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 F_3 progenies of F_2 plants were selected and bulked at harvest, whereas for ICGV 89104 the selected phenotypically similar F_2 plants were bulked together at harvest and the first selected bulk was designated as B_1. 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 $\mu g\ kg^{-1}$ seed in J 11 and 35.5 $\mu g\ kg^{-1}$ 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 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 and elliptical light green leaves (2). The number of primary branches ranges from 4 to 5 in ICGV 88145, and from 4 to 6 in ICGV 89104, and the number of secondary branches ranges from 0 to 2 in ICGV 88145 and from 3 to 8 in ICGV 89104. The main axes of these lines are approximately 17 cm in height, with a canopy width of approximately 26 cm.

Pods of ICGV 88145 are mainly two-seeded, medium to large in size (33 mm average length, 13 mm average breadth) with slight to moderate constriction, and prominently beaked. Pods of ICGV 89104 are mainly two-seeded, medium in size (average 23 mm length, 11 mm breadth) with slight constriction, and without beaks. Both lines have tan-colored seeds. The 100-seed mass is 35 g for ICGV 88145 and 32 g for ICGV 89104. Average meat content is 65% in ICGV 88145 and 68% in ICGV 89104. Oil and protein concentrations are 490 $g\ kg^{-1}$ and 199 $g\ kg^{-1}$, respectively, 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 through preharvest seed infection by *A. flavus*. The lines can also be used in germplasm enhancement programs.

Breeder seed of ICGV 88145 and ICGV 89104 is maintained by the Genetic Resources Division at ICRISAT Asia Center. Limited quantities of seed of these lines are available upon request. Seeds of the lines are also deposited with the National Seed Storage Laboratory, 1111 Mason St., Fort Collins, CO 80521-4500.

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