

# REGISTRATION OF GERmplasm

## Registration of Four Jassid-Resistant Peanut Germplasm Lines: ICGV 86252, ICGV 86393, ICGV 86455, and ICGV 86462

Four elite peanut (*Arachis hypogaea* L.) germplasm lines, ICGV 86252 (Reg. no. GP-69, PI 585001), ICGV 86393 (Reg. no. GP-70, PI 585002), ICGV 86455 (Reg. no. GP-71, PI 585003), and ICGV 86462 (Reg. no. GP-72, PI 585004), resistant to jassid (*Empoasca kerri* Pruthi), were developed at the Asia Center of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, India. They were released in 1993 by the ICRISAT Plant Materials Identification Committee.

These lines were developed using the bulk pedigree method from single and three-way crosses made in 1982. Following selection of individual F<sub>2</sub> plants, phenotypically similar plants were harvested in bulk for five generations, at which point the lines were uniform in appearance and resistance to jassids. The pedigrees of these lines are: ICGV 86252, ICGS 7/NC Ac 2214 F<sub>2</sub>-B<sub>1</sub>-B<sub>2</sub>-B<sub>2</sub>-B<sub>3</sub>-B<sub>3</sub>; ICGV 86393, 'J 11'/'M 13'/NC Ac 2214 F<sub>2</sub>-B<sub>1</sub>-B<sub>1</sub>-B<sub>1</sub>-B<sub>2</sub>; ICGV 86455, Kadiri 3/'M 13'/NC Ac 2214 F<sub>2</sub>-B<sub>1</sub>-B<sub>1</sub>-B<sub>1</sub>-B<sub>2</sub>-B<sub>2</sub>; ICGV 86462, ICGS 1/NC Ac 2240 F<sub>2</sub>-B<sub>2</sub>-B<sub>2</sub>-B<sub>3</sub>-B<sub>4</sub>-B<sub>2</sub>.

NC Ac 2214 (ICG 5040) and NC Ac 2240 (ICG 5043) are low-yielding, unadapted virginia runner germplasm lines with deep purple-colored seed and a high degree of resistance to jassids (1). The two lines are both F<sub>5</sub>-derived and share common ancestry, tracing to the same F<sub>2</sub> plant but different F<sub>3</sub> selections. Their pedigrees, summarized from Gregory and Emery's field book records (T.G. Isleib, personal communication), are NC Ac 2214 = Corduroy/Flop F<sub>2</sub>-82-01-B-08:F06 (1960); NC Ac 2240 = Corduroy/Flop F<sub>2</sub>-82-03-B-15:F06 (1960). Corduroy and Flop are two leaf mutants selected from irradiated NC 4 (6), J 11, Kadiri 3, M 13 (PI 366048), and ICGS 1 (PI 478780) are cultivars grown in India; Kadiri 3 and M 13 are selections from the exotic germplasm Robut 33 and NC 13, respectively. J 11 was selected from cross Ah 4218/Ah 4354 (2). ICGS 1 originates from a single-plant selection made in a natural hybrid population of Kadiri 3 (4). ICGS 7 (PI 478786) is a high-yielding breeding line developed from the cross 'TMV 7'/FSB 7-2 at the ICRISAT Asia Center.

ICGV 86252, ICGV 86455, and ICGV 86462 belong to the spanish botanical group (subsp. *fastigiata* Waldron var. *vulgaris* Harz) and ICGV 86393 to the virginia botanical group (subsp. *hypogaea* Krap. & Rig. var. *hypogaea* Gregory et al.). All have a Decumbent 3 growth habit and elliptical dark green leaves (3). The leaves of ICGV 86252 and ICGV 86462 are waxy. The average trichome numbers in these lines range from 2250 to 3780 on leaf midrib and lamina (average of five fully expanded leaves), and from 256 to 356 on 1 cm of leaf margin. The trichome numbers in jassid-resistant sources, NC Ac 2214 and NC Ac 2240, range from 10 860 to 22 387 on leaf midrib and lamina, and from 360 to 612 on 1 cm of leaf margin. By comparison, the jassid-susceptible control 'ICGV 87123' has 754 trichomes on leaf midrib and lamina, and 166 on 1 cm of leaf margin. These elite germplasm lines have predominantly two-seeded pods, with some one-seeded pods. Terminal beaks on the pods are slight or absent; pod constriction is slight to moderate, and dorsal ridges are moderate or

absent. Pod reticulation is slight to moderate in ICGV 86252 and ICGV 86455, smooth to slight in ICGV 86393, and slight in ICGV 86462. The average meat content in these lines ranges from 62 to 69%. They have tan-colored seeds, with 100-seed mass averaging 41 to 50 g, and oil content averaging 46 to 49%. The oil quality of ICGV 86455 and ICGV 86462 (oleic/linoleic fatty acid ratio [O/L ratio] = 1.2–1.3) is better than for the other two lines (O/L ratio = 0.97–0.98).

In a four-season trial at ICRISAT Asia Center, these lines produced 113 to 140% more pod yield than NC Ac 2214, and 238 to 281% more pod yield than NC Ac 2240. The average pod yield was 0.84 t ha<sup>-1</sup> for NC Ac 2214, and 0.53 t ha<sup>-1</sup> for NC Ac 2240 (5). The jassid damage score for these lines, averaged over seven locations and four seasons, ranged from 1.6 to 2.2 (on a scale of 1 to 9, where 1 = highly resistant, 2–3 = resistant, 4–5 = moderately resistant, 6–7 = susceptible, and 8–9 = highly susceptible), compared with 8.0 for the susceptible control Kadiri 3. The jassid damage score of NC Ac 2214 and NC Ac 2240, averaged over four seasons at a single location, was 1.3. These jassid-resistant lines are superior to their jassid-resistant parents in pod yield, meat content, 100-seed mass, and seed color. They can be used as improved germplasm sources of jassid resistance in breeding programs, and can be cultivated in areas endemic to jassid damage.

Limited quantities of seeds of these jassid-resistant lines can be obtained from the Genetic Resources Division, ICRISAT Asia Center. Seeds are also deposited with the National Seed Storage Laboratory, 1111 Mason St., Fort Collins, CO 80521-4500.

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### References and Notes

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