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# Groundnut Elite Germplasm

## ICGV 88145 and ICGV 89104

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- High-yielding, elite breeding lines with resistance to seed infection by *Aspergillus flavus*
- Mature in 110-120 days in the rainy season at ICRISAT Asia Center
- Average shelling turnover 65% in ICGV 88145 and 68% in ICGV 89104
- Average 100-seed mass 35 g for ICGV 88145 and 32 g for ICGV 89104
- Oil content 49% in ICGV 88145 and 53.4% in ICGV 89104
- Protein content 19.9% in ICGV 88145 and 18.2% in ICGV 89104



ICGV 88145



**ICRISAT**

**Plant Material Description no. 52**

International Crops Research Institute for the Semi-Arid Tropics  
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## Purpose of Description

ICGV 88145 and ICGV 89104 are high-yielding, elite breeding lines with high levels of resistance to seed infection by the aflatoxin-producing fungus *Aspergillus flavus*.

## Origin and Development

ICGV 88145 and ICGV 89104 were developed at ICRISAT Asia Center, Patancheru, Andhra Pradesh, India. These lines were bred following the bulk pedigree method from two single crosses involving PI 337409 and FESR 12 for ICGV 88145, and J 11 and U 4-7-5 for ICGV 89104. The crosses were made in the 1981 rainy season for ICGV 88145 and in the 1985 rainy season for ICGV 89104. PI 337409 and J 11 are resistant to seed infection and seed colonization by *A. flavus*. FESR 12 is a rust-resistant line. U 4-7-5 supports only low levels of aflatoxin production. The pedigree of ICGV 88145 is (PI 337409 x FESR 12-P 6-B<sub>1</sub>-B<sub>1</sub>-B<sub>1</sub>-B<sub>1</sub>) F<sub>2</sub>-14-B<sub>1</sub>-B<sub>1</sub>-B<sub>1</sub>-B<sub>1</sub>-B<sub>1</sub>-B<sub>1</sub>-B<sub>1</sub> and that of ICGV 89104 is (J 11 x U 4-7-5) F<sub>2</sub>-B<sub>1</sub>-B<sub>1</sub>-B<sub>1</sub>-B<sub>1</sub>-B<sub>1</sub>-B<sub>1</sub>.

## Performance

ICGV 88145 and ICGV 89104 were evaluated in field trials for seed infection by *A. flavus* in 1991 and 1992 rainy (under rainfed conditions) and in 1990/91, 1991/92, and 1992/93 postrainy (under imposed late-season drought conditions) seasons along with the resistant control cultivar, J 11 and the susceptible cultivar, JL 24. In these five evaluations, the average natural seed infection in ICGV 88145 by *A. flavus* was half of that of J 11 (Table 1). In ICGV 89104 the average seed infection was three fourths of that of J 11. The aflatoxin content in these two lines was zero compared with 2.1 µg kg<sup>-1</sup> seed in J 11 and 35.5 µg kg<sup>-1</sup> seed in

**Table 1. Natural seed infection and aflatoxin production by *Aspergillus flavus* in ICGV 88145, ICGV 89104, and the control cultivars.**

Variety	Seed infection <sup>1</sup> (%)					Mean	Aflatoxin content <sup>2</sup> (µg kg <sup>-1</sup> seed)
	Postrainy season			Rainy season			
	1990/91	1991/92	1992/93	1991	1992		
ICGV 88145	0.7 (3.8) <sup>3</sup>	0.7(3.8)	1.3(6.5)	0.3 (1.9)	0.4 (2.0)	0.7 (4.8)	0.0
ICGV 89104	1.3(6.5)	0.7 (3.8)	1.7 (7.2)	0.7 (3.8)	0.4 (2.2)	1.0(5.7)	0.0
Control							
J 11 (Resistant)	1.3 (6.5)	1.3(6.5)	1.7(7.3)	0.7 (3.8)	1.3(6.5)	1.3 (6.6)	2.1
JL 24 (Susceptible)	12.0 (20.3)	18.7(25.5)	23.3(28.8)	9.7(18.1)	11.0(19.0)	14.9 (22.7)	35.5
SE	±(1.43)	±(1.41)	±(1.40)	±(1.20)	±(1.00)		
Trial mean	(10.8)	(8.5)	(9.0)	(8.6)	(7.2)		
Number of varieties	64	25	25	25	25		
CV(%)	(23)	(29)	(26)	(28)	(23)		

1. Estimated under imposed late-season drought conditions in the postrainy season and under rainfed conditions in the rainy season at ICRISAT Asia Center.

2. Estimate from the 1992 rainy season trial at ICRISAT Asia Center.

3. Figures in parenthesis are are-sine transformed values.

**Table 2. Performance of ICGV 88145, ICGV 89104, and the control cultivar in different seasons and locations.**

Variety	Pod yield (t ha <sup>-1</sup> )	Shelling turnover <sup>1</sup>	100-seed mass <sup>1</sup> (g)	Oil content <sup>2</sup> (%)	Protein content <sup>2</sup> (%)
ICGV 88145	2.17 (14) <sup>3</sup>	65	35	49.0	19.9
ICGV 89104	2.20 (9)	68	32	53.4	18.2
Control					
J 11	1.78 (14) 1.87(9)	64	31	51.6	19.2

1. Average of five trials.

2. Estimate from a bulk sample of 1992 rainy season trial at ICRISAT Asia Center.

3. Figures in parenthesis are number of trials on which mean pod yield is based.

JL 24 in the 1992 rainy season. The average pod yield of ICGV 88145 in 14 trials was 2.17 t ha<sup>-1</sup> (22% more than J 11) and of ICGV 89104 in 9 trials was 2.20 t ha<sup>-1</sup> (18% more than J 11) (Table 2).

## Plant Characters

ICGV 88145 and ICGV 89104 belong to the Spanish botanical group and have erect growth habit, sequential branching, and elliptic-shaped light green leaves. The number of primary branches ranges from 4 to 5 in ICGV 88145 and 4 to 6 in ICGV 89104, and the number of secondary branches from 0 to 2 in ICGV 88145 and 3 to 8 in ICGV 89104. Their main axis is about 17 cm high with a 26-cm broad canopy. The lines mature in 110-120 days in the rainy season at ICRISAT Asia Center, India.

## Pod/Seed Characters

The pods of ICGV 88145 are mainly two-seeded, medium- to large-sized with slight to moderate constriction and prominent beak, and of ICGV 89104 are mainly two-seeded, medium-sized with slight constriction and no beak. Seeds of both lines are tan colored with a 100-seed mass of 35 g for ICGV 88145 and 32 g for ICGV 89104. Average shelling turnover is 65% in ICGV 88145 and 68% in ICGV 89104. Oil and protein contents are 49% and 19.9% in ICGV 88145 and 53.4% and 18.2% in ICGV 89104.



ICGV 89104



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## **Plant Material Descriptions**

from the

**International Crops Research Institute for the Semi-Arid Tropics**

Brief descriptions of crop genotypes identified or developed by ICRISAT, including:

- germplasm accessions with important agronomic or resistance attributes;
- breeding materials, both segregating and stabilized, with unique character combinations;
- cultivars that have been released for cultivation.

These descriptions announce the availability of plant material, primarily for the benefit of the Institute's cooperators. Their purpose is to facilitate the identification of cultivars and breeding lines and to promote their wide utilization. Requests for seed should be addressed to the Director General, ICRISAT, or to appropriate seed suppliers. Materials for research are sent by ICRISAT to cooperators and other users free of charge.