Authors:	Chatterjee, Kaushik (/browse?type=author&value=Chatterjee%2C+Kaushik)
Advisor:	Singh, Chandra Shekhar (/browse?type=author&value=Singh%2C+Chandra+Shekhar)
Title:	PERFORMANCE OF WHEAT CULTIVARS AT VARYING FERTILITY LEVELS UNDER SYSTEM OF WHEAT INTENSIFICATION (SWI) AND CONVENTIONAL METHOD OF WHEAT PRODUCTION SYSTEM
Publisher:	Birsa Agricultural University, Kanke, Ranchi, Jharkhand
Language:	en_US
Type:	Thesis
Pages:	110
Agrotags:	null
Keywords:	PERFORMANCE OF WHEAT CULTIVARS AT VARYING FERTILITY LEVELS UNDER SYSTEM OF WHEAT INTENSIFICATION (SWI) AND CONVENTIONAL METHOD OF WHEAT PRODUCTION SYSTEM

Abstract: The population in India is increasing in a geometric progression leading to an increased demand of wheat with no possibility in further increase in area due to growing urbanization. As per present population growth rate, population of India by 2025 will be around 1.3 billion and to meet the daily requirement of food grains we have to produce around 109 million tonnes of wheat. The normal area of wheat in India is 26.3 million hectare and its production & productivity is 68.7 million tonnes and 26.02 q/ha respectively (Fertilizer Statistics of India, 2005-2006). In Jharkhand, wheat is grown in about 86341 ha with production of 139940 tones and productivity of 16.21 q/ha. Today the package of practices for growing wheat are to be reinvestigated and renovated since dwarf wheat cultivars would never express their yield potential without appropriate agronomic practices. System of wheat intensification involving adoption of a set of agronomic practices has the potential for improvement of yield and factor productivity. It is based on the insights that wheat has the potential to produce more number of tillers and grains than now observed and wider spacing and optimal growth conditions can fulfill this potential. However, the potentiality of system of wheat intensification can only be judged under adequate and balanced fertilization. Almost all the wheat varieties respond positively to system of wheat intensification resulting in higher yield than conventional methods. However, there exist wide scale variability among wheat genotype in response to SWI cultivation. Hence, there is a need to evaluate wheat cultivars at varying fertility levels for their suitability under system of wheat intensification. Keeping this in view, an experiment entitled, " Performance of wheat cultivars at varying fertility levels under System of Wheat Intensification (SWI) and conventional method of wheat production system", was carried out in University Research Farm during winter season of 2009-10 in sandy loam soil of pH 5.6 with low organic carbon (0.37%), available nitrogen (253.42 kg/ha), available phosphorus (12.18 kg/ha) and available potassium (155.0 kg/ha). The experiment was laid out in Randomized Block Design in 3 replications with 3 factors- 2 method of cultivation, i.e., System of Wheat intensification(M1) and conventional method (M2); two fertility levels, i.e., 80:40:20 kg N, P2O5 and K2O/ ha (F1) and 120:60:40 kg N, P2O5 and K2O/ha (F2) and 5 wheat cultivars i.e. K 9107 (V1), Birsa Gehu3 (V2), HUW468 (V3), HUW 234(V4) and K 0307 (V5). Result revealed that system of wheat intensification produced higher dry matter (1123 g/m2), tillers number (435.2), number of spikes/m2 (417.8), spike length (10.2 cm),spikelets per spike (19.55), spike weight (2.53g), number of filled grains/spike (51.9) and 1000 grain weight (38.82 g) resulting in higher grain (41.6 q/ha), straw (59.5 q/ha) yield, gross energy output by grain (61255 MJ), net energy return by grain (43824 MJ), energy use efficiency (3.51), energy productivity (238.6 g/MJ), net return (Rs. 31282/ha) and benefit:cost ratio (1.42). System of wheat Intensification removes higher nitrogen (98.6 kg/ha), phosphorus (18.3 kg/ha) and potassium (87.8 kg/ha) and also maintained higher soil available nitrogen (260.5 kg/ha), phosphorus (17.04 kg/ha) and potassium (152.05 kg/ha) after crop harvest than conventional method of wheat cultivation. Application of 120:60:40 kg of N:P2O5:K2O/ha resulted in producing higher dry matter (1173 g/m2), taller plants (100.8 cm), tillers number (442.7), number of spikes/m2 (436.3), spike length (10.1 cm), spike weight (2.40g), number of filled grains/spike (50.1) and 1000 grain weight (38.87g) resulting in higher grain (43.6 q/ha), straw (61.3 q/ha) yield, gross energy output by grain (64193 MJ), net energy return by grain (44369 MJ), energy use efficiency (3.26), energy productivity (221.4 g/MJ), net return (Rs. 32286/ha) and benefit:cost ratio (1.38). Application of higher fertility level i.e. 120:60:40 kg of N:P2O5:K2O/ha resulted in higher uptake of nitrogen (105 kg/ha), phosphorus (19.7 kg/ha) and potassium (92.9 kg/ha) and also maintained the nutrient status of the soil i.e. soil available nitrogen (258.9 kg/ha), phosphorus (17.05 kg/ha) and potassium (152.07 kg/ha) after crop harvest than the lower dose of 80:60:40 kg of N:P2O5:K2O/ha. Among the cultivars, K9107 was found superior over the other cultivars as it produced higher dry matter (1173 g/m2), taller plants (108.4 cm), tillers number (463.4), number of spikes/m2 (438.6), spike length (10.9 cm), spikelets per spike(19.25), spike weight (2.39g), number of filled grains/spike (52.1) and 1000 grain weight (42.03g) which altogether led to higher grain (43.7 q/ha), straw (61.1 q/ha) yield, gross energy output by grain (64301 MJ), net energy return by grain (45872 MJ), energy use efficiency (3.51), energy productivity (239.1 g/MJ), net return (Rs. 32862/ha), benefit:cost ratio (1.44) nitrogen uptake (104 kg/ha), phosphorus uptake (18.8 kg/ha) and potassium uptake (88.6 kg/ha).

Description: PERFORMANCE OF WHEAT CULTIVARS AT VARYING FERTILITY LEVELS UNDER SYSTEM OF WHEAT INTENSIFICATION (SWI) AND CONVENTIONAL METHOD OF WHEAT PRODUCTION SYSTEM