request to the corresponding author. Appropriate recognition of the source is requested when these germplasm lines contribute to the development of a new breeding line, hybrid, or cultivar.

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References and Notes

Registration of FLIP 91-178C, FLIP 93-53C, and FLIP 93-98C: Chickpea Germplasm Lines Resistant to Ascochyta Blight, Fusarium Wilt, and Cold

Three kabuli chickpea (Cicer arietinum L.) germplasm lines, FLIP 91-178C (Reg. no. GP-168, PI 594328), FLIP 93-53C (Reg. no. GP-169, PI 594329), and FLIP 93-98C (Reg. no. GP-170, PI 594330), with combined resistance to ascochyta blight [caused by Phoma rabiei (Pass.) Khune & J.N. Kapoor; syn. Ascochyta rabiei (Pass.) Labrousse], fusarium wilt [caused by Fusarium oxysporum Schlechtend.:Fr. f. sp. ciceris (Padwick) Matuo & K. Sato], and cold, were developed by the ICRISAT-ICARDA Kabuli Chickpea Project at Aleppo, Syria, and released in 1995. They represent the first chickpea lines developed through hybridization that have resistance to three of the most important stresses.

FLIP 91-178C, was developed from a cross made in 1986 at Tel Hadya, Syria, between II.C 136 (a fusarium wilt-resistant line) and FLIP 84-18C (an ascochyta blight-resistant line). The F1 was then crossed with FLIP 84-78C (an ascochyta blight- and cold-resistant line) in 1987. The F1 of this second cross was grown in an off-season nursery at Terbol, Lebanon, in 1987. The F2 population was grown in the cold and ascochyta blight nursery at Tel Hadya from November 1987 through June 1988. Screening for cold resistance was done in the winter, by roguing plants that were apparently susceptible to cold. An epidemic of ascochyta blight was developed with the technique described by Singh and Reddy (3). Materials were evaluated on a 1-to-9 scale (3), and resistant plants were bulk harvested. Two thousand F3 seeds were sown at Terbol in the off-season of 1988. Matured plants were bulk-harvested in early October, when only part of the material was ripe, thus rejecting the late-maturing plants. The F4 bulk was grown in the cold and blight nursery in the main season (November to June) at Tel Hadya during 1988 to 1989. Reduction of cold-susceptible plants and selection of ascochyta blight-resistant plants followed the procedure described for the F3, but selected plants were harvested individually. The F5 progenies were grown in the cold and ascochyta blight nursery during 1989 to 1990. Selections were made for cold and blight resistance and other agronomic traits. Promising, uniform progenies were harvested in bulk. Five hundred seeds of each bulked progeny in the F6 were grown in the 1990 off-season at Terbol. Among such progenies was FLIP 91-178C.

Following the above procedure, FLIP 93-53C and FLIP 93-98C were developed during 1993 from the cross of UC 27 (a wilt-resistant line) × FLIP 84-78C (a blight- and cold-resistant line). This cross was made in 1989. The handling of materials and selecting of plants for resistance to ascochyta blight, fusarium wilt, and cold were made nearly the same way as that of FLIP 91-178C.

The major difference was that the process for the development of FLIP 93-53C and FLIP 93-98C was initiated and completed 2 yr later than FLIP 91-178C.

FLIP 91-178C, FLIP 93-53C, and FLIP 93-98C were evaluated for resistance to wilt in a wilt-sick plot at Tel Hadya in 1995. Materials were screened and scored using the scale suggested by Nene and Haware. The three lines were resistant to wilt, which was further confirmed in greenhouse tests conducted during July through October 1995. These latter tests were scored using the scale of Infantino et al. (1). All three lines, FLIP 91-178C, FLIP 93-53C, and FLIP 93-98C, have kabuli-type seeds, with a 100-seed weight of 40, 33, and 36 g, respectively, compared with 28 g 100 seed⁻¹ for the check cultivar, IL C 482. FLIP 91-178C has a normal plant height (34 cm) and is late maturing (176 d), whereas FLIP 93-53C and FLIP 93-98C are tall (plant height above 50 cm) and early maturing (less than 160 d). Seed yield of all three lines is comparable to that of the check cultivar, IL C 482.

The seeds of these lines are being maintained by the Germplasm Program and the Genetic Resources Unit of ICARDA, and small quantities can be obtained upon request for use in breeding programs.

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References and Notes
4. Germplasm Program, Int. Ctr. for Agric. Res. in the Dry Areas (ICARDA), P.O. Box 5466, Aleppo, Syria. Joint contribution of ICARDA and ICRISAT (Int. Crops Res. Inst. for the Semi-Arid Tropics, Patancheru P.O., AP 502 324, India). Registration by CSSA. Accepted 31 July 1996. *Corresponding author (m.saxena@cgiar.org).


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