

Urban trees: bridgeheads and sentinels

Trudy Paap, Treena Burgess, Mike Wingfield





Importance of urban trees and forests

- Biodiversity and ecosystem services
- Mitigate UHI effect
- Pollution reduction
- Enhance environment, benefit human health and well being

- Biological invasions by insect pests and pathogens pose a major threat to tree health globally
- Trees in urban areas particularly vulnerable





Importance of managing urban invasions

- Preservation of values
- Costs associated with treatment and removal
- First point of contact
- Bridgeheads:
 - establish on suitable host
 - pest population amplified
 - spread to natural and planted forest

- Ash trees: popular city street tree in the north eastern US
- Plantings primarily a limited number of cultivars of white and green ash (*Fraxinus americana*, *F. pennsylvanica*)
- Low genetic diversity: enhanced risk to the urban forest
- Extensive damage associated with the arrival of Emerald ash borer (*Agrilus planipennis*)





Phytophthora ramorum



- First UK detection 2002: imported nursery stock
- Spread to public and private gardens, semi-natural woodlands
- 2009: outbreak entered a new phase...

Host jump to Japanese larch

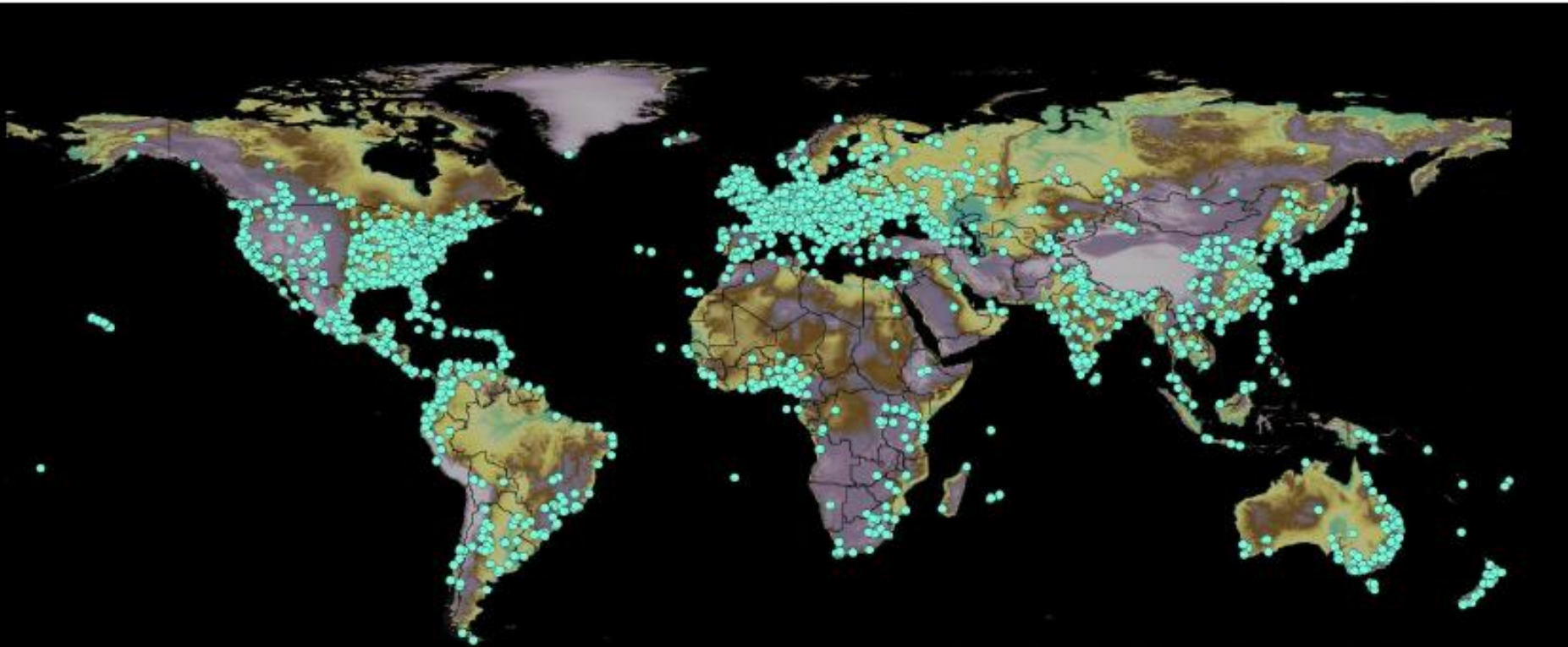


- Biological invasions by insect pests and pathogens pose a major threat to tree health globally
- Many damaging forest pathogens were unknown to science prior to their arrival in a new environment
- Biosecurity remains the first line of defence
- Early detection can be considered a second line of defence



Botanical gardens as sentinel plantings

- Over 3,000 botanic gardens with a wide geographical distribution
- House an estimated 30-40% of known plant species



Map of known botanic gardens courtesy of BGCI's GardenSearch database - http://www.bgci.org/garden_search.php



International Plant Sentinel Network

- Provide a platform to coordinate information exchange and support for sentinel plant research within botanic gardens and arboreta
- Objective of functioning as an early warning system to identify new and emerging pest and pathogen risks (www.plantsentinel.org)

Project aim

Improve surveillance and identification of new and emerging pest and pathogen risks by using botanical gardens and arboreta as sentinel sites for tree health monitoring in South Africa



Capacity raising within the gardens

- Currently very varied levels of capacity across the gardens
- Promote best practice methodologies in monitoring and surveying of plant pests and diseases, biosecurity and garden hygiene
- Access to training materials and workshops
- Diagnostics











International Plant
Sentinel Network



Plant Pest Monitoring and Prevention Workshops

KwaZulu Natal Botanical Gardens: 2-3 Nov

Kirstenbosch Botanical Gardens: 6-7 Nov

Pretoria Botanical Gardens: 9-10 Nov

trudy.paap@fabi.up.ac.za

Acknowledgements

Joey Hulbert

Duccio Migliorini

Staff of Kirstenbosch, Harold Porter,
Pretoria, KwaZulu Natal, Durban and
Stellenbosch University Botanical Gardens



Environmental Affairs
Agriculture, Forestry and Fisheries
Water Affairs



EXPANDED PUBLIC WORKS PROGRAMME
CONTRIBUTING TO A NATION AT WORK

