Effects of Albizia saman (Jacq. Mull) leaf mulch on vegetative growth of maize (Zea mays L.) and soil chemical properties through biomass transfer

ABSTRACT

The study presents the effects of Albizia saman (Jacq. Mull) leaves in a biomass transfer as a source of organic fertilizer on the soil chemical properties and vegetative growth of maize (Zea mays) compared with NPK (15-15-15) in greenhouse condition. Albizia saman leaves and NPK (15-15-15) were applied at the rate of 2.5, 5.0 and 7.5 t/ha or 60, 90 and 120 kg/ha respectively, separately or in combination. The findings revealed that application of 2.5 t/ha A. saman leaves produced the maximum values for mean leaf number, leaf area and stem height (7.77, 212.24 cm2 and 49.67 cm, respectively) among the leaf much treatments but were not significantly different from those obtained by applying 90 kg/ha NPK fertilizer (7.86, 225.55 cm2 and 48.78 cm, respectively). However, the maximum number of leaf (8.4), leaf area (240.5 cm2), plant height (54.64 cm) and biomass (16.17 g) were obtained from the combination of 2.5 t/ha leaves with 90 kg/ha NPK. There was significant improvement in the soil chemical status with the application of 2.5 or 5.0 t/ha A. saman leaves whereas the application of 5.0 t/ha A. saman leaves experienced the highest value for organic carbon (3.56%), total nitrogen (0.23%) and potassium (0.16 mg/kg) and 2.5 t/ha leaves gave the highest value for available phosphorus (22.30 mg/kg). It can, therefore, be inferred that the application of 2.5 t/ha A. saman leaves as source of organic fertilizer will give a better growth of maize and the combination of this quantity with 90 kg/ha of NPK would give better results in crop yield and maintenance of soil fertility.

Keyword: Albizia saman; Biomass transfer; Leaf mulch; Organic fertilizer; Soil quality; Vegetative growth; Zea mays L.