Registration of Peanut Germplasm
ICGV 88145 and ICGV 89104 Resistant to Seed Infection by Aspergillus flavus

ICGV 88145 (Reg. no. GP-74, PI 585006) and ICGV 89104 (Reg. no. GP-75, PI 585007) are improved Spanish peanut (Arachis hypogaea L. subsp. fastigiata Waldron var. vulgaris Harz) germplasm, bred at the Asia Center of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, India. These lines were released in 1993 by the Plant Materials Identification Committee of ICRISAT for their high levels of resistance to natural seed infection by the aflatoxin-producing fungus Aspergillus flavus Link:Fr. (3).

The two lines resulted from two single crosses, involving PI 337409 and FESR 12 for ICGV 88145 and ‘J 11’ and U 4-7-5 for ICGV 89104. PI 337409 is a germplasm line resistant to seed infection (8) and colonization (9) by A. flavus. FESR 12 is a line resistant to rust (caused by Puccinia arachidis Speg.) (1). J 11 is a cultivar widely grown in western and central India and resistant to seed infection and colonization by A. flavus (6). PI 337409 and J 11 are also resistant to seed infection by A. flavus in Senegal (5, 12) and Thailand (11), and are being used in the breeding programs of these countries (10). U 4-7-5 supports only low levels of aflatoxin production (7). ICGV 88145 and ICGV 89104 were bred following the bulk pedigree method. For ICGV 88145, the phenotypically similar F₃ progenies of F₂ plants were selected and bulked at harvest, whereas for ICGV 89104 the selected phenotypically similar F₂ plants were bulked together at harvest and the first selected bulk was designated as B₁. The process of bulking the selected phenotypically similar plants was repeated in successive generations until the bulks were phenotypically homogeneous.

The materials were evaluated in the field, for A. flavus seed infection (4) in two rainy seasons, under rainfed conditions, and three postrainy seasons, under imposed late-season drought conditions, and for seed colonization (4, 9) in one rainy season and two postrainy seasons. The average natural seed infection in ICGV 88145 (0.7%) by A. flavus was 50% that of the best resistant control J 11 (1.3%). In ICGV 89104 (1.0%) the average seed infection was 77% that of J 11. The seed colonization by A. flavus under artificial inoculation conditions averaged 22.2% in ICGV 88145, 24.0% in ICGV 89104, 21.4% in Ah 7223, and 15.6% in J 11. The natural aflatoxin contamination in these two lines was zero, compared with 2.1 μg kg⁻¹ seed in J 11 and 35.5 μg kg⁻¹ seed in the susceptible cultivar JL 24 in the 1992 rainy season. The natural aflatoxin contamination in U 4-7-5 was not estimated.

Both ICGV 88145 and ICGV 89104 produced higher pod yield than J 11 in several trials conducted across seasons, years, and locations in India. The average pod yield of ICGV 88145 in 14 trials was 2.17 t ha⁻¹ (22% more than J 11), and the average pod yield of ICGV 89104 in 9 trials was 2.20 t ha⁻¹ (18% more than J 11). These lines take 110 to 120 d to mature in the rainy season at ICRISAT Asia Center.

Both lines have erect growth habit with sequential branching. Pods of ICGV 88145 are mainly two-seeded, medium in size (length, 11 mm breadth) with slight constriction, and have tan-colored seeds. The 100-seed weight of ICGV 88145 and 32 g for ICGV 89104. Average oil and protein concentrations are 490 g kg⁻¹ and 199 g kg⁻¹ in ICGV 88145 and 534 g kg⁻¹ and 182 g kg⁻¹ in ICGV 89104.

ICGV 88145 and ICGV 89104 are high-yielding breeding lines and can be cultivated in areas where peanut is exposed to end-of-season drought conducive to aflatoxin contamination. Harvest seed infection by A. flavus. The lines can be used in germplasm enhancement programs.

Breeder seed of ICGV 88145 and ICGV 89104 can be obtained from the Genetic Resources Division at ICRISAT. Limited quantities of seed of these lines are available. Seeds of the lines are also deposited with the National Seed Storage Laboratory, 1111 Mason St., Fort Collins, CO 80521-4500. Seeds of ICGV 88145 and ICGV 89104 are mainly two-seeded, medium in size (length, 11 mm breadth) with slight constriction, and have tan-colored seeds. The 100-seed weight of ICGV 88145 and 32 g for ICGV 89104. Average oil and protein concentrations are 490 g kg⁻¹ and 199 g kg⁻¹ in ICGV 88145 and 534 g kg⁻¹ and 182 g kg⁻¹ in ICGV 89104.

References and Notes