# Evaluation of sampling methodology for imported plant products and preservation of pest area freedoms

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## Background

- Safeguarding crop production regions and biodiversity from introduction of invasive pests is achieved primarily through border security inspection.

- Biosecurity risks are increasing and opportunities to gain market access are diminishing due to: globalisation, climate change, increased volume, frequency and diversity of imports and ban on use of effective organophosphates like dimethoate and fenthion.

- The International Plant Protection Organisation agreed on the use of 600 units sample size for all horticultural products, both fruit and vegetables (FAO, 2008).

- The sample size is based on the statistical relationship that if all of 600 inspections fail to detect infestation then the estimated level of infestation is below 0.5% of units with 95% confidence.

### Biosecurity threat dispersal pathways



Increasing tourism and travel: human, plant and animal diseases

Island hoppers screw worm fly, fruit pests, tropical diseases

Natural phenomena insect pests, fungal diseases

Nursery plant and seed imports: diseases and pests

Cut flower imports: insect pest, diseases

Introduced pasture plants: weed and pests

Wood imports - furniture: insect pests

Scientific and germplasm imports

Aquarium trade: pest fish, fish diseases, aquatic weeds

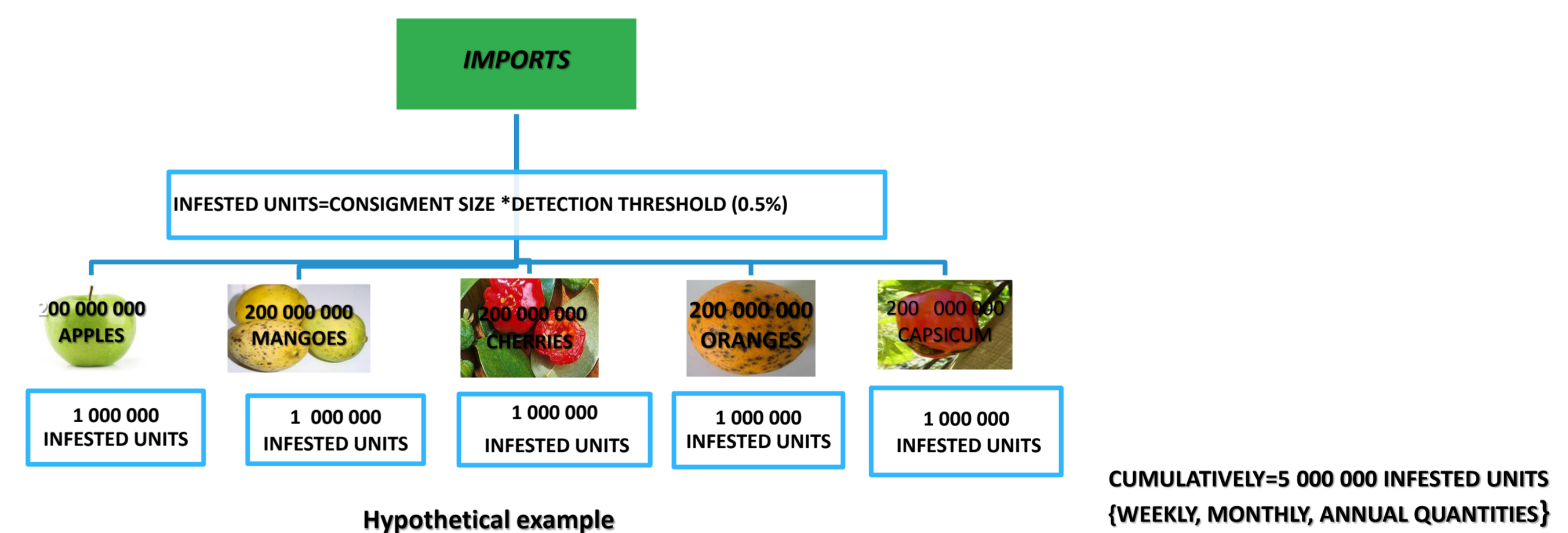Vessel ballast and biofouling: marine pests

## Sampling of consignments

- detects regulated pests.

- provides assurance that the number of infested units in a consignment does not exceed the specified tolerance level for the pest.

- detects organisms for which a phytosanitary risk has not yet been determined.

- optimizes the probability of detecting specific regulated pests.

- maximizes the use of available sampling resources.

- gathers intelligence on commodity pathways and profiling of importers and countries

- verify compliance with phytosanitary requirements.
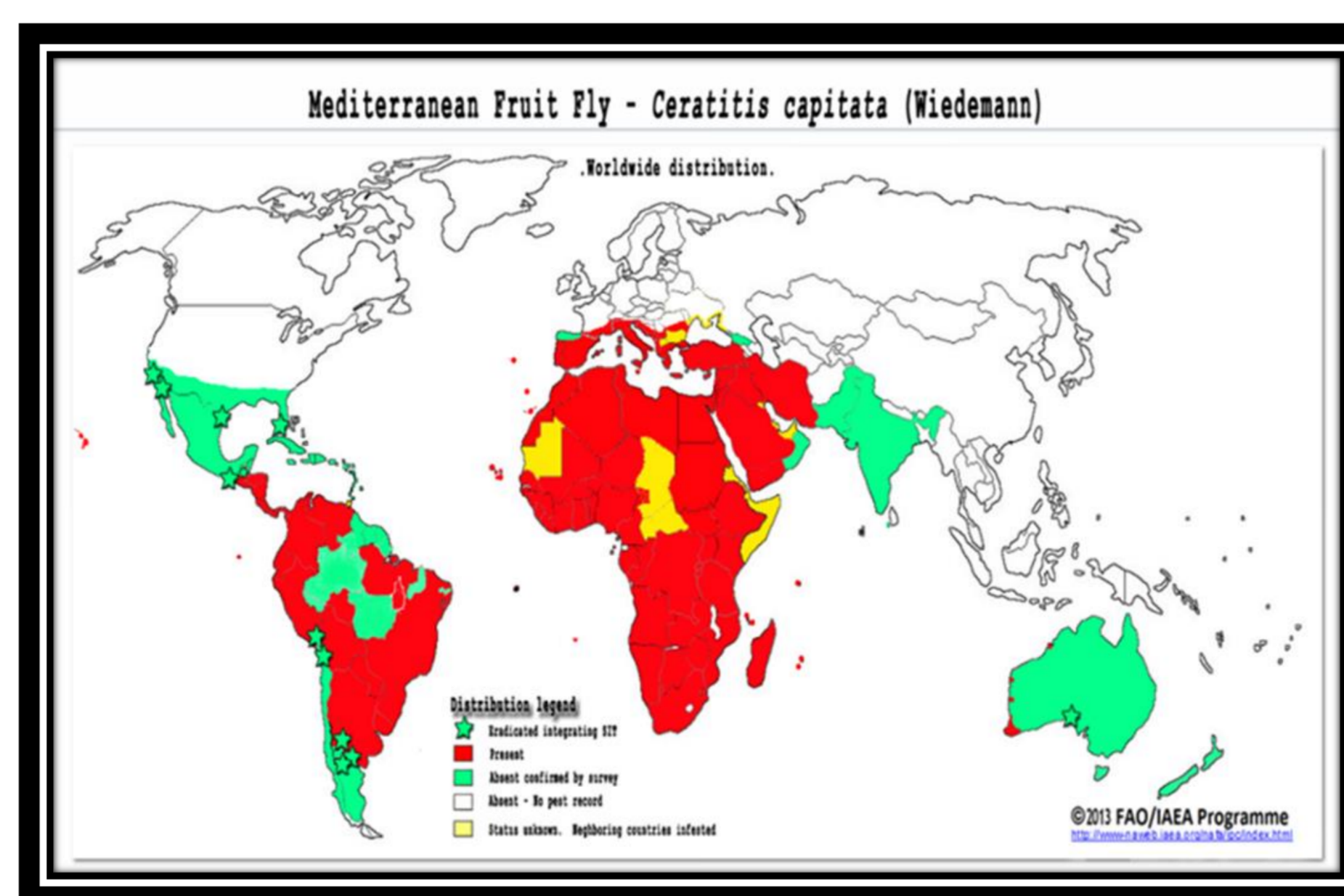
## Rationale

**Biosecurity inspection risk**

- Improved export strategies:-pre-shipping audits and inspection, pest free areas of production & areas of low-pest prevalence

- Inspection data is collected for individual consignments assessed but the cumulative risk is not quantified in the national risk assessment of imports.

IMPORTS

INFESTED UNITS=CONSIGNMENT SIZE *DETECTION THRESHOLD (0.5%)

| 00 000 000 APPLES | 200 000 000 MANGOES | 200 000 000 CHERRIES | 200 000 000 ORANGES | 200 000 000 CAPSICUM |
|---|---|---|---|---|
| 1 000 000 INFESTED UNITS | 1 000 000 INFESTED UNITS | 1 000 000 INFESTED UNITS | 1 000 000 INFESTED UNITS | 1 000 000 INFESTED UNITS |

CUMULATIVELY=5 000 000 INFESTED UNITS {WEEKLY, MONTHLY, ANNUAL QUANTITIES}

**Hypothetical example**

## Research gaps

- The distribution of number of contaminated items in a consignment is unknown so statistical distribution theory cannot be applied.

- Sampling strategy is not customised to the pest and the commodity pathway.

- No assessment of risk associated with inspection failure has been done.

- Most research targeted at optimisation of resources rather than the adequacy of the actual sample size.



Mediterranean Fruit Fly - Ceratitis capitata (Wiedemann)

Worldwide distribution.

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## Objectives

- Evaluate the efficacy and relevance of the border quarantine inspection protocols in achieving Appropriate Level of Protection (ALOP) from biosecurity threats.

- Identify options to enhance efficacy and efficiency of current sampling and inspection system.

## Expected outcomes

- The implementation of an improved sampling strategy for consignments which is risk based and accounts for trade volumes and type of commodity and pests.

- Improved market accessibility for the horticulture industry with the provision of objective protocols used for decision making for policy formulation and trade negotiations

## References

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