TECHNOLOGY OFFER

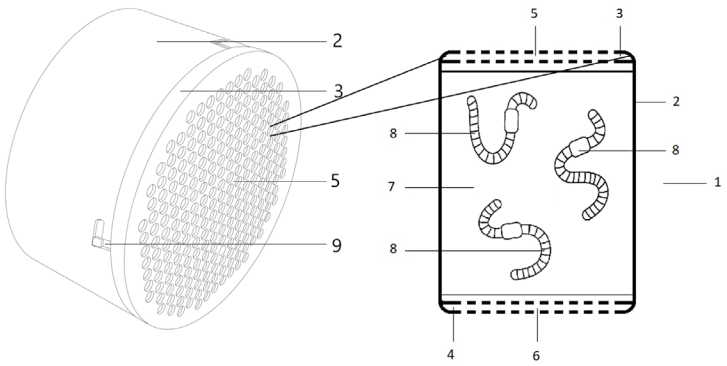
BIOSENSOR FOR ASSESSING RESPONSES TO PESTICIDE APPLICATIONS IN SOILS

Background

Soil organisms, such as earthworms, are good soil health indicators. They can change their behaviours when in contact with contaminated soil and uptake and accumulate toxic substances, like pesticides. Their responses can be monitored through different molecular biomarkers.
However, there are difficulties in conducting experimental field trials, namely in developing appropriate chambers/cages that can hold the model soil organisms in physical conditions that do not affect their behaviour and performance.

Technology

The invention refers to a biosensor device and method, holding earthworms as model soil organisms, for assessing responses to pesticide applications in soil. The first earthworm-based device for in-field assessment.
Earthworms are exposed to controlled environments that are closely related to real superior soil layers being exposed to phytosanitary treatments.



Biosensor device structure

Advantages

- In situ monitoring of the impacts of phytosanitary treatments on soil quality and biodiversity;
- Easy to place in the soil and reusable;
- Possibility of preparing the device in advance, sending it to the farmer to be placed in the field and then collecting it for analysis.

PATENT STATUS

International Patent Application via PCT WO2025003936
Priority date: 27.06.2023

DEVELOPMENT STAGE

TRL4 – Technology validated in lab
Further development for validation in large scale setups required

APPLICATIONS

Monitoring and evaluation of the impact of phytosanitary treatments on soil quality and biodiversity.

COOPERATION

Research Cooperation Agreement;
Licensing Agreement.

KEYWORDS

Soil quality
Biosensor
Earthworms
Pesticides

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