

Abstract

Knowledge on the possible influence of mucuna green manure application rate, and variable soil moisture conditions on decomposition of its biomass and available soil nitrogen levels is vital for efficient resource management. Consequently, potted soil experiment was carried out on these factors for 8 weeks under glasshouse conditions at Field Station-Kabete, University of Nairobi, Kenya in March-April, and repeated in May-June, 2005. The objective was to determine potential effect of mucuna green manure application rate and varying soil moisture level on decomposition pattern and available nitrogen in sandy clay soil collected from an experimental site in southwest Kenya. The treatments studied were: mucuna green manure applied at rates of 0, 60, 120 and 240 kg N ha⁻¹ equivalent to 0, 3, 6 and 12 t DM ha⁻¹ of the biomass and, soil water potentials at field capacity (- 0.01 Mpa), wilt point (-1.5 Mpa), and intermediate (-0.75 Mpa) levels represented by moisture contents of 22, 12 and 18 %, respectively. The two factors were combined factorially in a randomized complete block design with three replications. The treatments were applied and maintained in 10- litre imperforated plastic pots filled with 4 kg soil. Destructive sampling of soil and observation were done at 1, 3, 5 and 8 weeks after treatment. Results obtained showed that mucuna green manure application rate had non-significant effect on decomposition pattern. But, effect of soil moisture level on the pattern was significant. Mucuna green manure showed two phases of decomposition: an initial rapid phase and a slower second one. Half-life of mucuna green manure under field capacity soil moisture condition was one week. But, it took no less than 5 weeks for 50 % of the applied mucuna biomass to disappear if soil water condition was varying from wilting point, intermediate to field capacity as is likely to happen in field environment.