

ORIGINAL ARTICLES

Influence Of Various Nitrogen Sources On Some Botanical Characters Of Wheat Plant (*Triticum aestivum* L.).

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ABSTRACT

This experiment was carried out during the two successive seasons 2007-2008 and 2008-2009 aiming to study the effect of different nitrogen sources on some botanical characters of wheat plant under sandy soil conditions. The applied nitrogen fertilizer sources were; mineral $(\text{NH}_4)_2 \text{SO}_4$ (20.5% N), bio (*Azospirillum brasilense*, *Bacillus polymyxa*, *Azotobacter choococcum*, *Klebsiella pneumonia* and *Pseudomonas putida*), as well as plant compost. The study outcomes showed that, mineral nitrogen treatment led to the highest mean values of dry weight per plant, leaf area per plant, average spike length as well as grain yield per plant. Single bio nitrogen treatment caused minute effect on mean performance of the characters under investigation. The yielding ability of wheat plants could be enhanced by the following single nitrogen treatments ranked in ascending order; mineral nitrogen, plant compost and bio nitrogen treatments. The treatments of combined nitrogen sources proved to be more convenient for enhancing the studied traits. The highest mean values of the studied traits were recorded on plants that received mineral nitrogen plus plant compost treatment. Applying bio nitrogen plus 0.5 mineral nitrogen combined with 0.5 plant compost treatment showed the maximum values of dry weight/plant, leaf area per plant, average spike length and average grain yield per plant. Stem anatomical measurements and counts of treated plants proved that, all used nitrogen sources caused vital increase in whole stem diameter. These increments were accomplished with changing the investigated nitrogen sources, *i.e.* the mineral nitrogen source achieved the highest increase in stem diameter, while the lowest increase was attained with bio nitrogen treatment. The increments of stem wall thickness were reflected on the anatomical features of all tissues shared in stem structure; epidermis, sclerenchyma belt layers, vascular bundles and the ground parenchyma. The enlargement occurred on stem wall thickness was linked with remarkable increase in the average diameter of ground parenchyma tissue as well as the average vascular bundle diameter. Relative to control treatment, all nitrogen sources resulted in a remarkable increase in the measurements of all tissues in leaf lamina; thickness of upper and lower epidermis, thickness of mesophyll ground tissue, main vascular bundle length and width, metaxylem vessel diameter and thickness of phloem tissue.

Key words: *Triticum aestivum*, wheat, morphology, anatomy, nitrogen-fertilizers, mineral nitrogen, biofertilizer and plant compost.