
Groundnut Elite Germplasm ICGV 86031



- A high-yielding line with multiple resistance to and/or tolerance of *Spodoptera*, leaf miner, jassid, and thrips
- Resistant to bud necrosis virus and iron chlorosis
- Insensitive to photoperiod
- Average oil content 52%
- Average shelling turnover 66%
- Matures in 105-110 days in the rainy season in India



ICRISAT

Plant Material Description no. 32

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

ICGV 86031 is a high-yielding improved germplasm line with multiple resistance to and/or tolerance of insect pests (thrips, jassid, *Spodoptera*, and groundnut leaf miner), and bud necrosis disease. It is also resistant to bud necrosis virus, iron chlorosis, and insensitive to photoperiod (Table 1).

Origin and Development

ICGV 86031 was selected following the bulk pedigree method from a cross between F334A-B-14 and NC Ac 2214, made in 1982 at ICRISAT Center, India. Its pedigree is (F334A-B-14 x NC Ac 2214) F₂-B₁-8₃-B₂-B₃-B₂-B₃. F334A-B-14 is a high-yielding, agronomically acceptable breeding line possessing resistance to collar rot (*Diplodia gossypina* Cooke). NC Ac 2214 is resistant to thrips and jassid, but has poor agronomic characters. ICGV 86031 is a high-yielding line with many desirable traits. It can be used as a donor parent in germplasm enhancement programs. It can also be cultivated in areas endemic to *Spodoptera* and/or bud necrosis disease.

Performance

ICGV 86031, together with TMV 2 a commonly grown variety in India, were tested against leaf miner under sprayed and nonsprayed conditions during the 1990/91 postrainy season at ICRISAT Center. ICGV 86031 produced significantly higher pod-yield of 2.1 t ha⁻¹ compared to 0.7 t ha⁻¹ of TMV 2 under nonsprayed conditions. When leaf miner damage was controlled, ICGV 86031 produced 3.7 t ha⁻¹ compared to 2.7 t ha⁻¹ of TMV 2. In a similar trial against *Spodoptera* during the 1986/87 postrainy and 1987 rainy seasons, ICGV 86031 significantly outyielded TMV 2, when *Spodoptera* larvae were released at the seedling, flowering, and pod-filling stages, though no significant differences in percentage defoliation were observed between these two genotypes. Mean pod-yield advantages were 150% at the seedling, 76% at flowering, and 57% at pod-filling stages. The pod-yield of TMV 2 was 0.72 t ha⁻¹ at the seedling, 1.48 t ha⁻¹ at flowering, and 2.27 t ha⁻¹ at pod-filling stages.

Plant Characters

ICGV 86031, a Spanish type, has an erect growth habit with sequential flowering, and elliptic to obovate, dark green waxy leaves. It has 4–8 primary, and 0-2 secondary branches. Its main axis is 30 cm high with a 37-cm broad canopy. It matures in 105-110 days in the rainy season at ICRISAT Center, India.

Pod/Seed Characters

ICGV 86031 has mainly 2-1 seeded medium-sized pods with none to slight beak, none to slight constriction, and slight to moderate reticulation and ridges. It has a shelling turnover of 66%. The seeds are rose tan with a 100-seed mass of 39 g. Average oil content is 52%, and protein content 20%.

Table 1. Comparative evaluation of ICGV 86031 and other varieties for various biotic and abiotic stresses, ICRISSAT Center.

Variety	<i>Spodoptera litura</i> ¹				Thrips		Bud necrosis virus (BNV) concentration by ELISA				Iron ⁶ chlorosis (%)	
	Defoliation (%)		Mortality at 25°C (%)	damaged leaflets (%) ²	Jassid damage score ²	Leaf miner score ²	Inoculated leaves ³		Systemic leaves ⁴			Bud necrosis disease (BND) ⁵ incidence (%)
	Choice	No choice					1/10	1/100	1/10	1/100		
ICGV 86031	18 (24) ⁷	30 (32)	60 (51)	0.9	3.3	6.0	0.257 ⁸	0.012	0.024	0.030	15.0	1.5
TMV 2	56 (49)	58 (50)	37 (37)	2.4	6.3	8.3	- ⁹	-	-	-	-	-
JL 24	-	-	-	-	-	-	0.704	0.412	0.691	0.330	60.0	-
ICG 8720	-	-	-	-	-	-	-	-	-	-	-	4.1
SE	(±4.2)	(±5.5)	±3.4 (1.9)	±0.27	±0.41	±0.44	-	-	-	-	-	±0.22
CV(%)	(26.2)	(22.5)	11.6 (7.5)	30.0	14	10	-	-	-	-	-	17

1. Defoliation percentage was recorded under field conditions during the 1987 rainy season, and percentage mortality was determined in the laboratory during 1986.
 2. Leaf miner and jassid damage were scored in the field under natural incidence during the 1988/89 post-rainy season on a 1-9 scale, where 1 = highly resistant, 2-3 = resistant, 4-5 = moderately resistant, 6-7 = susceptible, and 8-9 = highly susceptible. Thrips injury was measured as percentage of leaflets damaged during the 1989/90 post-rainy season.
 3. ELISA test was performed on pot-grown plants under greenhouse conditions 2 weeks after inoculation. JL 24 showed characteristic BNV symptoms whereas, ICGV 86031 showed chlorotic and necrotic ring spots.
 4. The youngest nonfolded leaflets were used. Characteristic systemic BNV symptoms were observed on JL 24 and no visible symptoms on ICGV 86031.
 5. Mean; BND incidence of four rainy seasons from field screening (1985-90).
 6. Top fully expanded leaf on main stem were screened for iron chlorosis under field conditions on a 1-5 scale, where 1 = completely green leaves, 2 = about 25% yellowing of leaf, 3 = about 50% yellowing of leaf, and 4 = about 50-75% yellowing of leaf, and 5 = complete yellow-white with brown spot.
 7. Figures in parentheses are arc-sine transformed values.
 8. Mean of three replications; Absorption at 405 nm (values deducted from healthy plant controls).
 9. - = Not tested.



Plant Material Descriptions from ICRISAT

Leaflets in this series provide 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; and
- 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 lines and promote their wide utilization. Requests should be addressed to the Director General, ICRISAT, or to appropriate seed suppliers. Stocks for research use issued by ICRISAT are sent to cooperators and other users free of charge.

ICRISAT is a nonprofit, scientific, research and training institute receiving support from donors through the Consultative Group on International Agricultural Research. Its major mandate is to serve as a world center for the improvement of grain yield and quality of sorghum, millet, chickpea, pigeonpea, and groundnut, and to act as a world repository for the genetic resources of these crops. The plant materials announced in these leaflets are end-products of this work, which is aimed at enhancing the agricultural productivity of resource-poor farmers throughout the semi-arid tropics.