

**PARTICIPATORY VARIETY SELECTION AND EVALUATION
OF SIXTEEN SORGHUM [*Sorghum bicolor* (L) Moench]
VARIETIES GROWN ON THE FLAT AND ON TIED RIDGES**

BY

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Abstract

Sorghum [*Sorghum bicolor* (L.) Moench] is a crop of great diversity, mainly grown in semi-arid and arid areas because of its adaptability to moisture stress and low fertility. In Zimbabwe, sorghum production is affected by use of traditional varieties, lack of access to improved varieties, drought, and HIV and AIDS. At the same time, sorghum remains an important component in production systems and in human diets. Some of the constraints to sorghum production are due to contemporary plant breeding approaches used by researchers that have led to low adoption rates of improved technologies such as improved varieties.

A study was carried out at Chiredzi Research Station and Gwebi Variety Testing Centre to find out if some of the constraints to sorghum production could be addressed using Participatory Variety Selection (PVS). Sixteen sorghum varieties (Subplot factor) were planted in a Split Plot Design, replicated three times using two water management systems (Main plot factor, i.e, Flat and Tied ridges). The station trial was used as a site for the communal trial during the Participatory Variety Selection process with farmers and extension officers from Chikombedzi. Data was analysed using Genstat Version 8.

Results showed significant differences ($P < 0.001$) between varieties in agronomic traits (flowering, maturity, plant height, plant lodging and head exertion) and yield components (number of grains/panicle, mass of 1000 grains and grain yield). There were no advantages in using either Flat or Tied ridges as a water management system. Through PVS diagnostic and field discussions, earliness to maturity, grain yield and grain colour were established as the three most important sorghum selection characteristics by farmers in Chikombedzi. Mahube was identified as a very early maturing variety but was low yielding with low grain numbers per ear. Sima was very good after organoleptic tastes with Sila being recommended because of its white grain and high yield.

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Acronyms

AIDS:	Acquired Immune Deficiency Syndrome
ARDA:	Agricultural Rural Development Authority
AREX:	Department of Agricultural Research and Extension
ANOVA:	Analysis of Variance
CBI:	Crop Breeding Institute
CSRI:	Chemistry and Soils Research Institute
CRS:	Chiredzi Research Station
CV:	Coefficient of Variation
DAE:	Days After Emergence
GVTC:	Gwebi Variety Testing Centre
HIV:	Human Immune Virus
IBPGR:	International Board for Plant Genetic Resources
ICRISAT:	International Crops Research Institute for Semi-Arid Tropics
LSD:	Least Significant Difference
MOHCW:	Ministry of Healthy and Child Welfare
NS:	None Significant
P-Value:	Probability Value
PPB:	Participatory Plant Breeding
PRA:	Participatory Rural Appraisal
PCI:	Participatory Crop Improvement
PVS:	Participatory Variety Selection
SMIP:	Sorghum and Millet Improvement Programme
SADC:	Southern Africa Development Community
SED:	Standard Error of Differences
TGW:	Thousand Grain Weight