

SYNERGISTIC IMPROVEMENT OF YIELD AND GRAIN PROTEIN CONTENT OF DURUM WHEAT THROUGH CO-FERTILIZATION OF MULTIPLE NUTRIENTS

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Improving durum wheat yield and grain quality is an eternal topic in agronomic research because of an increase in market demand for acceptable grain quality. This aim is, however, hampered due to nutrient management practices, genetic variation, and their interaction with the environment. A field experiment was conducted to appraise the effect of nutrient supply on grain yield, protein content, and physio-morphological traits under drought condition. A split-split plot design was employed comprising two nitrogen doses (control, 60 kg ha⁻¹), and three-level of nutrients (control, zinc, sulfur) combined with four durum wheat varieties. Zinc and sulphur were applied foliarly at the flag leaf stage, both at a rate of 3 and 4 litter ha⁻¹, respectively. Results showed that, under drought conditions, chlorophyll content was found more significant for grain yield formation than spikes per m². A significant ($p < 0.05$) genetic variation was observed for grain yield, plant height, NDVI, SPAD, spike density, and protein content. Nitrogen fertilized varieties with lower spike density showed a better yielding formation. A significant and simultaneous improvement in protein content and grain yield was observed under 60 kg N ha⁻¹. Co-fertilization of nitrogen and zinc improved the grain yield of variety *Duragolg* by about 21.3%. Although robustness and reduction were observed, LAI, NDVI, and SPAD values were improved in nitrogen and developmental stage-dependent manner, even a small adjustment in the nitrogen application dose could cause significant alterations to these traits. The positive effects of sulphur, nitrogen and zinc application on protein content, physio-morphology, and yield formation substantiate the need to include these elements in the durum wheat cultivation system.