J.Agric.&Env.Sci.Alex.Univ.,Egypt Vol.7 (2)2008

EFFECT OF PLOUGHING AND PHOSPHORUS FERTILIZER LEVEL ON SUGAR BEET PRODUCTIVITY AND QUALITY

ABDOU, M.A. , N.M.M. AWAD AND E.H.H. SELIM

Sugar Crops Research Institute, Agricultural Research Center, Giza, Egypt.

ABSTRACT

Two field experiments were conducted at El-Manyal Village, Talkha Center, Dakahlia Governorate during the two winter seasons of 2006/2007 and 2007/2008 to study the effect of number of ploughing (without plough, one time, twice and three times) and phosphorus fertilizer level (zero, 15 and 30 kg P_2O_5/fad) on productivity and quality of two sugar beet cultivars (Kawemira and Pleno). A split plot design with four replicates was used for each ploughing treatment in the two seasons (Each plough treatment was considered as a separate experiment). The main findings of this investigation can be summarized as follows:

1- **Increasing number of ploughing from zero (without plough) up to three times significantly increased root weight /plant by (22.96 and 21.31 %), root length by (22.82 and 18.25 %), root yield t/fad by (23.19 and 21.03 %) and sugar yield t/fad by (21.23 and 16.60 %) in the first and second seasons, respectively.**

2- **Kawemira cultivar significantly surpassed Pleno cultivar in all studied characters for the two seasons. The increase in root weight was (15.45 and 17.10 %), in root length was (9.49 and 11.48 %), in root yield t/fad was (15.25 and 17.11 %), and (18.88 and 20.70 %) in sugar yield in the first and second seasons, respectively.**

3- **Increasing phosphorus fertilizer level from zero up to 30 kg P_2O_5/fad markedly increased root weight g/plant by (17.13 and 17.02 %), root length by (10.80 and 10.82 %), root yield t/fad by 17.56 and 17.72 %) and sugar yield t/fad**

by (29.31 and 29.52 %) in the first and second seasons, respectively.

4- **Kawemira cultivar with three times ploughing surpassed Pleno cultivar with same times of ploughing in root weight by (24.18 and 22.30 %), root length by (18.10 and 17.11 %), root yield by (24.26 and 22.51) and sugar yield by (29.14 and 27.80 %) in the first and second seasons, respectively.**

It could be concluded that ploughing sugar beet fields three times, planting Kawemira cultivar and adding 30 kg P_2O_5/fad are the suitable recommendations to maximize its yield and quality under conditions of Dakahlia Governorate.

INTRODUCTION

During last years, sugar factories encouraged not only the early but also the late sugar beet sowing to elongate juice duration and sometimes farmers had to delay sowing or they like to save some ploughing costs. So, they tended to sow sugar beet without plough or with only one time or two. Many researches studied the precedent treatments such as Korany and Khalifa (1998) in Egypt. They stated that increasing tillage depth improved root yield of sugar beet because of the root size (length and diameter) was increased. Kanany et al. (2005) revealed that preparation of seed bed is one of the major factors affecting crop production. Tillage is the first step to prepare suitable conditions for seed germination. It improves soil aeration, maintain and improve soil fertility and soil moisture and create favourable conditions for activity of useful micro organisms.

Regarding cultivars, El-Taweel, Fayza (1999) in Egypt, found that sugar beet cultivars Kawemira and Pleno did not significantly differe in sugar yield and the percentages of sucrose, T.S.S. and purity. Badawi *et al.* (2002) in Egypt, revealed that sugar beet cultivars (Top, Lola, Pleno and Kawemira) gave significantly high sucrose %, root and sugar yields/fad. They added that Kawemira cultivar was superior than the other studied cultivars in all of their studied characters. Osman (2005) found that Kawemira cultivar