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SPRAY AND PRAY? ADVANCES IN FOLIAR FERTILIZATION OF CROP PLANTS

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Foliar application of micronutrients is common practice to overcome temporary or permanent shortages on deficient and immobilizing soils, esp. to meet peak demands. The higher the yields and the more adverse climatic conditions, the more a timely and targeted foliar application is required. This will be shown for the example of boron demand and supply at different temperature conditions.

The efficacy of foliar nutrient supply is, however, highly variable. Thus there is a need for a better understanding of the processes controlling the availability of micronutrients on foliar surfaces. In our presentation, we will tackle the processes affecting the fate of foliar applied micronutrients on their way from the surface into the mesophyll apoplast.

The translocation of nutrients after the foliar application consists mainly of a diffusional transport driven by concentration differences, affected by temperature and the tortuosity of the diffusional path. Key factors are shown to be:

- physicochemical properties of the applied formula
- physical and chemical properties of the surface waxes and the cuticula
- alterations of the surface properties by contamination (e.g. by biofilms and organic and anorganic depositions on the foliar surface)
- cuticular pore sizes and hydrophilic modifications of stomata
- uptake rates across the plasmamembrane, which determine the concentration gradient, decisive for a diffusional transport.

Besides, the nutrient status of the plant can be of further importance. The effect of foliar applied nutrients is more difficult to predict in rather complex tank mixes when nutrients are supplied together with fungi- or pesticides. We will provide an example for Mn uptake and fate after foliar application with different adjuvant mixes.

The importance of the different factors under field conditions will be discussed for temperate and tropical conditions.

key-words: fertilizers, nutritional status of plants, nutritional deficiency.

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Promoção



Realização

