

EFFECT OF TILLAGE AND NITROGEN MANAGEMENT ON, GRAIN QUALITY, PRODUCTIVITY AND SOIL HEALTH OF WHEAT (*TRITICUM AESTIVUM* L.) UNDER SUBTROPICAL CLIMATIC CONDITION

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Abstract: Conservation tillage and nitrogen may improve soil fertility, yield on sustainable basis. The aim of this study was to evaluate the impact of three tillage systems viz. zero (ZT), reduced (RT), and conventional tillage (CT) with or without residue retention/incorporation and five N rates (0, 80, 120, 160, and 200 kg-N·ha⁻¹) on yield and grain quality, soil health i.e. soil organic matter (SOC), bulk density, infiltration rate and microbial biomass carbon of wheat (*Triticum aestivum* L.). Nitrogen rates significantly affected yield and quality with highest values recorded at 200 kg-N·ha⁻¹. Mean maximum grain yield (46.13 and 47.18 q ha⁻¹ and protein % 11.1 to 12.1%, gluten 10.6% and starch 63.5 to 67.5%) could be achieved at 160 kg-N·ha⁻¹. The use of ZT with residue retention and RT with residue retention for two crop cycle increased soil organic carbon by 54.68% and 54.22% more than that of conventional tillage (CT), respectively. The SOC, WSOC, POC and MBC were highest in ZT compared to other tillage systems. Though tillage × N interactions were not significant for most of the parameters under study, the overall effect of ZT with 160 kg-N·ha⁻¹ appeared to be most favourable compared to RT and CT. The results suggest that ZT with 160 kg-N·ha⁻¹ was optimum and sustainable strategy to achieve higher yield and also to improve SOC and MBC on sandy loam soil of subtropical India.

Keywords: Wheat; Tillage, Nitrogen, Grain quality, Soil health, Productivity

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