Strategy and practice to deal with pinewood nematode

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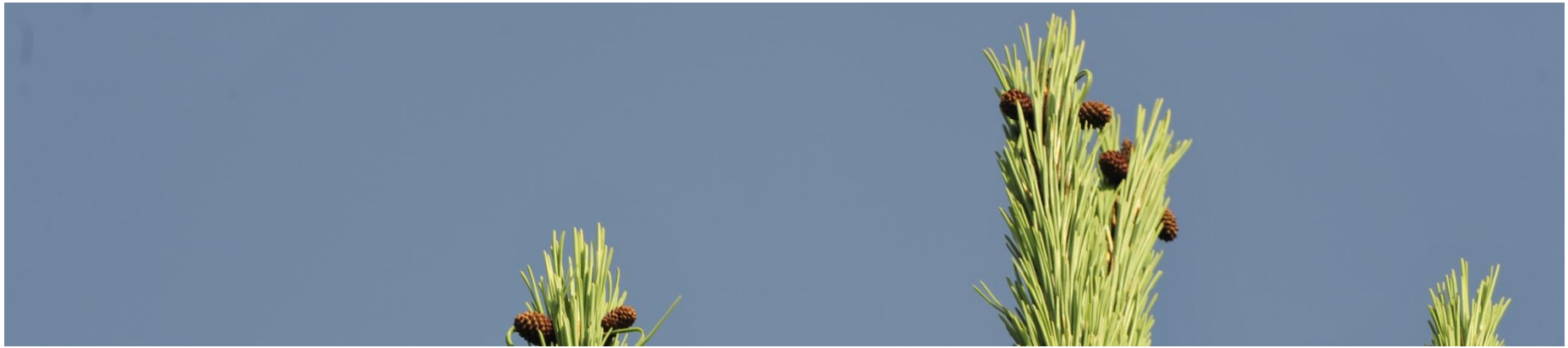


Forest Resilience Webinar, Lisbon, May 18 2021

centro PINUS
associação para a valorização da floresta de pinho

AGENDA

1. Centro PINUS: who we are
2. Pine Wood Nematode (PWN) basic facts
3. How can Pine PWN impact the EU
4. Our story and context
5. Managing the PWN: what we have learned

Who we are|| What we do

Non profit association created in 1998

Main goal: improve maritime pine forest production and productivity according to industry needs

Influencing policies
Stakeholders Forum
Technical Committees

Information| Data

Communication

R&D

28 Members


PUBLIC SERVICES
ICNF
INIAV
CONTRACTORS
ANEFA
Associados
centro PINUS
FOREST LANDOWNERS
Baladi
Fenafloresta
FNAPF
Forestis
Fórum Florestal
UNAC
Unimadeiras
FINANCE
S.G. Floresta Atlântica
RESEARCH
ESAC
IBET
ISA
UTAD
INDUSTRY (~ 50% OF NATIONAL PINE WOOD CONSUMPTION)
AIMMP
Carmo Wood
Celtejo
DS Smith
Fibromade
Investwood
Luso Finsa
Madeca
MTL
Pinhoser
RESIPINUS
Sonae Arauco
Vieirifabril

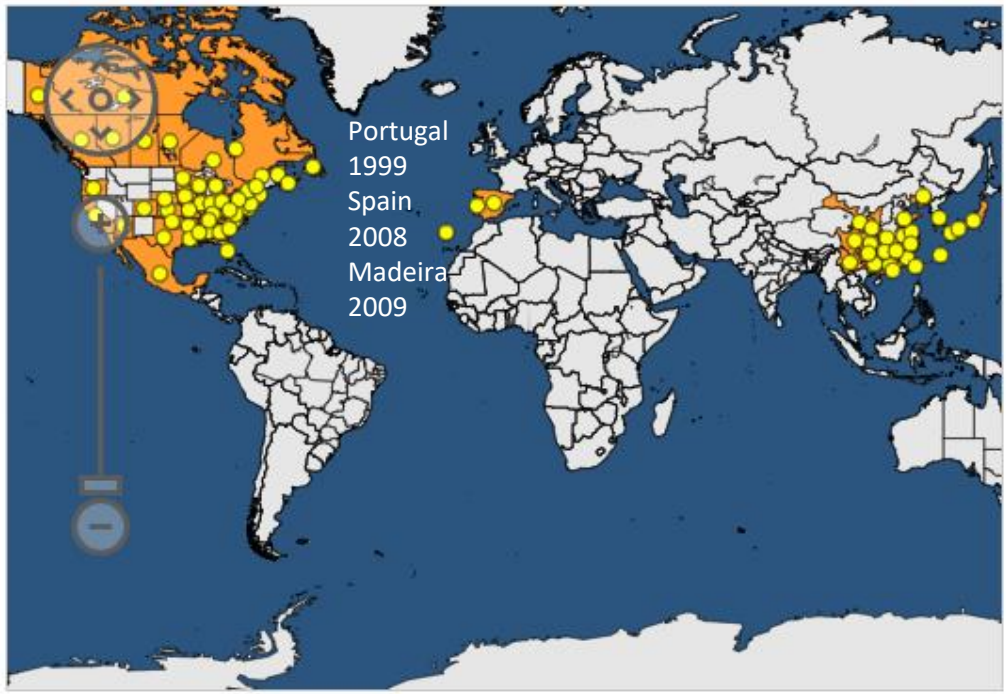
Bursaphelenchus xylophilus (PWN causal agent) global distribution

B. xylophilus is believed to originate from North America

Widespread in Canada and the USA

Native pine trees in North America **do not suffer from pine wilt disease**

Introduced to Asia



Japan: 1905
Taiwan:1985
China: 2008
S. Korea:2008

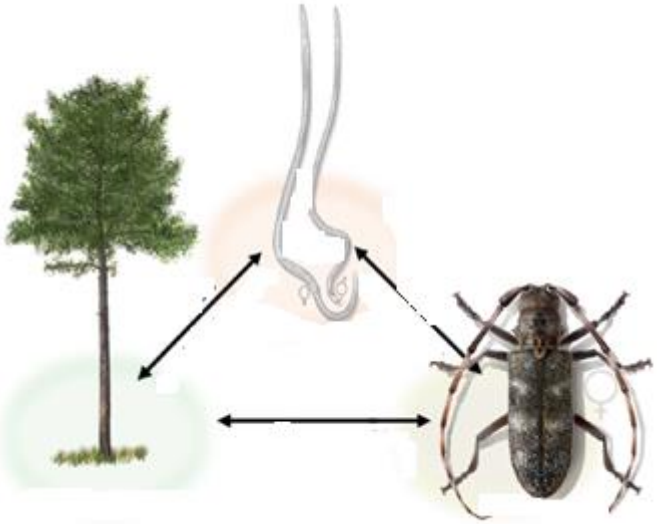
Introduced to the EU

Wood products circulation is the main cause of artificial dispersion

Severe attacks happened where it was introduced outside the original distribution

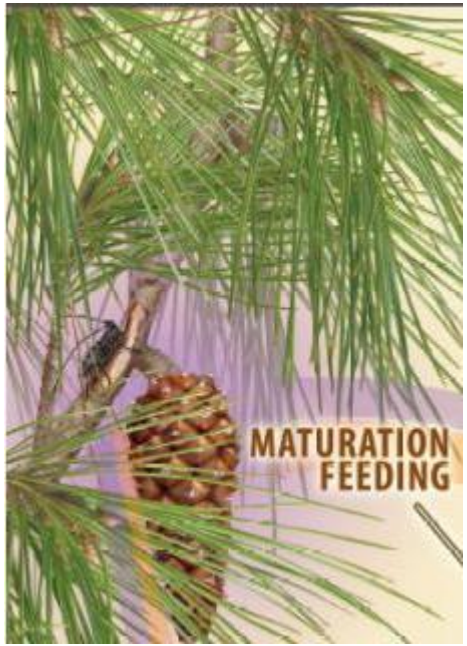
Source: EPPO, 2021

Pine Wood Nematode 101 || the triad + favourable environment



Vulnerable host
Most conifers
Tipically pines

A long-horned beetle of the genus *Monochamus acts as vector*
(Monochamus galloprovincialis in the EU)



Adult beetles can transmit *B. xylophilus* during **oviposition** and via the **feeding** wounds that are made during maturation feeding

The nematode spreads through the tree and eventually kills it—that's perfect for the beetles, which lay their eggs in dead or dying wood

Pictures adapted from Sousa *et al.* and Mota

Pine Wilt Disease Detection and Identification

Symptoms are unspecific and may include:
Rapid discoloration
(yellowing, browning and/or reddening)
Loss of needles
Loss of resin pressure

Detection is only confirmed by lab identification.

Pine wilt can be sudden and tree death can occur within 1 to 3 months.

Early autumn is when most of the symptoms appear.

In Portugal
Mostly adult stands (> 15 years)
Attacks more likely in old stands or trees
Symptoms commonly start in the biggest tree
Typically, a few trees die every year

Sines (South Portugal) | Severe attack
Picture: José Manuel Rodrigues

How can Pine Wood Nematode impact the EU

Bursaphenechus xylophilus is a Union **quarantine pest*** and it is also listed as a **priority pest****.

*listed in Annex II, part B, of **Commission Implementing Regulation (EU) 2019/2072**
** **Commission Delegated Regulation (EU) 2019/1702**

Host range and main hosts in the EU

B. xylophilus has been reported in the EU on

Maritime pine
Pinus pinaster

European black pine
Pinus nigra

Monterey pine
Pinus radiata

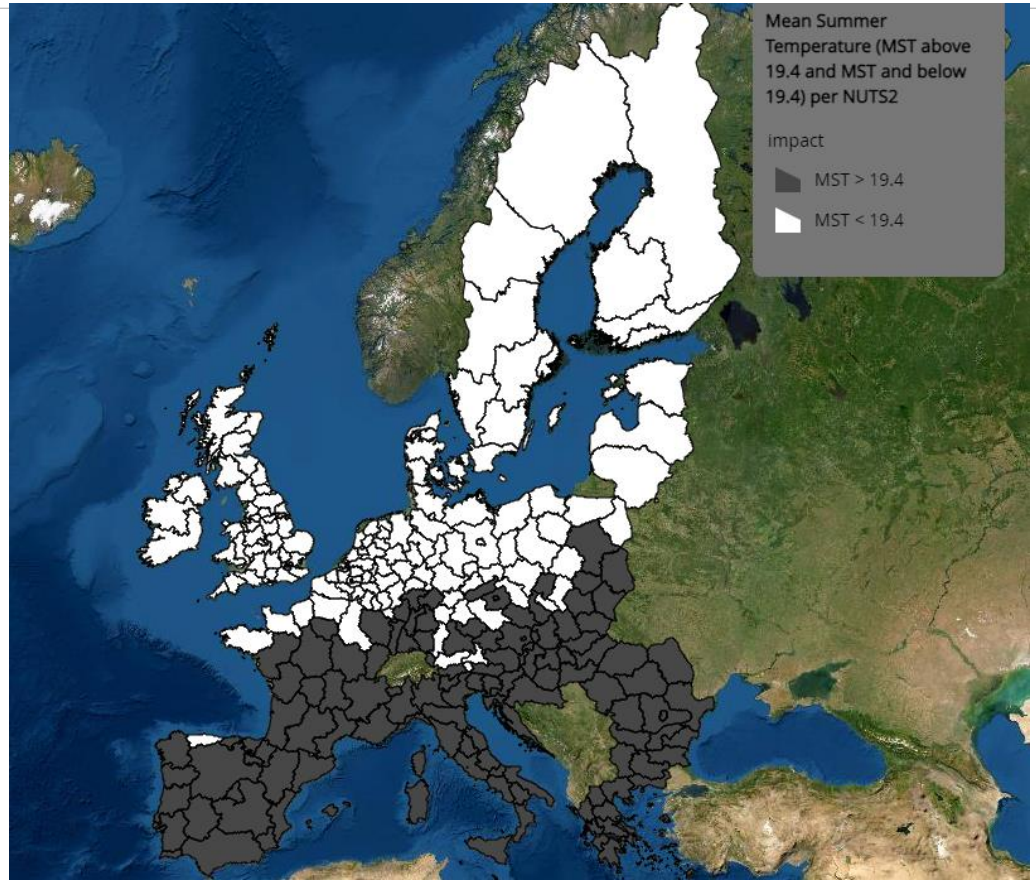
Source: Corine Land Cover year 2012 version 18.5 by European Environment Agency

Possible impact in the EU

Areas where the mean temperature was **20C or higher** were considered to be at higher risk for pine wilt disease expression.

Areas suitable for rapid wilt expression inlude:
Portugal
Spain
Southern France
Italy
Slovenia
Croatia
Hungary
Romania

Gruffudd *et al.,* 2016, cited by EFSA, 2020



Pinewood nematode has large economic consequences for the conifer forestry industry in the EU.

Substantial impacts in terms of infested stock are expected in Portugal, Spain, Southern France, and Northwest Italy but not elsewhere in the EU.

Soliman *et al.*, 2012

Conifer wood demand is expected to increase globally and in the EU

Picos, 2019

Our Story: Pine Wood Nematode evolution

1999

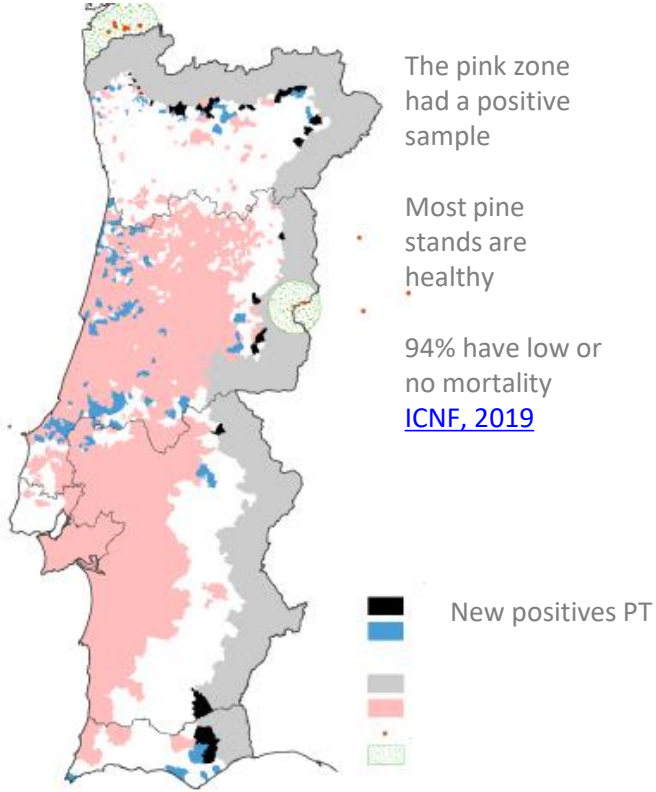
Introduction in the south

2008

First Detection in the center of the country

2013

Transition from erradication to containment strategy*



The pink zone had a positive sample

Most pine stands are healthy

94% have low or no mortality
ICNF, 2019

*under **COMMISSION IMPLEMENTING DECISION of 26 September 2012 (2012/535/EU)**

Map: ICNF, 2020

Tróia Case study (20 years of Pine Wood Nematode presence with active management)

Available in Youtube Centro PINUS channel

1999
30 dead trees/ha
of which 60% had PWN

2019
<1 dead trees/ha
of which 10% had PWN

The 3 Native Portuguese Pines

Pinus pinaster

Maritime Pine*

Pinus pinea

Stone Pine

Pinus sylvestris

Scots Pine**

Main exotic pines present in Portugal (small area)

Monterey Pine
Pinus radiata

European black pine*
Pinus nigra

Aleppo pine
Pinus halepensis

*Tested positive for PWN
** Oral information

Maritime Pine (*Pinus pinaster*)

A native tree

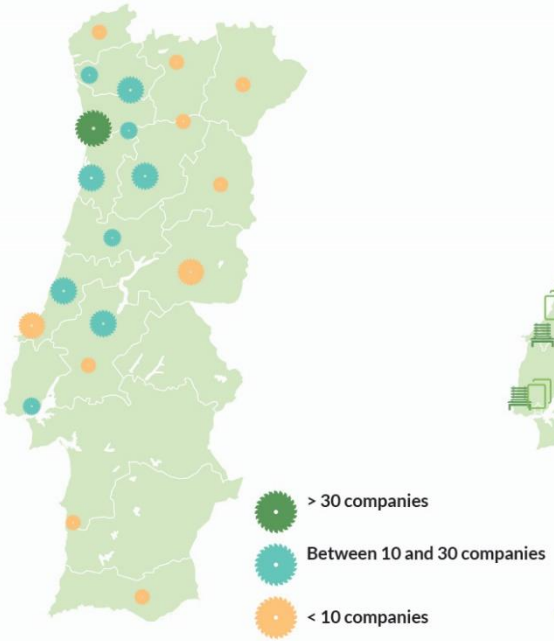
Pioneer, resilient species
714 000 ha *(- 27% since 1995)*
Currently the 3rd forest species in Portugal
Forest fire is the biggest threat and decline cause

Pine stands are mostly:
- semi-natural and or with low intensity forest management
- small private holdings
- small landscape units (69% under 10 hectares)

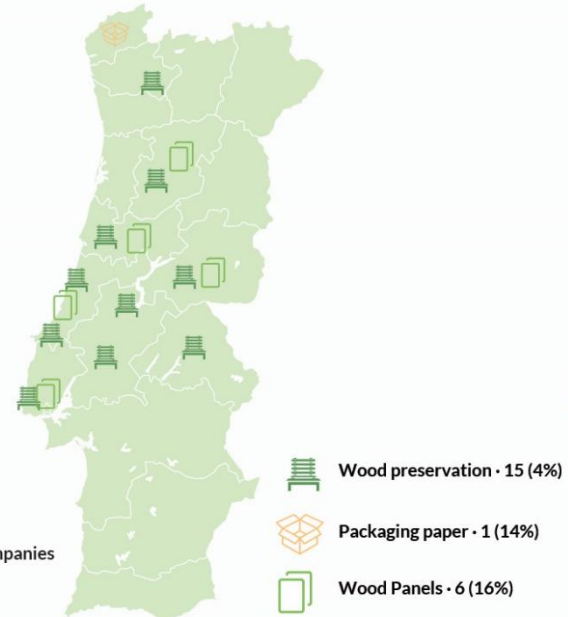
High percentage of young and uneven aged stands
Understocked and overstocked stands are common

Wood Manufacturing sites (% of the total wood consumption)

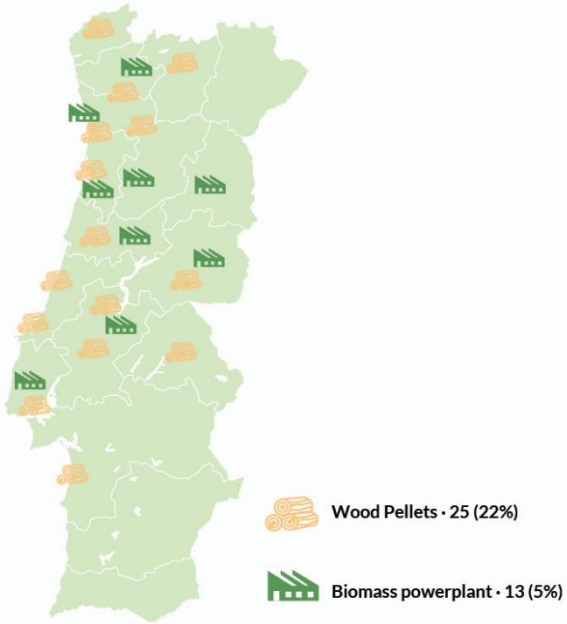
Sawmills · 249 (39%)



Wood preservation, Packaging paper and Wood Panels · 22 (34%)



Energy · 38 (27%)



Main impact in industry

Constraints and uncertainty in wood sourcing as new areas became infected

Heat treatment is compulsory even for the domestic wood pallets
Particularly demanding for the sawmills, the “backbone” and more vulnerable sector

More paperwork and legal requirements to follow up| new procedures| new expenses

Industry probably took the biggest impact since all the players were affected and their business lost competitivity

Managing Pine Wood Nematode

Managing Pine Wood Nematode: risk perception and trust

Le nématode menace la forêt

Lecture 3 min

A La Une • Landes • Arjuzanx

Après la tempête Klaus et le scolyte, il ne faudrait pas que la forêt des Landes risque une attaque de plus, celle du nématode. PHOTO ARCHIVES N. LE LIÈVRE © Crédit photo : Le Lievre Nicolas

Par JEAN-LOUIS HUGON
Publié le 25/03/2011

S'ABONNER

Landowners give up managing or planting pine because they perceive it as a “lost cause”

The PWN is an appealing theme for the press

Disinformation is also a risk do address

The perceived risk can easily outstand the field risk

NATIONAL GEOGRAPHIC

PINE WILT DISEASE. CREDIT: MATEINSIXTYNINE

SCIENCE | NOT EXACTLY ROCKET SCIENCE

Tree-Killing Worm, Please Make Your Way To The Boarding Gate

Managing Pine Wood Nematode: regulations

Legal requirements may be overwelming for economic operators and public organisms

Sometimes, details can “get in the way”of the big picture

Resources can be unsuficient and it is important to keep a clear vision of the priorities

Managing Pine Wood Nematode - Effective risk management

7 Golden rules

Sound scientific knowlege

Sharing operational experience

RigthTiming (with the biological cycle)

knowing wood main fluxes and stocks

Effective Communication

Stakeholder cooperation

Financial, human and operational resources

Managing Pine Wood Nematode -Effective risk management

Key actions

Early detection|| Monitoring insect vector population dispersal in order to insure

Timely harvesting of simptomatic trees and waste cuting management

Wood transport and stocking control

Picture: Edmundo Sousa

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Thank you

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