

# Environmental benign wood protection by means of electro osmotic pulsing technology (PLEOT)



*Vision:*

*--- A new alternative to chemical wood protection.*

*A wood protection technology that gives an extensive protection from wood degrading fungi without having negative influence on the surrounding environment ---*



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&  
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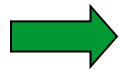


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## PLEOT - Background

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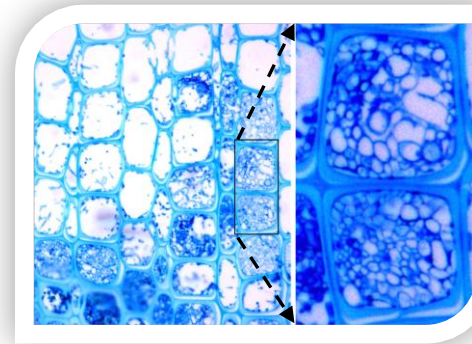
- European wood species – many have low durability
- Wood in contact with moisture leads to
  - Shrinkage and swelling
  - Good conditions for fungal degradation



- Wood protection by PLEOT
- Protect when wood is moist
- Refractory species can be used (Spruce)

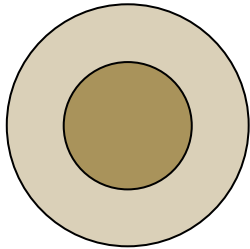


Photo: Mycoteam

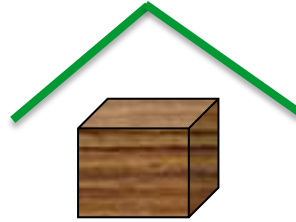


# PLEOT - Background

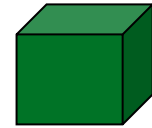
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**Natural  
durability**



**Constructive wood  
protection**

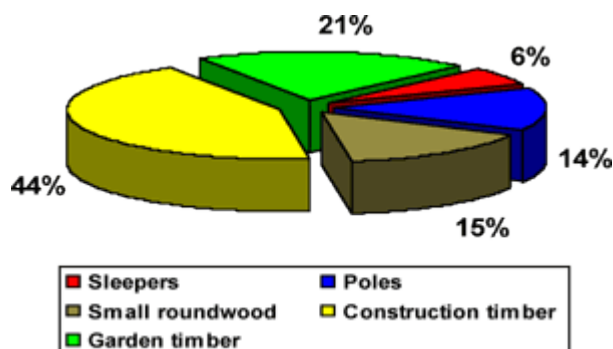


**Wood protection**

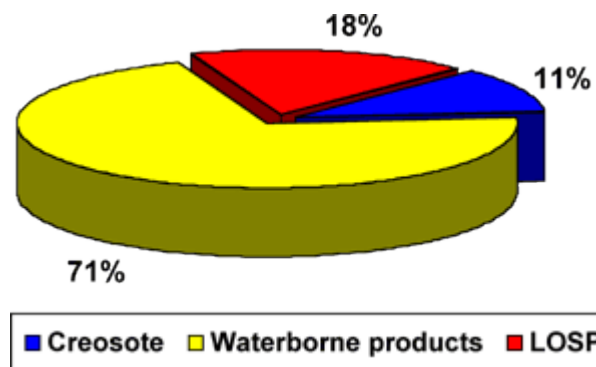
# PLEOT - Background

## Wood protection industry in Europe

6.5 million m<sup>3</sup> impregnated wood



<http://www.wei-ieo.org/woodpreservation.html>

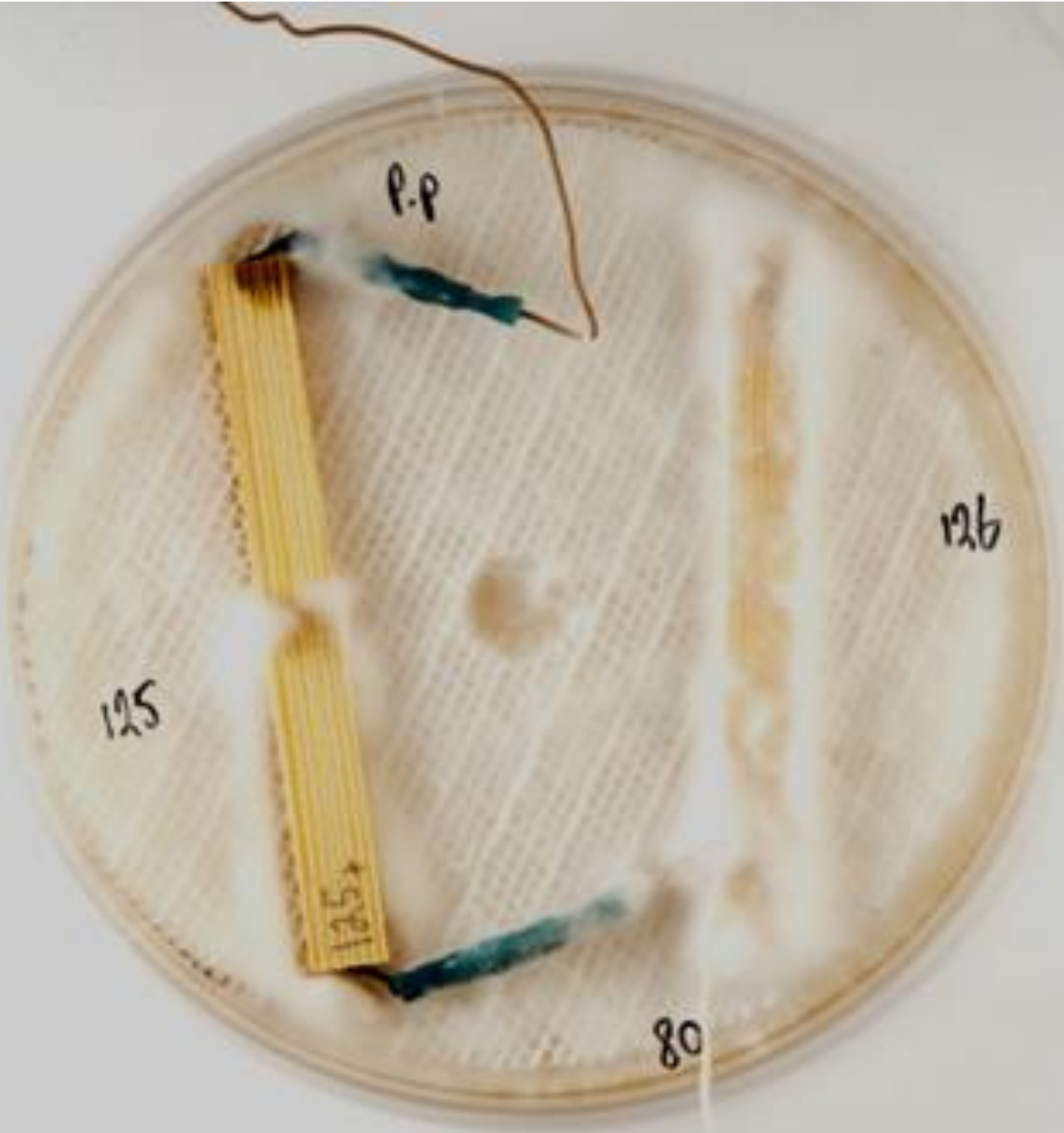


LOSP = Light Organic Solvent-borne Preservatives





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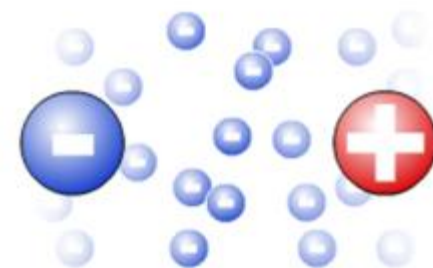


## Installation of PLEOT

- low frequency
- pulsed electrical current with off- period
- not harmful
- needs to be connected
- transport of ions and water



Electro osmosis: motion of polar liquid through membrane or porous material, when electric field is applied



## PLEOT – Competitive advantage

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### The environmentally friendly advantage:

- Minimal use of energy for protection
- No transport or use of chemicals

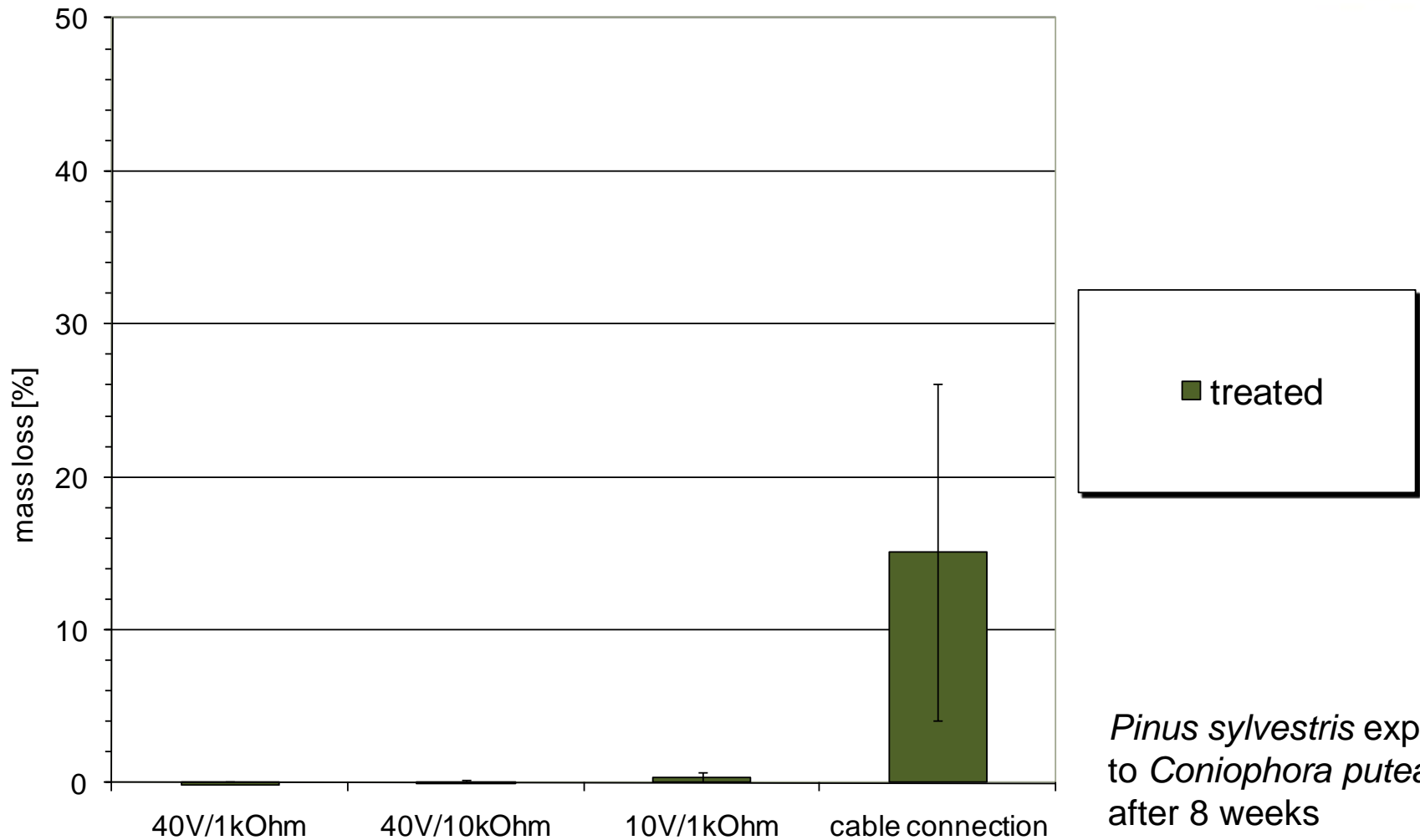
### The economical advantage:

- Can replace existing biocide based technology when/if restrictions will come
- Can be used on wood species not treatable with chemicals
- Can be implemented into cultural heritage buildings
- Low energy consumption, below 2€/ year



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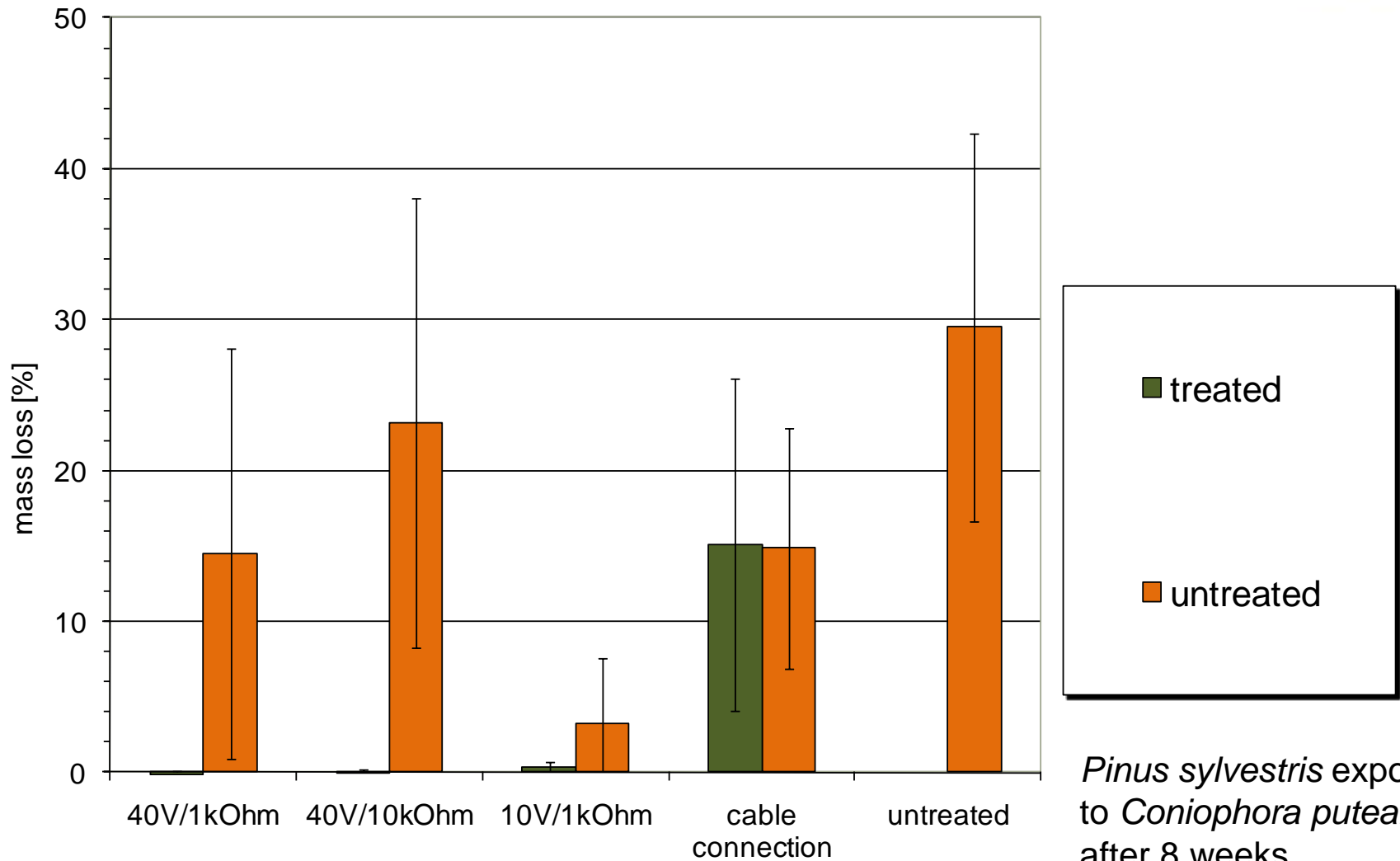
## Results - brown rot



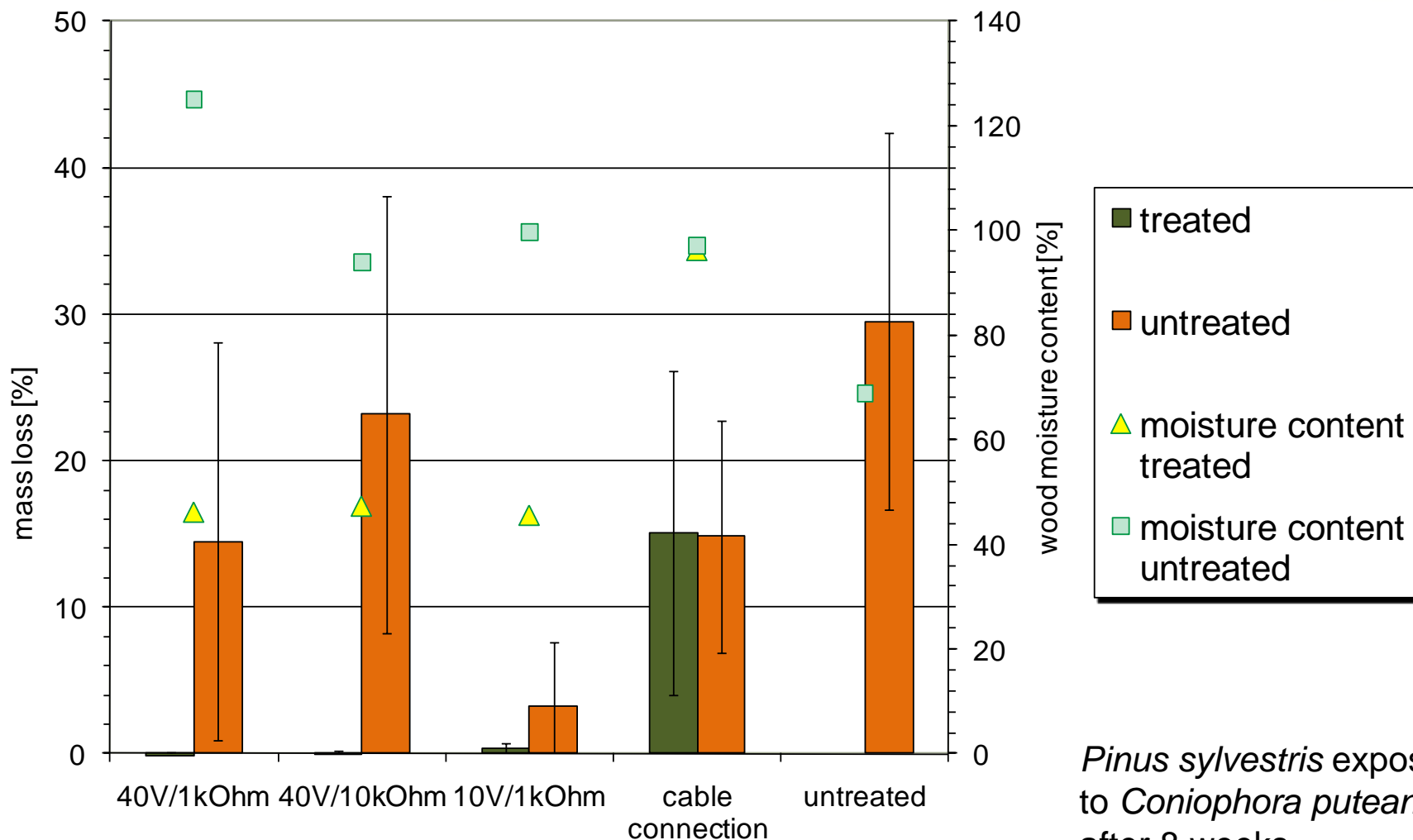


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## Results - brown rot



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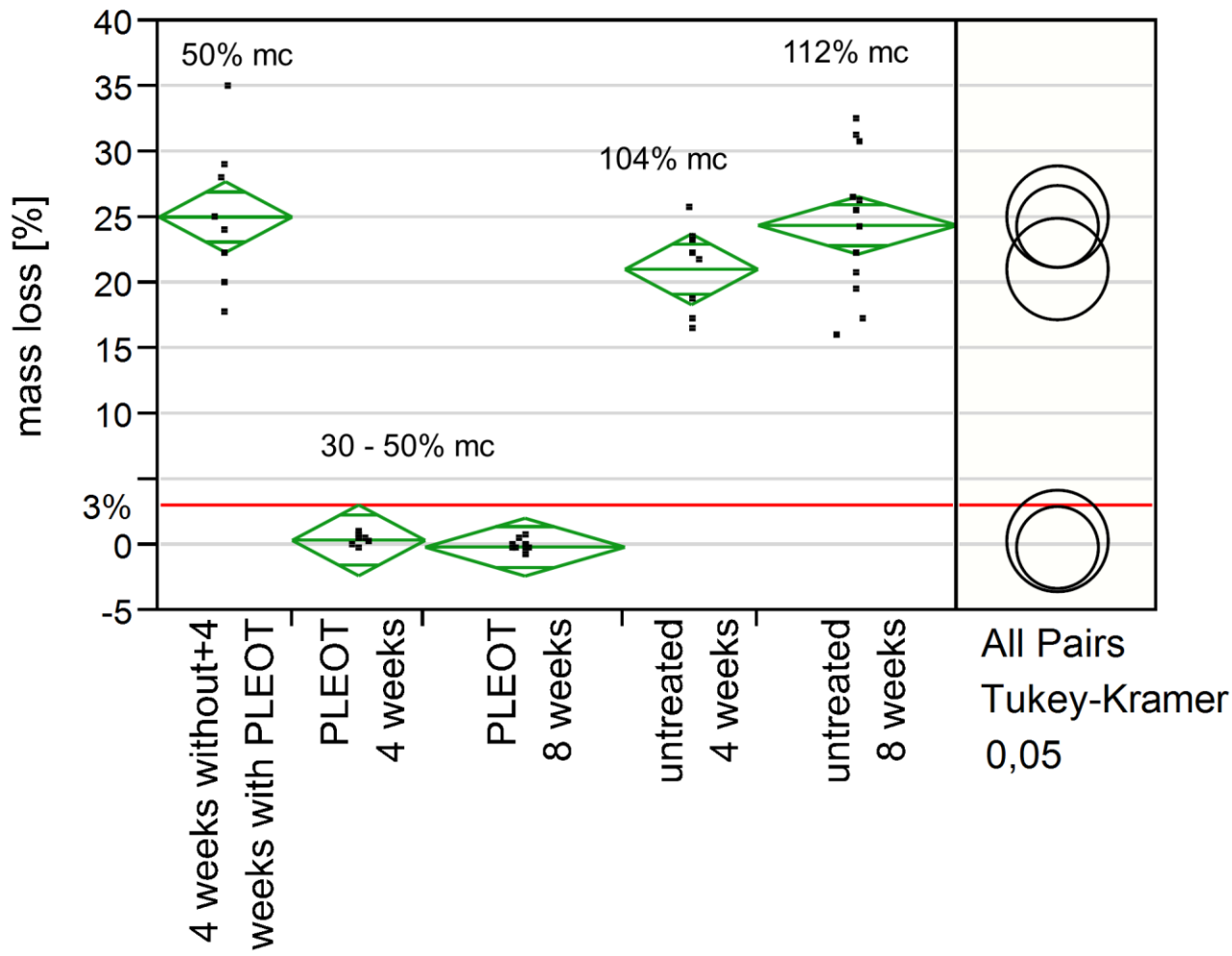


*Pinus sylvestris* exposed to *Coniophora puteana* after 8 weeks



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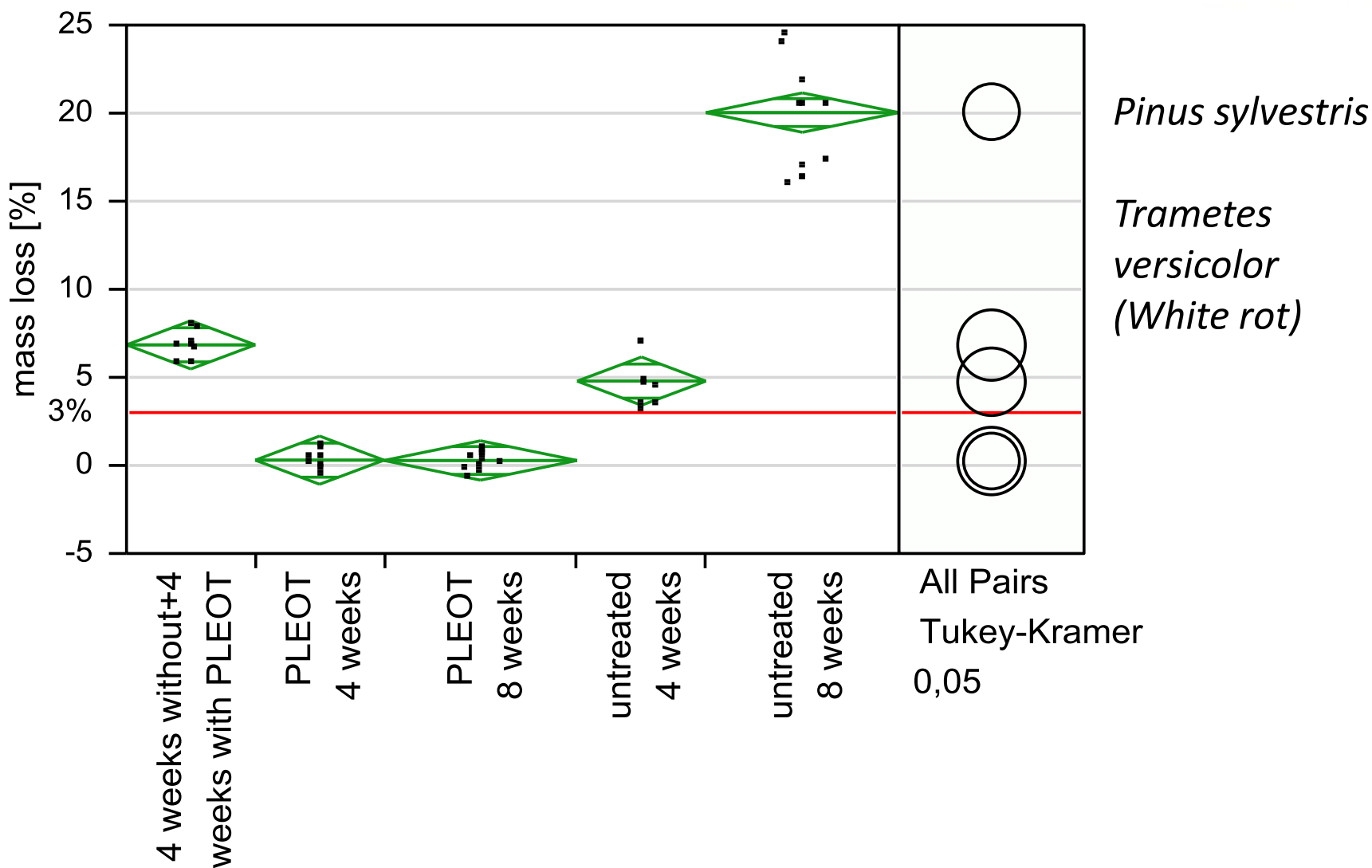
# PLEOT Results



Scots pine sapwood  
(*Pinus sylvestris*)

brown rot  
(*Coniophora puteana*)

# PLEOT Results



## PLEOT Outlook

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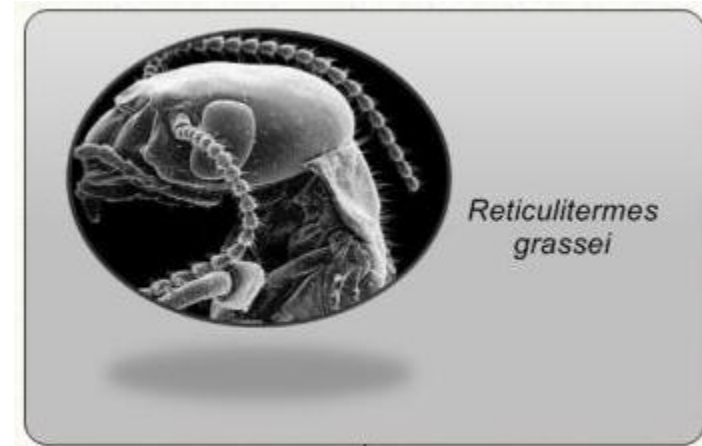
- Optimization of pulsing pattern
- PLEOT limitation;
  - Distance of electrodes, moisture content and fungal species
- Mode of action
- Implementation in existing buildings
- Implementation in new buildings
- Field trials





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# Protection against subterranean termites





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## PLEOT: prevent fungal degradation and transport of ions

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- Prevent staining fungi ?
- Reduce moisture content in wood / biomass ?
- New areas of use for wood based panels ?
- Longer lifetime for food ?
- Stimulate growth in plants/food ?
- Stop fungi from attacking living trees ?
- Stop fungal growth.....
- ++

Thank you for your attention!

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