

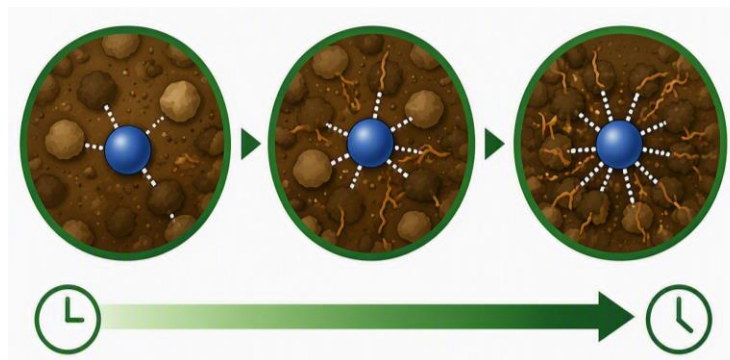


XVIII Symposium on Pesticide Chemistry

Next generation solutions and sustainable frontiers

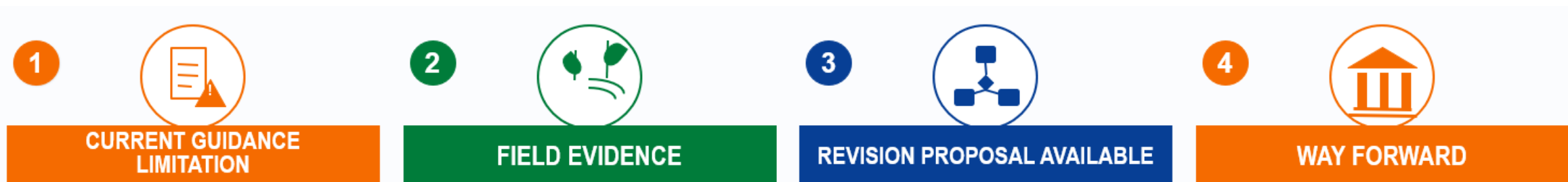
CREMONA, 2–4 SEPTEMBER 2026

Importance of Aged Sorption Processes in the Exposure Assessment of Pesticides



Bernhard Jene, Wendy Van Beinum, Ian Hardy, Sevil Payvandi, Klaus Hammel, Shiran Qiu

Outline



BACKGROUND AND RATIONALE

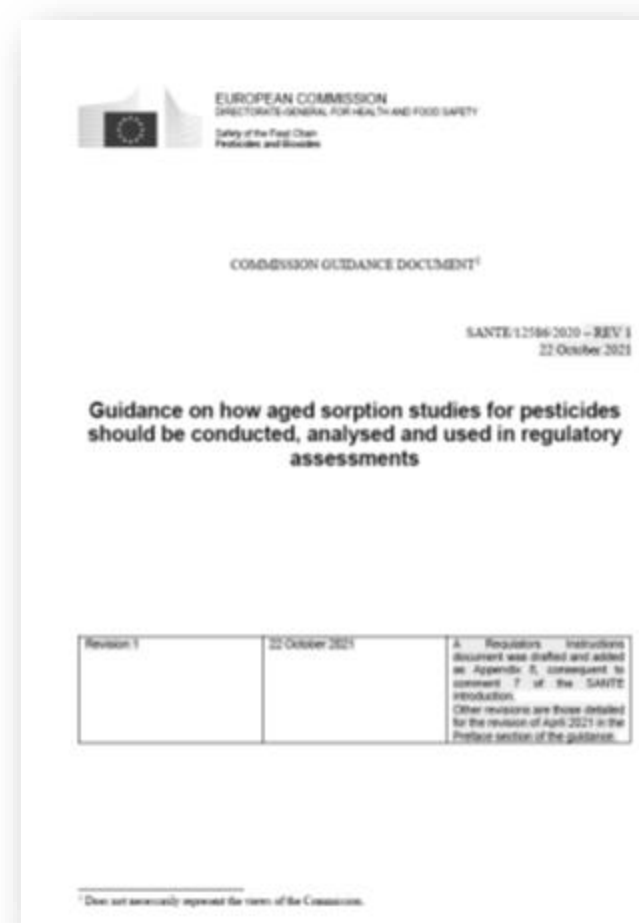
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CURRENT GUIDANCE LIMITATION

The EU Aged Sorption Guidance restricts the combined use of field DegT50 values and lab aged-sorption parameters (f_{NE} , k_{des})

.....
This limits the applicability of aged sorption in combination with DegT50_{field} to very few cases.



► The guidance does contain a way forward:

The PPR Panel (2018) considers that ideally the aged sorption parameters and the field degradation half-lives would be obtained simultaneously using inverse modelling. Industry are preparing evidence for aged sorption in field studies and this option should replace the current recommendations as soon as appropriate guidance has been developed and tested.

2

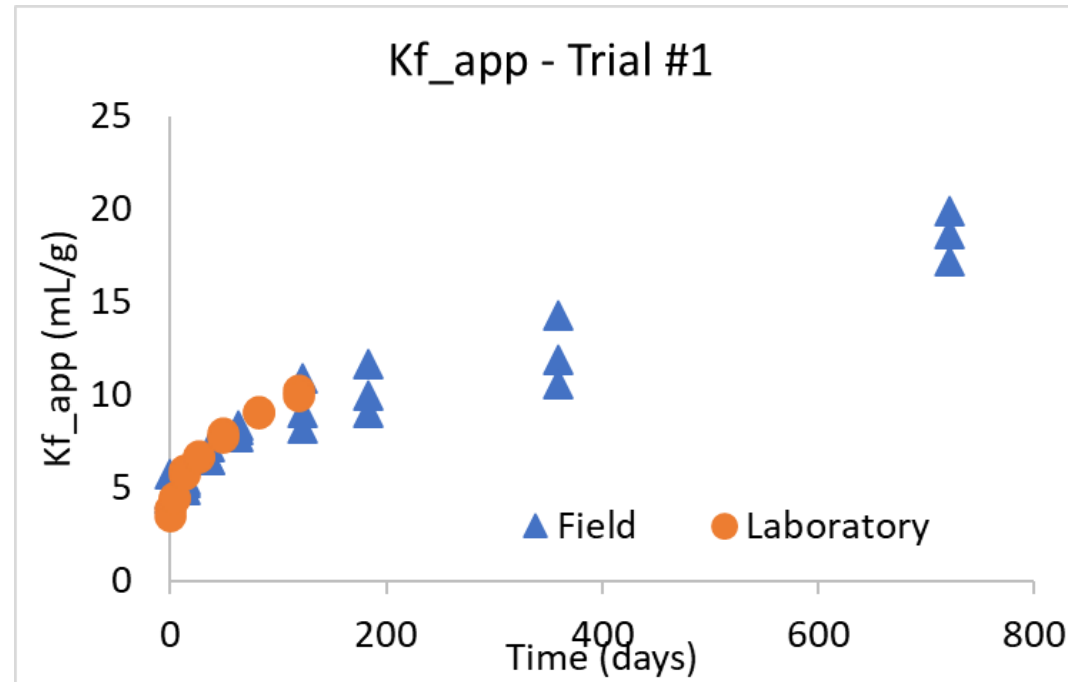


FIELD EVIDENCE

Field degradation studies were evaluated to demonstrate the field relevance of aged sorption.

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Aged sorption shown to be relevant under field conditions.

Comparable increase of sorption in laboratory and field soils



2



FIELD EVIDENCE

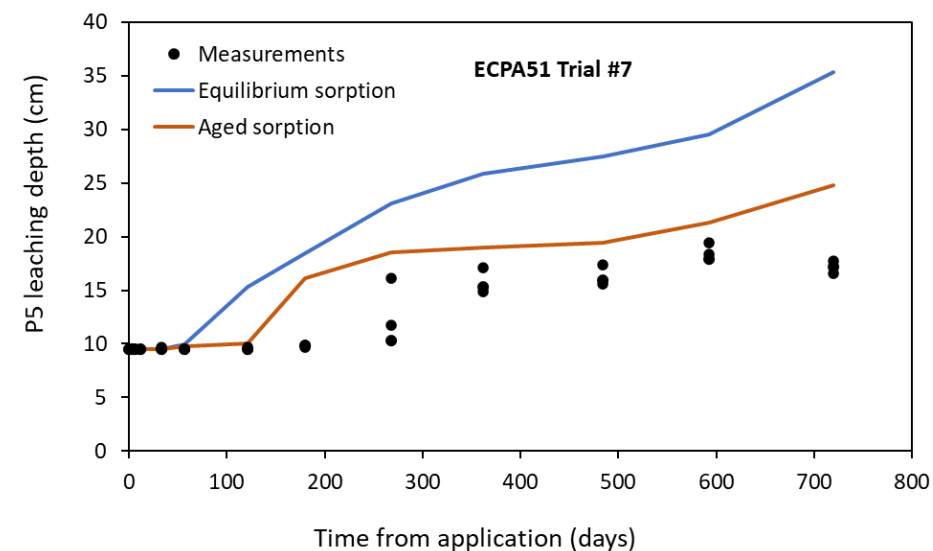
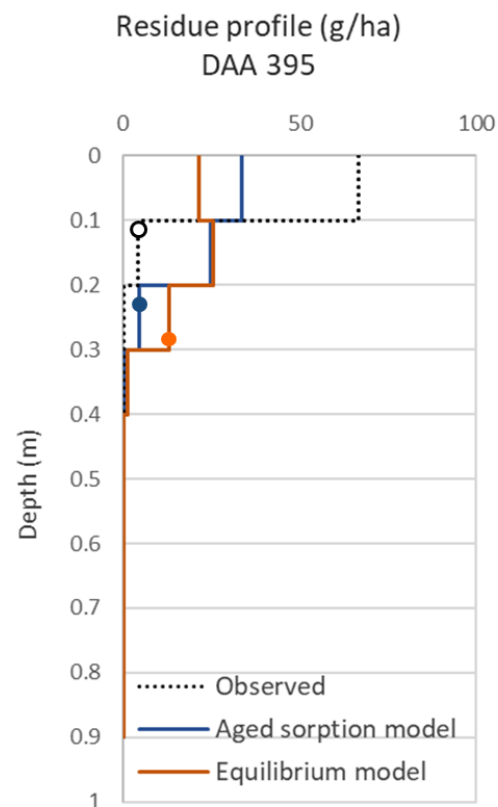
Field datasets

Laboratory and field study data:

Subst.	Laboratory aged-sorption	Field study data
ECPA06	4 soils	6 trials (not same soils)
ECPA50	16 soils	6 trials (same soils)
ECPA51	12 soils	12 trials (same soils)

New P5 Metric: Evidence of aged-sorption:

- ▶ PEARL simulations with and without aged sorption
- ▶ P5 metric calculated => depth below which 5% of residues are found
- ▶ If $P5_{\text{model,aged sorption}} \geq P5_{\text{observed}}$
 => Laboratory aged sorption parameters are relevant for field conditions



2



FIELD EVIDENCE

Key findings

- ✓ Consistent findings across all 22 field datasets
=> confirmed the relevance of aged sorption in field
- ✓ Comparable $K_{d/f}$ increases and improved P5 fits of observed residues support the use of aged sorption
- ✓ Field DegT_{50EQ} + laboratory aged sorption simulations reduced but still over-predict observed mobility
=> ensure conservative leaching assessments.

Evidence for aged sorption in field studies and the use of field DegT50 in combination with aged sorption

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Hardy, I., van Beinum, W., & Beulke, S. (2026). Evidence for aged sorption in field studies and the use of field DegT50 in combination with aged sorption. Zenodo.
<https://doi.org/10.5281/zenodo.22014152>

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REVISION PROPOSAL AVAILABLE

Evidence of aged-sorption under field conditions to be tested using P5-metric or K_{d_app}

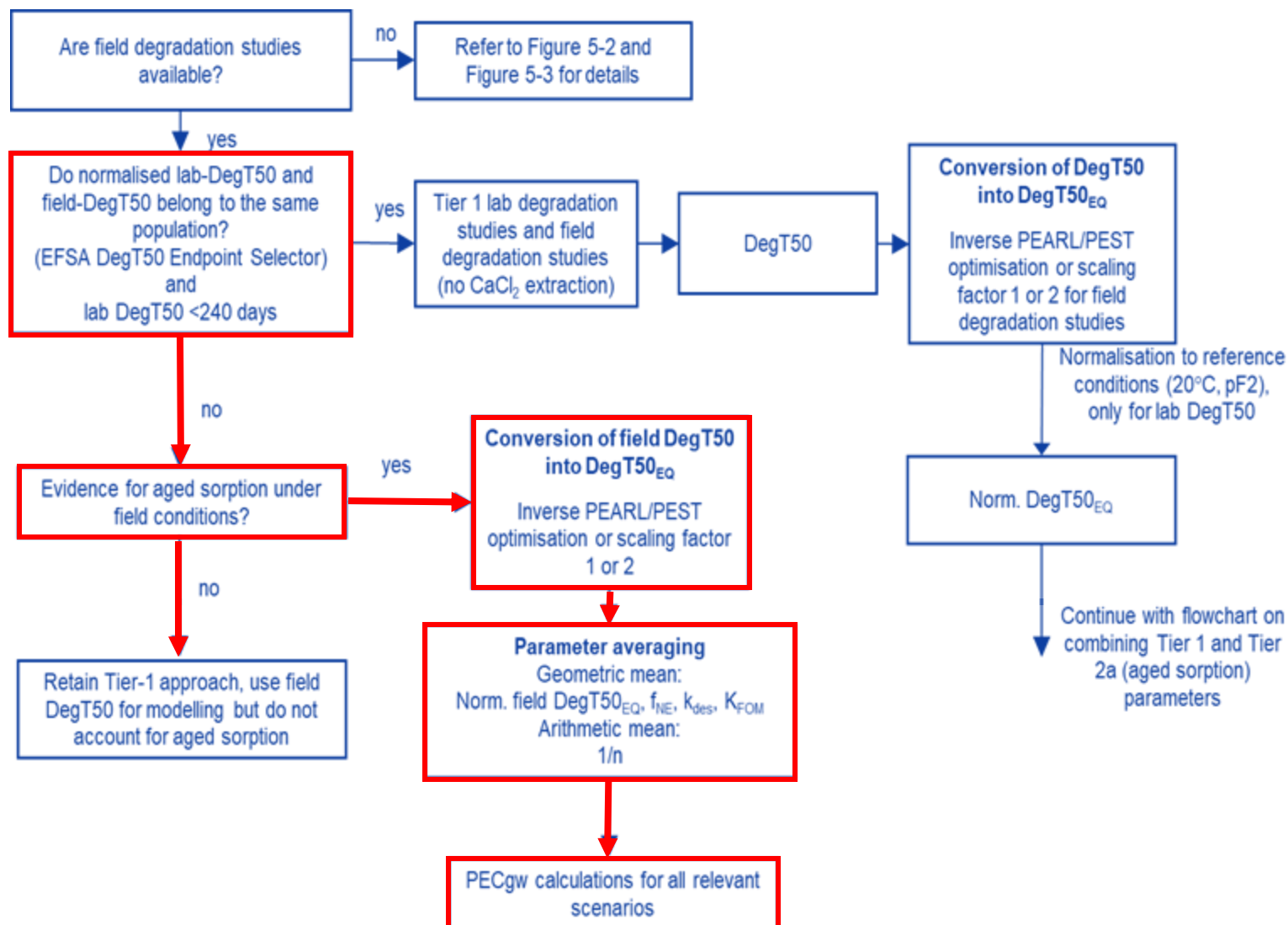


Evidence: The normalised geomean field $DegT50_{EQ}$ is used with the mean laboratory aged sorption parameters (k_{des} , f_{NE})

=> **rescaling of $DegT50$ to $DegT50_{EQ}$ is key**



No evidence: Field data and laboratory aged sorption parameters should not be combined. Tier-1 approaches should be retained



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REVISION PROPOSAL AVAILABLE

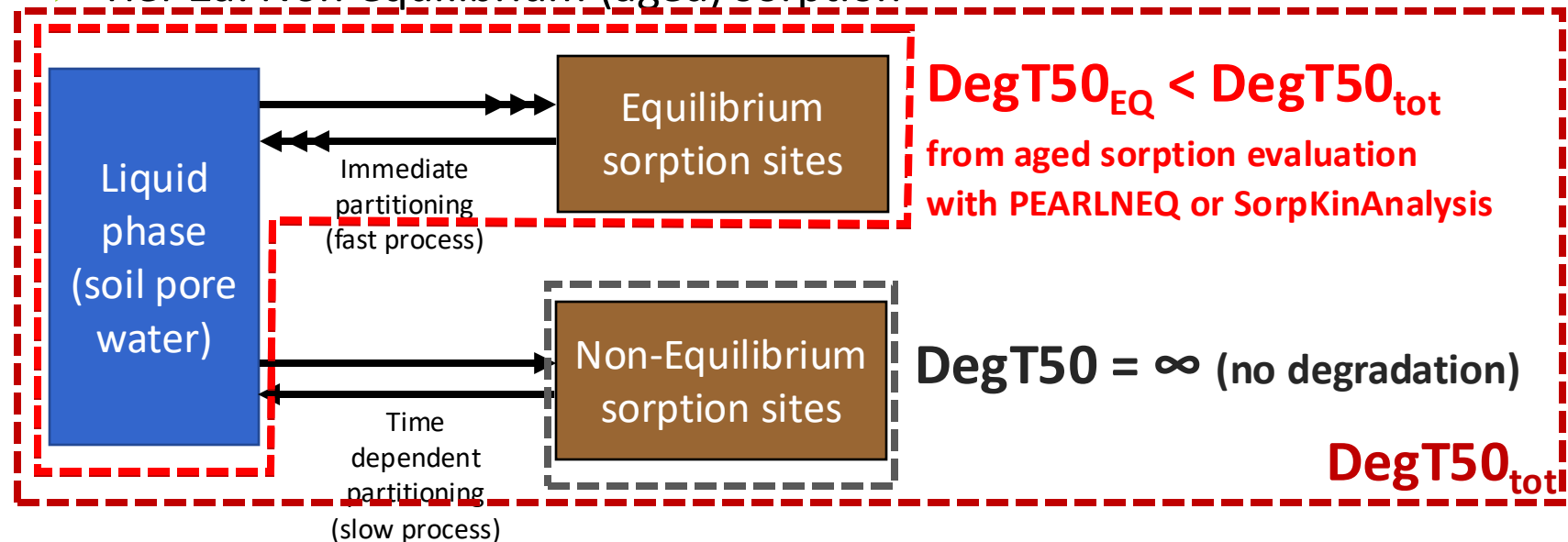
Scaling of DegT50 to DegT50_{EQ} – why necessary?

Not recommended for field DegT50 in current guidance version (Rev.1)

► Tier 1: Equilibrium sorption



► Tier 2a: Non-equilibrium (aged) sorption

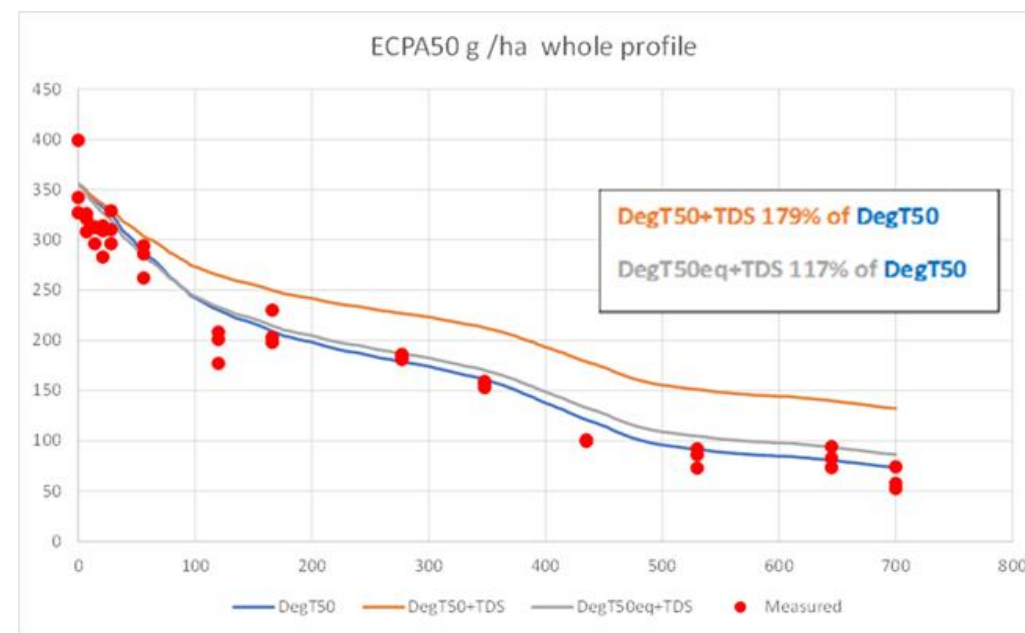




Scaling of DegT50 to DegT50_{EQ} – how?

- inverse modelling (with full aged sorption model – e.g. PEARL)
- conservative scaling factors proposed in guidance

- ▶ Without correction of the DegT50 to DegT50_{EQ}, residues significantly over-predicted when aged-sorption parameters are utilised:
- ▶ Blue line: is the optimised DegT50 fit (no aged sorption)
- ▶ Orange line: Forward fit with un-corrected DegT50 + aged-sorption
- ▶ Grey line: DegT50 corrected to DegT50_{EQ} with Scaling factor



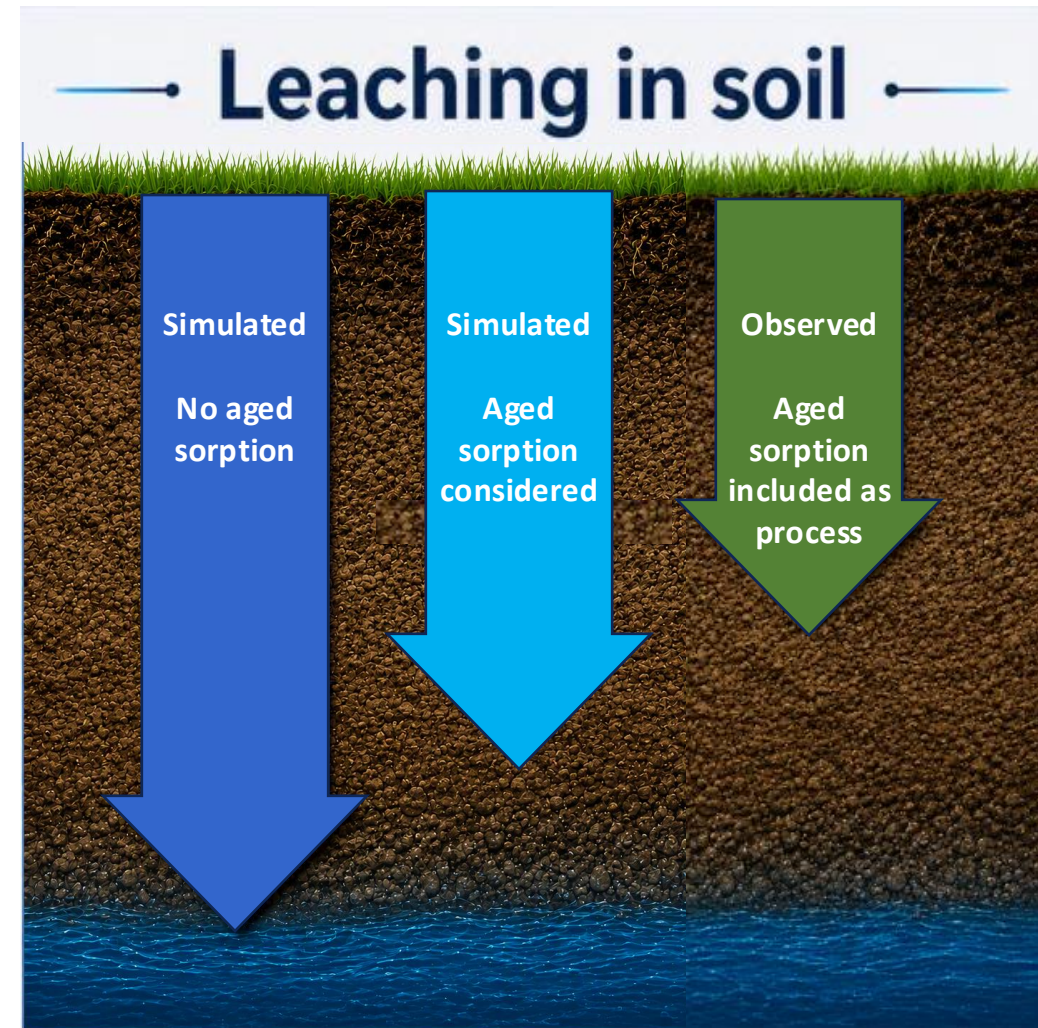
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WAY FORWARD

The scientific basis and an implementable proposal are available.

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Timely regulatory evaluation and endorsement are now needed to translate this work into harmonised regulatory practice.



Conclusions

