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A BALANCED UPTAKE OF NITROGEN BY SUGAR BEET DURING THE GROWING SEASON AS A PREREQUISITE OF HIGH YIELD OF SUGAR

**Une absorption d'azote équilibrée pendant la période de croissance de betteraves sucrières comme condition préalable de rendements en sucre élevés /
Eine ausgewogene Stickstoff-Aufnahme während der Wachstumsperiode von Zuckerrüben als Voraussetzung für hohe Zuckererträge**

ABSTRACT

The main objective of sugar beet production is to achieve the highest yield of sugar through increasing water, and N-use efficiency. In temperate regions, like in Europe, a fast early growth of sugar beet seedlings by developing plant canopy is crucial for an efficient use of solar-energy. In this period of growth, nitrogen concentration (Nc) in leaves is the driving factor affecting the size of the assimilation area, as a basis for the storage root growth. The critical phase of the dry matter increase, extending from the stage of 6th to 9th leaf up to the full rosette growth, depends on balanced supply of nitrogen, phosphorus and potassium, and other nutrients supporting the rate of N uptake by plants. The quadrature trend of N accumulation in the beet canopy during the growing season, reflects the crop N saturation status, being a prerequisite of high yields of storage roots. The linear model, revealing in years with pronounced drought, represents the sub-optimal status of N management in the sugar beet canopy, leading to yield decrease. A limited supply of any nutrient to beet plants at critical stages of yield formation, resulting both from the course of weather and/or soil fertility level, is the main reason of declining the rate of leaves and subsequently storage root growth in the early period of vegetation. Sugar beet is a crop sensitive to irregular periods of water deficits. The prerequisite for an efficient N use is the non-limited supply of soil potassium to growing plants since germination up to the period of the highest absolute biomass increase. The potential yield of white sugar is related to N and K balanced supply up to the time-point defined by the maximum dry matter yield increase. Its final realization depends on phosphorus supply during the maturation period of sugar beet growth.
