Research Application Summary

Performance of selected grain sorghum genotypes for improved food security and livelihoods

Muturi, P.W.[1], Rubaihayo, P.[1], Kyamanywa, S.[1], Mgonja, M.[2] & Sharma, H.C.[3]
[1]Department of Agricultural Production, Makerere University P.O. BOX 7062, Kampala, Uganda
[2]International Crops Research Institute for Semi-Arid Tropics P.O. Box 39063-00623, Nairobi, Kenya
[3]International Crops Research Institute for the Semi-Arid Tropics, Patancheru 502 324, Andhra Pradesh, India
Corresponding author: mutuphy@yahoo.com

Abstract

Sorghum is a useful cereal crop cultivated by numerous resource poor farmers in semi arid regions. The crop is indigenous thus well adapted to various environments in Kenya. Sorghum performs better than other cereal staples particularly maize especially during extended dry periods. Experiments to determine the performance of different sorghum genotypes were conducted. Results showed that grain yield varied significantly (Pd”0.01) among the genotypes evaluated. The best four ranked performers in decreasing order were Kari-mtama 1, IESV 930 SH, IS 27329 and Seredo.

Key words: Kenya, grain yield, semi arid regions, *Sorghum bicolor*

Résumé

Le sorgho est une céréale d’importance capitale cultivée par de nombreux agriculteurs pauvres en ressources dans les régions semi-arides. La culture est indigène et donc bien adaptée aux différents environnements au Kenya. Le sorgho est plus performant que les autres céréales de base en particulier le maïs spécialement pendant de longues périodes de sécheresse. Les expériences pour déterminer la performance des différents génotypes du sorgho ont été menées. Les résultats ont montré que le rendement en grains a varié significativement (P>0,01) parmi les génotypes évalués. Les quatre classés meilleurs en performance dans l’ordre décroissant étaient Kari-mtama 1, IESV 930 SH, IS 27329 et Seredo.

Mots clés: Kenya, rendement en grain, régions semi-arides, *Sorghum bicolor*

Background

Sorghum, *Sorghum bicolor* (L.) is an important food security crop in the arid and semi arid tropics (Sally *et al*., 2007). The crop is ranked third among cereals after maize and wheat in Kenya (GoK, 2002). Sorghum is well adapted to marginalised

conditions and performs fairly well compared to staples particularly maize. Sorghum is indigenous and is cultivated mainly by peasant farmers who constitute over 60% in Kenya (Grain production report, 2005). Recently, sorghum has become the "green gold" for it is utilised in beer brewing by major companies in the region (The Moi University Sorghum Research Team, 2010). The crop also has untapped prospective in bio-energy production. Sorghum production and productivity could be enhanced by use of improved high yielding varieties among the resource deprived farmers (Ashiono *et al*., 2005). It is vital that high yielding sorghum cultivars are identified and disseminated to farmers for cultivation. Therefore the current study aimed at evaluating sorghum cultivars for high grain yield.

Literature Summary

Sorghum significantly contributes to improved food and income security of the rural poor, living in arid and semi arid regions. In Kenya, sorghum is grown in drought-prone marginal areas of Eastern, Nyanza and Coast Provinces (Grain Report, 2005). Utilisation of sorghum is also localised to these growing areas. Generally, the very low sorghum grain yields of about 500–800 kg/ha on small scale farms in these semi arid regions is as a result of biotic and abiotic factors (The Moi University Sorghum Research Team, 2010). Key production constraints include poor agronomic practices, *Striga* weed, insect pests, diseases and soil infertility (Sally *et al*., 2007). The beneficial effects of planting high yielding sorghum cultivars is that the practice is environmentally friendly and economically sustainable for the resource poor farmers. Cultivation of high yielding sorghum cultivars would reassure farmers of food security and income thus improved livelihoods.

Study Description

Field experiments to determine the best performing sorghum cultivars were conducted at the Kenya Agricultural Research Institute (KARI), Kiboko, in 2010 long (A) and short rains (B). KARI Kiboko is situated in a semi arid zone (975 m above sea level) with minimum and maximum daily temperatures of 14.3^{O}C and 35.1^{O}C, respectively, with an overall annual mean temperature of 24^{0}C (Jaetzold and Schmidt, 1983). The long rains (A) are received from March to June with a seasonal mean of 233 mm, while the short rains (B) are more reliable and are received between October to January, with a seasonal mean of 328 mm (Mwacharo *et al.*, 2004). Fifteen sorghum cultivars were evaluated for grain yield in 2010 rains. The test material was planted in a randomised complete block design replicated thrice in single-row plots. The rows were 2.5m long,

and 0.75 m apart, and the interspacing within the plants was 0.25 m. All the recommended production practices were followed to raise a healthy crop. Agronomic traits including plant height, days to 50% flowering, days to panicle emergence, panicle length and grain yield were recorded. Data recorded was subjected to analysis of variance using Genstat software 14th version. Treatment means were compared using protected Fishers' least significant difference (LSD) test at P=0.05.

Research Application

Results from this study indicated that there were highly significant differences ($P \leq 0.01$) in all the traits monitored. The best four varieties ranked in terms of highest hundred seed mass in their decreasing order were Kari-mtama 1 (3.6 g), IESV 930 SH (2.9 g), IS 27329 (2.7 g) and Seredo (2.6 g). Panicle length of these best grain yielders ranged from 21-37cm long. These varieties were medium maturing and time to 50% flowering ranged from 72-75 days. Tall cultivars were not necessarily high yielders.

Recommendation

Based on the above observed results, it is recommended that the identified high yielding varieties be promoted for cultivation.

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