



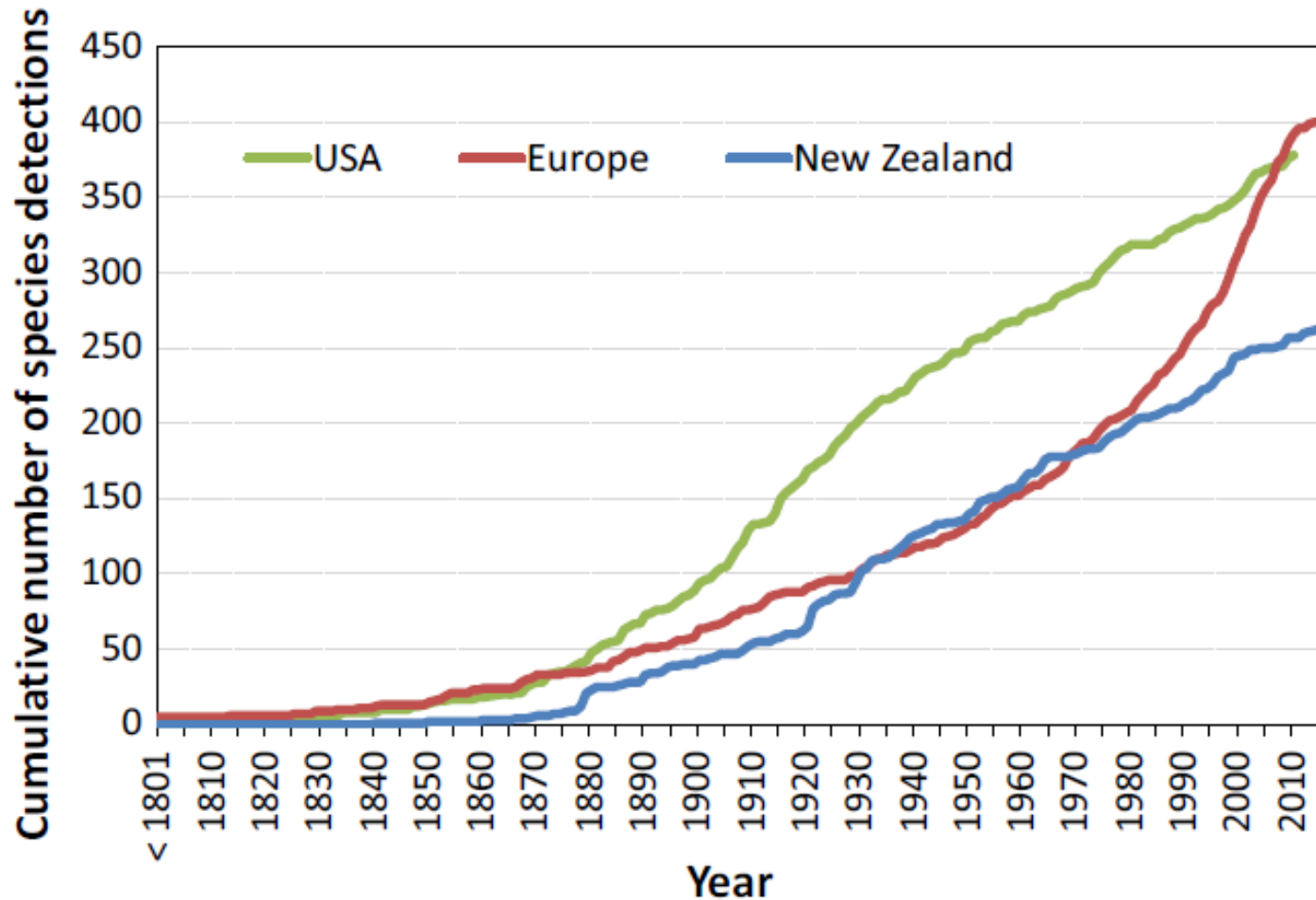
# **H**olistic **M**anagement of **E**merging forest pests and **D**iseases

Hervé Jactel, INRA



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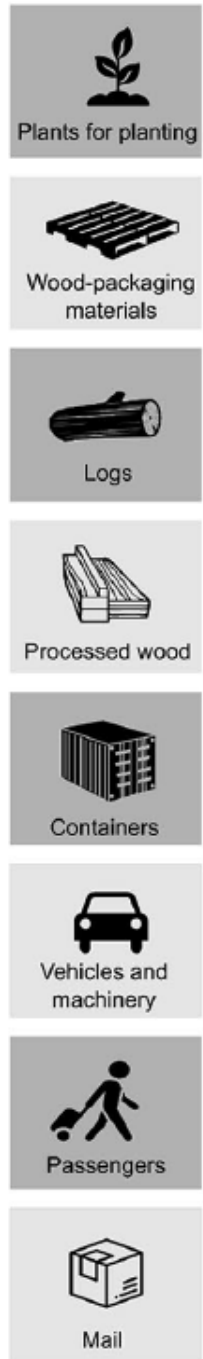
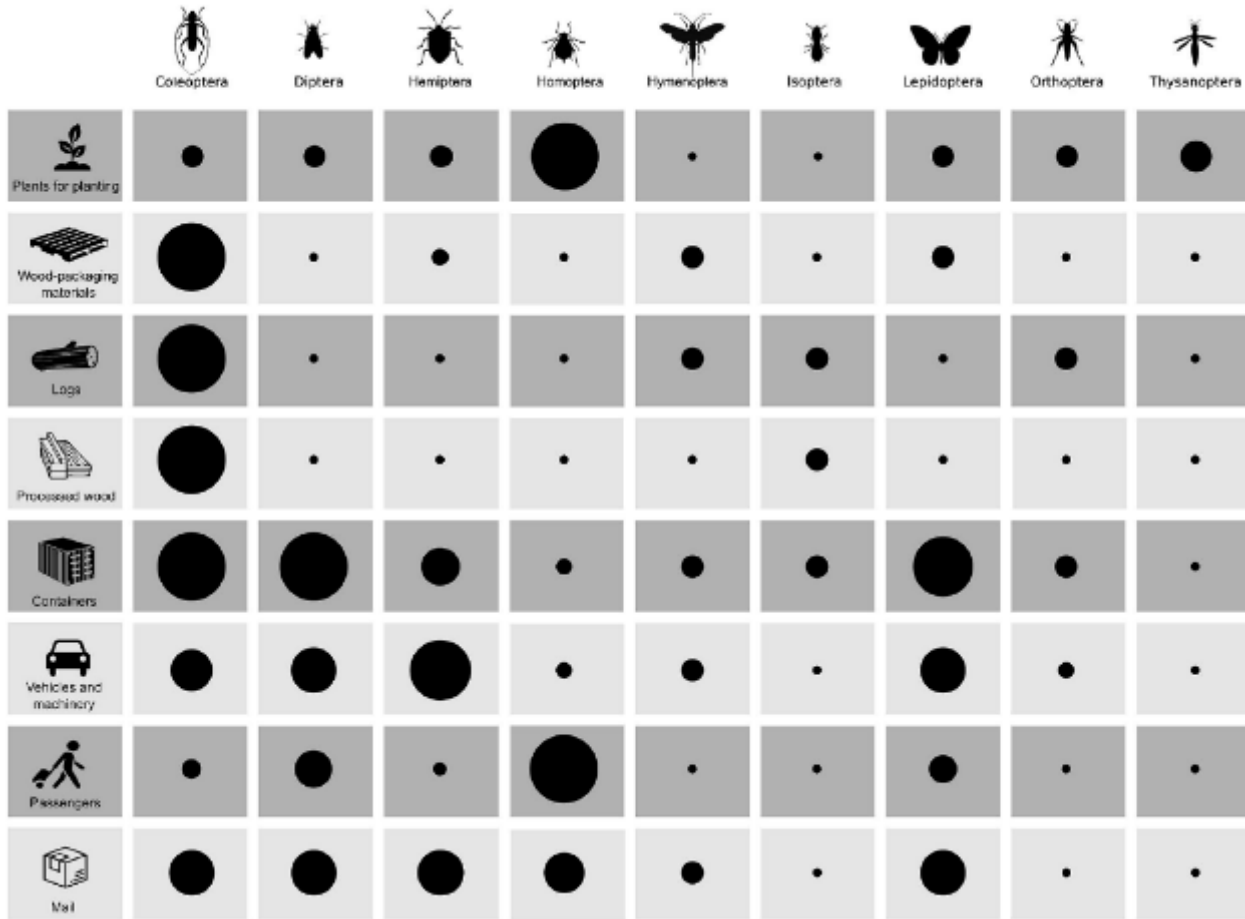
# Exponential increase of invasive forest pests and pathogens



(Brockerhoff & Liebhold, 2017)

# Many pathways

Journal of Pest Science

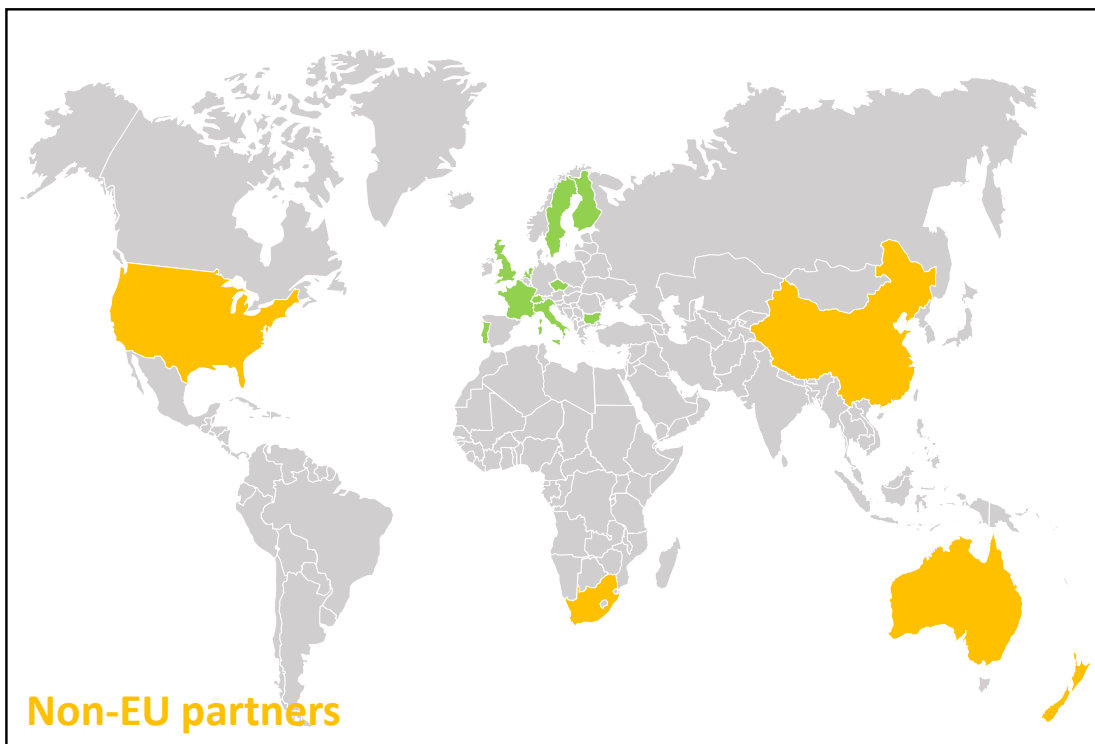


(Meurisse et al. 2018)

**Urgent need for better  
prevention and management  
of exotic  
pests and diseases  
in European forests**

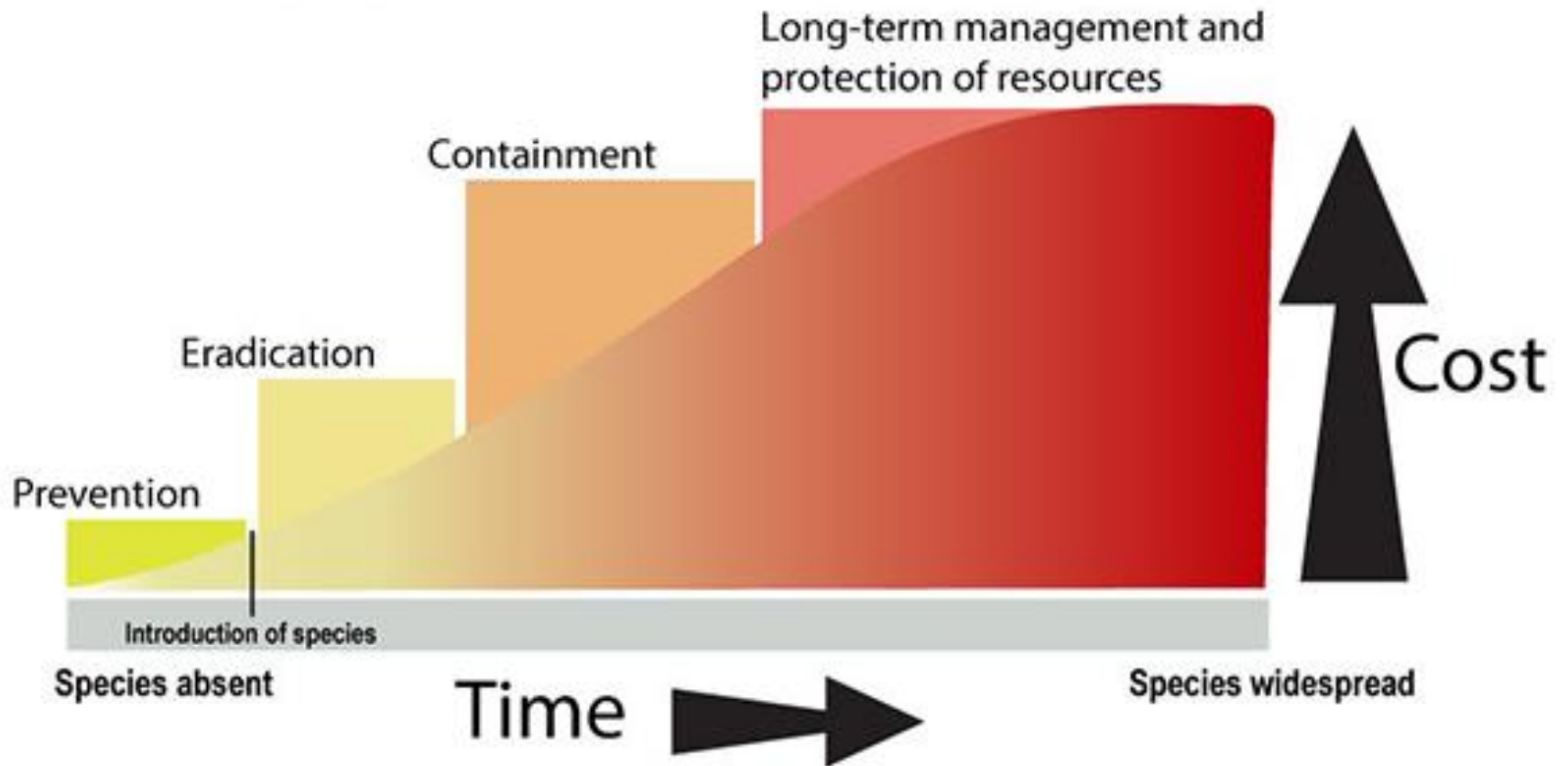


# Practical innovative tools and methods delivered to multiple actors in charge of risk prevention, risk analysis and risk mitigation in EU forests



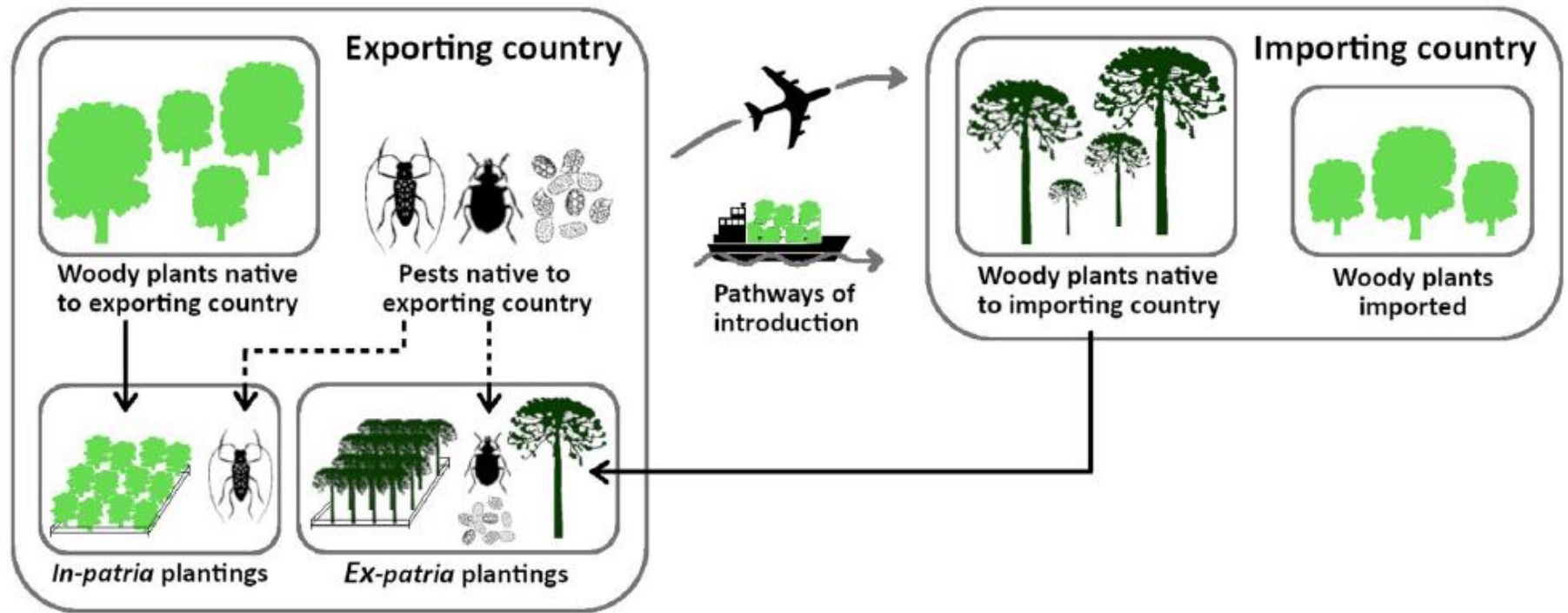
23 partner organizations

# The INVASION Curve



# Prevention

## Sentinel plantations



# Prevention

## Sentinel network of arboreta



**Arboreta & Demonstration site network**

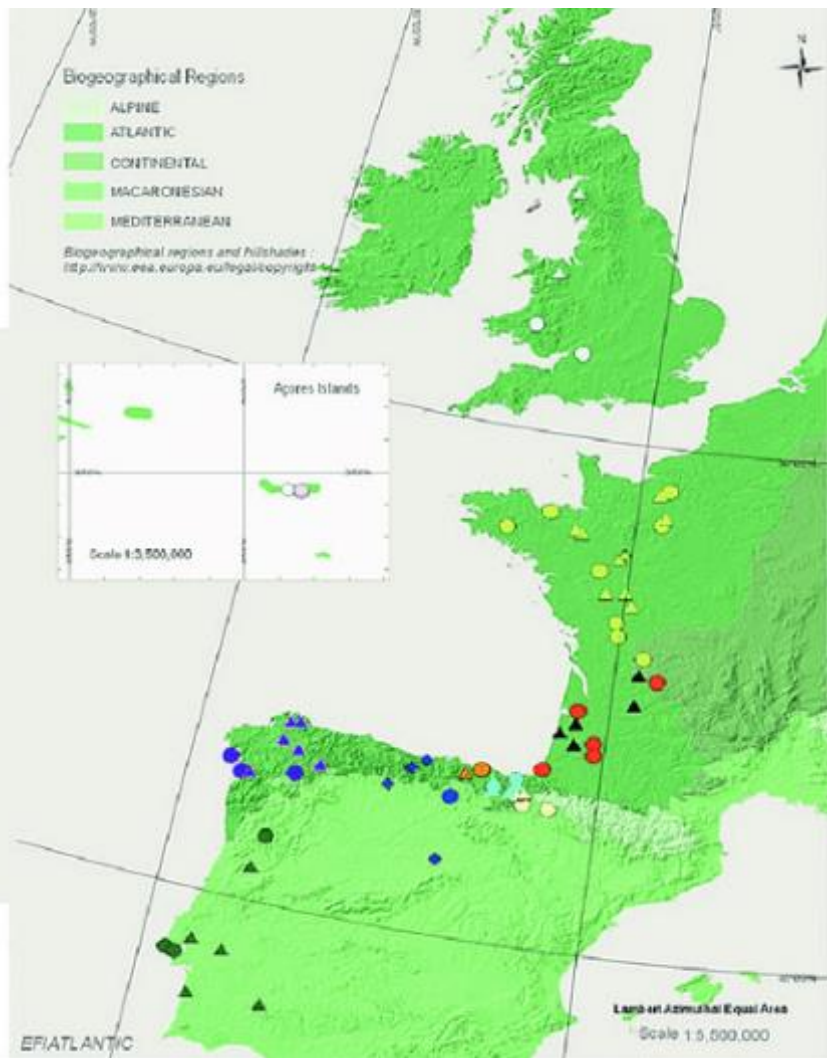
**PARTNERS RESPONSIBLE FOR SITE MANAGEMENT**  
*Site manager contact information can be found on the REINFORCE website*

- ▲ Centro de Investigación Forestal (CIF), Galicia, España
- ▲ Fundación General de la Universidad de Valladolid (FGUVA), España
- △ Forest Research (FR), United Kingdom
- △ Gestión Ambiental de Navarra (GAN), España
- △ HAZI Konsultoria, España
- ▲ Institut pour le Développement Forestier (IDF), France
- ▲ Instituto Superior de Agronomia (ISA), Portugal
- ▲ Neiker Tecnalia, Euzkadi, España
- ▲ Centre Régional de la Propriété Forestière d'Aquitaine (CRPF), France
- ▲ Institut National de la Recherche Agronomique (INRA), France
- ▲ Furnas Monitoring and Research Centre, Azarina S.A., Portugal\*
- Dirección Regional dos Recursos Florestais (DRRF), Portugal\*

\*Not financed by INTERREG

**Lead Partner: L'Institut Européen de la Forêt Cultivée (IEFC), France**

- Arboretum
- △ Demonstration Site
- △ Arboretum and demonstration site at the same location





# Detection

Multi-lure traps



Aerobiology

DNA bar coding

Sensors in containers



# Eradication

## Drone monitoring, detecting and spraying



# Containment



Food and Agriculture  
Organization of the  
United Nations

## Guide to the classical biological control of insect pests in planted and natural forests



*The parasitoid Apechthis  
compunctator parasitizing  
a boxwood tree moth  
(Cydalima perspectalis) pupa*

<http://homed-project.eu/>



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# HOLISTIC MANAGEMENT OF EMERGING FOREST PESTS AND DISEASES

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**Collaborations are welcome !**