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Thema
Kommission I: Bodenphysik und Bodenhydrologie

Wurzel-Boden-Wechselwirkung und physikalische Prozesse in der Rhizosphäre

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Titel
Rhizosphere engineering: innovative improvement of root enviroment

Abstract
Many studies show that the ability of roots to extract water and nutrients from soil depends on biophysical properties of the rhizosphere, which is strongly influenced by mucilage secretion. Here, we introduced that concept of rhizoligand as an additive that alters the biophysical properties of the rhizosphere. A rhizologand is defined as an additive that increases the wettability of the rhizosphere and that links the mucilage network maintaining it close to the root surface. Our hypothesis was that rhizoligands: i) facilitate the rewetting of the rhizosphere during repeated drying and wetting cycles; ii) enhance the formation of rhizosheath; and iii) increase biological activity in the rhizosphere.
To this end, we tested whether a commercial surfactant act as rhizoligand. We present experimental evidence that upon treatment with rhizoligand the rhizosphere remained wet and mechanically better connected to the root surface (rhizosheath formation) and that the enzyme activity in the rhizosphere was higher. These modifications of the rhizosphere have the potential to increase water and nutrient availability to plants exposed to severe drying and improve plant tolerance to abiotic stresses.

Literatur
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