Registration of Five Spanish Peanut Germplasm Lines with Fresh Seed Dormancy

ICGV 86155, ICGV 86156, ICGV 86158, ICGV 87378, and ICGV 87921 spanish peanut (*Arachis hypogaea* L. subsp. *fastigiata* Waldron var. *vulgaris* Harz) improved germplasm lines (Reg. no. GP-79 to GP-83, PI 594969 to PI 594973) were bred at the Asia Center of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, Andhra Pradesh, India. These five lines were released in 1995 by the Plant Materials Identification Committee of ICRISAT for their fresh seed dormancy in the spanish background.

ICGV 86155, ICGV 86156, and ICGV 86158 originated from ICGS 30/('TMV 10'/Chico F_6 breeding line) cross, and ICGV 87921 from ICGS 21//'TMV 2'/Chico cross, made in the 1983 rainy season and 1983–1984 postrainy season, respectively. ICGS 30 (ICGV 87126) and ICGS 21 (ICGV 87124) are high-yielding medium-duration spanish varieties developed at ICRISAT Asia Center. TMV 10 and TMV 2 are released cultivars in India (2). TMV 10 belongs to the virginia botanical group (subsp. *hypogaea* Krap. & Rig. var. *hypogaea* Gregory et al.) and TMV 2 to the spanish botanical group. Chico is a spanish short-duration germplasm line selected from PI 268661 in the USA (1). In F_3 progeny rows from high-yielding F_2 plants of each cross, phenotypically similar plants were selected and bulked at harvest. This process of bulking phenotypically similar plants was repeated each generation until the F_8 generation, when the bulks were phenotypically homogeneous. The pedigrees of four of the germplasm lines are as follows: ICGV 86155, ICGS 30/(TMV 10/Chico F_6) F_2–P_{23}–B_1–B_1–B_1–B_1–B_1; ICGV 86156, ICGS 30/(TMV 10/Chico F_6) F_2–P_{26}–B_1–B_1–B_1–B_1–B_1; ICGV 86158, ICGS 30/(TMV 10/Chico F_6) F_2–P_{32}–B_1–B_1–B_1–B_1–B_1; ICGV 87921, ICGS 21//TMV 2/Chico F_2–P_{30}–B_3–B_2–B_1–B_2–B_1. The fifth line, ICGV 87378, is a mass-selected population from Kanto No. 40 (also known as ICG 7261 and EC 123074), a Japanese spanish germplasm line.

These improved germplasm lines were evaluated after harvest in the laboratory for germination of fresh seeds in the 1991–1992 and 1992–1993 postrainy, and the 1992 and 1993 rainy seasons, and of 1-wk-cured seeds in the 1991–1992 and 1992–1993 postrainy, and the 1993 rainy seasons. Each test was repeated three times. The average cumulative fresh seed germination after 4 wk of incubation was 9.3% in ICGV 86155, 5.3% in ICGV 86156, 15.2% in ICGV 86158, 6.4% in ICGV 87378, and 3.7% in ICGV 87921, compared with 13.6% in the dormant control 'M 13' and 81.5% in the nondormant control 'JL 24'. The average cumulative cured seed germination after 2 wk of incubation was 5.9% in ICGV 86155, 1.0% in ICGV 86156, 8.0% in ICGV 86158, 5.9% in ICGV 87378, and 5.1% in ICGV 87921, compared with 8.3% in M 13 and 88.1% in JL 24. Further, these lines were evaluated for in situ sprouting in the field after maturity by repeated irrigation in the 1991–1992 and 1992–1993 postrainy seasons. The average cumulative in situ field sprouting 2 wk after maturity was 1.0% in ICGV 86155, 0.2% in ICGV 86156 and ICGV 86158, and 0.0% in ICGV 87378 and ICGV 87921, compared with 0.6% in M 13 and 9.4% in JL 24.

All except ICGV 86155 produced 18 to 52% higher pod yield than the popular cultivar JL 24 in 4 to 10 trials conducted in four rainy (1986, 1987, 1992, and 1993) and three postrainy (1987–1988, 1991–1992, and 1992–1993) seasons at ICRISAT Asia Center, India (4). ICGV 86156, ICGV 86158, ICGV 87378, and ICGV 87921 mature in 120 to 125 days after planting (DAP) during the rainy season at ICRISAT Asia Center. ICGV 86155 matures in 110 to 115 DAP, with a pod yield similar to JL 24.

Except for number of primary branches, canopy width and height, and pod and seed characteristics, all the lines are similar in plant and flower characteristics. They have erect growth habit with sequential branching, and elliptical light green leaves (3). The flowers are yellow colored with garnet crescent marks.

The number of primary branches ranges from 4 to 6 in ICGV 86155, 5 to 6 in ICGV 86156, 3 to 4 in ICGV 86158, 2 to 6 in ICGV 87378, and 3 to 5 in ICGV 87921. The height of main axes of these lines is approximately 23 cm in ICGV 86155, 20 cm in ICGV 86156 and ICGV 87378, 16 cm in ICGV 86158, and 24 cm in ICGV 87921 at 80 DAP during the rainy season at the ICRISAT Asia Center. Canopy width is approximately 32 cm for ICGV 86155, 29 cm for ICGV 86156, ICGV 87378, and ICGV 87921, and 21 cm for ICGV 86158.

All germplasm lines have mainly two-seeded pods. Pods of ICGV 86155 are medium in size (27 mm average length, 12 mm average breadth) with slight to moderate beak, moderate to deep constriction, and slight reticulation. Pods of ICGV 86156 are medium to large in size (42 mm average length, 18 mm average breadth) with slight beak, moderate constriction, and slight reticulation. Pods of ICGV 86158 are medium in size (32 mm average length, 13 mm average breadth) with slight to moderate beak, moderate to deep constriction, and slight reticulation. Pods of ICGV 87378 are medium in size (34 mm average length, 14 mm average breadth) with slight beak, moderate constriction, and slight reticulation. Pods of ICGV 87921 are medium to large in size (38 mm average length, 15 mm average breadth) with slight to moderate beak, moderate constriction, and slight reticulation. The average meat content is 71% in ICGV 86155, 62% in ICGV 86156, 69% in ICGV 86158, 60% in ICGV 87378, and 65% in ICGV 87921. ICGV 86155 and ICGV 86158 have seeds with a red testa, ICGV 86156, ICGV 87378, and ICGV 87921 have a tan testa. The 100-seed weight is 39 g for ICGV 86155 and 51 to 53 g for ICGV 86156, ICGV 86158, ICGV 87378, and ICGV 87921. Average oil in these lines ranges from 460 to 484 g kg^{-1}; average protein concentration, from 196 to 222 g kg^{-1} (4).

ICGV 86155, ICGV 86156, ICGV 86158, ICGV 87378, and ICGV 87921 are high-yielding germplasm lines with fresh seed dormancy in the spanish background. They can be cultivated in areas where the crop at maturity is caught in rains, otherwise resulting in in situ germination and loss in yield and quality of produce. They can be used in the germplasm enhancement program to develop fresh seed dormant, short-duration cultivars.

Breeder seed of these germplasm lines is maintained by the Genetic Resources Division, ICRISAT Asia Center. Limited quantities of seed of these lines are available upon request. Seeds of the lines are deposited with the U.S. National Seed Storage Laboratory, Fort Collins, CO 80521-4500.

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References and Notes

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