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“Development on the margin”

Time of Sowing Sorghum (*Sorghum bicolor* L.) as Affected by Nitrogen Mineralisation from Farm Yard Manure in three Soil Types

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Abstract

Synchronizing inorganic nitrogen during mineralisation of added organic matter with uptake by the subsequent crop is environmentally sound. In this study, laboratory and field experiments were conducted to estimate (in the first experiment) potential mineral N ($\text{NH}_4\text{-N} + \text{NO}_3\text{N}$) release pattern from farm yard manure (FYM) applied to three soil types and to determine (in the second experiment) the optimum time for sowing (one, two and three weeks after manure application) fodder sorghum (*Sorghum bicolor* L.) after application of the manure (10 t ha^{-1}). Potentially mineralisable N was determined by mixing farmyard manure with surface soil (0–30 cm) collected from sandy clay, clay loam and clay soils. The mixture was aerobically incubated for 12 weeks at about 70% water holding capacity and mineral N was determined at a week interval time.

All amended soils immobilised N during the first week, but later net release of inorganic N occurred. Maximum N mineralisation (14–15.6% and 13.9%) from added N were obtained after 9 and 7 weeks in the light and heavy textured soils, respectively. By the end of the incubation period, total net mineral N accumulated in the sandy clay, clay loam and clay soils were 91.7, 91.5 and 34.2 mg N kg⁻¹, respectively. In the light soils, sowing sorghum after two to three weeks from incorporation of manure gave significantly higher dry matter yields than after one week, whereas, in the heavy textured soil, sowing date had no significant effect. It could be concluded that adjusting sowing date, in light texture soils, of the subsequent crop after manure incorporation might improve yield.

Keywords: Farm yard manure, N mineralisation, soil type, sorghum, sowing date, synchrony