

Abstract

A set of laboratory experiments were conducted to evaluate the physiological quality of *Sorghum bicolor* (L.) Moench seeds subjected to different field cultural management practices. The main aim of this study was to contribute towards improved production of *Sorghum bicolor* (L.) Moench through better understanding of the crop's agronomy. The experimental design was a three factorial split-split block design in the rain fed *Sorghum bicolor* (L.) Moench producing areas of Bomet County of Kenya. Treatments within the block were randomized. There were three factors which included variety at two levels (improved and local varieties); fertilizer application at two levels (with and without fertilizer); and seed selection at three levels (continuous, from booting stage and at harvest). Percentages of crop emergence and days to 50% physiological maturity were determined. The following seed quality tests were carried out: 1000-seed weight, standard germination, mean germination time and electrical conductivity. The improved variety had a field emergence of 100% while that of the local variety ranged from 60 - 97%. In regard to field emergence and maturity, there were significance differences ($P \leq 0.001$) between plots with fertilizer and those without regardless of the variety. Those plots with fertilizer outperformed those without. Germination and vigour tests indicated that seed selection time did not influence seed vigour, viability and yield ($P \leq 0.05$). However, there were significant differences ($P \leq 0.001$) between the improved variety (E1291) and local (*Ochuti*) variety. In relation to this, variety E1291 showed better seed vigour, viability and yield as compared to *Ochuti*. Similarly, there were significant differences ($P \leq 0.001$) between plots to which fertilizer was applied and those without. Fertilizer application led to an increase in seed yield, seed weight, seed vigour and viability. It was therefore concluded that (i) E1291 was more adapted to the study area as compared to *Ochuti* and hence should be adopted by farmers; (ii) farmers should apply optimal phosphate and nitrogenous fertilizers to their soils so as to increase the quality and yield of their seed; and (iii) farmers could continue selecting their seed using their indigenous knowledge.