

COMPARISON OF AGRONOMICAL AND PHYSIOLOGICAL NITROGEN USE EFFICIENCY IN THREE CULTIVARS OF WHEAT AS AFFECTED BY DIFFERENT LEVELS OF N-SOURCES.

By

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ABSTRACT

Efficient nitrogen (N) fertilizer management is critical for the improved production and nitrogen use efficiency of wheat (*Triticum aestivum* L.) and can be achieved through source and levels of N application. Thus, an experiment was carried out at the Research Farm of the Faculty of Agriculture, Kafrelsheikh University, during 2007/08–2008/09 seasons to test the effects of sources and levels of N application on yield, yield components and nitrogen use efficiency of three wheat cultivars (Sakha94, Sakha93 and Giza168). Nitrogen sources were ammonium sulphate (NH_4SO_4), ammonium nitrate (NH_4NO_3) and urea ($\text{CO}(\text{NH}_2)_2$) applied at the levels (119, 166 and 214 kg ha⁻¹). Sakha94 surpassed the other two varieties in all studied traits except spike length, grain weight per spike and 1000-grains weight whereas Giza 168 surpassed the other two varieties in these traits. Increasing N fertilizer levels significantly increased all studied traits in both seasons. Grain yield/ha. was increased (6.10, 6.45 and 6.79) in the 1st season and (6.64, 7 and 7.33) in the 2nd season due to increasing the levels of N from (119, 166 and 214 kg N/ha). respectively. While, % apparent recovery N of fertilizer, agronomic NUE and physiological efficiency decreased with increasing N levels. Nitrogen addition as ammonium sulphate showed a favorable significant effect in improving most studied traits than ammonium nitrate and urea. The fertilizer N uptake showed that ammonium sulphate was a more available source of N for wheat than urea and ammonium nitrate. The maximum grain yield was achieved by 214 kg N/ha. as ammonium sulphate with Sakha94.

Key Words: Wheat, Nitrogen Sources, nitrogen use efficiency.