

Image techniques: New approaches in metal homeostasis

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INTRODUCTION

Plant physiological processes take place in a complex cellular environment. Organs are complex structures made up of different tissues with distinct cell types. Traditional biochemistry involves the analysis of bulk samples containing a mixture of heterogeneous tissues, leading to a non correct interpretation of the results. This averaging effect can only be overcome by increasing the spatial resolution of analysis to a tissue- or even cell-specific level, in other words, by using image techniques.

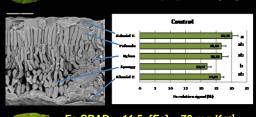
ELECTRON MICROSCOPY

TEM (sugar beet leaves)

SEM (sugar beet leaves)

Surface imaging

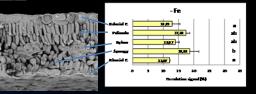
Elemental mapping

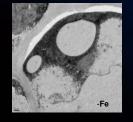


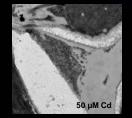
LT-SEM (peach leaves)

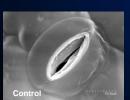
Control SPAD = 39.7 [Fe] = 95 mg Kg⁻¹



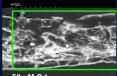








300 µM Zn



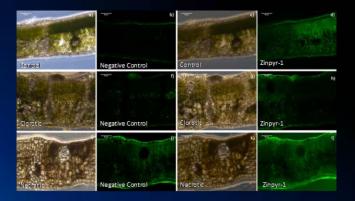
50 µM Cd



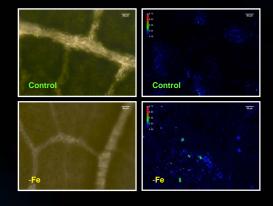


FLUORESCENT MICROSCOPY

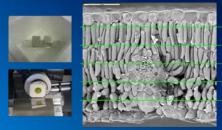
Zn localization (pecan leaves)



Apoplastic pH image analysis (peach leaves)

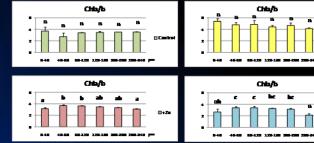


PARADERMAL CRYOSECTIONING Pigments (sugar beet leaves)



1. 0-40 μm	Adaxial E.
2. 40-80 μm	Palisade
3. 80-120 µm	Palisade
4. 120-160 μm	Spongy
5. 160-200 μm	Spongy

200-240 µm Abaxial E



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