The background of the slide is a composite image. On the left, there is an aerial view of a city with a river and green spaces. Overlaid on this are several faint, white, concentric circles and a grid pattern, suggesting a scientific or analytical theme. The right side of the slide is white, providing a clean background for the text.

Towards a tool for interpreting RHIZOtest measurements, to assess soil-to-plant transfer of contaminants

PhD dec 2023 – dec 2026

Intersol 2024 – Alexandra MILLE-EGEA

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Context

70%

of European soils are degraded

with 2.8 million

potentially polluted sites

3 million

of m³ of crop soils are moved to urban areas
each year in France



Context

New solutions for management of contaminated sites and soils :



Limit soil excavation to concentrated source areas only



Reduce consumption of crop soil



Context



Contamination source
Contamination in soil



Way of transfert:
by market garden
crops consumption



Target



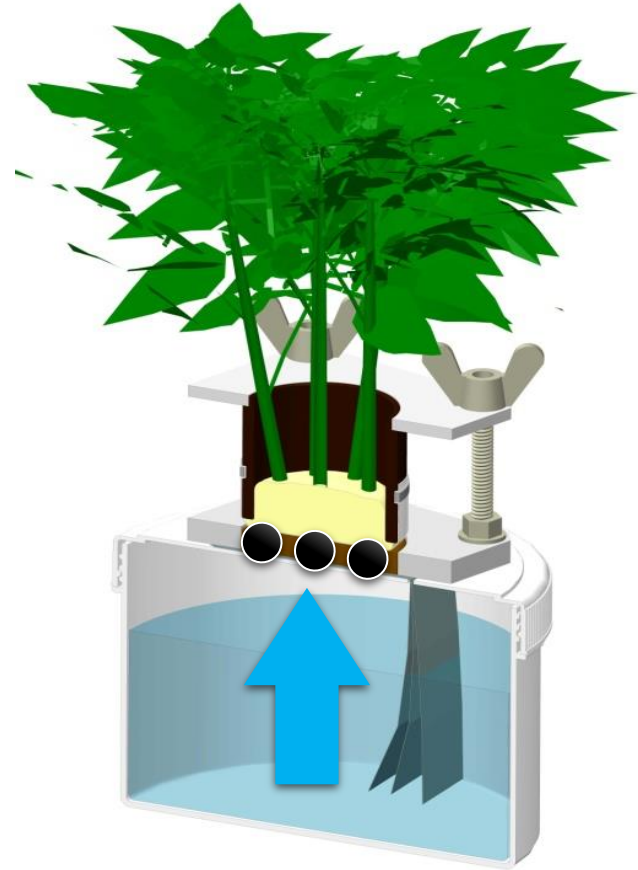
RHIZOtest method for phytoavailability

Phytoavailability : Contaminants quantity able to be collected by a plant

- = Trace elements from soil (*Ex: Cd, Pb, As*)



On field

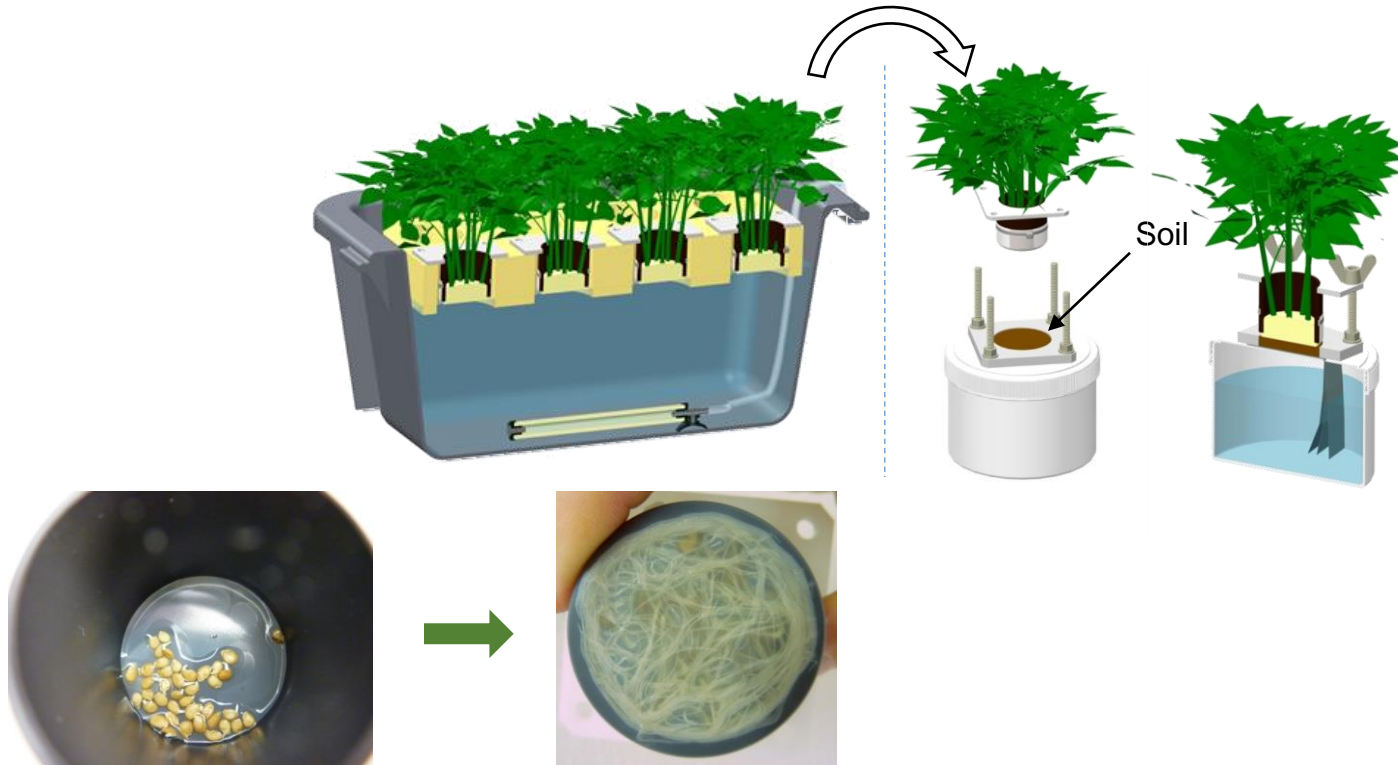


In RHIZOtest

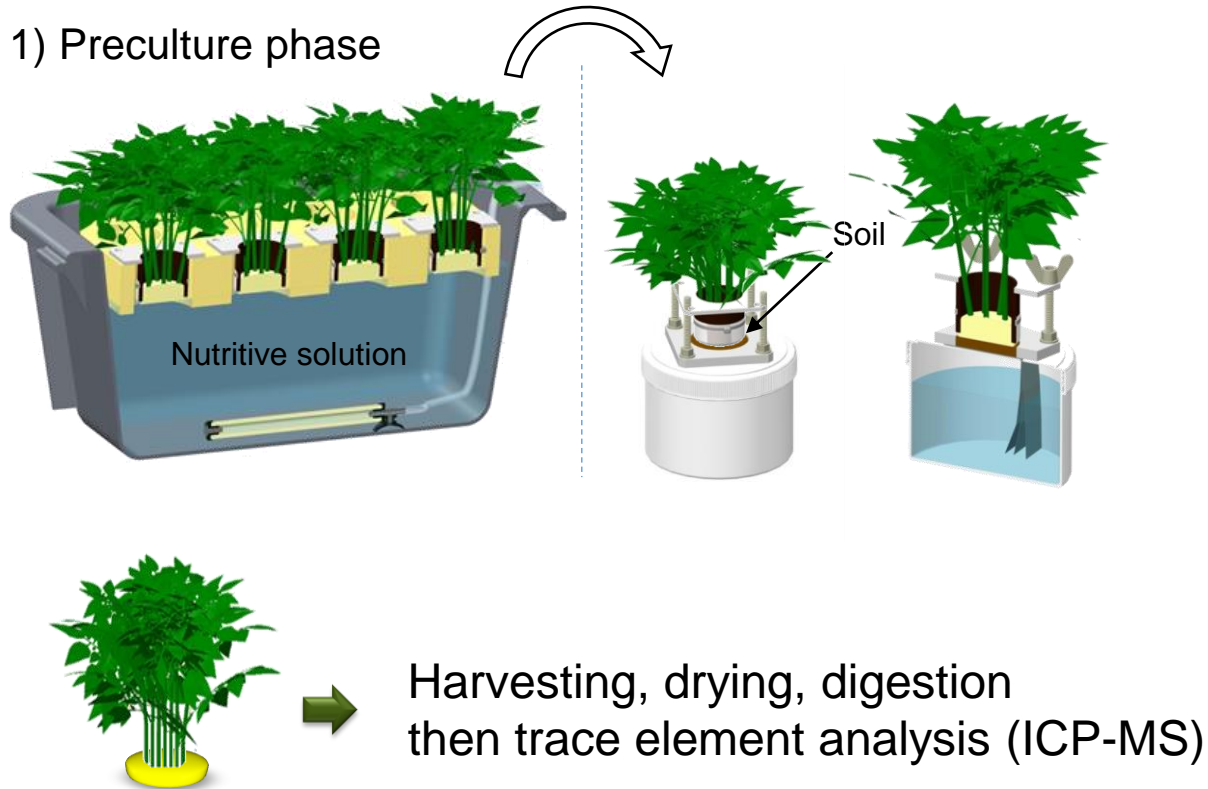
RHIZOtest method for phytoavailability

1) Preculture phase

2) Test phase



RHIZOtest method for phytoavailability



RHIZOtest



- NF EN ISO 16198



- Quick versus field



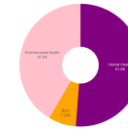
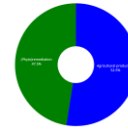
- Little soil used



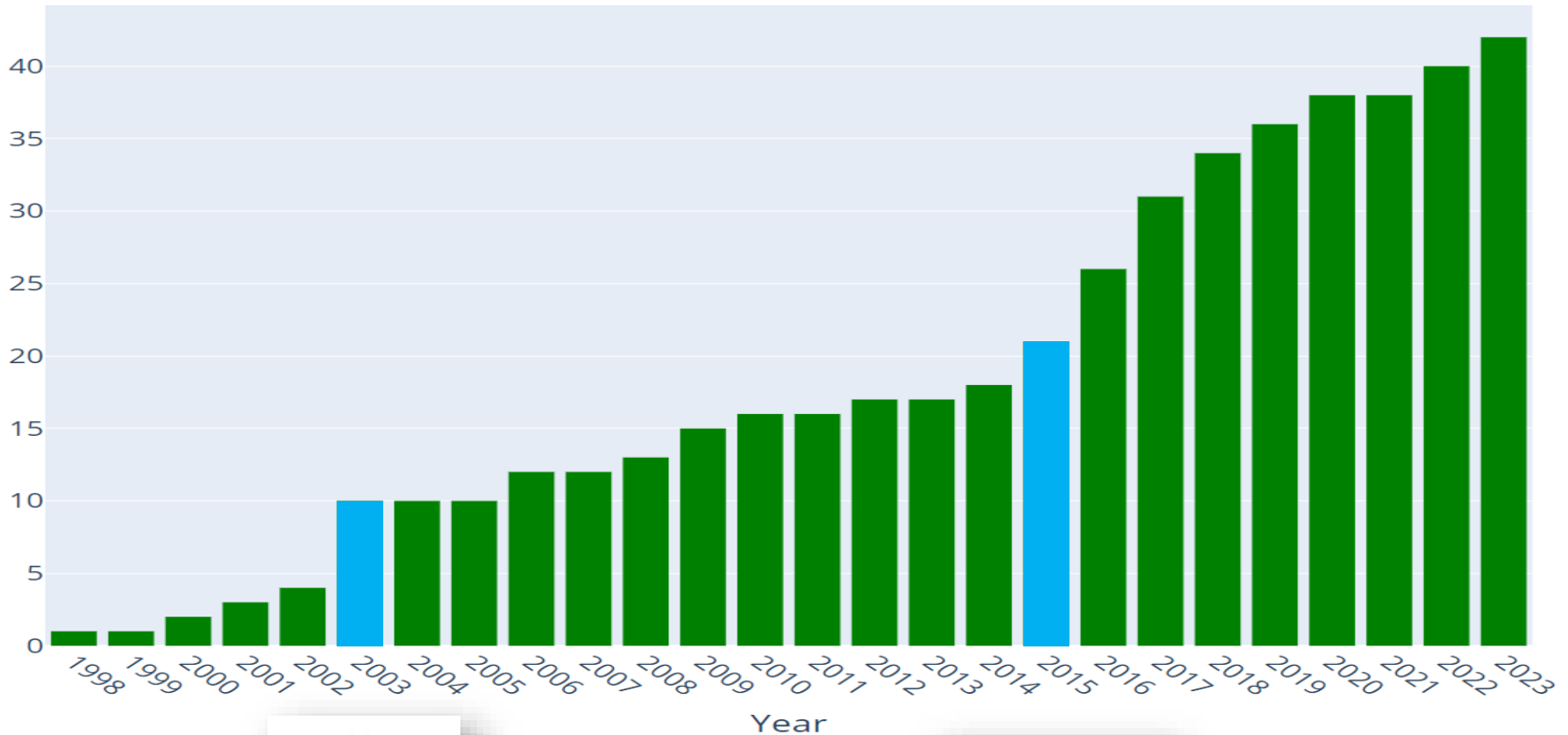
- Account for multi-contamination

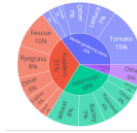
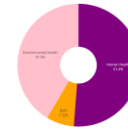
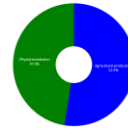
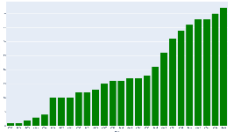


- Adaptability : plants, soils, contaminants, practices

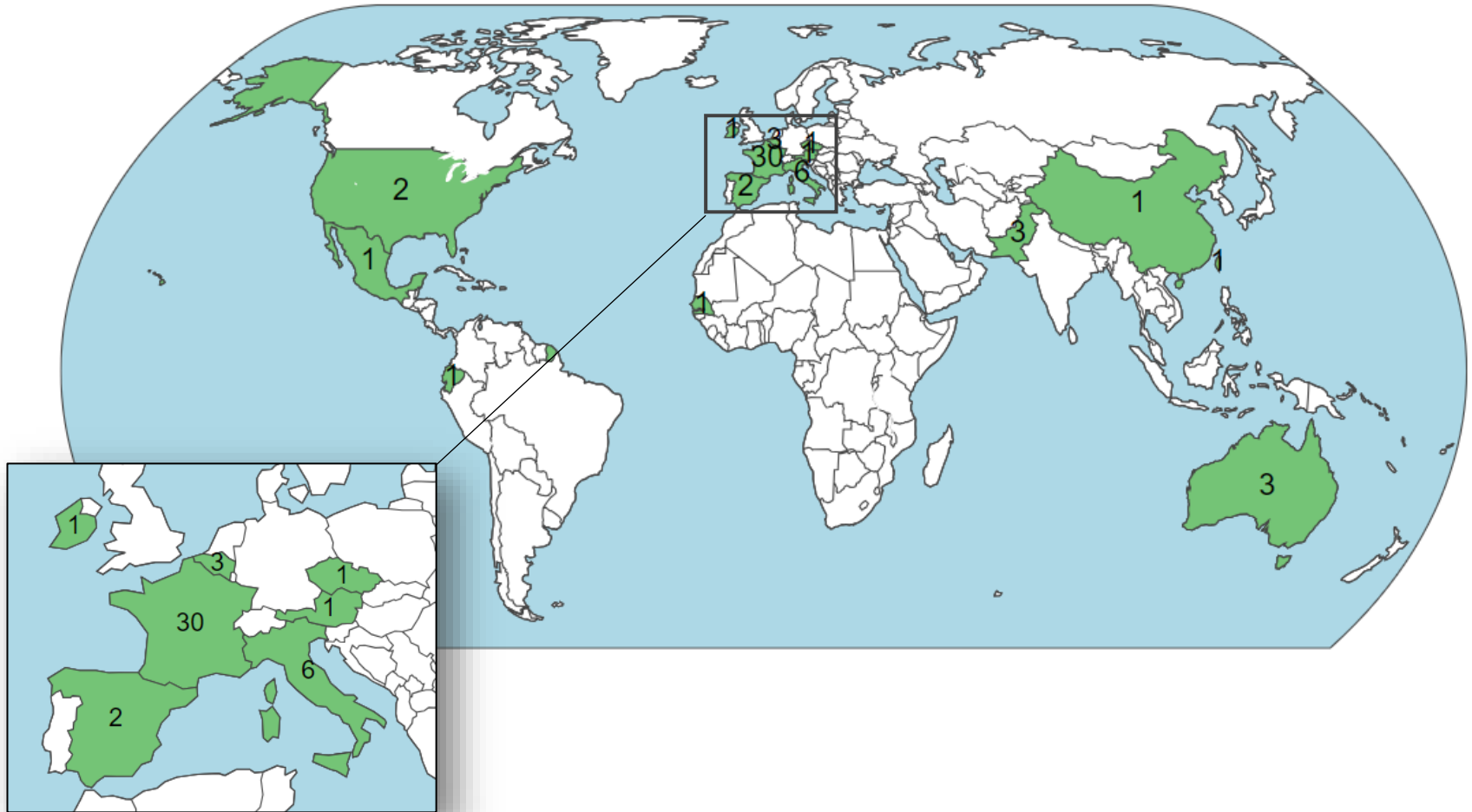


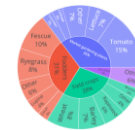
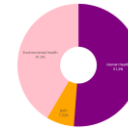
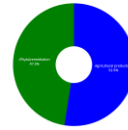
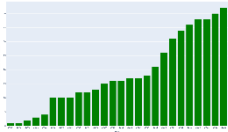
Number of publications using the RHIZOtest method in their experiments



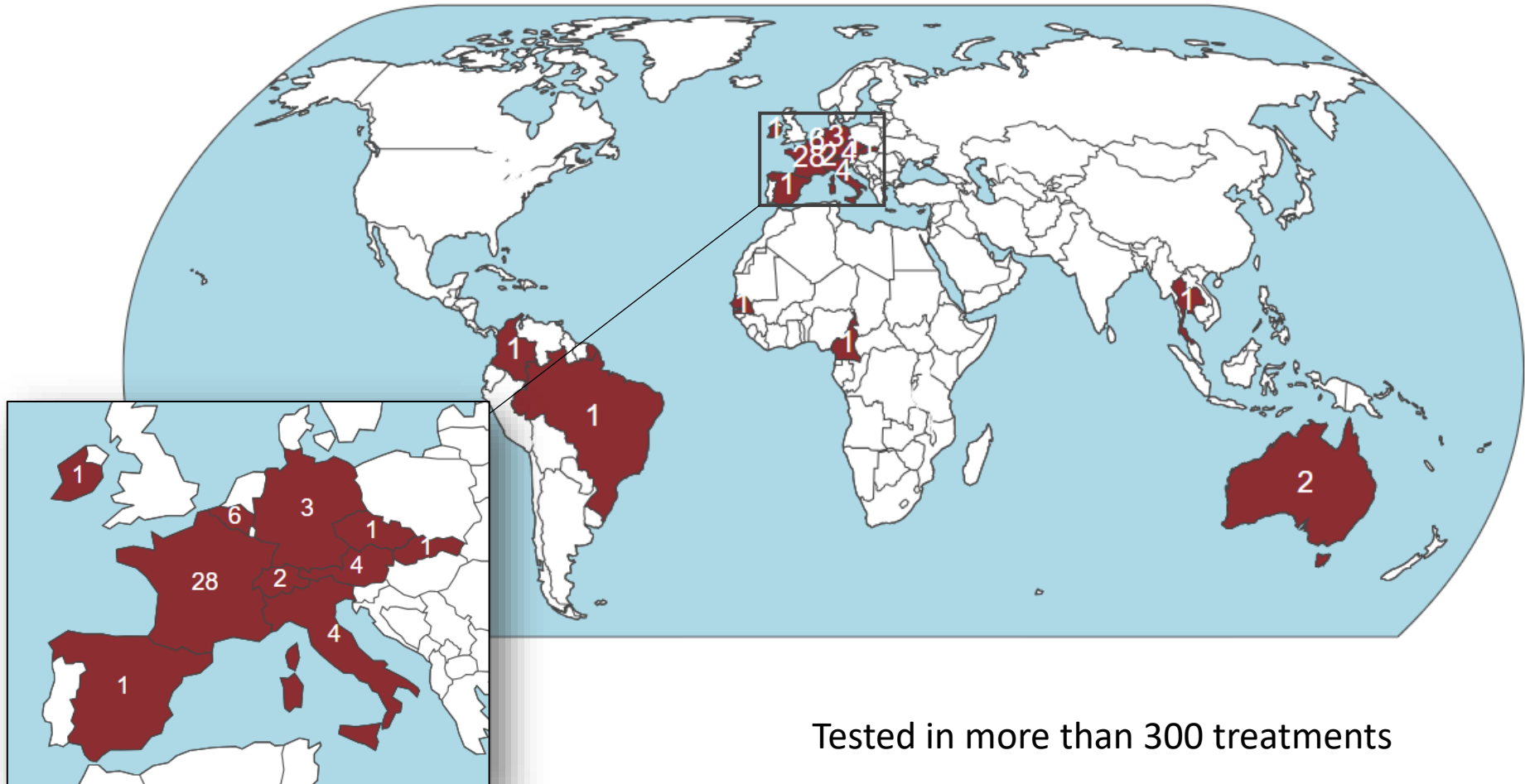


Affiliations countries by study using RHIZOtest

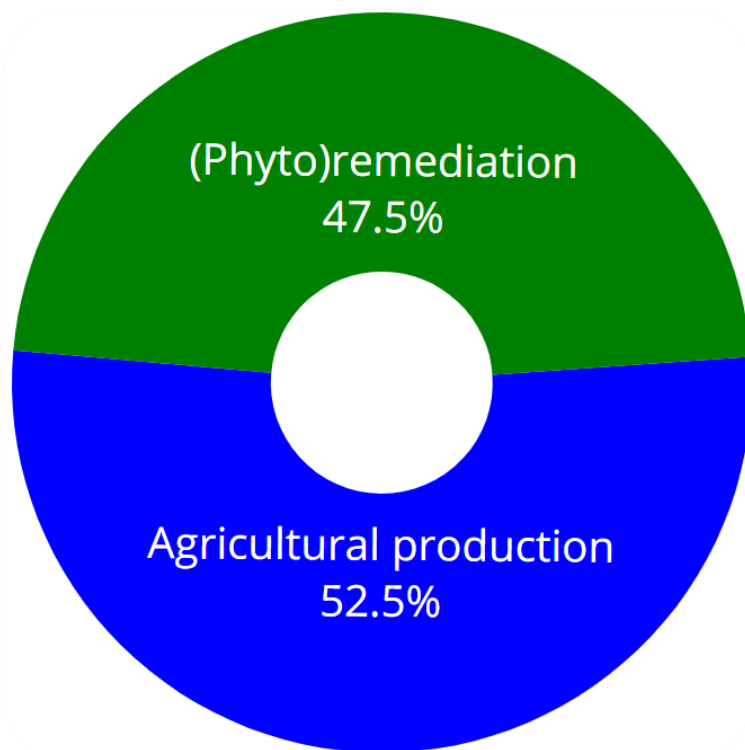
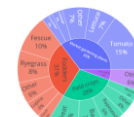
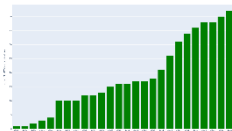




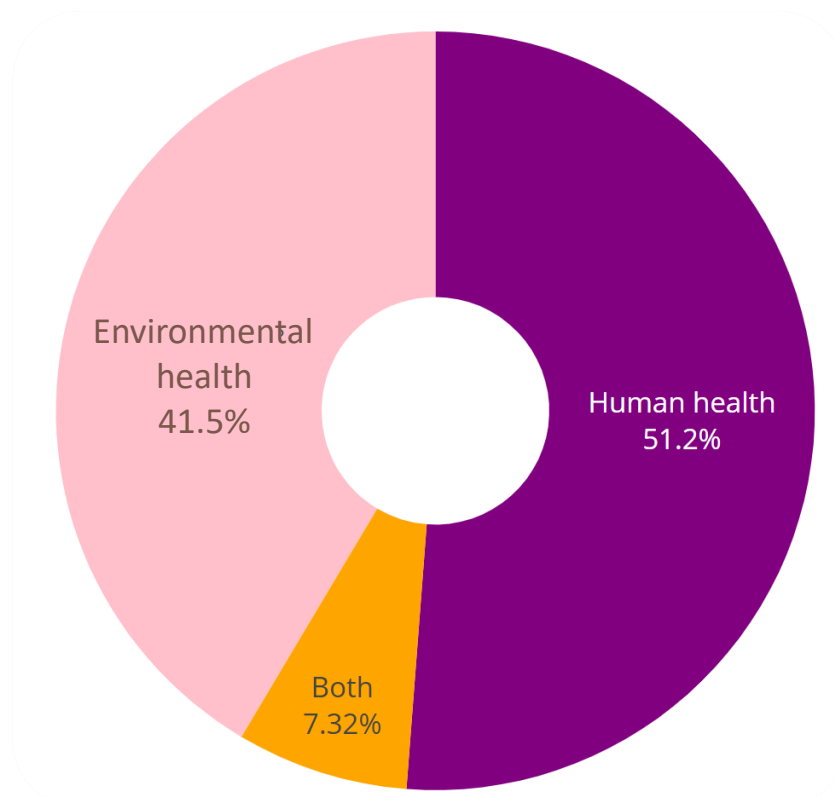
Around 60 soils studied in 20 countries



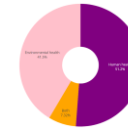
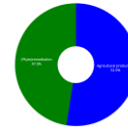
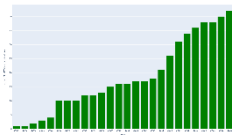
Tested in more than 300 treatments



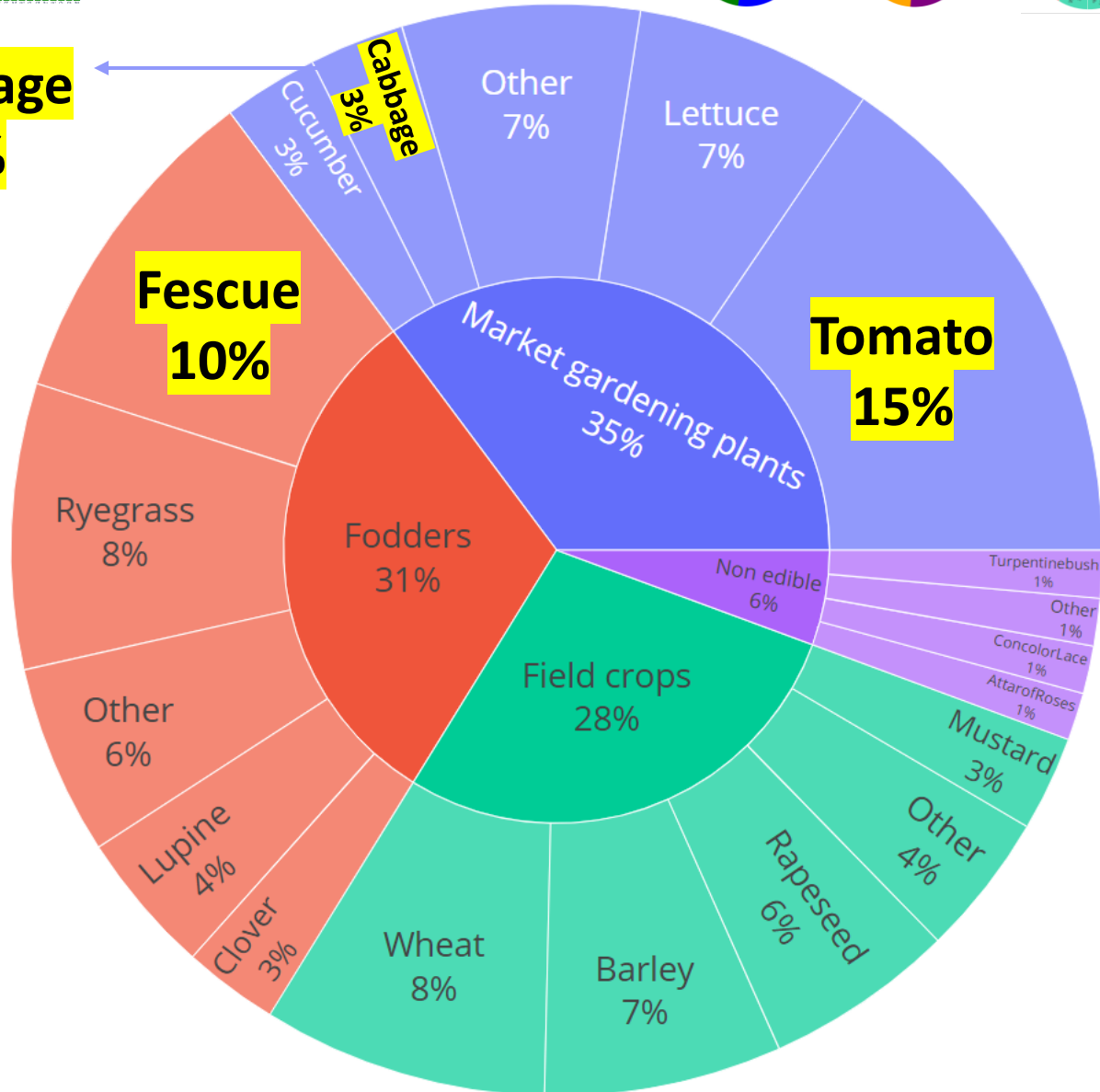
Sites functions



Risks assessments



Cabbage
3%



28 species tested in RHIZOtest

Thesis objective

- Limitation : compare the results obtained on soil samples with an experimental reference

➡ Operational risk assessment using the RHIZOtest measure would therefore benefit from absolute interpretation.



Thesis objective

Develop a dashboard / tool to create an absolute interpretation of RHIZOtest measures :



- Bibliometry of RHIZOtest studies



- RHIZOtest database



- Clean and harmonize data



- Create a biostatistic model to interpret data

*Towards a tool for interpreting RHIZOtest measurements,
to assess soil-to-plant transfer of contaminants*

To go further : <https://rhizotest.cirad.fr/>

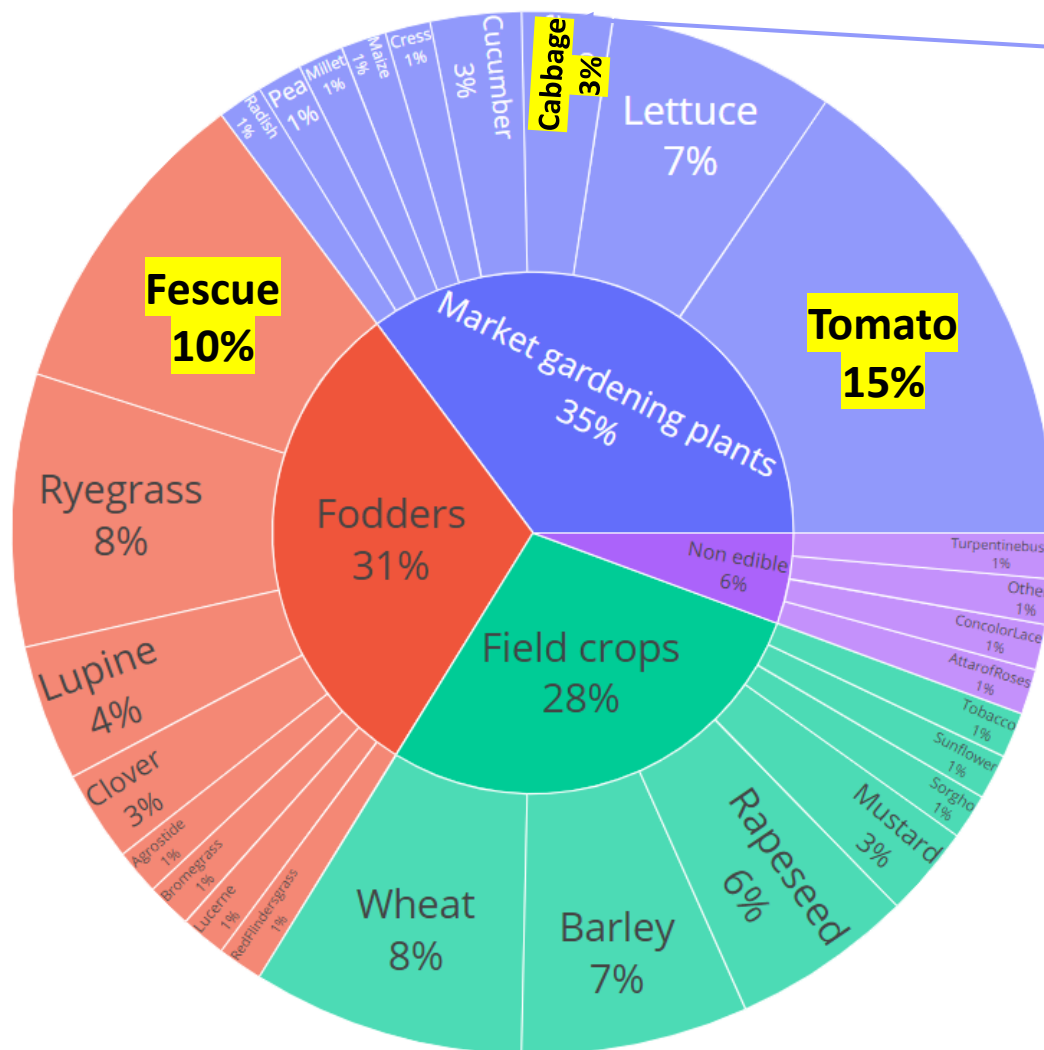
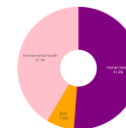
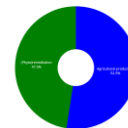
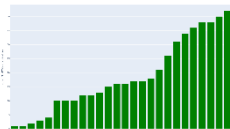
ISO 16198 RHIZOtest : <https://www.iso.org/fr/standard/55834.html>

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Laure LEMAL

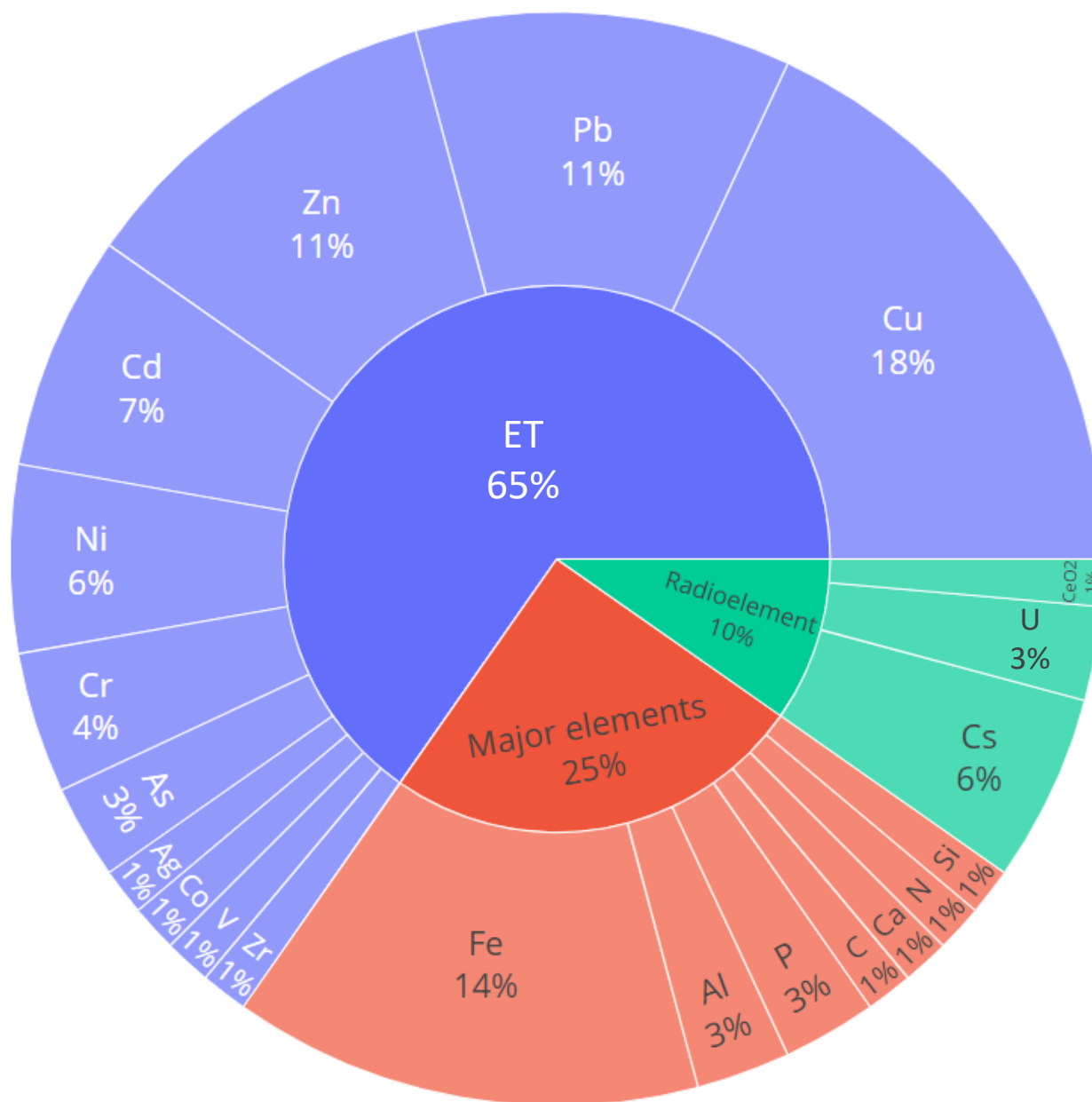
l.lemal@groupeginger.com



Cabbage
3%

28 species tested in RHIZOtest

Repartition of contaminants studied in RHIZOtest



RHIZOtest method for phytoavailability

Phytoavailability : Contaminants quantity able to be collected by a plant

● = Trace elements
from soil

