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Integrated effect of some bio and chemical fertilization treatments on wheat growth and yield under sandy soil conditions

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Abstract : Two field experiments were established in 2012/2013 and 2013/2014 winter seasons at the Research and Production Station, National Research Centre, El-Nubaria Province, El-Behira Governorate, Egypt. The study aimed to investigate the impact of biofertilization with Azolla 2 L/fed. or Mycorrhiza 1kg/fed. in combination with foliar application with KNO_3 or $\text{Mg}(\text{NO}_3)_2$ at (5g/L) on growth, pigmentation and yield of wheat grown under sandy soil conditions. Results indicated that bio inoculant treatments significantly affected photosynthetic pigments content, growth and yield characters compared with the control treatment, with superiority to Mycorrhiza over Azolla. The results also indicated that foliar application with either KNO_3 or $\text{Mg}(\text{NO}_3)_2$ significantly enhance all the previous characters as compared with control treatment (tap water). Foliar applied KNO_3 produced the highest values for plant height (cm), grain yield (tons/fed), straw yield (tons/fed), 1000 grains weight (g) and crude protein (%). As for photosynthetic pigments content, $\text{Mg}(\text{NO}_3)_2$ surpass KNO_3 . Moreover, either bio inoculant or foliar application treatments significantly affected the N, P, K and Mg content of wheat grains. The combined treatment of mycorrhiza and KNO_3 recorded the highest values for growth, yield and its components, as well as the percentage of N, P and K, while the highest photosynthetic pigments content and Mg content were recorded in plants treated with mycorrhiza and sprayed with $\text{Mg}(\text{NO}_3)_2$. Such results emphasize that biofertilization is not a substitute but a partial supplement for the recommended NPK mineral fertilizers which could be ascribed partially to the increased mobility of fixed nutrients like P in the soil or fixing more N which reflected directly on most growth and yield characters of wheat in sandy soils.

Key words: wheat, Azolla, Mycorrhiza, foliar application of K or Mg, growth, photosynthesis, productivity.

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