

عنوان مقاله:

Comparison of Complete and Sulfur Coated Urea Fertilizers with Pre-plant Urea in Increasing Grain Yield and Nitrogen Use Efficiency in Wheat

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In order to increase grain yield, nitrogen use efficiency (NUE) and nitrogen apparent recovery fraction (NARF) in wheat (*Triticum aestivum* L.), this experiment was carried out with 5 or 6 treatments and 3 or 4 replications in 14 locations at 22 different sites in Iran during the 2004-05 growing season. The experiment was designed as a completely randomized block. The effect of N sources and timing on the grain yield, protein content, NUE and NARF of the current best adapted cultivars of different regions were evaluated. The treatments included T₁= the control; T₂= 150 kg ha⁻¹ of N as urea in 3-split applications; T₃= 150 kg ha⁻¹ of N as urea in 2-split applications; T₄= 150 kg ha⁻¹ N as SCU as the base fertilizer; T₅= 1/3 N as SCU as the base fertilizer + 2-split urea applications and T₆= 1/3 N as complete fertilizer as the base fertilizer + 2-split urea applications. Protein content, NUE and NARF were calculated by measuring grain yield, N% and N-uptake. While the average grain yield and protein% for the control plots were 2,840 kg ha⁻¹ and 10.03%; the yield and protein for T₂, T₃ and T₄ were 4,160 kg ha⁻¹ and 11.66%; 4,278 kg ha⁻¹ and 11.78%; and 3,921 kg ha⁻¹ and 11.60%, respectively. Grain yield and protein content for T₅ were 4,330 kg ha⁻¹ and 11.89%. Yield of 4,674 kg ha⁻¹ and protein content of 12.01% were obtained by substituting complete fertilizer with 1/3 urea (T₆). The grain yield for T₆ was significantly different from T₂ for various reasons, including higher levels of available P, K, S, Zn, lower N-leaching and appropriate N-timing. NUE for T₂, T₃, T₄, T₅, and T₆ was measured to be 8.8, 9.6, 7.3, 9.9, and 12.2 kg kg⁻¹, respectively, and NARF were calculated to be 23.2, 25.3, 19.4, 26.3 and 31.6%, respectively. While the superiority of complete and SCU fertilizers over pre-plant urea has been proven, especially in the light-textured soils, it is highly recommended that the experiment be further tested and evaluated, since this practice has been increased the grain yield up to 12%, NUE up to 39 kg kg⁻¹ and NARF up to 36% in comparison with the best wheat growers' N-fertilization practice.

کلمات کلیدی:

Wheat, Yield, Complete fertilizer, NUE and NARF, Sulfur Coated Urea (SCU), Urea

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