# ABSTRACT

Two field trials were conducted at Sakha Agricultural Research Station, **Kafr EL-Sheikh** Governerate, during the two successive growing seasons, ***2000-2001 and 2001-2002***, to study the effect of row width, hill spacing, and varieties on growth, juice quality and yield of sugar beet.

***Del 938*****,** ***Del 939*** **and** ***Del 937*** varieties, which were obtained from sugar Crop Research Institute ARC. Egypt was used in this study.

The first experiment was designed to be harvested after **180** days and the second after **210** days under the same treatments. Sugar beet was sown at plant population of 62.222, 46.667, 37.333, 50.909, 38.182, 30.545, 43.077, 32.308 and 25.846 plant /fed.

The design of the experiment in each season was a split-split plot with four replications. The row width was arranged at random in the main plots, whereas the plant density was randomly assigned to sub- plots. The three varieties were randomized as the sub – sub- plots.

Data exhibited significant effects row width at harvesting 180 and 210 days sowing 65cm between row for root diameter, root weight, top fresh weight/plant root yield, sugar yield, sucrose % ,TSS% , extractable sugar % moreover alpha amino nitrogen K and Na, gave the highest values while on 55cm row width top yield gave the highest result in both seasons.

Concerning hill spacing at 180 and 210 days showed clearly that the significant effects of 25cm for root diameter, root weight, top fresh weight/plant, root yield, sugar yield, top yield, sucrose %, TSS% , sugar loss to molasses , alpha amino N ,K and Na in both seasons

About the varieties it showed significantly effect at 180 and 210 days after sowing for root weight, root diameter , top fresh weight/plant , root and top yields ton/fed. for Del 939 variety while Del 938 variety gave the best results for in sugar yield ton/fed, TSS, sucrose, sugar loss to molasses, extractable sugar, K and Na percentages. But Del 937 variety gave the highest purity % in both seasons.

The correlation coefficient were positive and significant between sugar yield and each of root yield, root weight and sucrose percentage at harvest after 180 and 210 days from sowing at both seasons except correlation between sugar yield and root weight in the second season at harvest after 180 days from sowing . Also same trend were found between sucrose and purity percentage in both harvest date and seasons.

Statistical regression showed that ($R^2$) analyses of sugar yield as (root yield ton/fed., root weight kg/plant (R2= 56% and 23% respectively) in the first season at 180 days after sowing. While in the second season showed that significant regression coefficient (liner) for root yield, sucrose percentage ($R^2$ = 61% and 23% respectively) in sugar content moreover harvesting at 210 days after sowing observed that significant regression coefficient (liner) for root yield, root weight kg/plant, and sucrose %

($R^2$ = 77, 39 and 28 % respectively) in sugar yield in first season. meanwhile in the second season harvesting at 210 days after sowing observed that significant regression coefficient (liner) for root yield, root weight kg/plant, and sucrose % ($R^2$ = 78, 88 and 27 % respectively).

# CONTENTS