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

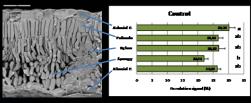
LT-SEM (peach leaves)

metadata, citation and similar papers at core.ac.uk

TEM (sugar beet leaves)

SEM (sugar beet leaves)

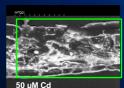
Control SPAD = 39.7 [Fe] = 95 mg Kg⁻¹



-Fe

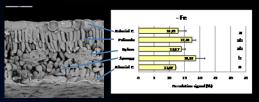


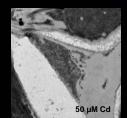
Surface imaging



Elemental mapping

-Fe SPAD = 11.5 [Fe] = 70 mg Kg⁻¹





300 µM Zn

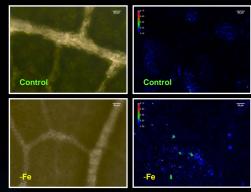
Ca

FLUORESCENT MICROSCOPY

Zn localization (pecan leaves)

Negative Control Control Zinpyr-1 Negative Control Elorotic Zinpyr-1 Zinpyr-1

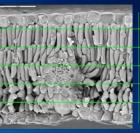
Apoplastic pH image analysis (peach leaves)



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
6. 200-240 μm Abaxial E.

