RIGIDIPORUS LIGNOSUS
White root disease

IDENTITY

Latin name	*Rigidiporus lignosus*
Common name	White root disease
Taxonomic classification	*Fungi: basidiomycota: Polyporaceae: Rigidiporus*

Figure 1 - Symptoms of *Rigidiporus* on roots

MORPHOLOGY

Description:

- The fungus forms flat, white strands of mycelium, which grow and cling firmly to the surface of the root bark.
- Thickness: 1mm to 2mm.
- Able to grow up to several metres long.
- Colony: white with circular growth.
- Interlaced filiform hyphae.
- Spores: round and firmly attached to the strand of hyphae in a net-like structure.

LIFE CYCLE

- Healthy plants are infested by rhizomorphs from tree stumps or infected woody debris buried in the soil, and by roots coming into contact with the roots of an infected neighbouring tree.
- The fungus penetrates the plant's taproot.
- The wood is colonised up to the root crown and other parts of the root system.
- The internal progression of the root tissue is slower than the epiphyte growth of the mycelium on the root.
- The rhizomorphs transform morphogenetically into infectious hyphae able to break down wood.
- Yellow-orange sporophores form at the base of trees which have been severely attacked by the fungus.
- These sporophores produce a large amount of basidiospores (reproducing spores).

CONDITIONS CONDUCIVE TO ITS DEVELOPMENT

- Environment:
    - Pepper farms set up immediately after forest clearance:
      R. lignosus mycelium filaments cause infections.
    - The swathing of old stumps of felled trees left between lines of crops.
    - Farm layout: plots of pepper plants at the foot of small hills, which are very common in the region, promotes water run-off onto farms.
    - The soil texture (sandy or clay-like) can promote and regulate anoxia (presence or absence of oxygen), affecting the development of fungi in the soil.
- Period conducive to the development of the disease:
    - The rainy season is conducive to the development of sporophores (April to October).

SYMPTOMS AND DAMAGE

The symptoms on support trees and pepper plants are similar to those for slow decline disease, namely:

- Yellowing of leaves starting from the base.
- Plants lose vigour.
- Gradual defoliation.
- Fall in productivity.
- Death of plants.
- When the roots of infected plants are exposed, the widespread white rhizomorphs are clearly visible.

MONITORING STRATEGY

This disease is extremely widespread in the Penja region and affects old plants from the very first farms set up over 50 years ago.

Each plot is inspected thoroughly. The initial health inspection should be carried out as early as possible, ideally two or three years after planting.

Outbreaks are easy to spot on the farm due to empty spaces in a row, one or more dead trees with carpophores (fruiting bodies) at the base of the trunk, or one or more infected trees with symptoms visible on the leaves.

Mark the trees requiring treatment when outbreaks are spotted within a plot. All the trees located close to the outbreak should be inspected by digging up the soil around the root crown and lateral roots to detect whether the parasite is present. Only infected trees (pepper plants and support trees) and healthy trees near dead or infected trees should be marked and treated.

Swift detection of symptoms enables pepper plant producers to take timely decisions to reduce the level of infestation throughout the orchard.

▶ *Penja pepper producers are advised to carry out this inspection using an observation and monitoring sheet provided in the appendix.*

GOOD FARMING PRACTICES TO COMBAT PROBLEM

- **Crop control:**

  - Prepare the ground well before planting.

  - Clear the forest and remove all tree stumps every 1-2 years before planting.

  - Burn all woody debris that can be collected.

  - Carry out an 80cm subsoiling for planting rows.

  - Remove all plant debris from planting holes.

  - Remove all woody debris on which the parasite could survive and from which it could spread.

  - Dead and infected trees must be removed.

  - Taproots and lateral roots should be removed and taken off the farm.

- **Organic control:** research has demonstrated the ability of *Trichoderma harzianum* to control the pathogenic agent *Rigidiporus lignosus* in in vitro conditions. However, this technique is not currently accessible to pepper plant producers.

- **Control using plant protection products:** the treatment must be carried out around the base of the infected plant and on the closest neighbouring plants. It should be carried out on damp soil, between April and October. However, it should be noted that no product is currently approved in Cameroon to combat *Rigidiporus lignosus* in pepper plants (List of pesticides approved in Cameroon consulted on 4 March 2021). Some commercially-available solutions authorised for combating white root rot in rubber trees (see table below) could be used on Penja pepper plants subject to prior authorisation from the competent authorities.

Solutions	Method of use	Status as per Regulation (EC) No 1107/2009	Crop-pest combination for which the active substance is approved in Cameroon	EU MRL for pepper
Difenoconazole 10g/kg	30g cp/tree	Difenoconazole: Approved	White root rot/ Rubber trees	Difenoconazole: 0.3
Cyproconazole 100g/l	5-10ml cp/tree to be diluted in 2L of water	Cyproconazole: Not approved	White root rot in rubber trees	Cyproconazole: 0.05*

(*) cp: Commercial product
(*) Indicates the lower limit of the analytical determination

APPENDIX: OBSERVATION AND MONITORING SHEET

Campaign: ....

Date: ....

Plot code: ....

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Vegetative stage: ....

Date of last treatment: ....

Product(s) used: ....

Observations: ....

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INFESTATION LEVEL

White root disease: ....

Comments: ....

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