SVEN FISCHER[1], HOLGER LEMME[2], KLAUS BÜRCKY[3], HEINZ-JOSEF KOCH[2]
[1]Bodengesundheitsdienst GmbH, Marktbreiter Straße 74, D – 97199 Ochsenfurt
[2]Institute of Sugar Beet Research (IfZ), Holtenser Landstr. 77, D – 37079 Göttingen
[3]Südzucker AG, Marktbreiter Straße 74, D – 97199 Ochsenfurt

INFLUENCE OF LIME ON THE EUF EXTRACTABLE NUTRIENTS IN THE SOIL AND YIELD AND QUALITY OF SUGAR BEETS

Influence du chaulage sur des éléments nutritifs extractibles par électro-ultrafiltration (EUF) du sol ainsi que sur le rendement et la qualité de betteraves sucrières / Einfluss von Kalk auf EUF extrahierbare Nährstoffe im Boden sowie Ertrag und Qualität von Zuckerrüben

ABSTRACT

Sugar beets are frequently grown on neutral or weakly acid soils with a lack of calcium. These soils require the periodic application of lime. An increasing pH-value and a rising calcium content in the soil after liming might cause a shift in the availability of certain soil nutrients. This study investigated the effects of a lime treatment previous to sugar beet cultivation on nutrient extractability from the soil by electro-ultrafiltration (EUF) and nutrient uptake, yield and quality of sugar beets.

In pot and field experiments different rates of lime were applied to Central and Southern German soils with pH-values close to 7 and low calcium contents. After an incubation period of 8 to 24 weeks soil samples were taken from the different lime treatments and analyzed for their nutrient contents using EUF. Subsequently, sugar beets were grown on these soils. The plants were harvested and the nutrient contents determined.

The results showed a positive effect of a lime application with equivalent up to 24 t CaO ha^{-1} on EUF extractable and plant available phosphate in pot experiments. Furthermore, in pot and in field experiments liming resulted in a slight increase of extractable soil potassium, especially within the 2. EUF-fraction, but plant uptake of potassium remained unchanged. Overall, in field experiments plant yield and white sugar yield were slightly raised by liming neutral to weakly acid soils.