Registration of a Drought-Resistant Chickpea Germplasm

ICC 4958 is a desi chickpea (Cicer arietinum L.) germplasm line collected from Madhya Pradesh, India (1) It has been identified as drought resistant (Reg. no. GP-113, PI 439824) by the scientific staff of the Legumes Program, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). It was subsequently identified for release by the ICRISAT Plant Material Identification Committee (PMIC) in 1992.

ICC 4958 was one of more than 1500 diverse germplasm lines screened for drought resistance under field conditions between 1978 and 1983 at ICRISAT Center and was one of the most drought-resistant entries evaluated (2). In spring plantings in western Asia, ICC 4958 also proved to be the most drought-resistant entry in trials conducted in the terminal drought environments at the International Center for Agricultural Research in the Dry Areas (ICARDA), Aleppo, Syria (3). Drought resistance of ICC 4958 was also validated in recent multilocational trials in India (4). Mean yield of ICC 4958 and Annigeri was 0.6 and 0.4 t ha\(^{-1}\), respectively. The yield of ICC 4958 was 120\% of that of the mean yield of all entries in the stress environments (0.5 t ha\(^{-1}\) ) (5); in 1 yr, ICC 4958 yield relative to Annigeri reached as high as 157\%. When the mean yield of stress environments was 0.8 g ha\(^{-1}\), the yield advantage of ICC 4958 ranged from 102 to 117\%.

Characteristic features of ICC 4958, as observed in the warm-winter, short-duration, terminal-drought environment represented by ICRISAT Center in peninsular India (6), are described below.

ICC 4958 is a brown-seeded desi type of chickpea. As in other desi types, it has the characteristic presence of the anthocyanin pigmentation in the foliage and stems. All comparisons of this drought-resistant germplasm are made with Annigeri, the best adapted variety for the peninsular Indian region. ICC 4958 is adapted to short duration, progressively increasing, terminal drought environments, such as at ICRISAT Center. It is semi-spreading and has a terminal branching growth habit. Branches are few (15 ± 1.8 in ICC 4958; 22 ± 4.3 in Annigeri) but the canopy height is similar to that of Annigeri (37 ± 8.0 cm). The compound leaves have 13 to 14 pinnules, smaller than that in Annigeri (14 ± 26, compared to 196 ± 42 in Annigeri) for relatively higher and stable yields in terminal drought-prone environments of 90 to 95 d duration, with a mean rainfed yield of 0.5–0.7 t ha\(^{-1}\). For environments of longer duration, ICC 4958 can be used as a donor parent to introgress the desirable trait of a larger root system into an adapted background. Seed of this germplasm accession is maintained by and can be obtained for research purposes through the Genetic Resources Program, ICRISAT, Patancheru, India.

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References and Notes


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Registration of AG-S4 Autogamous Broad-Leaf Birdsfoot Trefoil Germplasm

AG-S4 (Reg. no. GP-7, PI566818) autogamous broad-leaf birdsfoot trefoil (Lotus corniculatus L.) germplasm was developed and released 10 December 1992 by the United States Department of Agriculture, Agricultural Research Service, in cooperation with the Oregon, Idaho, and Washington Agricultural Experiment Stations.

AG-S4 originated from a single autogamous clone identified in the broad-based MU-81 germplasm, a genetically diverse, self-incompatible population that was produced by three cycles of intercrossing plants from 56 foreign introductions and 35 experimental synthetics or cultivars (1). S2 seeds resulting from both unassisted selfing and hand manipulations were collected from the autogamous clone and grown to flowering in a greenhouse under long-day conditions (16 h). S1 and S2 generation seeds were produced from 11 S1 and 16 S2 plants, respectively, that were selected at random from seeds of bulk populations of each and grown under similar greenhouse conditions with only unassisted selfing (no hand manipulations). AG-S4 is a composite of equal numbers of S2 seeds produced from 12 S2 plants.

Leaves from AG-S4 are more ovate and lighter green than the original autogamous MU-81 clone which displays typical L. corniculatus morphology. AG-S4 exhibits no inbreeding vigor depression when compared to MU-81 and is a prolific