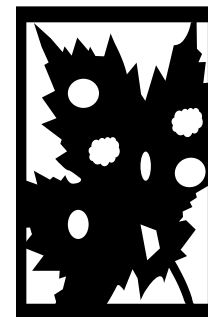
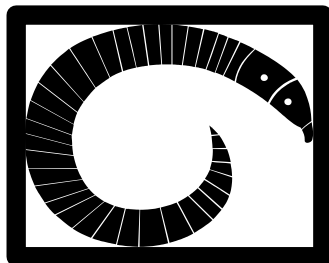


Pest Lists: What are they and how do we use them? A Regulatory Perspective



USDA, APHIS, PPQ
Center for Plant Health Science and Technology
Plant Epidemiology and Risk Analysis Laboratory

Why do we use pest lists

- Decision-making for imports
- Supporting exports
- Support domestic policies
- One step in conducting pest risk analysis:
determine what pests are associated with the commodity that are present in the export area
- As a preliminary step in negotiating with trading partners
- Surveys and other domestic activities

Definitions

- PEST: Any species, strain or biotype of plant, animal or **pathogenic** agent injurious to **plants** or **plant products**.
- QUARANTINE PEST: A **pest** of potential economic importance to the **area endangered** thereby and not yet present there, or present but not widely distributed and being **officially controlled**

What is a pest list?



Shows us which pests we need to evaluate in a PRA

- Associated with the commodity
 - “association” may be interpreted differently depending on the commodity
- Present in the country of production
- Reasonably likely to follow the pathway

What does a pest list look like?

Table 2. Actionable pests reported on *Annona cherimola* (in any country) and present in Freedonia (on any host).

Pest name	Evidence of presence in Freedonia	Host association	Plant part(s) association	On harvested plant part(s)?	Notes
ARTHROPODS					
Acari: Tenuipalpidae					
<i>Brevipalpus Freedoniansis</i> Baker	Peña and Bennett, 1995; Prado, 1991	CABI, 2012; Gonzalez, 2006; Peña and Bennett, 1995; Prado, 1991	Leaf, fruit, stem, shoot (CABI, 2012); leaf, fruit, stalk, twig, bark (Gonzalez, 2006); fruit (Renato and Larral, 2003)	Yes	Plant part association based on feeding behavior of the species on its hosts in general.
Coleoptera: Curculionidae					
<i>Naupactus xanthographus</i> (Germar)	Peña and Bennett, 1995; Prado, 1991	CABI, 2013; Peña and Bennett, 1995; PPQ, 2002; Prado, 1991	Shoot, leaf, root, trunk, branch, branch, bud (PPQ, 2002); leaf, root, trunk, bark, fruit (CABI, 2013)	No	Plant part association based on feeding behavior of the species on its hosts in general. See additional discussion in section 2.3.
Hemiptera: Ortheziiidae					
<i>Praelongorthezia olivicola</i> (Beingolea) (syn. <i>Orthezia olivicola</i> Beingolea)	Ben-Dov et al., 2012; Klein Koch and Waterhouse, 2000	Alata Condor, 1973; Peña and Bennett, 1995; Tijero, 1992	Leaf, twig (Aguilera and Grana, 1976)	No	
Thysanoptera: Thripidae					
<i>Scirtothrips inermis</i> Priesner	Klein Koch and Waterhouse, 2000; Prado, 1991	Klein Koch and Waterhouse, 2000; Prado, 1991	Leaf (Mound and Walker, 1982) Plant part association based on feeding behavior of the species on its hosts in general.	No	<i>Scirtothrips inermis</i> is present in California (Anonymous, 1972; Mound and Palmer, 1981; Mound and Walker, 1982; Sakimura, 1986).
FUNGI					
<i>Armillaria</i>	Farr et al., 2013;	ICUC, 2006;	Root, stem (Paull	No	

- **Scientific name of pest**
- **Distribution**
 - Exporting country
 - PRA area
- **Quarantine status**
 - If widely distributed, often not a Q-pest
- **Plant part association**
 - e.g., Fruit, leaves, roots, etc.
- **Associated with commodity at harvest**
 - Does the pest follow the pathway?
 - Based on plant part association and industry practices
- **Notes**
- **References!**

Some important concepts

- Pest lists are dynamic and subject to change
- Should *consider* evidence – the good, the bad and the ugly (but you might have to talk about uncertainty*)
- Pest lists are important tools for communicating information to stakeholders – they show **due diligence**
- NPPOs can be held accountable for decisions or regulations that arise from pest lists (and PRAs)
- Pest lists are *usually* developed for a country / commodity combination (but there are exceptions)
- Just because a pest is listed on a pest list does NOT mean
 - it will follow a pathway
 - it presents a risk

“How come *that* pest ended up on the pest list???”

- The pest may be associated with the **PLANT** at some stage of production / growth
- If there is literature that indicates an association of the pest with the commodity
- The pest may have unclear host status, geographic distribution or regulatory status
- Commodity production practices are unspecified, unclear, inconsistently applied or outside of regulatory control
- REMEMBER: pest lists may show *association*, but don't tell you the full story!

So what about pest risk analysis?

- Pest risk analysis (or PRA): likelihood of **introduction** (entry and establishment) x magnitude of **consequences**
- Usually NPPO to NPPO communication due to issues related to official information and official actions
- **Association with the commodity \neq risk**
- There **must** be entry, establishment AND impacts for there to be risk
- We also have to talk about uncertainty...(in the pest list ***and*** PRA)



What about uncertainty?



- Natural or statistical variability
- Incorrect information
- Ambiguous information
- Insufficient information
- Conflicting information
- Error
- “Black Swans”

Variability

- Individuals in nature are different
- Variability may not be reduced with better measurements
- However, we can estimate and predict variability



Examples:

- Female fecundity
- Virulence
- Cold tolerance
- Host preference
- Susceptibility to pesticides

“True” uncertainty

ARE YOU COMING TO BED?

I CAN'T. THIS
IS IMPORTANT.

WHAT?

SOMEONE IS WRONG
ON THE INTERNET.



- Arises from lack of perfect knowledge
 - Missing information
 - Extrapolation of information
 - Ambiguous or conflicting information
 - Unreliable sources/wrong information
 - Incorrect assumptions or models
- Can sometimes be reduced by obtaining better information (from researchers, industry, trading partners etc.)
- NAPPO RSPM on Pest Risk Management provides a good discussion uncertainty

Approaches for dealing with uncertainty

Missing information



Extrapolate from similar situations where you have evidence. How applicable is the information? How similar are the conditions?

Approaches for dealing with uncertainty

Ambiguous information



Extrapolate from similar situations where you have evidence; make assumptions

Approaches for dealing with uncertainty

Conflicting information



Is it an issue of variability? What information fits the situation you are analyzing best?



Is there a difference in the quality of information? Are some sources more reliable than others? Preponderance of evidence?

Approaches for dealing with uncertainty

Unreliable
information



Old/dated sources.

Evaluate how likely it is that the situation would change over time.



Information may be wrong. Evaluate the quality of information sources.

Approaches for dealing with uncertainty

Incorrect assumptions or models



Evaluate quality of information sources. Has the model been peer reviewed? Tested/validated?

Commodity information:

- Taxonomy
 - Genus level?
 - Species level?
 - Cultivar?
- Parts of the plant being imported
- Morphological characteristics
- Biology of the commodity
 - Seasonality, growth, susceptibility to pests at various stages



Commodity information

- Degree of processing
- Production practices
 - Pre-harvest to packaging
 - Standard industry practices
- Some things always occur (usually included in considerations)
- Some things occur commonly but not always (may not be included in considerations)



Country Specific Information:

- Pests associated with commodity
- Production areas
- Production practices
 - Harvest, post-harvest handling
- Complications arise if we cannot determine origin
- Provided by NPPO of exporting country*



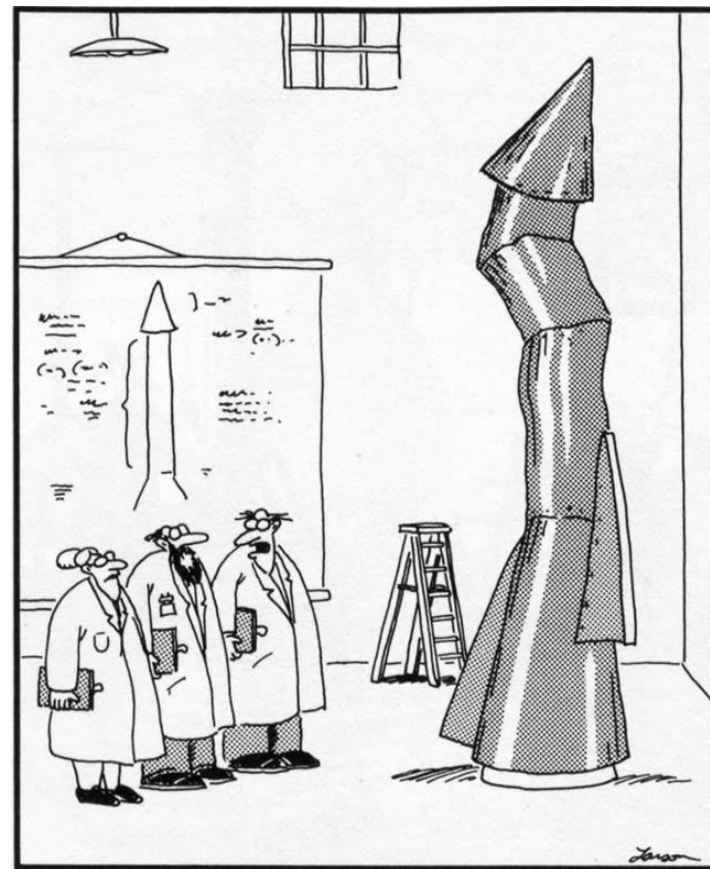
Pest-specific information:

- Taxonomy/Diagnostics
 - Include synonyms
- Distribution
 - Present in export area?
 - Present in US?
- Host range
 - Part of plant attacked
- Life cycle and feeding habits
- Is it likely to remain with the commodity?



Opportunities for collaboration

- Pest – host complexes
- Diagnostics, testing, identification
- Presence / absence
- Industry practices
- NPPO actions / requirements



"It's time we face reality, my friend. ... We're not exactly rocket scientists."

dank u
 Tack ju faleminderit
 Asante 谢谢 Tak mulțumesc
 kiitos **Salamat!** Gracias
 Merci Terima kasih Aliquam
 ありがとう Dankie Obrigado
 köszönöm grazie
 Aliquam Go raibh maith agat
 děkuji Thank you