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Abstract: Wheat (*Triticum aestivum* L.) is known as king of cereals. It is an important cereal crop for the majority of habitants on the earth. Wheat is the most important staple food for 36% of the world population. It is cultivated in all the continents of the world. Wheat crop is fertilizer responsive and exhibit full yield potential when supplied with adequate quantities of nitrogenous fertilizer. The farmers of Jharkhand are compelled to use either insufficient dose of N-fertilizer due to poor economic status or excessive dose of N-fertilizer because of poor knowhow. Therefore, nitrogenous fertilizers should be applied in right quantities and at right time. Keeping these points in view the present investigation was carried out. A field experiment entitled "Precision Nitrogen Management in Irrigated Wheat (*Triticum aestivum* L.)" was carried out on sandy loam soil, slightly acidic in reaction (pH 5.5), having low organic carbon (0.32%) and available nitrogen (175.6 kg/ha) with medium available phosphorus (15.38 kg/ha) and exchangeable potassium (183.46 kg/ha) during Rabi 2017-18 at Birsa Agricultural University Farm, Ranchi. The experiment was laid out in RBD with 12 treatments replicated thrice. The wheat variety was HD2967, seed rate was 125 kg/ha and date of sowing was 25-11-2017. The treatments comprising of: T1- absolute control, T2 to T4 - application of 120 kg N in two and three split doses, T5 to T7 - application of 150 kg N in two and three split doses, T8 to T10 - application of 180 kg N in two and three split doses and T11 and T12 (guided by Greenseeker by NDVI technique taken at 45DAS and 65DAS) were applied with 136 kg N and 140 kg N in three split doses respectively. The two splits consisted of at sowing + atCRI and three splits consisted of at sowing + atCRI + at tillering stage. Results revealed that N-Management as 180 kg N in three split dose produced significantly taller plant (110.67 cm) whereas higher total number of tillers (424.5), dry matter (1307.5 g/m²) and crop growth rate (8.14 g/m²/day) were found by the application of 140 kg N in three split dose. Precision N-Management guided by Greenseeker in 140 kg N in three split dose recorded significantly higher yield attributing characters namely effective tillers/m² (410.56), spike length (12.96 cm), spikelets/spike (21.66), filled grains/spike (53.10), unfilled grains/spike (2.56) and 1000 grain weight (42.80 g). Grain yield (48.39 q/ha), straw yield (71.22 q/ha), cost of cultivation (₹ 31848/ha), gross return (₹ 87543/ha), net return (₹ 55694/ha) and B:C ratio 1.75 were found to be maximum in 140 kg N in three split dose. Application of 140 kg N in three split dose increased the nitrogen content in grain (1.959 %) and in straw (0.565 %), phosphorus content in grain (0.362 %) and in straw (0.077 %), potassium content in grain (0.495 %) and in straw (1.605 %), nitrogen uptake in grain (94.63 kg/ha) and in straw (40.53 kg/ha), phosphorus uptake in grain (17.50 kg/ha) and in straw (5.50 kg/ha) and potassium uptake in grain (23.95 kg/ha) and in straw (115.09 kg/ha). Improved nitrogen use efficiency was obtained due to application of N-Management based on Greenseeker optical sensor which was determined in terms of agronomic efficiency, recovery efficiency and physiological efficiency. Agronomic efficiency (19.68%) and recovery efficiency (53.46%) were significantly maximum in 140 kg N in three split dose however physiological efficiency was highest (48.14%) in 120 kg N in two split dose. Hence, on the basis of one year data it can be concluded that application of 140 kg N in three split doses i.e. 30 kg N as basal, 60 kg N at CRI and Greenseeker guided nitrogen application of 40 kg at 45 DAS (second irrigation) and 10 kg at 65 DAS (third irrigation) recorded the highest grain yield (48.39 q/ha), straw yield (71.72 q/ha), net return (₹ 55694/ha) and B:C ratio (1.75). Also application of Greenseeker (NDVI technique) under precision nitrogen management increased the agronomic efficiency from 13.06% to 19.68% and recovery efficiency from 33.73% to 53.46% with a saving of 10 kg N in comparison to 150 kg N.

Description: PRECISION NITROGEN MANAGEMENT IN IRRIGATED WHEAT (*Triticum aestivum* L.)

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