

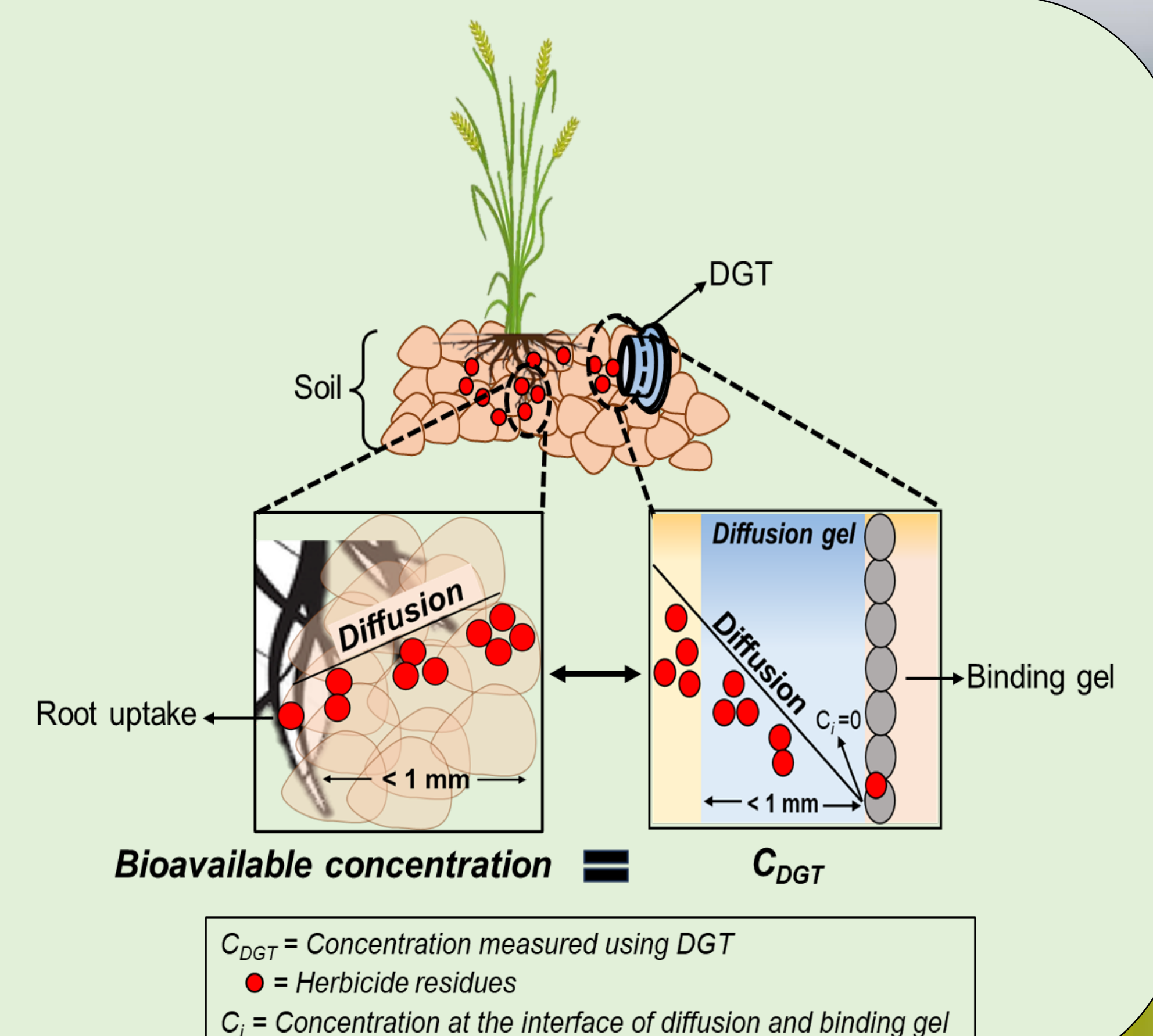
Measuring herbicide residues in soils using a diffusive gradients in thin films (DGT) technique

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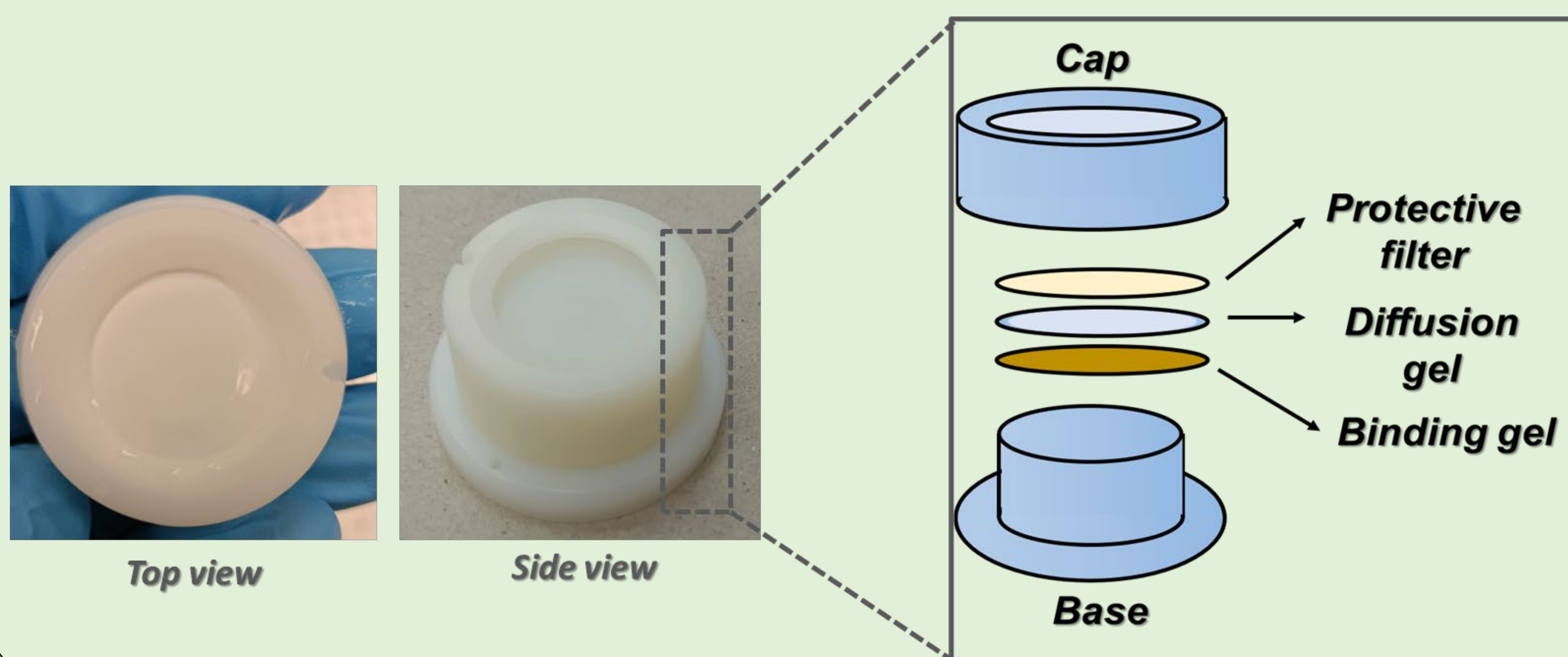
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Background

- Australia uses around 60,000 tons of pesticide every year, of which $\frac{2}{3}$ are herbicides.
- However, these herbicides persist in soils for a longer period (months to years) and cause crop injury and yield loss.
- Current methods for measuring these herbicide residues in soils are not user-friendly and do not measure the concentration that is potentially taken up by plants (bioavailable concentrations).
- **Diffusive gradients in thin-films (DGT)** is an easy, affordable, and simple technique for measuring the plant-available herbicide concentration in soils.



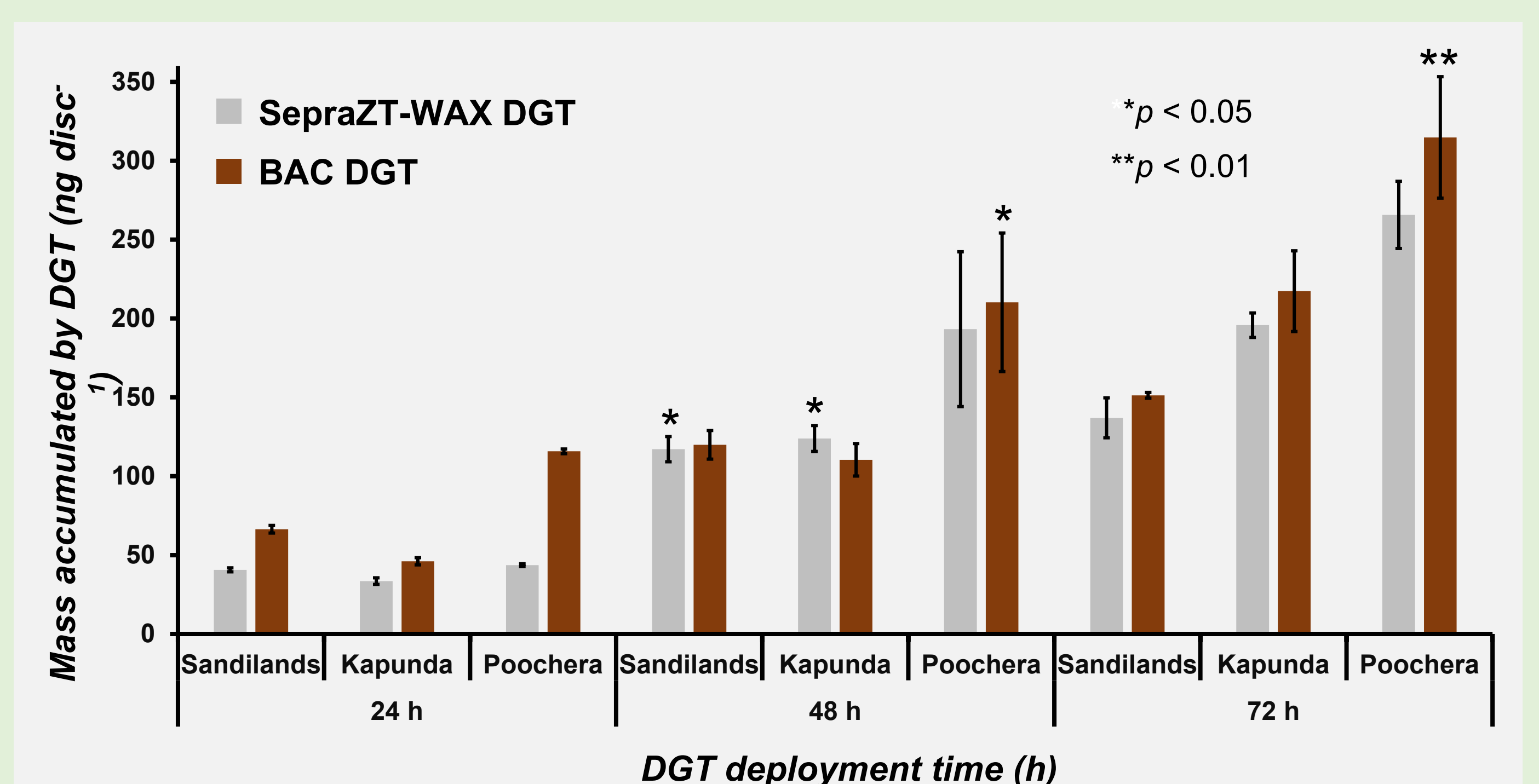
DGT development



- **Sepra^{2T}-WAX** and **bioactive carbon (BAC)** based novel binding gels were prepared, and their herbicide binding and elution efficiency were determined.
- Both Sepra^{2T}-WAX and BAC DGT were studied for their herbicide binding capacity, adsorption rate, and effectiveness in different soil conditions, and in the presence of dissolved organic matter & competitive anions.

Soil incubation experiment

- Sandy loam soil with contrasting pH collected from three sites: acidic (Sandilands), neutral (Kapunda), & alkaline (Poochera).
 - Soils spiked with IMI herbicide at recommended application rate (35 g/ha). Both Sepra^{2T}-WAX & BAC DGT deployed for 24, 48, and 72 h.
- **Alkaline** soils had **significantly highest** bioavailable herbicide concentration throughout the DGT deployment period.



Are you interested in measuring IMI herbicide residues in your field?

We are currently testing both DGTs in different cropping regions of South Australia for measuring imidazolinone (IMI) herbicide residues. If anyone wants to measure the IMI residues in your soils, please get in touch with me *via* LinkedIn.