High population pressure in the central highlands of Kenya has led to continuous cultivation of land with minimal additional inputs leading to soil nutrient depletion. Research work has reported positive results from use of manure and biomass from Tithonia, Calliandra, Leucaena, Mucuna and Crotolaria for soil fertility replenishment. An experimental field was set up in Chuka Division to test different soil nutrient replenishment treatments. The experimental design was randomised complete block with 14 treatments replicated three times. At the beginning and end of the experiment, soil was sampled at 0-15 cm depth and analysed for pH, Ca, Mg, K, C, N and P. End of the 2000/2001 short rains (SR) season and 2001 long rains (LR) season, soil samples were taken at 0-30, 30-100 and 100-150 cm for nitrate and ammonium analysis. All the treatments received an equivalent of 60 kg N ha^{-1}, except herbaceous legume treatments, where N was determined by the amount of the biomass harvested and incorporated in soil and control treatment received no inputs. Results indicate soil fertility increased slightly in all treatments (except control) over the 2-year study period. Average maize grain yield across the treatments was 1.1, 5.4, 3.5 and 4.0 Mg ha^{-1} during the 2000 LR, 2000/2001 SR, 2001 LR and 2001/2002 SR, respectively. The reduced yield in 2000 LR and 2001 LR are attributed to poor rainfall distribution during the two seasons. On average, Tithonia with half recommended rate of inorganic fertilizer recorded the highest (4.8 Mg ha^{-1}) maize yield followed by sole Tithonia (4.7 Mg ha^{-1}). Highest average concentration (144.8 and 115.5 kg N ha^{-1}) of mineral N was recorded at the 30-100 cm soil depth at the end of both 2000/2001 SR and LR, respectively. The lowest average concentration (67.1 kg N ha^{-1}) was recorded in the 100-150 cm soil depth in both seasons, while during the 2001 LR, the 0-30 cm soil depth recorded the lowest concentration (52.3 kg N ha^{-1}). The residual mineral N in the 100-150 cm soil depth doubled at the end of the LR 2001 compared to what was present and the end of the SR 2000/2001 season in all treatments. This shows that there is substantial amount of mineral N that is being leached below the rooting zone of maize in this region.