

Effects of Harvest Dates and Potassium Rates and Timing of Application, on Sugar Beet Yield and Quality

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TWO FIELD experiments were carried out in 2002/2003 and 2003/2004 seasons at Sakha Agricultural Research Station, Kafrel-sheikh Governorate to study the effects of potassium fertilization and harvesting dates on the yield and sugar beet quality. Potassium fertilization treatments included a factorial combination of three rates (24, 48 and 72 kg K₂O/fed) and 7 application times; single dose at sowing or 30 / or 60 DAS, two equal split doses at sowing/30 DAS; sowing, 60 DAS, at 30, 60 DAS and finally at 30/ 90 DAS. Harvesting was done 180 or 210 DAS.

Applying 72 kg K₂O/fed in two equal doses (50/50 at 30/60 or 90 DAS) significantly increased percentage of sucrose, purity, sugar extractable, extractability, Alkalinity coefficient and K in extracted root juice as well as root and sugar yields.

The results showed also that delaying harvest from 180 to 210 DAS significantly increased root yield and quality parameters.

Keyword: Potassium fertilization, Harvest dates, Sugarbeat.

Sugar beet (*Beta vulgaris* L.) is grown for sugar production and is the second important sugar crops after sugar cane. Fertilization is the most important factor, which has a distinct role on production of all crops. Potassium is an important nutrient but its functions appears to be linked to assimilation of carbon dioxide from the air and the subsequent formation and translocation of sugars within the plant. It also controls water movement in the plant and is responsible for osmotic regulation. Furthermore, potassium has regulatory role in respiration and conversion of intermediate sugar to sucrose in sugar crops.

Several studies (El-Shafai, 2000; Hassanin, 2001; Ismail & Abo El-Ghait, 2004; Osman, 2005 and Moustafa *et al.*, 2006) have shown an increase in sugar beet root yield and sucrose percentage with increasing rate of potassium. Potassium is known as a juice impurity or non-sugar component, which is not removed during various processing steps. Commercially acceptable concentrations of beet K for processing are in the range of 700 to 1000 mg K/100 g sugar.