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### الملخص باللغة الإنجليزية:

Two field experiments were conducted at the farm of the Faculty of Agriculture, Demo, Fayoum University, Egypt, during 2012/13 and 2013/14 growing seasons. The objective of this investigation was to study the effect of nitrogen fertilization and boron foliar spraying on plant traits, juice quality and yield of Kawemira sugar beet variety grown in sandy loam soil. The experimental design was a split-plot design with three replications. Two levels of nitrogen *i.e.*, 100 (N<sub>1</sub>) and 140 (N<sub>2</sub>) kg N/fed were allocated in the main plots and six boron concentrations *i.e.*, 0 (B<sub>0</sub>), 30 (B<sub>1</sub>), 60 (B<sub>2</sub>), 90 (B<sub>3</sub>), 120 (B<sub>4</sub>) and 150 (B<sub>5</sub>) ppm applied at two times (80 and 110 days) after sowing in the sub-plots. Results indicated that N levels significantly increased all studied traits *i.e.*, root length and diameter, as well as root, and top fresh weight, in addition to yield of root, top, biological, gross sugar, white sugar and loss sugar, also K, Na and  $\alpha$ -amino N. Whereas harvest index was decreased. Insignificant differences were observed on white sugar and purity (%). Application of 120 (B<sub>4</sub>) and 150 (B<sub>5</sub>) ppm boron significantly improved root yield and its attributes and percentage of gross and white sugar. On contrarily Na, K,  $\alpha$ -amino N, loss sugar percentages, harvest index and loss sugar yield were decreased. Maximum root, top, sugar yields/fed and root quality produced by 140 (N<sub>2</sub>) kg N/fed and 120 (B<sub>4</sub>) and/or 150 (B<sub>5</sub>) ppm boron. Correlation analysis revealed the presence of highly significant *r* values between gross sugar yield with each of root yield and gross sugar (%). The letter two traits were among ones contributed to variation of the former trait.