PBCRC 1108

A risk return prioritisation tool for global trade inspections

Dean Paini, Paul Mwebaze, Daniel Heersink (CSIRO), and John Nielsen (Dept Agriculture)

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A risk return prioritisation tool for global trade inspections

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Problem being addressed

- Globalisation
Problem being addressed

All ports = 5 steps

Keller et al 2011 Div & Dist
Problem being addressed

Asian Gypsy Moth (AGM) – *Lymantria dispar*
Problem being addressed

- Females lay eggs 1\textsuperscript{st} June to 30\textsuperscript{th} September
  - Egg diapause (cooling period)
  - Source ports = Japan, China, Korea, Russia

- Can egg masses survive trip to Australia and be viable?
- When would they arrive?
- Real time tool
Results so far

- Egg survival and viability =
  - Analysed 2010 Lloyds data
  - Gray’s egg diapause model
    - Age and temperature dependent
    - Temperature response is nonlinear
Gray’s diapause model
Results so far

Matsuki et al 2001 Agric. & Forest Ent.

biosecurity built on science
biosecurity built on science
Results so far
Challenges and issues arising from the research

- Gray model
  - Model uncertainty
  - Real time assessment
Economic analysis

- How much inspections to do?

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<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Total Cost</th>
<th>Low level of inspections</th>
<th>Optimal level of inspection</th>
<th>High level of inspections</th>
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<tbody>
<tr>
<td>Cost</td>
<td></td>
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<tr>
<td>Cost of conducting inspections</td>
<td>(salaries + benefits)</td>
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<td>Cost of waiting time</td>
<td>(time x value of time)</td>
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Prospective cost-benefit analysis

Potential benefits
- Reduced number of vessels requiring inspections for AGM risk
- Reduced costs for the Dept. of Agriculture
- Minimising disruption to vessel itineraries and associated delay costs for the shipping industry

Costs
- Project and ongoing costs
- Implementation costs
- Other R&D costs
Thank you

- For more information, please email Dean.Paini@csiro.au