

Abstract

Sorghum (*Sorghum bicolor* (L.) Moench) is one of the cereals grown in the marginal areas of the world. Fertilisers have not been commonly utilised in the cultivation of sorghum in many of the marginal parts of Kenya. This study was conducted using a dual-purpose cold tolerant sorghum E1291 to determine the effect of varying rates on nitrogen (N) and phosphorus (P) on its growth and yield at KARI, Beef Research Centre, Nakuru for three seasons. The experiment was laid out in a 5 x 5 factorial in a Randomised Complete Block Design. Phosphorus (P_2O_5) (0, 20, 30, 40 and 50 kg/ha) was applied at sowing and N (0, 20, 30, 40 and 50 kg/ha) at 50 cm height. Treatment effects were determined using plant height, 1000-seed weight, crude protein (CP) and grain yield. Nitrogen levels beyond 40 kg/ha and phosphorus levels beyond 30 kg/ha did not increase plant height, seed weight, crude protein and grain yield. Crude protein content in grain increased from 9.38 to 11.56%, while grain yield increased from 7 to 9 tons/ha. The optimum sorghum grain yield was attained at 40 kg/ha N and 20 kg/ha P_2O_5 , respectively. For crude protein the optimum was obtained at 20 N and 30 P kg/ha, respectively. Overall, this study showed that fertilisers could enhance the production of grain sorghum (*Sorghum bicolor* (L.) Moench) in the dry highlands of Kenya. However, the conventionally recommended rates of 88 kg/ha of nitrogen (N) and 94 kg/ha of phosphorus (P_2O_5) seem wasteful and excessive.