Improving Inspection Programs Using Risk-Based Sampling

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Message

- Inspection is a useful (stand-alone) phytosanitary procedure
- But could perhaps be best used to improve inspection programs
  - Example: Plant propagative materials
What is inspection?

“Official visual examination of plants, plant products or other regulated articles to determine if pests are present and/or to determine compliance with phytosanitary regulations.”

ISPM No. 5
Objectives of Inspection (ISPM 23)

- Detect pests that are present
- Verify effectiveness of measures
- Confirm compliance with regulations
- Detect organisms for which risk has not yet been determined
- *Deter exporters from sending infested goods*
- *Provide useful information for programs*
Inspection in a Phytosanitary Context

Offshore Programs

Permitting

Pest ID and Mitigation

Early Detection/Rapid Response

Smuggling Interdiction and Trade Compliance

Management Programs

Pest Safeguarding Continuum

“We were a very effective first line of defense.”

Miami Inspection Station Officer, August 10, 2016
Other Inspectional Issues

- Usually based on sampling, not 100 percent
- Not all pests visually detectable
- Inspectors are not perfect

Thus, not 100 percent effective
- Implies some tolerance for “leakage”
- Rate reduction at best, *not* elimination
Sampling Issues

- PPQ: traditionally use 2 percent sampling
  - Detection level varies with lot size
  - Rate estimates not valid/comparable
  - Unfair; trading partners can manipulate

- Improved sampling
  - 5% detection level with 95% confidence, assuming 80% efficiency
  - More meaningful rates, more fair, etc.
  - Instituted in FY15 in plant inspection stations
Risk-Based Sampling

- Direct inspections away from lower risk goods toward higher risk goods
  - More efficient
    - Less resources used on lower risk goods
    - More resources used on higher risk goods
  - Incentives for industry to be cleaner
  - Feedback between inspection and targeting
    - Places inspection in a better context
    - Lets inspectors see impacts on programs
Ratings-Based Approach

- PPQ experience (e.g., cut flowers)
- Rate combinations by risk
  - Ideal = producer-taxon
  - Practical (currently) = country-genus
- Implement after data collection and rating phases, then monitor
RBS Implementation by PPQ

- **Pathway**
  - Propagative material
  - Plant inspection stations (PPQ inspectors)

- **FY15 Description**
  - 91,698 shipments; 512 genera; 40 countries
  - 5,001 combinations (>10 shipments = 1,398)
  - 467 pest-related actions
  - Mean action rate = 0.005
### Example Rating Scheme

<table>
<thead>
<tr>
<th>Action Rate</th>
<th>Upper Limit</th>
<th>Risk Rating</th>
<th>No. combinations</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;0.01</td>
<td>Any</td>
<td>High</td>
<td>139</td>
</tr>
<tr>
<td>&gt;0.0-0.01</td>
<td>Any</td>
<td>Medium</td>
<td>53</td>
</tr>
<tr>
<td>0.0</td>
<td>&gt;0.10</td>
<td>Medium</td>
<td>591 [644]</td>
</tr>
<tr>
<td>0.0</td>
<td>0.05-0.10</td>
<td>Low</td>
<td>330</td>
</tr>
<tr>
<td>0.0</td>
<td>&lt;0.05</td>
<td>Very Low</td>
<td>285</td>
</tr>
</tbody>
</table>

- **Example incentives**
  - Low = Inspect 1 of 5
  - Very Low = Inspect 1 of 10
### Potential Inspections

<table>
<thead>
<tr>
<th>Rating</th>
<th>Current Shipments</th>
<th>Current Plants</th>
<th>Under RBS Shipments</th>
<th>Under RBS Plants</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>13,504</td>
<td>277,718,787</td>
<td>13,504</td>
<td>277,718,787</td>
<td>1.0</td>
</tr>
<tr>
<td>Medium</td>
<td>24,981</td>
<td>316,863,337</td>
<td>24,981</td>
<td>316,863,337</td>
<td>1.0</td>
</tr>
<tr>
<td>Low</td>
<td>17,304</td>
<td>127,649,476</td>
<td>3,461</td>
<td>25,531,371</td>
<td>0.2</td>
</tr>
<tr>
<td>Very Low</td>
<td>36,179</td>
<td>662,158,084</td>
<td>3,618</td>
<td>66,217,639</td>
<td>0.1</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>91,698</strong></td>
<td><strong>1,384,389,684</strong></td>
<td><strong>45,564</strong></td>
<td><strong>686,331,134</strong></td>
<td><strong>0.5</strong></td>
</tr>
</tbody>
</table>

- Note: Savings can be directed into greater sampling intensity on higher risk combinations.
Conclusions

- Inspection is often used less than ideally
  - Stand-alone procedure
  - Fixed-percentage sampling too common
- More optimal use
  - Improved statistically-based sampling
  - Information for RBS programs
    - Greater efficiency
    - Industry incentives, fairness
    - Feedback between inspections and targeting
    - Better context for inspections in safeguarding
International Symposium, July 2017?

- Trend to implementation
  - Australia
  - Early stages: EU, New Zealand, Japan, Mexico
  - USA
    - PPQ implementation ongoing
    - CBP with other agencies; ag cargo in future

- Opportunities
  - Review academic studies
  - Share lessons learned
  - Begin harmonization
BEFORE WE CROSS THE THRESHOLD INTO THE ETERNAL DARKNESS OF THE SWIRLING ABYSS - ANY FRUITS OR VEGETABLES?