

# Science for Environment Policy

## Native and non-native pine trees show contrasting response to pests and disease

**A recent study has assessed** how the choice and cultivation of native and introduced pine tree species affects the impact of insect pests and fungal diseases in Spanish plantations. Native maritime pine trees appeared to be more susceptible to insect attack, whilst non-native Monterey pines were more likely to suffer from fungal attacks. Thinning trees also had differing effects on reducing the effects of pests, depending on the tree species.

**Monoculture (single species) tree plantations** are considered to be at greater risk from attack by pests and diseases than forests of mixed species, partly because they are an easy target for insects to find in the landscape. Many monoculture plantations around the world are of non-native species, chosen for their fast growing rate. However, introduced trees may respond differently to native tree species when attacked by local insects and diseases.

The study assessed the vulnerability of two types of monoculture plantations to attack from insect pests and fungal diseases in North-west Spain: plantations of maritime pine (*Pinus pinaster*), a native species, and plantations of the non-native Monterey pine (*Pinus radiata*) both commonly grown in study region. It highlights the important consideration of plant choice and cultivation methods in the management of commercial forests. Trees in the study area were inspected for evidence of insect and fungal attack, and the nutritional value of the trees for insects was assessed by measuring the nitrogen and carbohydrate content of the pine needles and other plant tissue.

In addition, the researchers compared the effects of thinning the tree stands on their ability to protect themselves from pests and disease. Thinning can lead to healthier growth of the remaining trees, making them more resistant to attack by their insect and disease enemies.

The native maritime pine appeared to be more susceptible to attack by insect pests than the non-native Monterey species. The researchers found two to four times as many plant-eating insects in the maritime pine stands than in the Monterey stands, and more trees were infested with insect pests, especially borers, such as the pine shoot beetle.

In contrast, the non-native Monterey pine appeared to be more susceptible to attack by fungi. The percentage of fungi-infected trees in Monterey pine stands was seven times greater than for the maritime pine stands.

Four out of the five species of fungi identified in the study areas target the pine needles, such as *Mycosphaerella dearnesii* and *Mycosphaerella pini*, which both cause forms of blight. Thinning was found to be particularly effective in reducing damaging fungal attacks, probably because it increases air circulation, making conditions less favourable for fungi.

In addition, thinning was found to reduce attacks by bark beetle pests more effectively on stands of the maritime pine compared with Monterey pine stands. It is likely that thinning had more of an effect on the resin flow (an indicator of tree defence) in maritime pine trees.



20 November 2012  
Issue 306

Subscribe to free  
weekly News Alert

**Source** Lombardero, M.J.,  
Alonso-Rodríguez, M.,  
Roca-Posada, E.P. (2012)  
Tree insects and pathogens  
display opposite tendencies  
to attack native vs. non-  
native pines. *Forest  
Ecology and Management*.  
281: 121–129.  
Doi.org/10.1016/j.foreco.2  
012.06.036.

**Contact:**  
[mariajosefa.lombardero@usc.es](mailto:mariajosefa.lombardero@usc.es)

**Theme(s):** Forests

The contents and views  
included in Science for  
Environment Policy are  
based on independent,  
peer-reviewed research  
and do not necessarily  
reflect the position of the  
European Commission.

To cite this  
article/service: "Science  
for Environment Policy":  
European Commission DG  
Environment News Alert  
Service, edited by  
SCU, The University of the  
West of England, Bristol.