

Table S2. The grouping of the 60 accessions using Tukey method at 95% confidence level for desirable characters of the six qualitative traits. Accessions with mean frequency values of a character not sharing a letter (A-G) are significantly different in that character

| Acc | FS-5 | LC-3 | SC-1 | CS-1 | LM-5 | SH-3 |
|--------|------------|----------------|--------------------|--------------|------------------|------------|
| Ar A26 | 0.33 a b c | 0.76 a b c d e | 0.58 a b c - - - - | 0.36 a b c d | 0.64 a b c d e - | 0.44 a b c |
| Ar C25 | 0.29 a b c | 0.84 a b c d e | 0.44 a b c d e f g | 0.36 a b c d | 0.42 a b c d e f | 0.42 a b c |
| Ar E24 | 0.52 a b c | 0.90 a b c - - | 0.54 a b c d e - - | 0.03 - - c d | 0.72 a - - - - | 0.41 a b c |
| Ar F24 | 0.43 a b c | 0.82 a b c d e | 0.43 a b c d e f g | 0.18 - b c d | 0.42 a b c d e f | 0.46 a b c |
| Ar H24 | 0.25 a b c | 0.85 a b c d - | 0.65 a - - - - - | 0.28 - b c d | 0.59 a b c d e - | 0.46 a b c |
| Bl A29 | 0.69 a b - | 0.86 a b c d - | 0.61 a b - - - - | 0.12 - b c d | 0.37 a b c d e f | 0.59 a b - |
| Bl B28 | 0.66 a b - | 0.94 a b - - - | 0.31 a b c d e f g | 0.04 - b c d | 0.35 a b c d e f | 0.33 - b c |
| Bl C28 | 0.61 a b c | 0.58 - - - d e | 0.51 a b c d e - - | 0.40 a b c d | 0.57 a b c d e - | 0.37 a b c |
| Bl G28 | 0.60 a b c | 0.80 a b c d e | 0.44 a b c d e f g | 0.10 - b c d | 0.47 a b c d e - | 0.38 a b c |
| Bl N01 | 0.33 a b c | 0.86 a b c d - | 0.29 a b c d e f g | 0.06 - b c d | 0.54 a b c d e - | 0.30 - b c |
| Gj A18 | 0.14 - b c | 0.94 a b - - - | 0.25 - b c d e f g | 0.38 a b c d | 0.40 a b c d e f | 0.54 a b - |
| Gj C16 | 0.26 a b c | 0.78 a b c d e | 0.32 a b c d e f g | 0.10 - b c d | 0.63 a b c d e - | 0.34 - b c |
| Gj C17 | 0.41 a b c | 0.86 a b c d - | 0.19 - - - d e f g | 0.52 a b c - | 0.74 a - - - - | 0.42 a b c |
| Gj C18 | 0.46 a b c | 0.82 a b c d e | 0.46 a b c d e f g | 0.05 - b c d | 0.51 a b c d e - | 0.34 a b c |
| Gj C19 | 0.48 a b c | 0.93 a b - - - | 0.41 a b c d e f g | 0.10 - b c d | 0.41 a b c d e f | 0.44 a b c |
| Gj D18 | 0.49 a b c | 0.98 a b - - - | 0.27 - b c d e f g | 0.02 - - c d | 0.52 a b c d e - | 0.33 - b c |
| Gj F17 | 0.52 a b c | 0.87 a b c d - | 0.26 - b c d e f g | 0.14 - b c d | 0.66 a b c d e - | 0.29 - b c |
| Gj G18 | 0.26 a b c | 0.95 a b - - - | 0.47 a b c d e f g | 0.17 - b c d | 0.44 a b c d e f | 0.46 a b c |
| Gj H18 | 0.27 a b c | 0.77 a b c d e | 0.25 - b c d e f g | 0.11 - b c d | 0.60 a b c d e - | 0.57 a b - |
| Gr A16 | 0.55 a b c | 0.85 a b c d - | 0.28 - b c d e f g | 0.13 - b c d | 0.55 a b c d e - | 0.29 - b c |
| Gr F15 | 0.61 a b c | 0.85 a b c d - | 0.34 a b c d e f g | 0.03 - - c d | 0.62 a b c d e - | 0.37 a b c |
| Gr H15 | 0.60 a b c | 0.67 - b c d e | 0.28 - b c d e f g | 0.00 - - - d | 0.54 a b c d e - | 0.28 - b c |
| Gr N15 | 0.62 a b c | 0.91 a b c - - | 0.18 - - - - e f g | 0.05 - b c d | 0.59 a b c d e - | 0.53 a b - |
| Gr P15 | 0.44 a b c | 0.61 - - c d e | 0.28 - b c d e f g | 0.14 - b c d | 0.43 a b c d e f | 0.32 - b c |
| Gr T15 | 0.16 - b c | 0.76 a b c d e | 0.37 a b c d e f g | 0.20 - b c d | 0.62 a b c d e - | 0.61 a b - |
| Gr W15 | 0.41 a b c | 0.80 a b c d e | 0.38 a b c d e f g | 0.34 a b c d | 0.72 a - - - - | 0.47 a b c |
| Gr X15 | 0.35 a b c | 0.80 a b c d e | 0.33 a b c d e f g | 0.04 - b c d | 0.63 a b c d e - | 0.31 - b c |
| Hr A21 | 0.47 a b c | 0.91 a b c - - | 0.61 a b c - - - - | 0.16 - b c d | 0.22 - - - - e f | 0.44 a b c |
| Hr B21 | 0.28 a b c | 0.86 a b c d - | 0.40 a b c d e f g | 0.28 - b c d | 0.61 a b c d e - | 0.39 a b c |
| Il F2 | 0.21 a b c | 0.95 a b - - - | 0.57 a b c - - - - | 0.23 - b c d | 0.54 a b c d e - | 0.58 a b - |
| Il J2 | 0.49 a b c | 0.92 a b c - - | 0.36 a b c d e f g | 0.26 - b c d | 0.33 a b c d e f | 0.45 a b c |
| Jm B2 | 0.27 a b c | 0.88 a b c d - | 0.49 a b c d e f - | 0.33 a b c d | 0.63 a b c d e - | 0.56 a b - |
| Jm X | 0.25 a b c | 0.79 a b c d e | 0.43 a b c d e f g | 0.43 a b c d | 0.41 a b c d e f | 0.50 a b c |
| Sh A19 | 0.22 a b c | 0.74 a b c d e | 0.46 a b c d e f g | 0.13 - b c d | 0.45 a b c d e f | 0.56 a b - |
| Sh B6 | 0.21 a b c | 0.83 a b c d e | 0.42 a b c d e f g | 0.31 a b c d | 0.55 a b c d e - | 0.56 a b - |
| Sh E7 | 0.14 - b c | 0.78 a b c d e | 0.45 a b c d e f g | 0.79 a - - - | 0.02 - - - - f | 0.47 a b c |
| Sh I4 | 0.16 a b c | 0.86 a b c d - | 0.50 a b c d e f - | 0.38 a b c d | 0.60 a b c d e - | 0.47 a b c |
| Sh I7 | 0.07 - - c | 0.92 a b c - - | 0.40 a b c d e f g | 0.55 a b - - | 0.27 - - - d e f | 0.48 a b c |
| Sh R4 | 0.32 a b c | 0.89 a b c d - | 0.33 a b c d e f g | 0.24 - b c d | 0.47 a b c d e - | 0.52 a b - |
| Sh S19 | 0.39 a b c | 0.90 a b c - - | 0.54 a b c d e - - | 0.13 - b c d | 0.54 a b c d e - | 0.51 a b - |
| Sh T19 | 0.22 a b c | 0.92 a b c - - | 0.55 a b c d - - - | 0.10 - b c d | 0.64 a b c d e - | 0.57 a b - |
| Sh U3 | 0.54 a b c | 0.92 a b c - - | 0.37 a b c d e f g | 0.29 a b c d | 0.51 a b c d e - | 0.47 a b c |

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|--------|------|---|---|---|------|---|---|---|---|------|------|---|---|---|---|---|------|---|------|---|---|------|---|------|---|---|---|---|------|---|------|---|---|---|
| Tg K13 | 0.48 | a | b | c | 0.93 | a | b | - | - | 0.13 | - | - | - | - | - | g | 0.00 | - | - | - | d | 0.27 | - | b | c | d | e | f | 0.41 | a | b | c | | |
| Tg N13 | 0.57 | a | b | c | 0.89 | a | b | c | d | - | 0.28 | - | b | c | d | e | f | g | 0.01 | - | - | - | d | 0.72 | a | b | c | d | - | - | 0.43 | a | b | c |
| Tg R13 | 0.73 | a | - | - | 0.89 | a | b | c | d | - | 0.13 | - | - | - | - | - | f | g | 0.00 | - | - | - | d | 0.57 | a | b | c | d | e | - | 0.37 | a | b | c |
| Tg T13 | 0.50 | a | b | c | 0.53 | - | - | - | - | e | 0.20 | - | - | - | d | e | f | g | 0.00 | - | - | - | d | 0.50 | a | b | c | d | e | - | 0.40 | a | b | c |
| Tg V13 | 0.57 | a | b | c | 0.83 | a | b | c | d | e | 0.13 | - | - | - | - | - | f | g | 0.00 | - | - | - | d | 0.44 | a | b | c | d | e | f | 0.37 | a | b | c |
| Wg B3 | 0.34 | a | b | c | 0.92 | a | b | c | - | - | 0.55 | a | b | c | d | - | - | - | 0.39 | a | b | c | d | 0.27 | - | - | c | d | e | f | 0.13 | - | - | c |
| Wg D3 | 0.54 | a | b | c | 0.94 | a | b | - | - | - | 0.29 | a | b | c | d | e | f | g | 0.05 | - | b | c | d | 0.34 | a | b | c | d | e | f | 0.59 | a | b | - |
| Wg K3 | 0.28 | a | b | c | 0.92 | a | b | c | - | - | 0.28 | - | b | c | d | e | f | g | 0.26 | - | b | c | d | 0.53 | a | b | c | d | e | - | 0.60 | a | b | - |
| Wg L3 | 0.20 | a | b | c | 0.81 | a | b | c | d | e | 0.47 | a | b | c | d | e | f | g | 0.26 | - | b | c | d | 0.60 | a | b | c | d | e | - | 0.49 | a | b | c |
| Wg P3 | 0.37 | a | b | c | 0.94 | a | b | - | - | - | 0.52 | a | b | c | d | e | - | - | 0.33 | a | b | c | d | 0.56 | a | b | c | d | e | - | 0.65 | a | b | - |
| Wg R3 | 0.40 | a | b | c | 0.91 | a | b | c | - | - | 0.13 | - | - | - | - | - | f | g | 0.16 | - | b | c | d | 0.42 | a | b | c | d | e | f | 0.47 | a | b | c |
| Wg T3 | 0.35 | a | b | c | 0.99 | a | - | - | - | - | 0.33 | a | b | c | d | e | f | g | 0.12 | - | b | c | d | 0.32 | a | b | c | d | e | f | 0.58 | a | b | - |
| Wg U2 | 0.39 | a | b | c | 0.81 | a | b | c | d | e | 0.31 | a | b | c | d | e | f | g | 0.34 | a | b | c | d | 0.50 | a | b | c | d | e | - | 0.47 | a | b | c |
| Wl B10 | 0.45 | a | b | c | 0.83 | a | b | c | d | e | 0.46 | a | b | c | d | e | f | g | 0.32 | a | b | c | d | 0.35 | a | b | c | d | e | f | 0.49 | a | b | c |
| Wl F8 | 0.54 | a | b | c | 0.99 | a | - | - | - | - | 0.34 | a | b | c | d | e | f | g | 0.13 | - | b | c | d | 0.47 | a | b | c | d | e | - | 0.71 | a | - | - |
| Wl L7 | 0.39 | a | b | c | 0.94 | a | b | - | - | - | 0.36 | a | b | c | d | e | f | g | 0.32 | a | b | c | d | 0.49 | a | b | c | d | e | - | 0.46 | a | b | c |
| Wl T7 | 0.27 | a | b | c | 0.94 | a | b | - | - | - | 0.33 | a | b | c | d | e | f | g | 0.37 | a | b | c | d | 0.44 | a | b | c | d | e | f | 0.55 | a | b | - |
| Wl Z7 | 0.46 | a | b | c | 0.97 | a | b | - | - | - | 0.38 | a | b | c | d | e | f | g | 0.44 | a | b | c | d | 0.57 | a | b | c | d | e | - | 0.38 | a | b | c |

Note: These characters are positively correlated with number of seeds per plant (NSPP), except stem hairiness (SH), and hence have positive contribution to seed yield. Stem hairiness was not correlated with NSPP, and SH-3 was considered here because it was the most frequent character of SH. FS-5: Flower size = large; LC-3: Leaf color = green; SC-1: Stem color = green; CS-1: Capitulum size = small; LM-5: Leaf margin = course; SH-3: Stem hairiness = medium