



ORIGINAL ARTICLE

THE EFFECT OF TILLAGE DEPTH, BIO AND MINERAL NITROGEN FERTILIZER ON WHEAT PRODUCTION AND SOME SOIL PHYSICAL PROPERTIES

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Abstract: The appropriate management of the field through the selection of the appropriate tillage method, the right variety and the availability of nutrients suitable for growth are essential factors for the success of wheat cultivation in irrigated areas. The objective of study was to evaluate effect of three tillage depths (12, 24 and 36 cm), bio-fertilizer on two levels (not inoculation and *Azotobacter* inoculation) and four mineral nitrogen (N) fertilizer (0, 50, 100 and 150 kg N ha⁻¹) on yield component and yield of wheat (*Triticum aestivum* L., Bancal) and some soil physical properties. The experiment was laid in randomized complete block design with split-split plot arrangement, where tillage depths in main plots, bio-fertilizer in subplots and nitrogen levels in sub-sub plots have three replications. The results showed that increasing tillage depth resulted in a lower bulk density and higher porosity, available water content and root mass density. In addition, increasing tillage depth significantly increased plant height, yield components, biological and grain yield, and harvest index as well as root mass density. The results also showed that application of bio-fertilizer increased plant height, yield components, biological and grain yield, harvest index as well as root mass density. Considering N rate, there were significant effects on plant height, grain and biological yield, harvest index, root mass density and other yield components. In general, with increasing N fertilizer rates, all of these traits increased. Stepwise regression analysis emphasized the importance of grain weight as an important grain yield component.

Key words: Available water content, *Azotobacter*, Bio-fertilizer, Bulk density, Root mass density, Stepwise regression.

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