Upcoming Research Findings on Wood Borer Detection Rates in Wood Packaging Materials From 2003-2020

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ISPM 15: Background Information

Objective: Reduce the risk of pests from being introduced to other countries in WPM through international trade

First approved in 2002

NZ - 1st implemented in 2003

USA - 2005-2006 (10-month phase in)
Note: 1000s of Insects Infest Woody Plants Worldwide

<table>
<thead>
<tr>
<th>Insect Group</th>
<th>Species Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buprestids (Metallic Wood Borers)</td>
<td>&gt;15,000</td>
</tr>
<tr>
<td>Cerambycids (Longhorned Beetles)</td>
<td>&gt;35,000</td>
</tr>
<tr>
<td>Scolytines (Bark and Ambrosia Beetles)</td>
<td>&gt;6,000</td>
</tr>
<tr>
<td>Siricids (Woodwasps)</td>
<td>100</td>
</tr>
</tbody>
</table>

Of these 4 groups

> 2,500 North American species

Over 100 exotic
Background on the USDA APHIS “AQIM Program” (Agriculture Quarantine Inspection Monitoring)

- Containerized shipments selected randomly for inspection at cooperating land and maritime US ports (record both + & - data)
  - Data are recorded on a consignment basis
- WPM 1st added to AQIM in 2003 (> 40 ports)
- 1st analysis by Haack et al. used 2003-2009 data ca. 35,000 records with WPM
- New analysis 2003-2020 (>100,000 records)
Major Findings of

- WPM infestation rates fell by **36-52%** (depending on start date and countries included)

<table>
<thead>
<tr>
<th>Year</th>
<th>Infestation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003-05</td>
<td>0.2%</td>
</tr>
<tr>
<td>PRE-ISPM 15</td>
<td></td>
</tr>
<tr>
<td>2006-09</td>
<td>0.1%</td>
</tr>
<tr>
<td>POST-ISPM 15</td>
<td></td>
</tr>
</tbody>
</table>
New Findings
Haack et al. 2022. Frontiers in Forests and Global Change. (In review)

2003-2020: 109,709 inspection records total

After dropping all records from Canada and records without the ISPM 15 mark from 2006-2020, there were 87,571 records in the final dataset.
New Findings


Overall borer detection rates in WPM for all AQIM Programs

<table>
<thead>
<tr>
<th>Year</th>
<th>Pre/Interim</th>
<th>POST with regs</th>
<th>POST with bark regs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003-04</td>
<td>0.34%</td>
<td>0.13%</td>
<td></td>
</tr>
<tr>
<td>2005-06</td>
<td>0.13%</td>
<td>0.18%</td>
<td></td>
</tr>
<tr>
<td>2007-09</td>
<td>0.18%</td>
<td>0.18%</td>
<td>0.22%</td>
</tr>
<tr>
<td>2010-20</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Detection rates for ALL WPM and 3 AQIM Special Programs

WPM associated with **Perishables** (i.e., food, cut flowers)

WPM associated with **Italian tiles**

**General WPM (GWPM):** any maritime containerized product
Detection rates varied among major trading partners.
180 records with borers out of 87,571 total records (2003-2020)
China: 4.6% of all inspection records (40 with borers)
Italy: 12.7% all records (27 with borers)
Mexico: 30.4% of all records (22 with borers)
Turkey: 1.4% of all records (15 with borers)
Type of WPM inspected for all consignments ($N = 87,571$) and for those where wood borers were found ($N = 180$). Other = WPM items such as wood blocks and spools.

* = sig. under-represented

* = sig. over-represented
Detection rates for all WPM and individual programs at 2-year intervals
There are many possible reasons why we might not see a larger drop in borer detections

- Pest tolerance of the treatment
- Unintentional noncompliance
- Fraud
- Data issues in AQIM (done on a consignment basis)
- Post-treatment colonization of WPM
- Policy anticipatory effect
- Improved inspector training
- Changing in trading partners over time
Thank you!

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