The effect of Pellet fertilizer application on Wheat Yield and its Components

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Abstract

Increased use of fertilizer nitrogen (N) in agricultural production continues to raise concerns, because of the risk of surplus N leaving the plant-soil system and thereby causing environmental contamination. Therefore, decreasing nitrate leaching from crop production fields, such as in wheat fields, is of considerable importance. Against this backdrop, a field experiment was conducted to assess the effect of pellet fertilizer, produced by mixing urea and dry cow dung manure, on wheat yield and its components. The study was carried out, during the 2007-2008 wheat-growing season, at the experimental farm of Zanjan Agricultural Research Center in Iran. The experimental layout was a randomized complete block design replicated four times. The pellet fertilizer was produced by mixing urea (50, 100 and 150kg N/ha) with dry cow dung (100, 200 and 300 kg/ha i.e. twice the rate of urea). The mixture was ground and compressed by closed die method at three levels (167, 223 and 279 mp) of compressive forces, giving a total of ten treatments including: treatments nine of pellet fertilizer plus a control treatment with 150kg N ha-1. The biological yield, grain yield, number of spikes per square meter, number of grains per spike, grain weight, harvest index, and grain protein content was calculated. Treatment T7 significantly produced better harvest index, higher number of spikes/m2, highest 1000 grain weight, the maximum biological yield, the maximum grain yield and highest grain protein content per hectare. The use of pellet fertilizer is therefore a better alternative to uncoated urea due to its slow and continuous nutrient release for plant uptake at different stages of its growth.