

**The Influence of Fertilizer Rates and Plant Density on Grain
Yield, Yield Components and Head Blast of Finger Millet
[*Eleusine coracana* (L.) Gaertn] in Kisii Highlands**

by

Judith Nafula Wakhungu

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ABSTRACT

This study investigated the effect of plant population density and fertilizer levels (specifically N and P) on finger millet grain yield, grain yield components and head blast incidence and severity in Kisii highlands specifically at Kisii Agricultural Training Centre as the experimental site. The broad objective of this study was to develop a package on appropriate fertilizer levels and plant population for reduced blast disease and improved finger millet production in Kisii highlands. The treatments were population density and fertilizer level in a split plot design where the population levels was in the main plots and the fertilizer levels in the sub plots. The experiment was replicated thrice with variety P224 as the plant material. The data collected included; plant parameters (for direct analysis) as levels of head blast incidence, levels of head blast severity, number of productive tillers per plant, number of fingers per head, grain yield and 1000-seed weight (g) at 14% moisture content all of which taken at physiological maturity. Also taken were soil parameters initial organic carbon, nitrogen, phosphorus, pH and soil texture and cation exchange capacity (CEC), base saturation (BS), % Al and % Mn at harvest these being mainly to help understand some responses and define circumstances surrounding the experiment. The data was analyzed using Statistical Analysis System (SAS) and means separated using the least significant difference (LSD). Correlation coefficients of the parameters were derived using pearsons correlation coefficients. The result showed that high grain yields and low head blast severity of finger millet is achievable through use of proper agronomic practices of proper fertilization regime and plant population. Population level of 222,222 plants ha⁻¹ and fertilizer level of 10 kg P and N ha⁻¹ or unfertilized plots lowered blast severity and increased number of tillers per plant, fingers per head and grain yields.