Registration of Three Leafminer-Resistant Chickpea Germplasm Lines: ILC 3800, ILC 5901, and ILC 7738

Chickpea (*Cicer arietinum* L.) germplasm lines ILC 3800 (Reg. no. GP-154, PI 587039), ILC 5901 (Reg. no. GP-155, PI 587040), and ILC 7738 (Reg. no. GP-156, PI 587041) were jointly released in 1994 by the International Center for Agricultural Research in the Dry Areas (ICARDA) at Tel Hadya, Syria, and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) at Patancheru, India. They were released to chickpea researchers in the Mediterranean region for use in breeding programs because of their resistance to leafminer (*Liriomyza cicerina* Rondani).

ICARDA screened 6025 germplasm lines of chickpea for resistance to leafminer following the technique and rating scale described by Reed et al. (1) and Weigand and Tahhan (2). The three lines ILC 3800, ILC 5901, and ILC 7738 were consistently rated resistant (i.e., 3 on a scale of 1 to 9, where 1 = free from insect damage and 9 = severe mining on almost all leaflets and >30% defoliation) for at least three seasons. ILC 3800 and ILC 7738 are introductions from Mexico; ILC 5901 is from the former USSR. These lines are mixtures and were purified by mass selection for resistance to leafminer. The procedure for purification included selection and bulk harvesting of leafminer-resistant plants in the first year. Bulked seeds were grown in the second year in the leafminer nursery; the same procedure was followed as in the first year. The bulked seeds of leafminer-resistant plants were assigned the original accession numbers. A yield loss study conducted at ICARDA showed <10% loss of yield in the resistant lines, whereas in some susceptible lines the yield loss was >35% (1).

Registration of FLIP 87-59C, a Drought-Tolerant Chickpea Germplasm Line

FLIP 87-59C (Reg. no. GP-157, PI 587042) chickpea (*Cicer arietinum* L.) was jointly developed by the International Center for Agricultural Research in the Dry Areas (ICARDA), located at Tel Hadya, Syria, and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), located at Patancheru, India. Because of its demonstrated tolerance to terminal drought stress, it was released to chickpea researchers in 1994 for use in breeding programs in the Mediterranean region, where chickpea is often subjected to terminal drought. Besides drought tolerance, this line has an intermediate reaction (rating 5 on a scale of 1 to 9, where 1 = free from damage and 9 = all plants killed) to ascochyta blight [caused by *Phoma rabiei* (Pass.) Khune & J.N. Kapoor; syn. *Ascochyta rabiei* (Pass.) Lab.], a desirable trait in the region.

FLIP 87-59C was developed from a cross, ILC 3843/FLIP 82-130C, made in 1985 at ICARDA. The F1 was grown in the off-season nursery at Terbol, a high-altitude substation of ICARDA in Lebanon, to produce F2 seeds. The F2 bulk was grown in the ascochyta blight nursery at Tel Hadya. The 100-seed weight of FLIP 87-59C was 14 g, compared with 14 g for the control, ILC 72 (1).

The field screening technique for tolerance involved sowing 3 wk later than normal spring sowing at ICARDA, located at Tel Hadya (20 March), which is a dry site for spring-sown chickpea (average annual rainfall of 332 mm, compared with >400 mm needed for spring-sown chickpea). Lines were compared near maturity using a rating scale of 1 to 9, where 1 = severe drought damage (as in the irrigated control) and 9 = all plants died (as in the irrigated control) without producing any seed (2). Of a total of 10 lines evaluated at ICARDA in 5 yr, FLIP 87-59C was the most consistently rated as drought tolerant (score of 3), more from 1990 to 1992 in yield evaluation. FLIP 87-59C was the highest yielding at 1125 kg ha−1 compared with 299 kg ha−1 produced by the control.

FLIP 87-59C matured in 85 d, compared with 100 d for the control, ILC 72. The 100-seed weight was 35 cm, compared with 25 g and 14 g for the control and FLIP 87-59C, respectively. Seed from this line is being maintained by the Germplasm Program and small quantities of seed of this line are available on request from either the Germplasm Program or the Genetic Resources Unit of ICARDA.

No association between any morphophysiological traits and leafminer resistance was found. All three lines, characterized by large rams-head-shaped beige seeds, have compound leaves. The 100-seed weights of ILC 3800, ILC 5901, and ILC 7738 were 14, 26, and 14 g, respectively. ILC 3800 is medium-maturing and the rest are early maturing. All three lines are characterized by small leaves and medium plant height. The percent protein in ILC 5901, and ILC 7738 was 22.1, 23.1, and 21.8, respectively.

Seeds of these lines are being maintained by the Germplasm Program and small quantities of seed of these lines are available upon request from either the Germplasm Program or the Genetic Resources Unit of ICARDA.

K. B. SINGH* AND S. WEIGAND (3)

References and Notes


3. K.B. Singh, ICRISAT/ICARDA Chickpea Project, P.O. Box 5466, Aleppy, Syria, and S. Weigand, Germplasm Resources Unit, ICRISAT, Patancheru, A.P., 502 324, India. Accepted 30 Sept. 1995. *Corresponding author.