

Characterization and Preliminary Evaluation

Characterization and preliminary evaluation of germplasm are the prerequisites for utilization in crop improvement.

Phenotypic characterization and evaluation

- Characterization involves recording characters, which are
 - highly heritable,
 - easily seen by the eye, and
 - are expressed in all environments.
- Preliminary evaluation consists of recording a limited number of additional agronomic traits considered to be desirable by users of the crop.

Follow the same sowing and cultural practices for the field grow-out. Grow the accessions in 1-3 rows of 4 m each. Maintain the row to row distance at 75 cm and plant-to-plant distance at 10 cm. Evaluate the accessions in an augmented block design. Plant standard check cultivars at every 10 or 20 accessions. Use the descriptors developed by ICRISAT and IBPGR (now Bioversity International) for characterization and preliminary evaluation (ICRISAT/IBPGR 1992a,b and 1993a,b; ICRISAT/IBPGR/ICARDA 1993).

Descriptors for characterization of sorghum

Vegetative phase

Plant height (cm): Height of the main axis from ground to the top of inflorescence at 50% flowering. Mean of 5 randomly selected plants (Fig. 1).

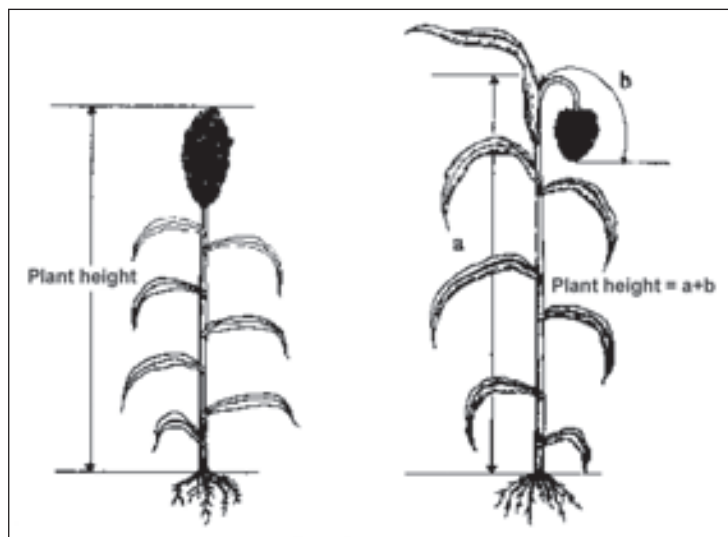


Figure 1. Plant height in sorghum.

Plant pigmentation: Stem and plant pigmentation at maturity.

P Pigmented

T Tan

Basal tillers number: Number of basal tillers, main plant as 1.

Nodal tillers number: Presence or absence of nodal tillers.

P Present

A Absent

Midrib color: Color of the midrib.

W White

D Dull green

Y Yellow

B Brown

Reproductive phase

Days to flowering: Number of days from the day of first irrigation to the date when 50% of plants started flowering within an accession.

Panicle exertion: Length of peduncle from ligule flag leaf to base of inflorescence (Fig. 2).

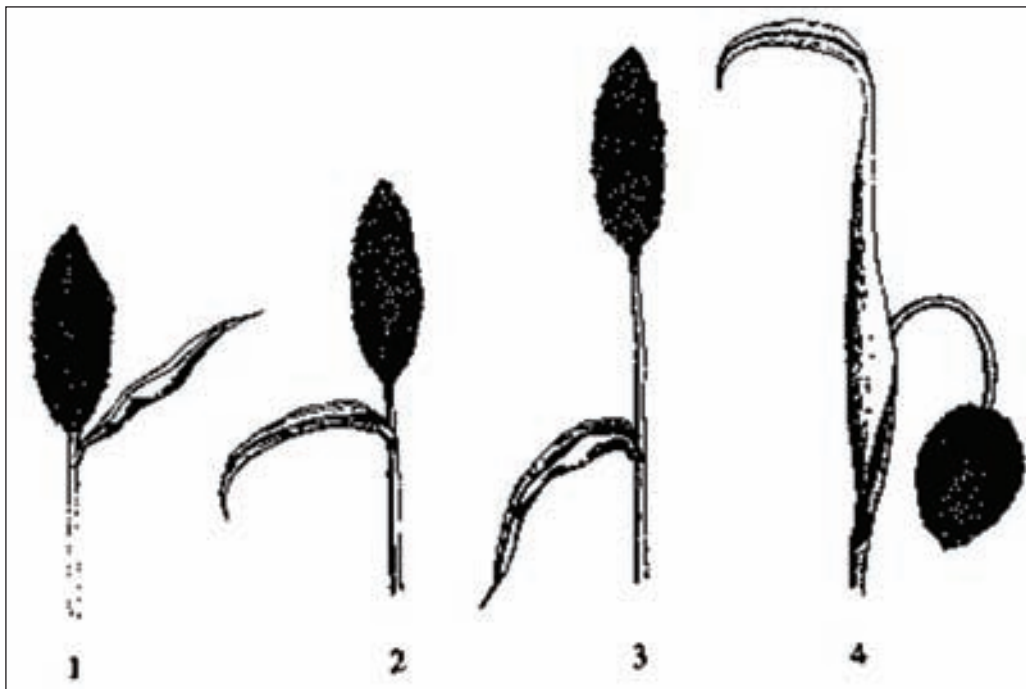


Figure 2. Panicle exertion in sorghum.

- 1 Slightly exserted
- 2 Exserted
- 3 Well-exserted
- 4 Peduncle recurved

Panicle length (cm): Length of panicle from base to the tip. Mean from five representative plants.

Panicle width (cm): In natural position at the widest portion. Mean from five representative plants.

Panicle compactness and shape (Fig. 3 and 4)

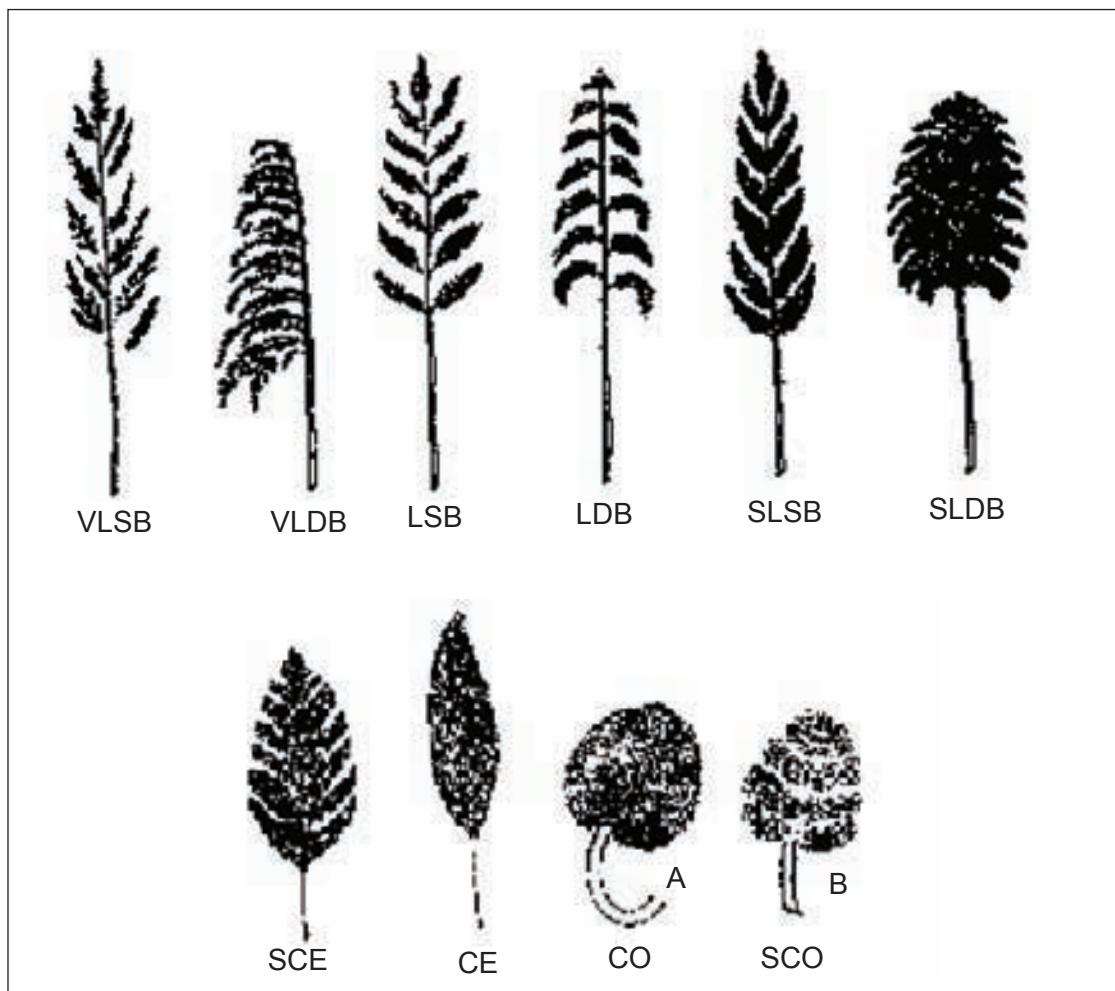


Figure 3 Inflorescence compactness and shape in sorghum.

- | | |
|------|------------------------------|
| VLSB | Very loose stiff branches |
| VLDB | Very loose drooping branches |
| LSB | Loose stiff branches |
| LDB | Loose drooping branches |

SLSB	Semi-loose stiff branches
SLDB	Semi-loose drooping branches
SCE	Semi-compact elliptic
CE	Compact elliptic
CO	Compact oval
SCO	Semi-compact oval



Figure 4. Diversity for panicle traits in sorghum germplasm assembled at ICRISAT.

Glume color: Color of the seed covering structures.

W	White	R	Red
S	Straw	DR	Dark red
Y	Yellow	P	Purple
LB	Light brown	B	Black
B	Brown	G	Grey
RB	Reddish brown	PSB	Partly straw and brown
LR	Light red	PSP	Partly straw and purple

Glume covering: Extent of seed covered by glumes at maturity (Fig. 5).

1	25% seed covered
2	50% seed covered

- 3 75% seed covered
- 4 Seed fully covered
- 5 Glumes longer than seed

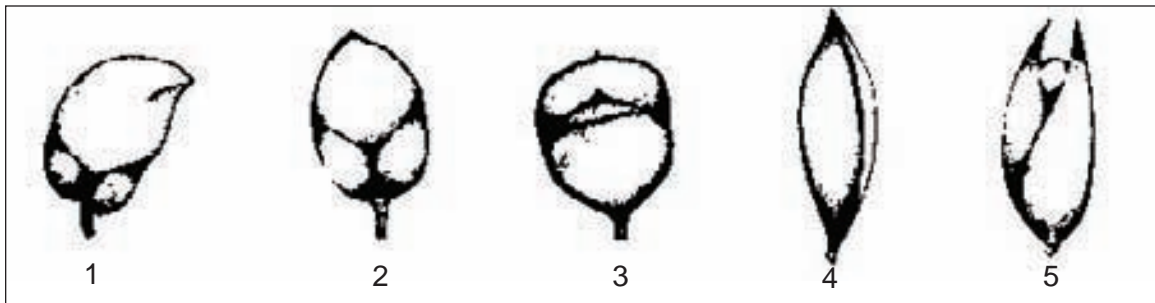


Figure 5. Seed covering in sorghum.

Seed color: Color of freshly harvested seeds.

CW	Chalky white	RB	Reddish brown
W	White	LR	Light red
S	Straw	R	Red
Y	Yellow	G	Grey
LB	Light brown	P	Purple
B	Brown	WR	White and red mixed

Seed lustre: Shininess of seed.

- L Lustrous
- NL Nonlustrous

Seed sub-coat: Presence or absence of black layer below the testa.

- P Present
- A Absent

Seed size (mm): Width of the seed at the broadest point.

Seed weight (g): Weight of 100 seeds at 12% moisture content.

Endosperm texture: Nature of endosperm (Fig. 6).

- 1 Completely corneous
- 2 Almost corneous
- 3 Partly corneous
- 4 Almost starchy
- 5 Completely starchy



Figure 6. Endosperm texture in sorghum seed.

Threshability: Ease with which seeds can be separated from the panicle.

FT Freely threshable

PT Partly threshable

DT Difficult to thresh