

Plant health risks posed by the sea container pathway

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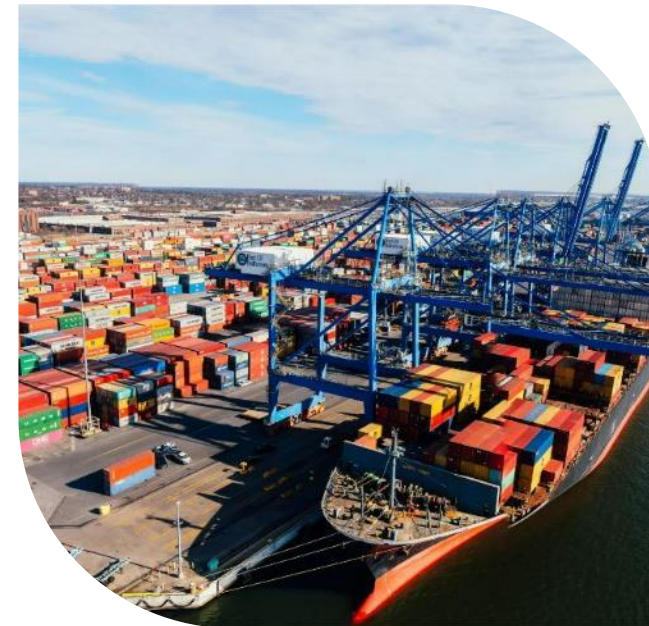


SCFG Subgroup on Risk and Data: members – Rama Karri, Sina Waghorn, Wendy Asbil, Wendy Beltz, Guanghao Gu, Shaimaa Ibraheem, Martijn Schenk,

Sea container risks – no boundaries



- Globally, approximately **25 million** containers are in circulation and **241 million** container movements occur annually.
- Even a small proportion of contaminated containers can lead to international spread of pests!
- Containers don't always travel between the same two countries – their movement is influenced by supply and demand.
- In addition to pests hitching a ride in containers, certain pests have the ability to survive in containers for extended periods.

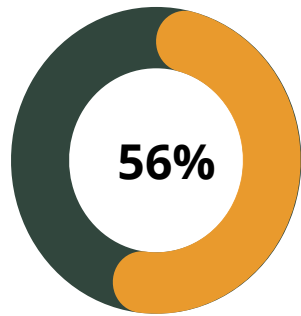


Interception surveys



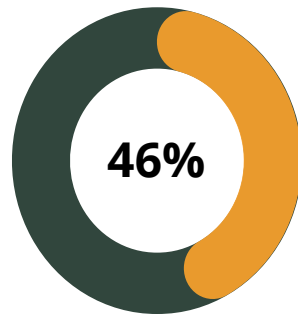
Surveys from across the globe demonstrate that there are significant plant pest risks associated with the global movement of sea containers.

Kenya
reported that:



of 789 sea containers they inspected from 2019-2022 were **contaminated**. Contamination was both external and internal.

China
reported that:



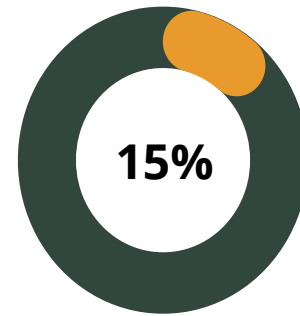
of 264,482 loaded containers & 33% of 428,616 repositioned containers inspected in 2017 were **contaminated with plant pests**.

Australia
reported that:



of 126,689 containers from high-risk countries inspected from 2019-2022 were **externally contaminated**.

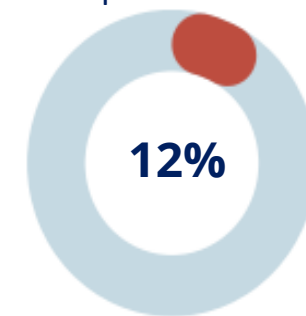
New Zealand
reported that:



of 116,701 empty sea containers inspected from 2010-2015 were **contaminated with hitchhiker pests**. Contamination was both external and internal.

Khapra Approach Rate Trial

Australia
reported that:



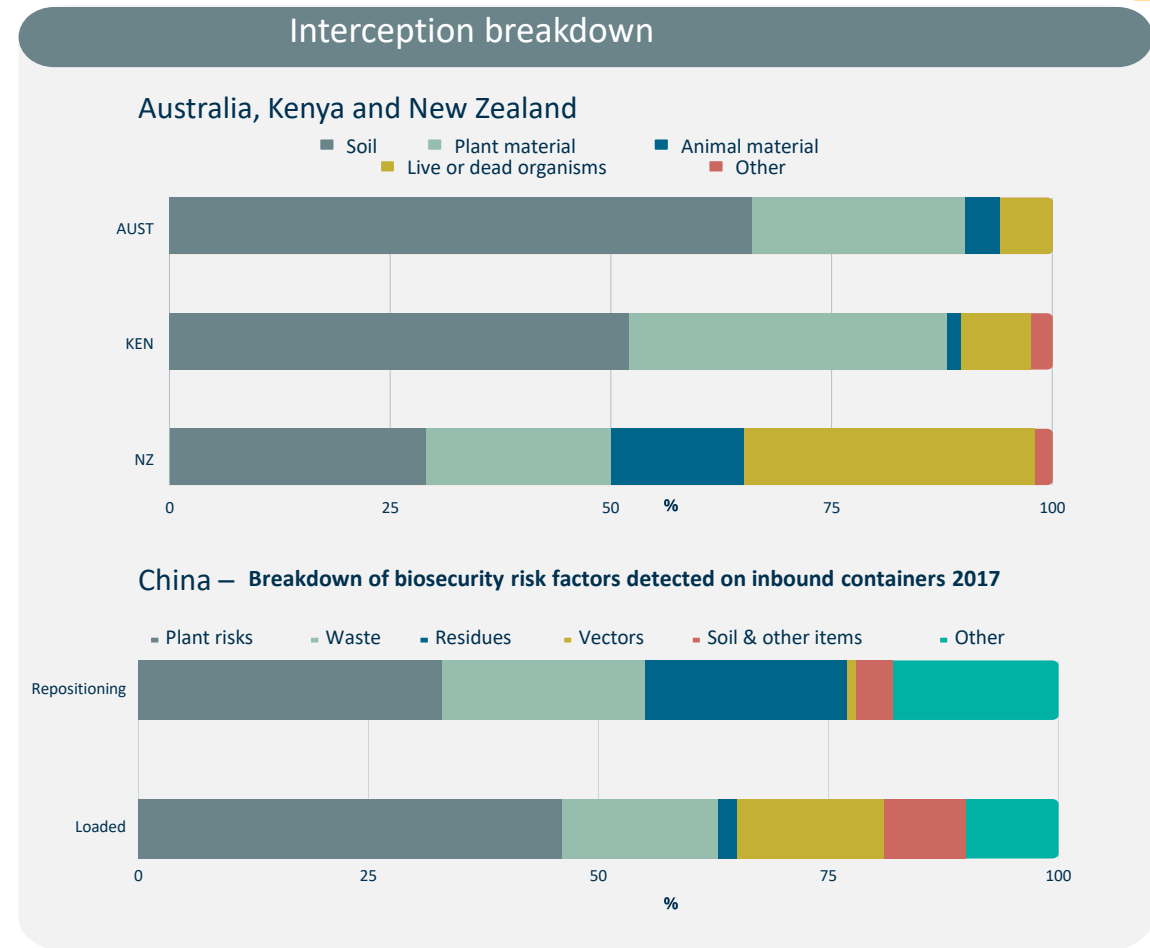
of 2000 randomly selected containers surveyed in 2021 12 % had **evidence of khapra beetle**. Of this, 11% indicated previous presence of the pest, and 1% indicated active presence of the pest.

Interception breakdown

- In **Australia, Kenya and New Zealand**, the **most common contaminant** detected on sea containers was **soil**.

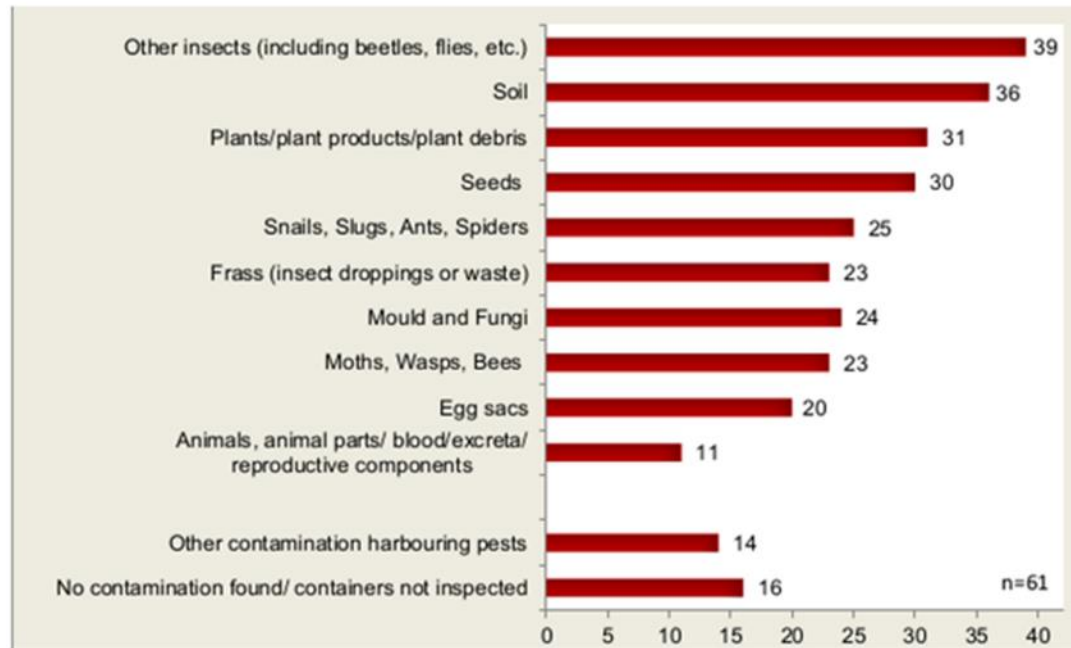


- Soil is a known source for carrying all kinds of plant pests including nematodes, bacteria, fungi, weed seeds and insects.
- A study in 2000 found that 4% of soil samples collected from sea containers contained plant parasitic nematodes and 83% yielded fungi of genera known to contain pathogenic species.



NPPO surveys (SCTF Report)

Questions	# countries
Are containers and their cargo seen as a risk for spreading pests?	68
Yes, regardless of the type of cargo	47
Yes, but only if carrying regulated articles	18
No	3



Species commonly intercepted in/on containers



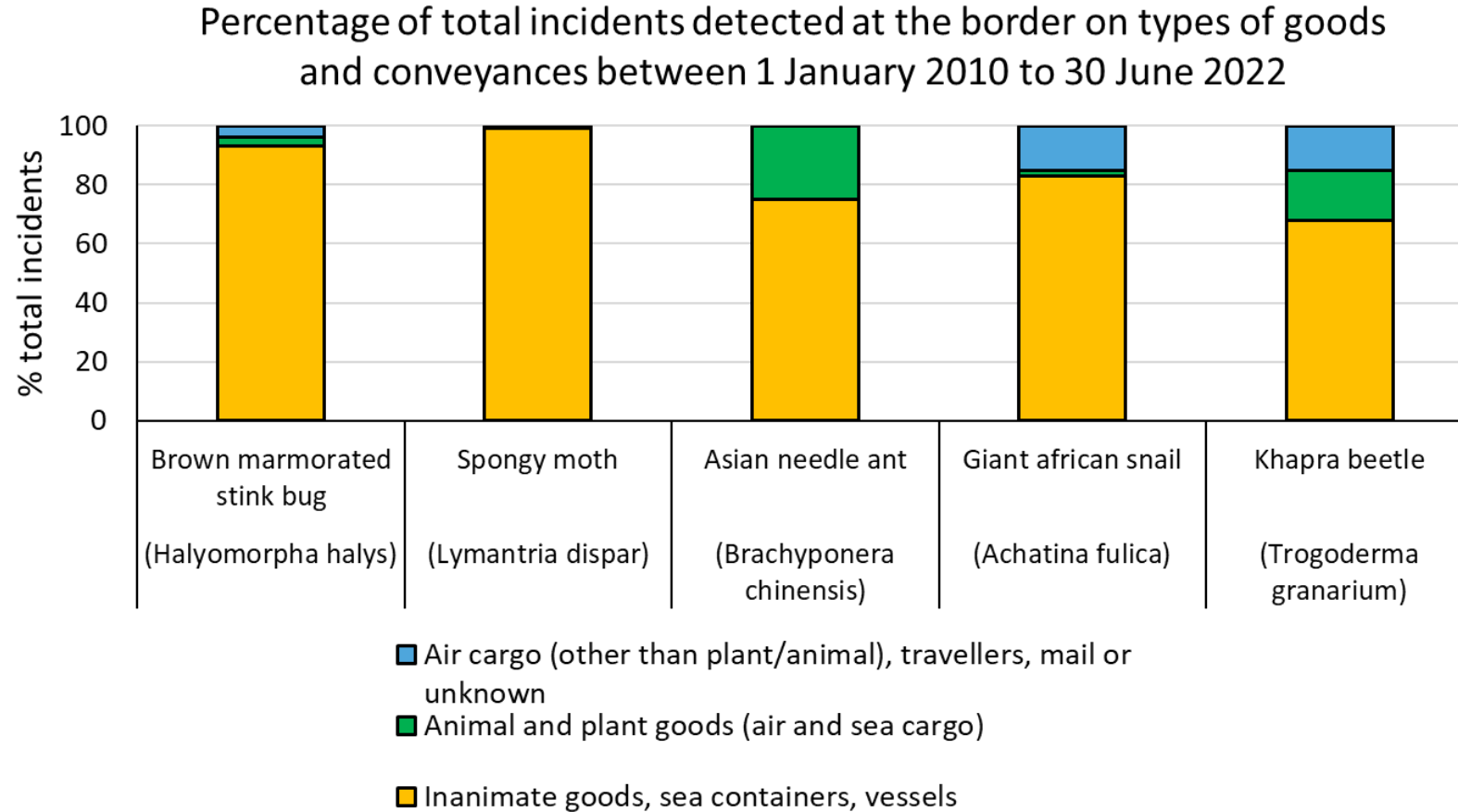
- Asian Longhorn beetle
- Yellow Crazy Ant
- Giant African snail
- Cane toad
- Spongy moth
- Big-headed ant / Brown house-ant
- Apple snail
- Red imported fire ant
- Khapra beetle

All listed in 100 of the World's Worst Invasive Species list in the Global Invasive Species Database.



Criteria: Their serious impact on biological diversity and/or human activities, and their illustration of important issues surrounding biological invasion.

Australian historical interception data



Breaches, incursions and establishment of pests

Border breaches

Occur when organisms are detected post border in original host material and then eradicated before they spread to local host populations and cause an actual incursion.

Incursions

Are where an isolated population of a pest recently detected in an area, not known to be established, but expected to survive for the immediate future.

Spread

Refers to the expansion of the geographical distribution of the pest.

Establishment

Encompasses the perpetuation, for the foreseeable future, of a pest within an area after entry.

Examples

Khapra beetle has breached the Australian border via sea containers:

- 3 times in 2007, 2016 and 2018
- 2 times in 2020

Europe alien insect species

- In 2009, there were around 1,300 alien insect species.
- In 2019, there were around 2,500 alien insect species.
- Such invasions are mainly attributed to an increase in international trade.

Sea container contamination has resulted in:

- Worldwide spread of Red imported fire ant
- Tropical fire ant in NZ
- Three Eurasian land snails in North America
- Brown Marmorated Stink Bug in the USA.

Estimated economic impact

(if established in Australia)



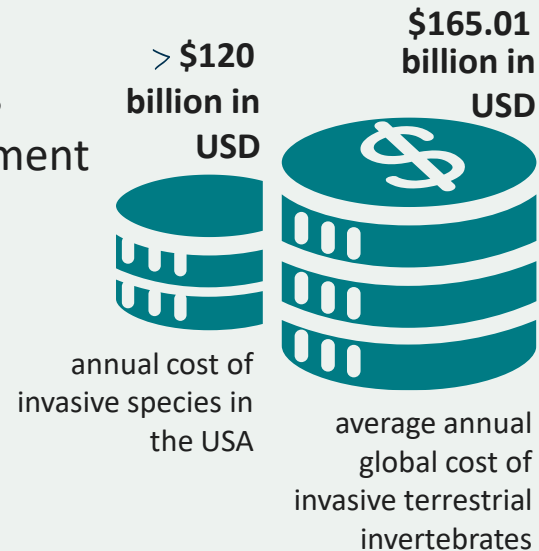
Hitchhiker pests have the potential to inflict significant damage

Consequences of pest establishment



Economic impacts of invasive species can include the cost of introduced invasive species on:

- agriculture
- forestry
- fisheries
- environment
- tourism



Economic consequences of introduced and established pests



USD \$890 million for the Emerald ash borer, reported by the US.



USD \$200 million for the Spongy moth, reported by the US.



NZD \$318 million/annum for the Red imported fire ant if established, reported by NZ.

External contamination - examples



Soil contamination on external surface



Soil on rails under the container



Plant material caught on the underside



Seed contamination on container underside



Giant African Snail on external surface



Dead khapra on underside of container



Hive on underside of container



Germinating seed above twist lock

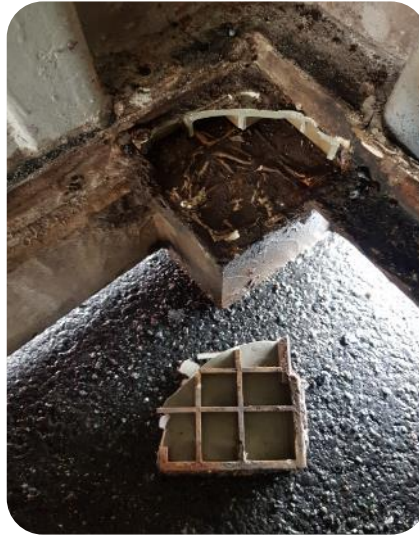


Cotton seed in twist lock and underside

Internal contamination - examples



Khapra beetle larvae and cast skins in corner of container after floor removal



Sub-floor corner block



Seeds and debris on interface between floor and wall



Khapra beetle infestation from underfloor area



Seed caught in interface between wall and floor



Insects inside a container



BMSB on container floor after fumigation

Thank you

