

Economics Perspectives on Managing Risk from Live Plant Imports

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Workshop: Protecting Trees and Forests from Invasive Pests through Collaborative Solutions

September 20, 2022



Hemilia sp.



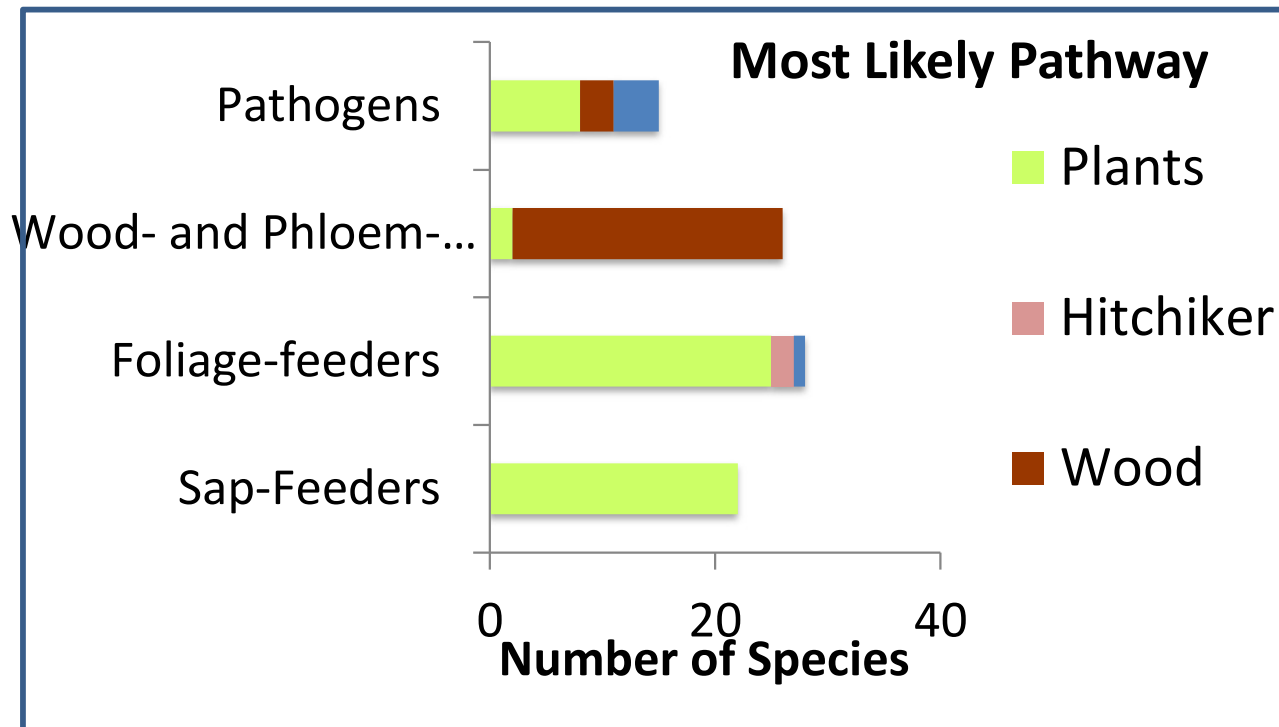
Schefflera sp.



Hemlock wooly adelgid

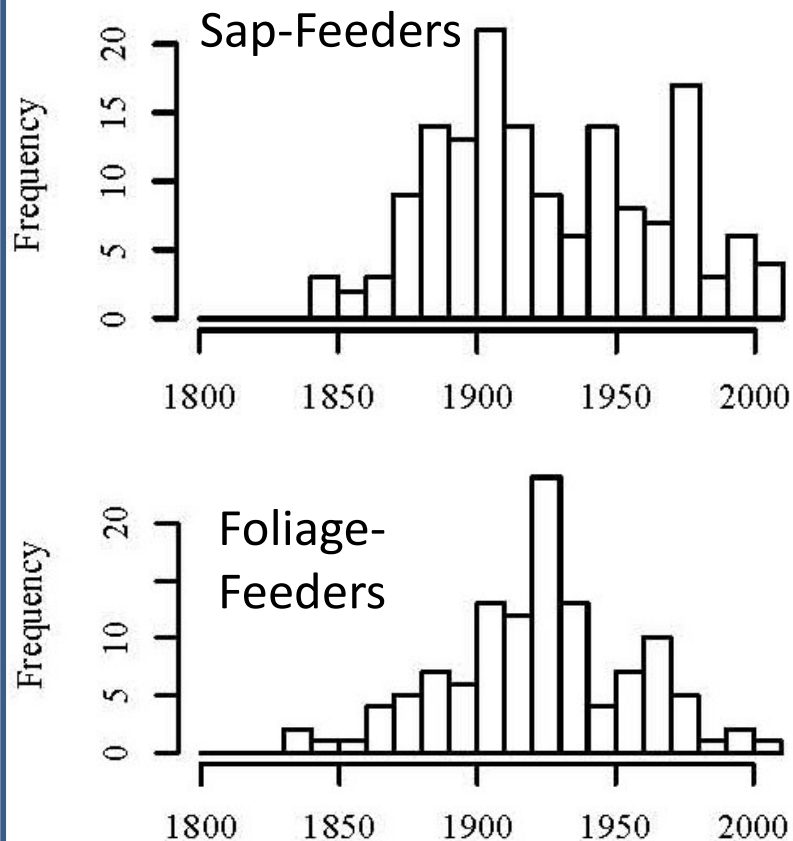
Live plant imports

- Key input to domestic horticultural industry
- Important pathway for nonnative pest introduction over past centuries

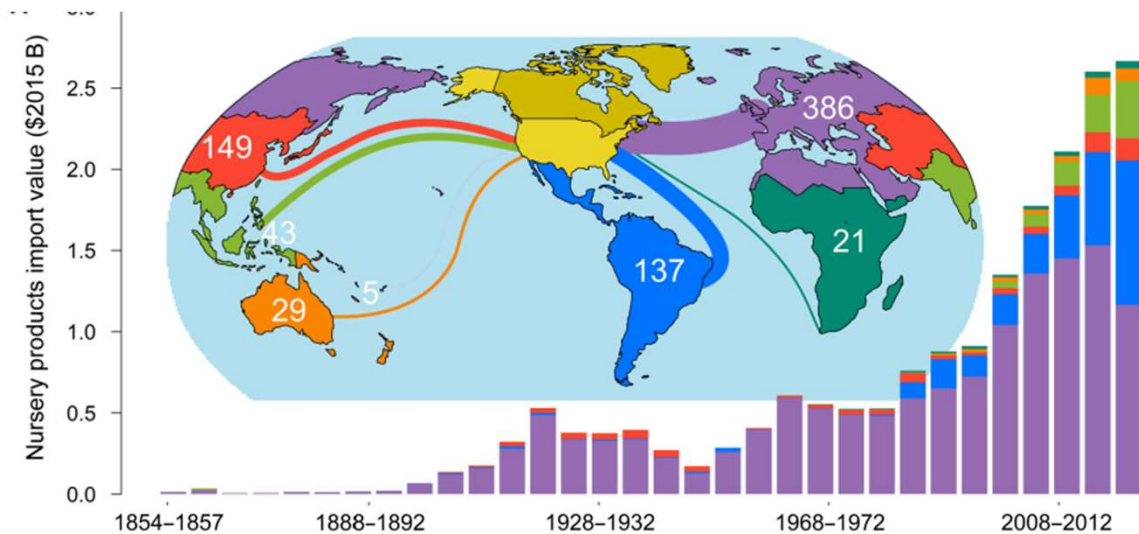
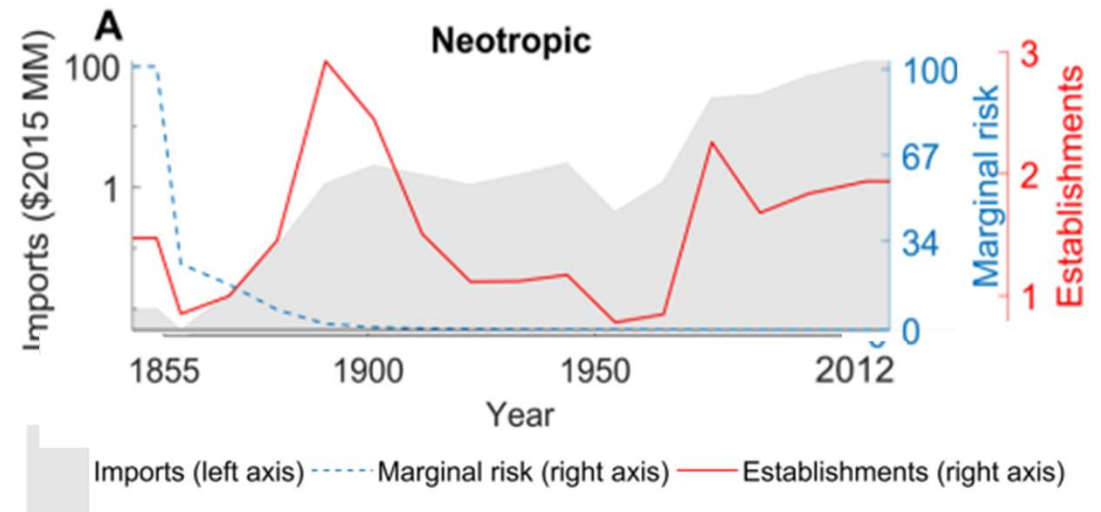


Evidence for decreasing marginal risk across time

Nonnative Forest Species Detections by Decade



Aukema et al. . 2010. Bioscience
60: 886-897



MacLachlan et al. 2021. Science Advances. 2021

Exporting Country

Cultivation,
Production, Shipping

Pre-entry programs

permit

Pest-risk analysis

inspection

Phytosanitary treatment

- Prohibition
- Pest-free areas

Phytosanitary
certificate

border

Rejection;
destruction

Shipment Arrival in
Ports

Post-entry
quarantine

Phytosanitary
treatment

inspection

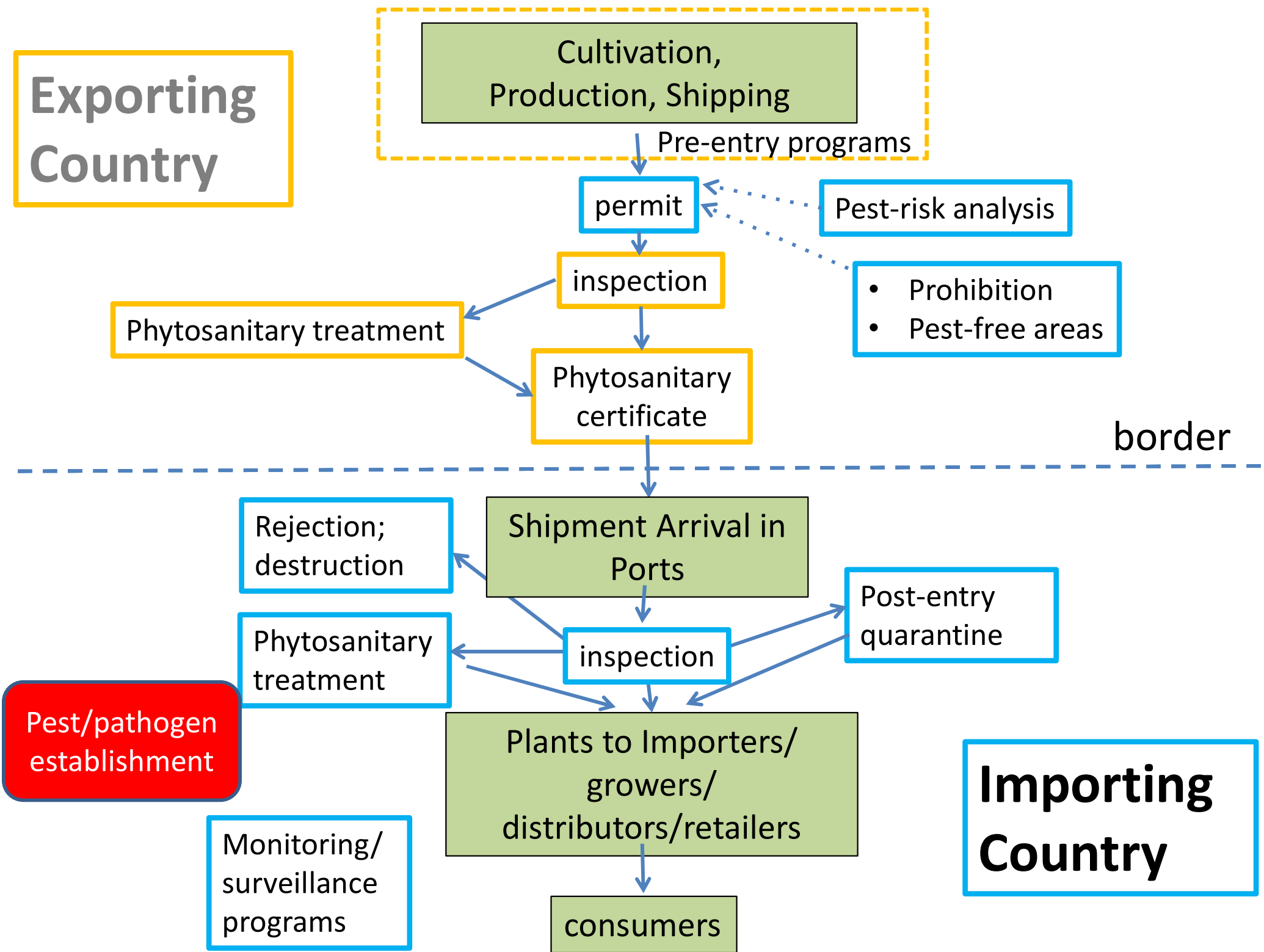
Pest/pathogen
establishment

Monitoring/
surveillance
programs

Plants to Importers/
growers/
distributors/retailers

Importing Country

consumers



Exporting Country

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- **Prohibition**
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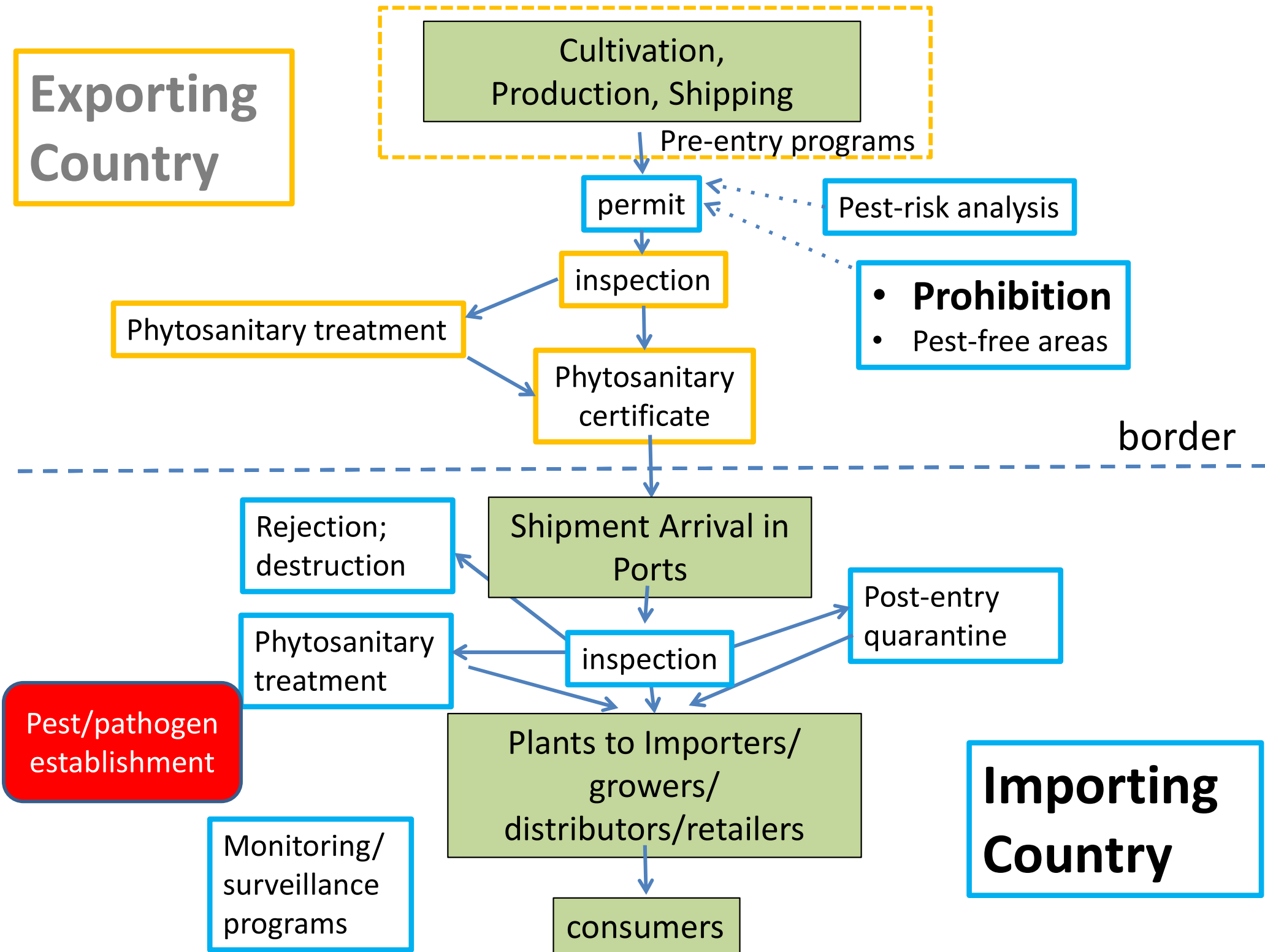
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**Exporting
Country**

Cultivation,
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Pre-entry programs

~~permit~~

Pest-risk analysis

~~Phytosanitary treatment~~

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certificate~~

border

Unauthorized entry

~~Rejection;
destruction~~

~~Shipment Arrival in
Ports~~

~~Post-entry
quarantine~~

~~Phytosanitary
treatment~~

~~inspection~~

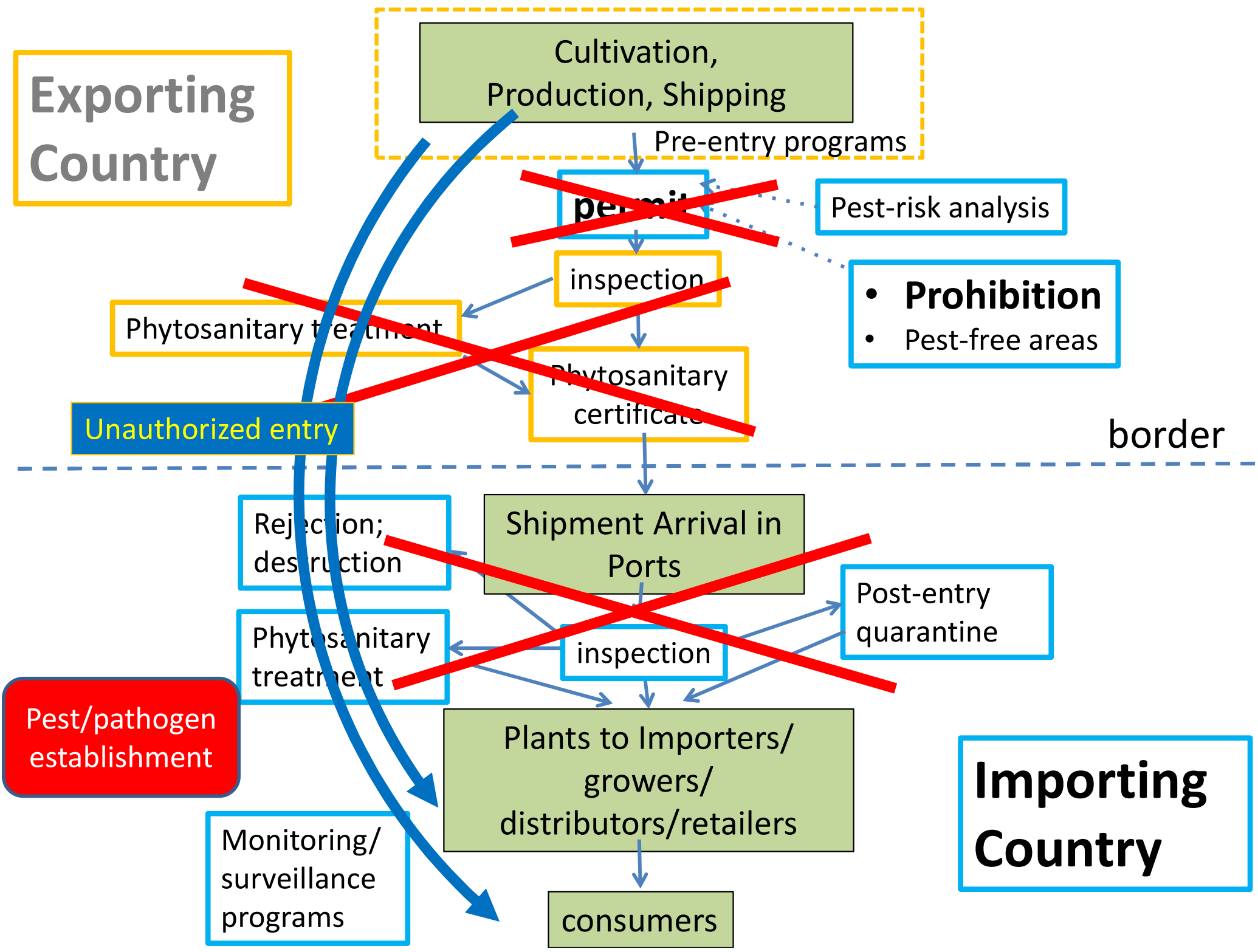
**Pest/pathogen
establishment**

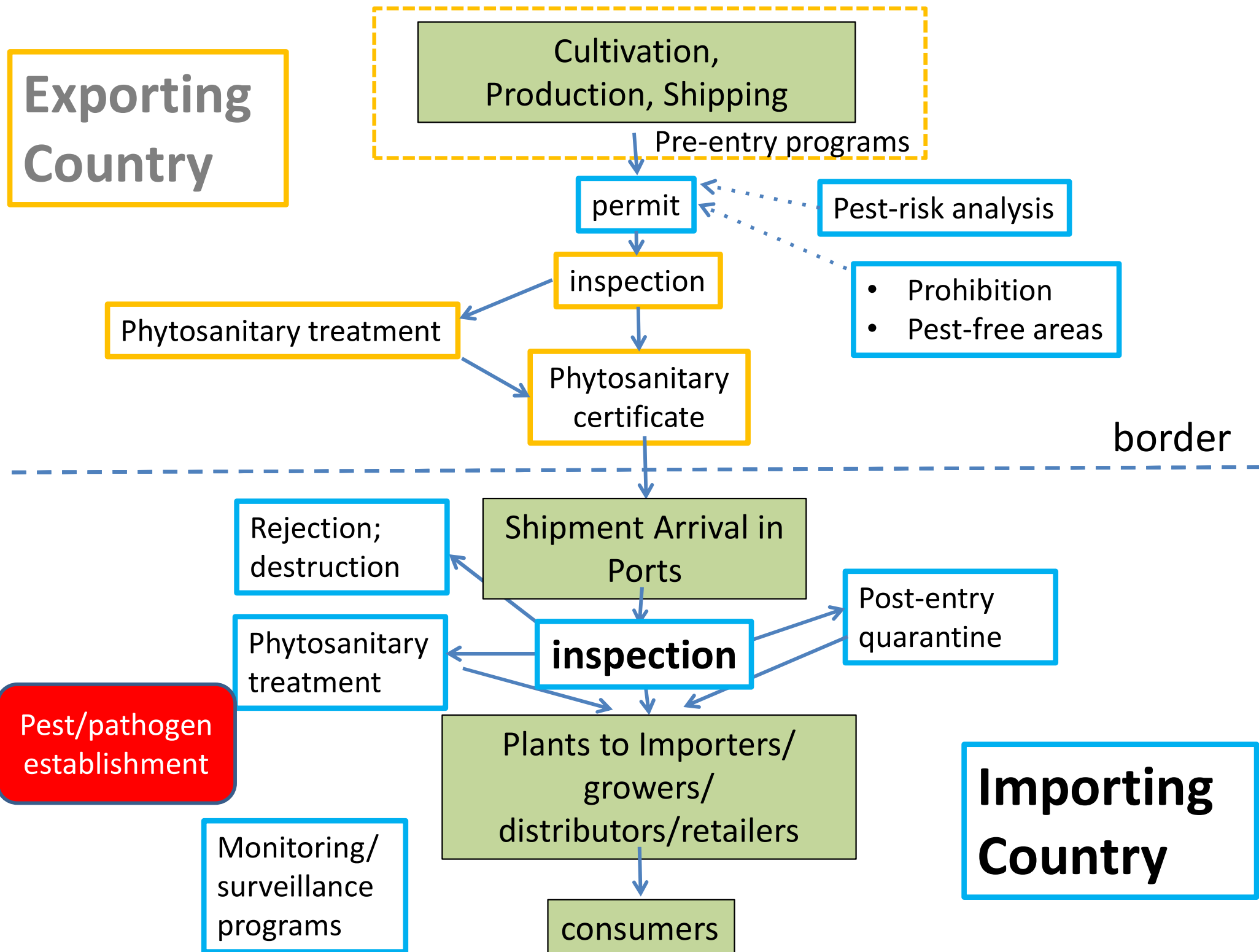
Monitoring/
surveillance
programs

Plants to Importers/
growers/
distributors/retailers

**Importing
Country**

consumers





Inspection of Live Plant Imports

Benefits of Inspection:

- 1) Intercept & prevent introduction of pests
- 2) Gain information about pathway risks
- 3) Deterrence

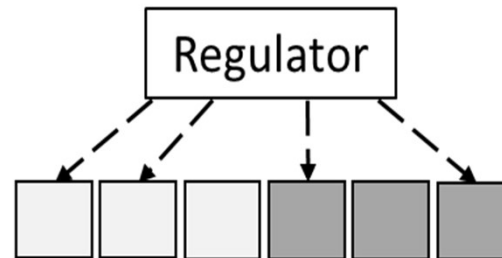
- Can't inspect all plants!
 - How allocate inspection resources to minimize acceptance of infested shipments?



Analyzed shift from “uniform” to risk based inspection (RBI)



Historic Uniform Inspection Policy:



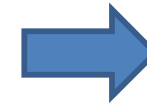
— — — — —> Inspection



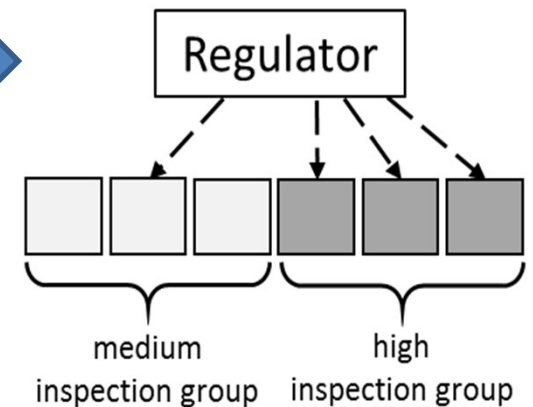
Shipment from producer with low historic interception rate



Shipment from producer with high historic interception rate



Risk Based Inspection Policy:



Benefits of Risk Based Inspection

Reduced # of accepted infested shipments by reallocating existing resources

- Targets risky shipments more intensively
- Incentivizes cleaner shipments!
.....from both high and low risk groups



Exporting Country

Cultivation,
Production, Shipping

Pre-entry programs

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Pest-risk analysis

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Phytosanitary
certificate

border

Direct to
Consumer
Sales

Shipment Arrival in
Ports

inspection

Post-entry
quarantine

Phytosanitary
treatment

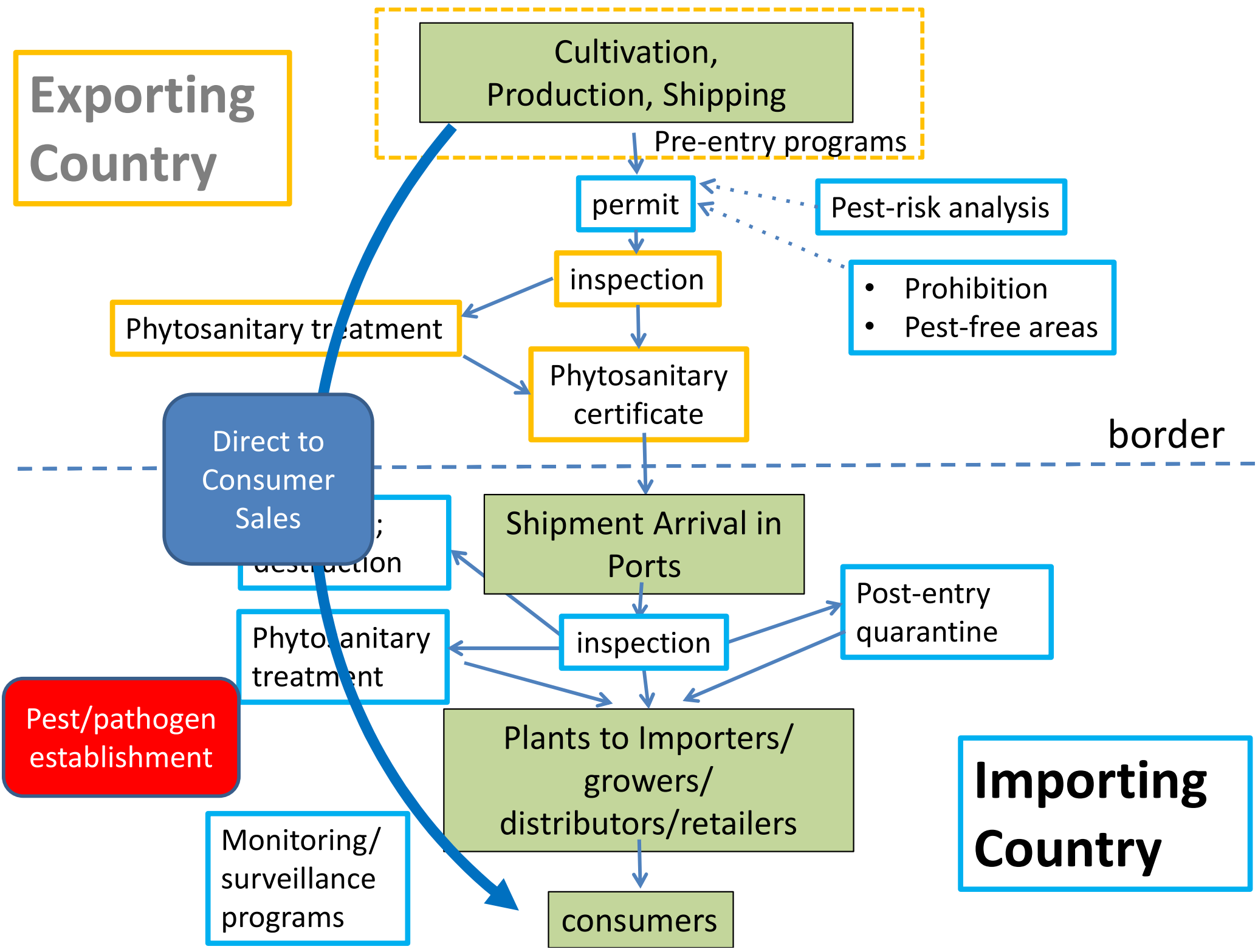
Pest/pathogen
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Plants to Importers/
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Importing Country

consumers



New Pathways!

- E-commerce & social media
 - Rapidly growing
 - Difficult to regulate & inspect
 - Diffuse
- Requires new tools
 - Online search-bots
 - Supplier outreach
 - Consumer messaging



New Pathways!

- E-commerce & social media



– **ebay** Checkout

- Re



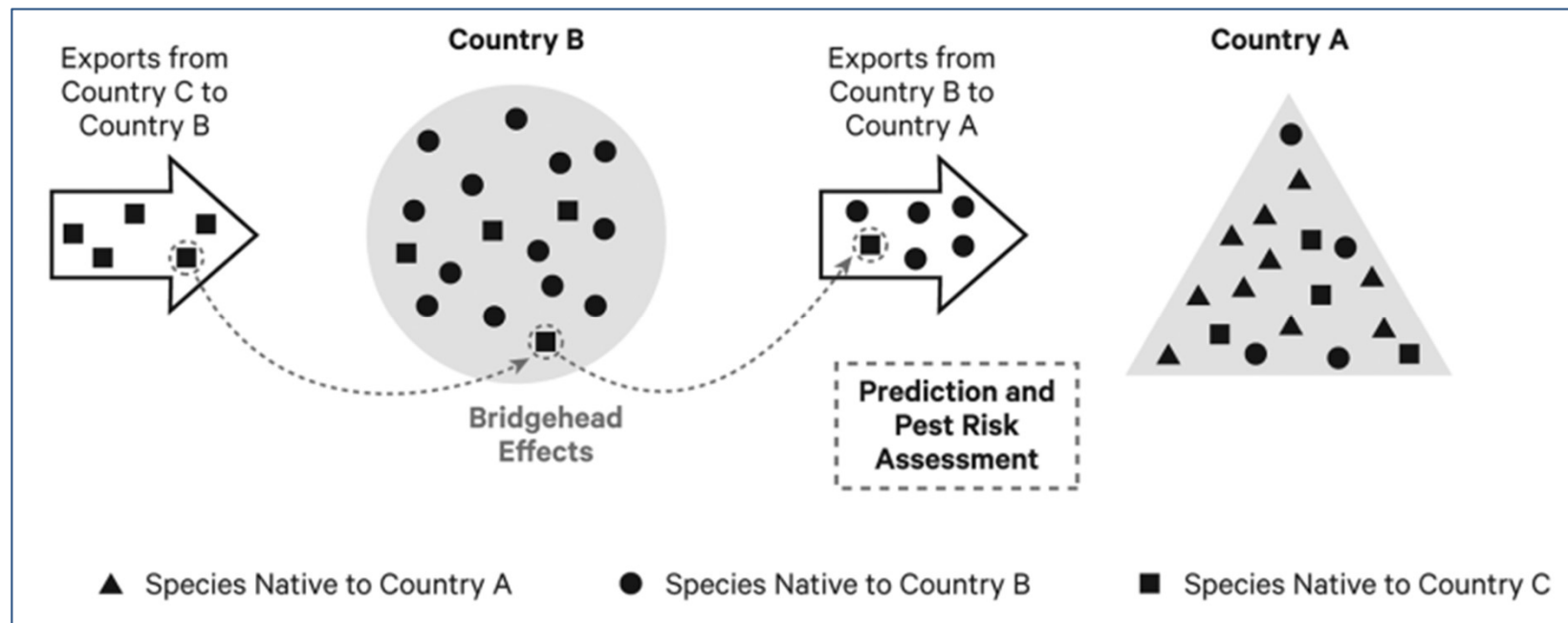
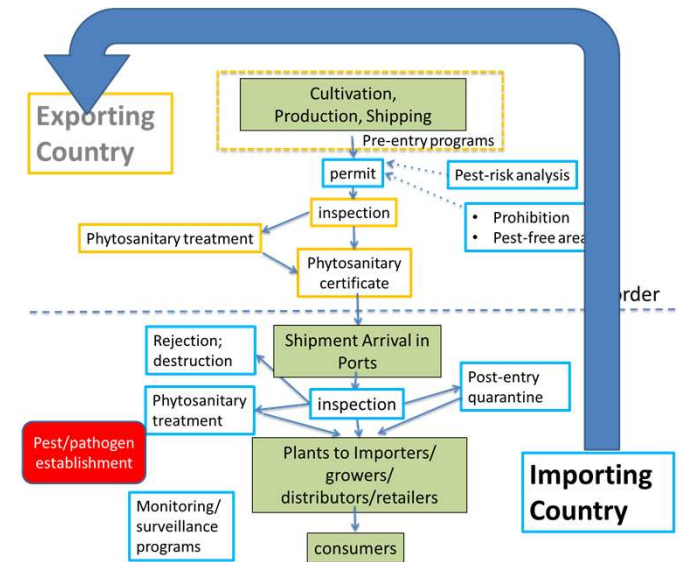
Attention: Australian biosecurity requirements may apply

Before buying an item from overseas, you should ensure that any applicable biosecurity requirements are met. As the buyer, you are held responsible for doing this. If you are unsure about your purchase, visit the [Department of Agriculture and Water Resources](#) website for advice. The department screens international mail and will confiscate any items that present a biosecurity risk.

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Benefits of International Cooperation

- High variation in phytosanitary policy across countries (Eschen et. 2016)
 - E.g., due to risk perceptions and technical capacity
- Prevention efforts elsewhere reduce local risk from bridgehead invasions



Concluding Thoughts

- Many safeguards currently in place
 - But, changing risks, pathways, technologies
- Continued need to leverage
 - Interventions across biosecurity continuum
 - Including offshore assistance
 - Risk-based policies
 - Policies targeting emerging trade trends
 - e.g. ecommerce
 - Strategic and behavioral responses
 - to augment desired behaviors & avoid unintended consequences

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Thank You!



United States Department of Agriculture
Animal and Plant Health Inspection Service



EFETAC

EASTERN FOREST
ENVIRONMENTAL THREAT
ASSESSMENT CENTER



NATIONAL
SOCIO-ENVIRONMENTAL
SYNTHESIS CENTER

