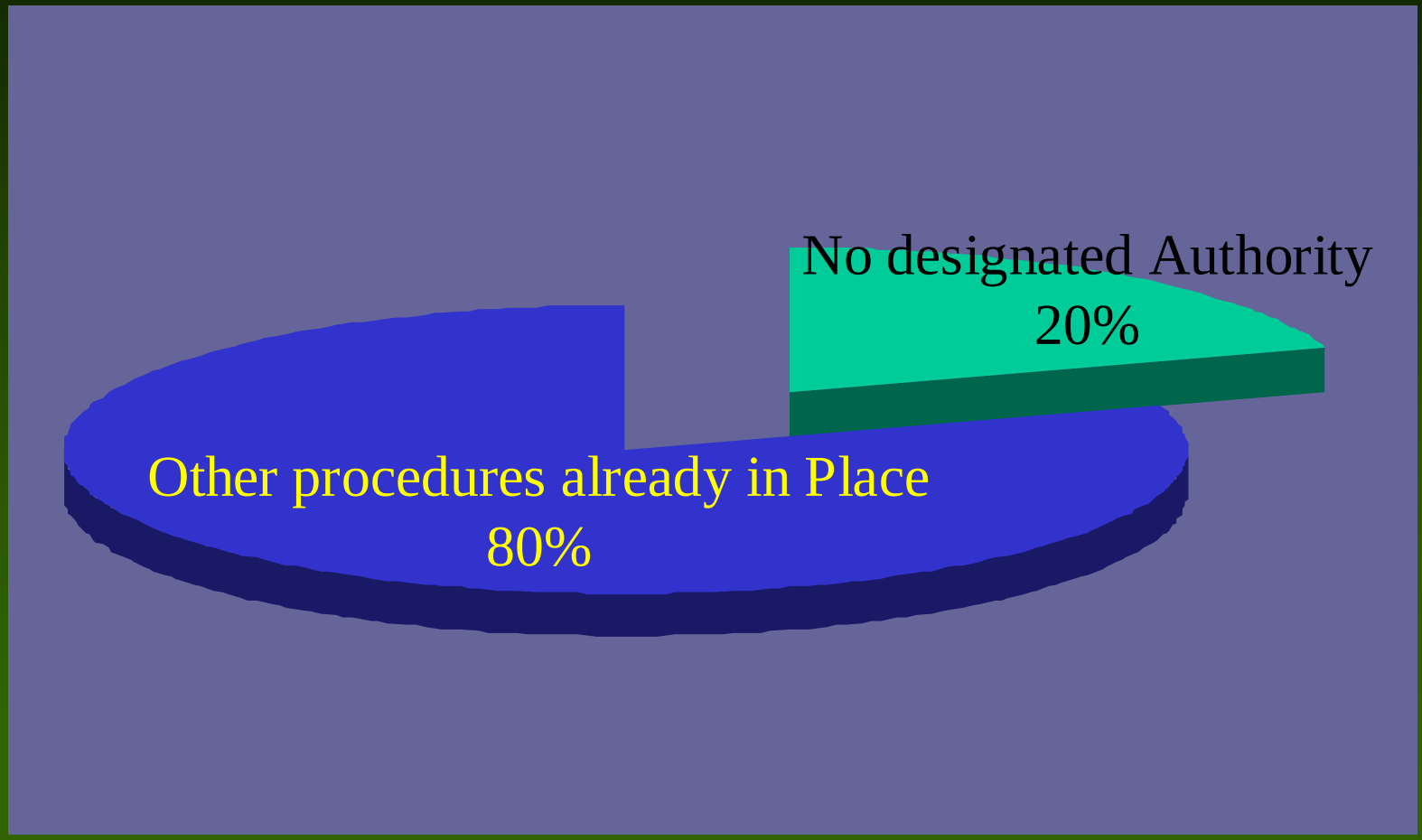
Reason for not using ISPM3



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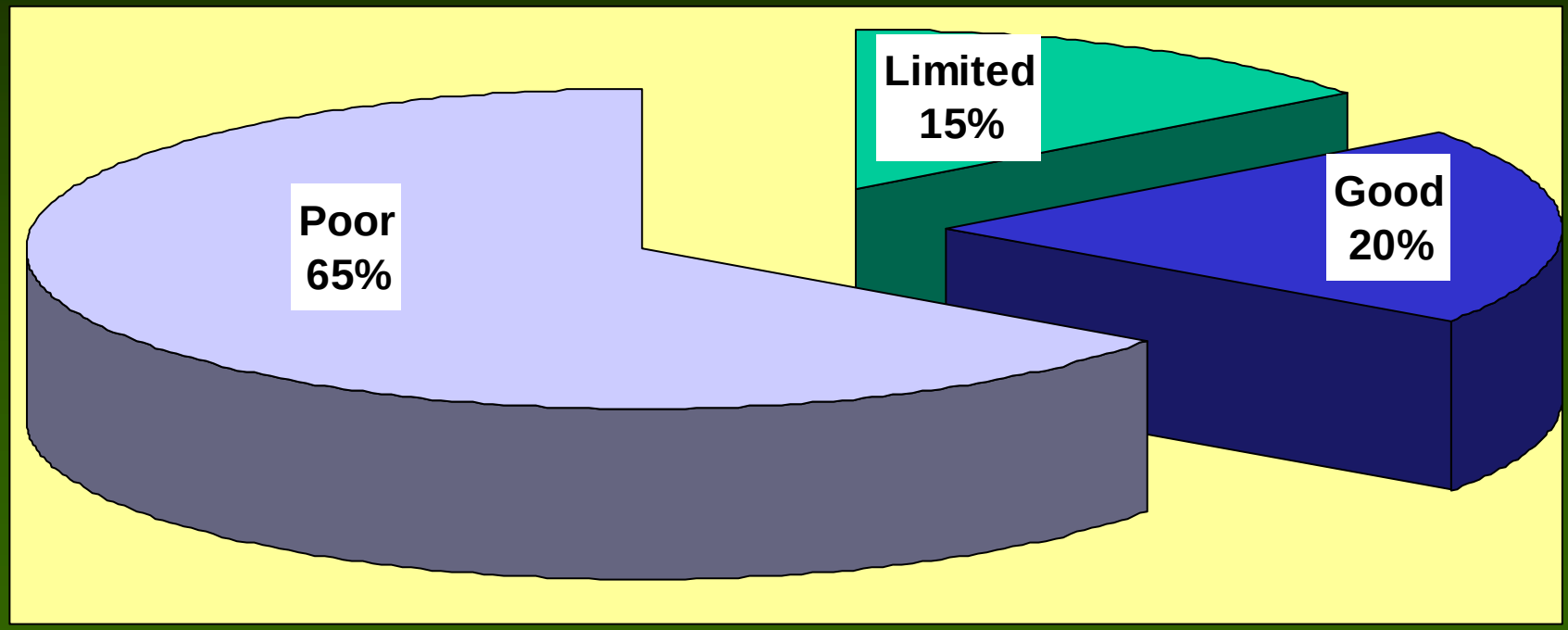
Awareness among relevant agencies and stakeholders



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Importers and Exporters of BCA

- Government agencies – 48%
- Regional and international research agencies - 48%
- Private sector – 6%

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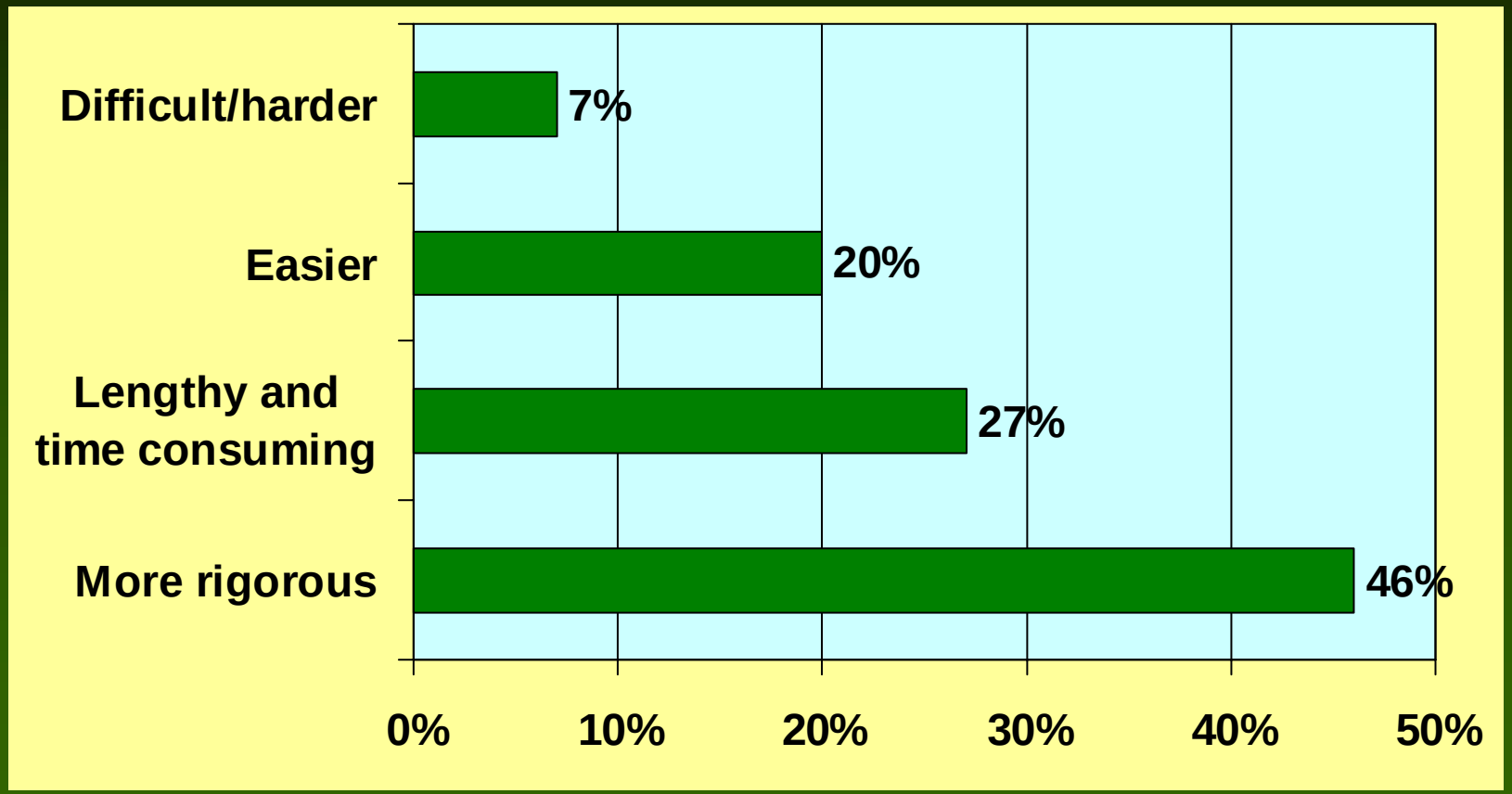
Impact of ISPM3 on biological control introductions.

Made them…



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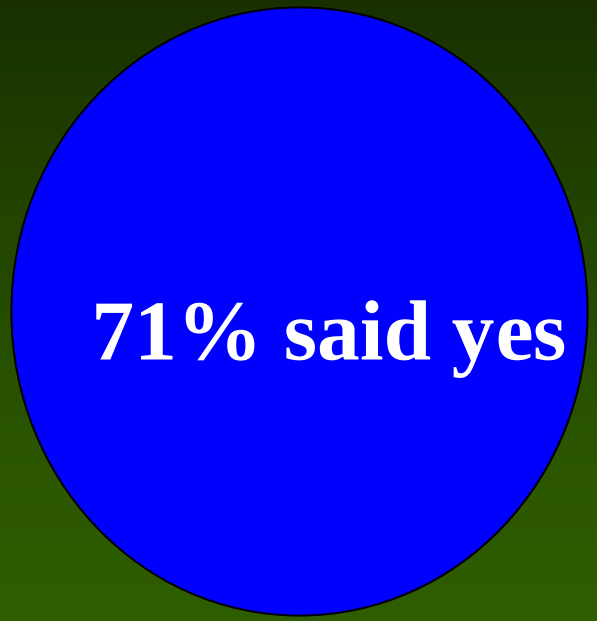
National legislative frameworks -1

- Do you have national legislation governing introduction and release of BCA?



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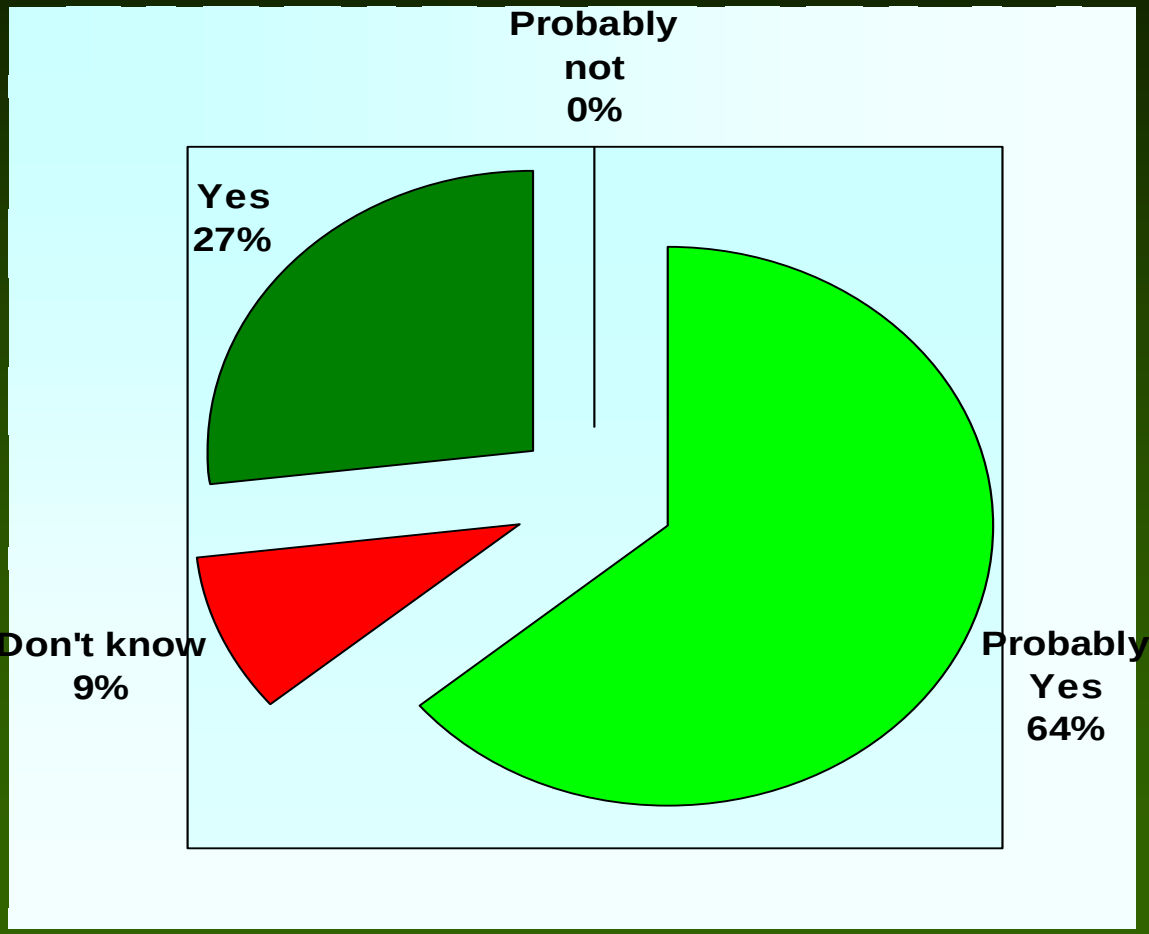
National legislative frameworks - 2

- Will ISPM3 provide a basis for development of legislation?



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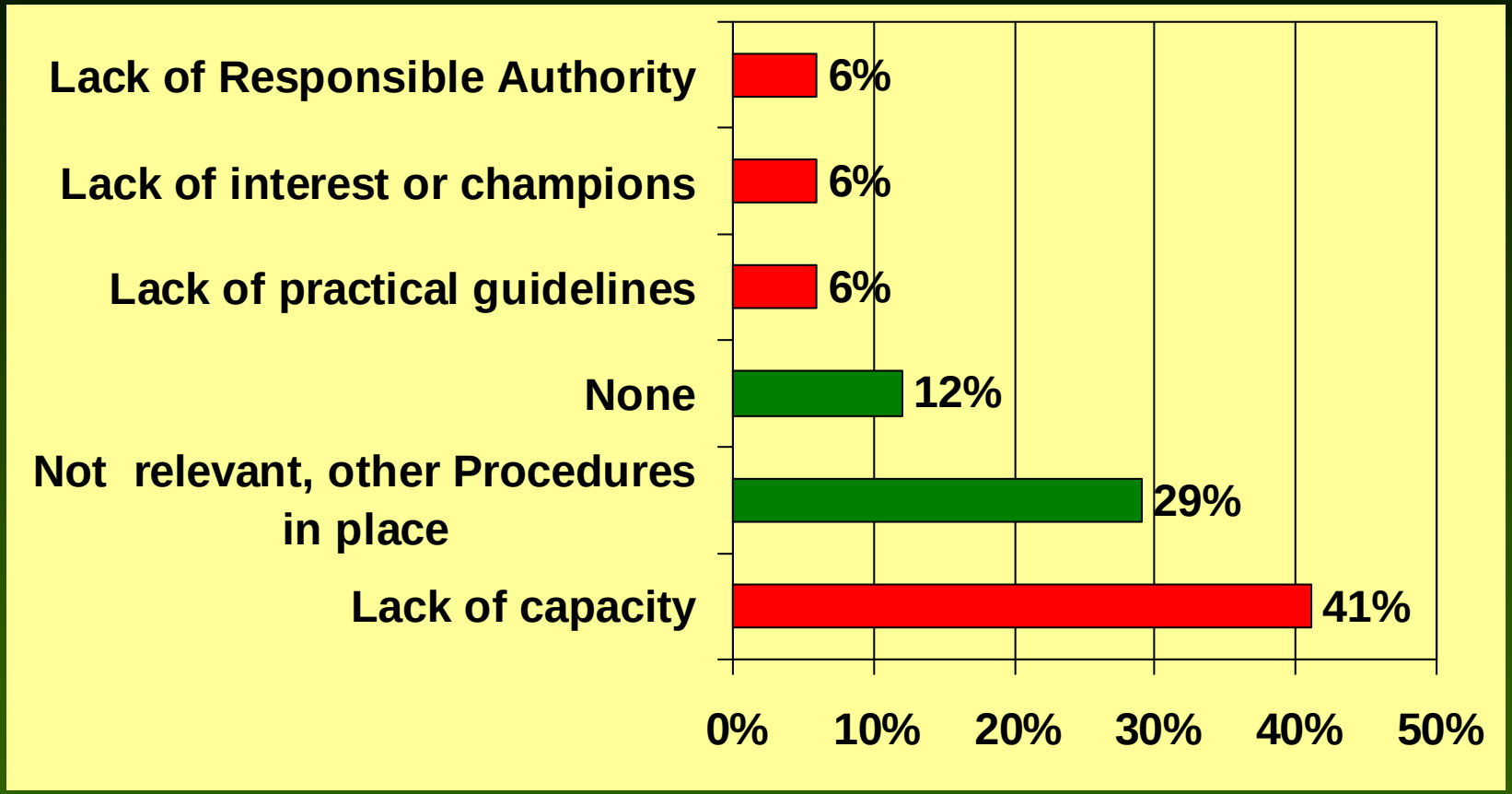
Constraints to use of ISPM3



- ….but also, 47% of countries do not have a quarantine facility?

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Case histories

- Caribbean
- West Africa
- Kenya
- Yemen
- Colombia
- Brazil

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Caribbean - 1

- Prior to 1995, very little experience at implementing biological control
- National mechanisms governing introduction of biological control agents non-existent or outdated
- Little capacity or experience at implementing the ISPM3

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Caribbean - 2

- Since 1990, the region has faced a number of new exotic pests
- Pink Hibiscus Mealybug, Citrus Blackfly, Coconut Blackfly, Giant African Snail…..

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Caribbean - 3

- In the case of HMB, dossiers instigated by FAO/CABI
- …….but the problem with HMB created regional awareness
- National programmes are now requesting that dossiers be prepared for new introductions as a matter of practice

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West Africa

- *Aleurodicus dispersus* a regional problem
- At the instigation of FAO/CABI, a dossier prepared on *Nephaspis bicolor*
- Decision to introduce deliberated at the regional level

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Kenya

- Need for process guiding introduction of biological control agents already addressed before ISPM3 was ratified
- Authority to introduce vested with the Minister of Agriculture and implemented by DoA who was advised by KSTCIE – Chaired by DoA and the MD KEPHIS is Secretary
- Prior to 1996, KSTCIE required written petition and verbal presentation
- ISPM3 validated this arrangement and refined content of dossiers

Yemen

- Prior to arrival of the Brown Peach Aphid (BPA) in 1993, the GDPP had implemented a biological control project against the potato tuber moth.
- No set mechanism for assessing potential introductions was in place
- In 1995 a project was started to implement biological control of BPA funded by FAO
- A dossier was prepared for the selected natural enemy, *Pauesia antennata* and this provided for the first time a critical look at introductions and established the important role of the national authority (GDPP)

Colombia

- *Hypothenemus hampei* is a major pest of coffee
- Biocontrol efforts commenced in the 1980s resulting in introduction of two parasitoids
- A new project in 1993 funded by DfID commenced, part of which was to introduce *Phymasticus coffeae*

- Laboratory host feeding studies on *Phymasticus* showed that in no choice situations it could attack other small scolytids
- Results were presented to the MoA who gave permission for introduction
- The dossier allowed decision makers to make an informed decision.
- No adverse effects observed in the field

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Brazil

- Since 1991 – introductions overseen by the national quarantine facility, Costa Lima
- Specific procedures agreed among COSAVE member countries used
- Regional standards agreed in 1996
- In developing these, ISPM3 was referenced as well as national legislations and US guidelines
- From 1991-2000, 170 introductions processed

Problems with the dossier approach

- Delay implementation of biological control projects
- Scant resources limit the kinds of studies that can be conducted
- Little information on remedial action after agents are released
- Lack of competent authorities to review dossiers
- Lack of adequate follow-up after release

Conclusions

- Production and dissemination of the ISPM3 was timely and appropriate
- ISPM3 ensures environmental issues are raised
- The ISPM3 provided a mechanism for formalising good practice, within an internationally recognized frame
- Facilitation of regional collaboration
- Urgent need to address constraints – capacity, lack of guidelines and development of national mechanisms for its implementation
- Proposed revision of ISPM3 is timely, taking into account the growing need for biological control

Acknowledgements

- For Information: A. Sakala, A.E Bustillo, A.T. Daudi, C. Persad, C.J. Kedera, D. Dominique, E.H Kapeya, E.M. Mussonda, F. Anzueto, F.J. Tambasco, G. Mathurin, H.C. Arredondo, j.G. Francis, J.O. Diaz, L. Munroe, M. Odong, M. Sherwood, O. sosa, and R.D. Gautam
- Various Picture credits from the CABI-CPC
- Key reference: Kairo, M.T.K; Cock, M.J.W & Quinlan, M.M 2003 – *Bicontrol news and Information* 24 1() 15N-27N

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