same rate of urea was applied. All the recommended agronomic practices such as weeding, cultivation and thinning were applied as required regularly.

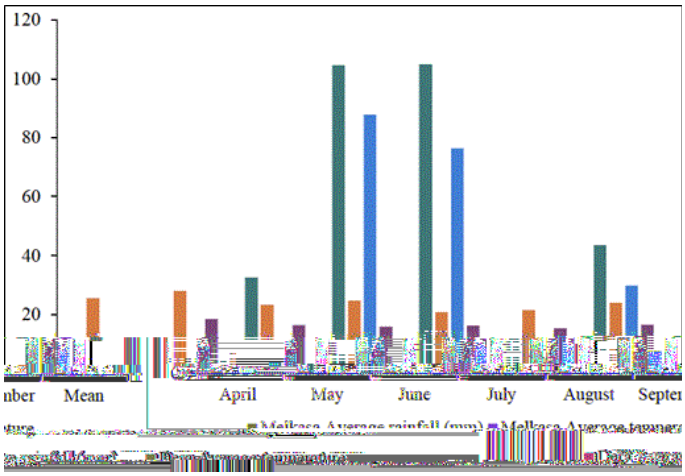

Figure 1: Average rainfall and temperature during growth and development stages of sorghum germplasms at Melkasa and Dera.

Sorghum Descriptor IBPGR/ICRISAT was used for characterization of test germplasms based on major quantitative morphological traits [23]. Accordingly, data were collected on Leaf Number per plant (LN), Leaf Length in cm (LL), Leaf

in cm (IL), Plant Height in cm (PH), Panicle Length in cm (PL), Panicle Width in cm (PW), Days to Maturity (DM), Number of Primary Branches Per Panicle (NPBP), 1,000 Seed Weight in gram (TSWt), Grain Yield Per Panicle in gram (GYPP). All data were recorded from the middle row on ten randomly selected individual plants; except for percent stand establishment, days to 50% owering and number of days to maturity which were recorded on plot basis. To estimate leaf area, a procedure

Accessions from Hararge showed relatively higher leaf number per plant, leaf area, and plant height and internodes length.

from Wello. e rest of the clusters contained di erent number of accessions from all regions. Moreover, cluster mean analysis indicated that cluster six (C-6) contained Sorghum germplasms with the highest values of most morphological traits such as leaf length, leaf width, leaf area, internode length, plant height, panicle length, panicle width, days to maturity and grain yield per panicle (Table 2). However, cluster-1 and cluster-4 represented with Sorghum germplasms with least values of most morphological traits (Table 2).

In this study, the contribution of most adaptive quantitative morphological characters such as plant height and number of days to 50% owering and maturity in cluster analysis is very high. Many early owering and early maturing Sorghum

respectively.

Principal component analysis

e rst four principal components with eigenvalues greater than one accounted for a cumulative variation of 62.09% (Table 3). Some characters have greater importance in determining the existing variability than others. In the present study, leaf length, days to 50% owering, plant height, leaf area and days to maturity were the most important traits contributing to the rst principal components. e contribution of internodes length, panicle length and grain yield per panicle in the second principal component analysis was also very high. Leaf width, number of primary branches per panicle and thousand seed weight were the most important traits in the third, fourth and h principal components, respectively.

Discussion

is study indicated the existence of high genetic diversity among Ethiopian Sorghum germplasm accessions collected from the major growing areas of Ethiopia. e highest signi cant positive correlation was obtained between most of the quantitative traits. e correlation that exists between di erent characters is very important in plant breeding program as it helps in the identi cation of easily measured characters that could be used as indicators of the more important and complex characters [13]. Moreover, high correlation coe cients between characters show that the characters share common element of genetic control between genes.

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