Combatting the threat of globalization and pest invasions with a workflow tool for risk assessment

CABI Action on Invasives

Laura Doughty, 3rd September 2019, IPPRG 2019 Annual Meeting

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CABI

Overview

- Introduction to CABI's Action on Invasives programme
- Overview of the Pest Risk Analysis Tool
- Description of the decision making process
- Dissemination
- Next steps

Taking action

CABIs **Action on Invasives** programme aims to protect and improve the livelihoods of 50 Million poor rural families impacted by invasive species

The programme adopts a systems-based approach to managing biological invasions:

- **Prevention**: developing and implementing biosecurity policies and raising awareness of potential threats
- **Early detection and rapid response**: developing surveillance and emergency action plans for detecting and eradicating new invasions
- **Control**: scaling up existing invasive species management solutions, embedding them in policy and making sure that rural communities have access to them

UKaid
from the British people

Ministry of Foreign Affairs of the Netherlands

Action on Invasives

How we deliver the programme

Each work package includes strong elements of **gender** and **youth** involvement, and **monitoring and evaluation:**

Stakeholder engagement

Foster and strengthen the right partnerships at regional, national, and local levels

Community action

Facilitate scalable access for communities to new solutions to mitigate biological invasions

Knowledge and data

Dedicated knowledge tools enhanced for practical decision support

Best practice solutions

Research developed and validated in collaboration with trained in-country stakeholders

Outcome

Protect and restore ecosystems, reduce crop losses, improve health and protect trade

Impact

Protect and improve the livelihoods of 50 million poor rural families impacted by invasive species

CABI Pest Risk Analysis Tool

A **decision support tool** to aid the selection of appropriate measures for r**educing risk and facilitating the safe movement of plants and plant products**

Pest Risk Analysis Tool

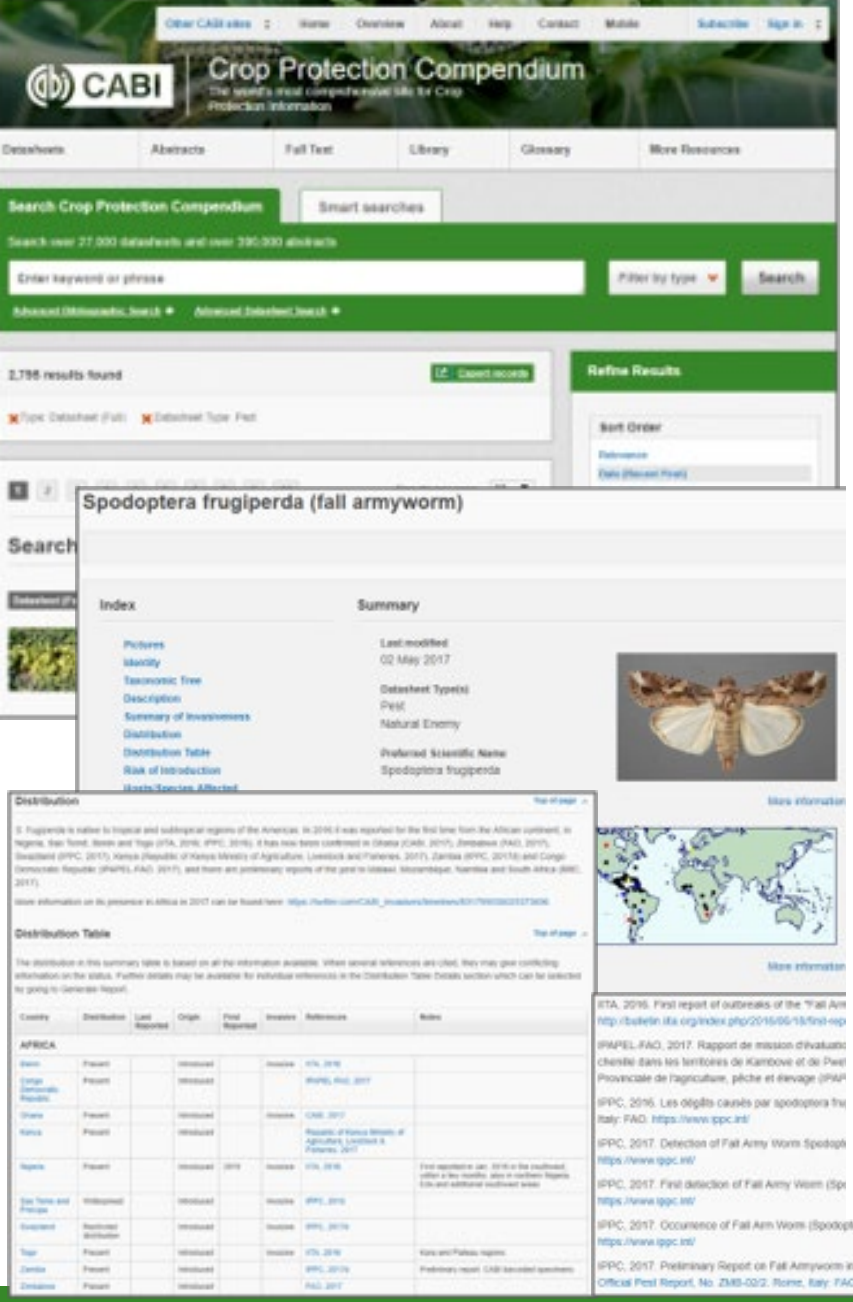
Target users: risk assessors, plant protection officers, quarantine officers

Scope

- Tool for Pest Risk Analysis of plant pests
- Addressing unintentional introduction of pests
- Phase 1 (2018) focussed on pathway-initiated PRA (commodity import)
- Phase 2 (July – September 2019) focussed on pest-initiated PRA

Overview

- Built on Crop Protection Compendium (CPC) data
- Available to CPC subscribers
- Provided free to 97 NPPOs
- Workflow is based on the design on the CPC CD-ROM PRA tool
- Follows standards set out by the International Plant Protection Convention (IPPC) ISPM 11



Crop Protection Compendium

- Global resource of information on **crop pests and crops**
- Over **28,000 datasheets**
- **3,900 Full datasheets** - written by experts and independently verified
- 24,000 Basic datasheets
- Over **8,000 pictures**
- **442,434 bibliographic records** updated weekly
- Full text of over **47,309 articles**
- **Downloadable distribution data**
- Decision support tools: Advanced searching, **Horizon Scanning Tool**, and **Pest Risk Analysis tool**

Pest Risk Analysis Tool

Phase 1 - 2018

April	May	June	July	Aug	Sept	Oct	Nov	Dec
CABI consultation	Prototype	User workshop Nairobi	Requirement gathering and technical specification	IT build and testing				User workshop Nairobi

Phase 2 - 2019

Jan	Feb & March	April	May	June	July	Aug	Sept	Oct
Beta launch	User consultation	NPPO Contact	Prototype, Technical specification IT build and testing					Launch

Pathway initiated PRAs - commodity

Importing onions to Dominica from the Netherlands

1. Pest lists and risk assessments | 2. Pest risk management | 3. Pest risk analysis summary

Categorized pest lists

Pests have been categorized into two lists based on CABI's distribution data and details of crop and commodity types entered at the Initiation stage. Select which list to view below:

- (•) Pests potentially requiring phytosanitary measures
- ( ) Pests excluded from assessment

Or view both lists by downloading the full pest list [Download full pest list]

95 Pests potentially requiring phytosanitary measures

Pests recorded on selected crop, recorded as present in the exporting country and not recorded or recorded as absent in the importing country or present with special regulatory status. Individual risk assessment can be completed on pests included in this table.

Use the 'user action' button ••• to:

- Go to and complete risk assessments for each pest
- Exclude the pest from the assessment (moving it to the 'Pests excluded from the assessment list')
- Add Regulatory status
- Add notes
- Link to CPC species datasheets

User actions	Type	Pest name	On crop	On commodity type	Exporting Country	Importing Country	Number of countries where present	Regulatory status	Risk assessment	Notes	Modified by user
•••	Spermatophyta	Abutilon theophrasti (velvet leaf)	Yes		Present	Absent	34		InProgress	💬	👤
•••	Spermatophyta	Amaranthus blitum (livid amaranth)	Yes		Present	Absent	97		InProgress	💬	👤
•••	Spermatophyta	Ambrosia artemisiifolia (common ragweed)	Yes		Present	Absent	75		InProgress		
•••	Nematoda	Aphelenchoides fragariae (strawberry crimp nematode)	Yes		Present	Absent	37		Incomplete		
•••	Ascomycota	Aspergillus fumigatus	Yes		Present	Absent	13		InProgress		

Workflow

Initiation

- Importing country
- Exporting country
- Crop(s)

Categorisation

Tool generates list of pests present in the exporting country but not present in the importing country

Risk assessment

Every pest in the list can be assessed for:

- Probability of entry
- Probability establishment
- Probability spread
- Potential economic, environmental and social consequences

Decision Point: Does the pest require phytosanitary measures?

Risk management

Management measures are assigned to pests requiring phytosanitary measures

PRA summary

Review all management measures assigned to the commodity
Provide recommendations for next steps
Export report (HTML / Word)

Pest initiated module

Home > Initiation: By Pest > Categorization

Session#: P00676

1. Categorization | 2. Risk assessment | 3. Risk management | 4. PRA summary

Categorization of Spodoptera frugiperda (fall armyworm)

Categorization is a rapid assessment of the pest's identity, distribution and potential impacts to determine whether the pest potentially requires phytosanitary measures

- If the pest does not fulfil criteria to qualify as a quarantine pest, the PRA process can stop.
- If the pest does fulfil the criteria to qualify as a quarantine pest or in the absence of sufficient information, the uncertainties should be identified and the PRA process should continue to the risk assessment stage.

View datasheet

Identity

Provide details on taxonomy and nomenclature.
Ensure the PRA is being performed on a specific organism and the all information used in the PRA is relating to the organism in question.
Generally the taxonomic unit of the pest is species. The use of higher or lower taxonomic units should be supported by scientifically sound rationale. The level of listing should be relatable to identified phytosanitary measures (symptom and/or test based)

The fall armyworm, Spodoptera frugiperda, is a lepidopteran pest that feeds in large numbers on the leaves, stems and reproductive parts of more than 350 plant species, causing major damage to economically important cultivated grasses such as maize, rice, sorghum, sugarcane and wheat but also other vegetable crops and cotton. Native to the Americas, it has been repeatedly intercepted at quarantine in Europe and was first reported from Africa in 2016 where it caused significant damage to maize crops. In 2018, S. frugiperda was first reported from the Indian subcontinent (Ganiger et al., 2018; Sharanabasappa Kalleshwaraswamy et al., 2018). It has since invaded Bangladesh, Thailand, Myanmar, China and Sri Lanka (IPPC, 2018b, 2019; FAO, 2019c). The ideal climatic conditions for fall armyworm present in many parts of Africa and Asia, and the abundance of suitable host plants suggests the pest can produce several generations in a single season, and is likely to lead to the pest becoming endemic.

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Presence or absence in the PRA area

The pest should be absent from all or a defined parts of the PRA area. If it is likely that the pest is absent from the PRA area as a result of successful regulation, deregulation should not be proposed

S. frugiperda is native to tropical and subtropical regions of the Americas. In 2016 it was reported for the first time from the African continent, in Nigeria, Sao Tomé, Benin and Togo (Goergen et al., 2016; IPPC, 2016). It has now been confirmed in more than 30 African countries (FAO, 2018). For further information on S. frugiperda in Africa, see CABI's Fall armyworm portal.

In 2018, S. frugiperda was reported from the Indian subcontinent (Ganiger et al., 2018; IITA, 2018; Sharanabasappa Kalleshwaraswamy et al., 2018). In Karnataka (ICAR-NBAIR, 2018a) and Andhra Pradesh (EPPO, 2018). The pest has also been reported in Bihar, Chhattisgarh, Gujarat, Maharashtra, Odisha, Tamil Nadu, Telangana and West Bengal (ICAR-NBAIR, 2018b; EPPO, 2019). A live tracking tool for fall armyworm in India has been developed by PEAT, CABI and ICRISAT: https://plantix.net/en/live/fall-armyworm. S. frugiperda has also been reported in Myanmar (IPPC, 2019a), Sri Lanka (FAO, 2019a), China (IPPC, 2019), Bangladesh (FAO, 2019c), Thailand (IPPC, 2018b) and Korea Republic (IPPC, 2019b). There is a preliminary report of fall armyworm in Japan (IPPC, 2019d).

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Workflow

Initiation

- Pest (search CPC for datasheet)
- Area at risk
- Scope of PRA / previous PRAs

Categorisation

- Identity, regulatory status of the pest, distribution, association with host plants

Decision Point: Does the pest require a risk assessment

Risk assessment

Every pest in the list can be assessed for:

- Probability of entry – individual pathways can be assessed
- Probability establishment
- Probability spread
- Potential economic, environmental and social consequences

Decision Point: Does the pest require phytosanitary measures?

Risk management

Management measures are assigned to pests requiring phytosanitary measures

PRA summary

Review all management measures assigned to the commodity
Provide recommendations for next steps
Export report (HTML / Word)

In the pipeline…

Allow sharing of data between users

Data feedback

Quantitative assessment of economic impact

Regional PRAs

Incorporating external datasets

Automated assessment of risk and impact

Climate change risk

Improve risk management

Translations

Prioritizing pest lists

Incorporating CABI datasheet information

Intentional introductions

and more….

PRA Tool – NPPO Engagement

- To ensure maximum use of the PRA Tool in low income countries, CABI is providing gratis access to both the CPC and the PRA Tool to the registered NPPOs of 97 countries identified on the basis of UN Index Number

- To date we have:

Region	Responded	Access	Used	Total
Africa	37	25	10	49
Asia	13	10	5	29
Europe				1
Latin America & Caribbean	13	10	3	18
Total	63	45	18	97

Usage to date

- Since the beta launch the tool has been used in 109 countries

- 13 NPPOs have shown repeated use. Among them are the NPPOs in Kenya, Uganda, Sri Lanka & Jamaica

- A training workshop is taking place this week in South Asia with participants representing the NPPOs for India, Bangladesh, Nepal, Sri Lanka and Pakistan.

Inspired by the Global Burden of Disease for human health, the Global Burden of Crop Loss initiative aims to provide rigorous, authoritative evidence on impacts, causes, and risk factors of crop loss.

This will enable everyone from policymakers to farmers to be more effective in their plant health interventions.

Requiring

- A large group of collaborators
- High-quality data gathering mechanisms,
- Analytical methods
- Creation of metrics that are globally recognised

Launch of programme in 2020 the IYPH. First iteration of results in 2023.

The Pest Risk Analysis Tool will be formally launched on the 15th October 2019

Contact pra@cabi.org or l.doughty@cabi.org for more information

CABI is an international intergovernmental organisation, and we gratefully acknowledge the core financial support from our member countries (and lead agencies) including:

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Australian Government
Australian Centre for International Agricultural Research

Agriculture and Agri-Food Canada

Ministry of Foreign Affairs of the Netherlands

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
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Afghanistan


Anguilla


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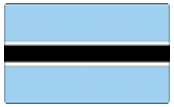
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