

PN-ABR-332

Pigeonpea Variety ICPL 87119

- Resistant to fusarium wilt and sterility mosaic
- High yielding
- Wide adaptation
- Large seed



ICRISAT

Plant Material Description no. 43

International Crops Research Institute for the Semi-Arid Tropics
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ICPL 87119 is a high-yielding pigeonpea variety, resistant to fusarium wilt and sterility mosaic diseases, identified for release in the central and south zones of India in 1992.

Origin and Development

ICPL 87119 was developed by the bulk-pedigree method from a cross ICP 1-6-W3-W1 × C 11. The F₂ to F₆ generations of this cross were advanced in the wilt-screening nursery where one pod from each of the resistant plants was bulked to reconstitute the population. Wilt-resistant single-plant selections were made in the F₇ generation, and one selection (ICPX 78143-WB-WB-WB-WB-W27-B) was found most promising because of its resistance to fusarium wilt and sterility mosaic. It was evaluated in yield trials from the 1986/87 to the 1988/89 cropping seasons at ICRISAT Center and other Indian locations. During the 1989/90 cropping season, it was evaluated as an entry in the Advanced Coordinated Trial 2 (ACT 2) of the All India Coordinated Pulses Improvement Project (AICPIP) in the central and south zones of India.

Plant Characters

ICPL 87119 is a medium-duration variety with an indeterminate growth habit. Its stem is green and its flowers are yellow, with red streaks on the back of the standard petal. The pods are green with maroon streaks. Its plant height ranges from 140 to 227 cm. Its time to 50% flowering ranges between 110 and 125 days and it takes 160 to 202 days for 75% maturity.

Seed Characters

The seeds of ICPL 87119 are brown and oval with a 100-seed mass ranging from 10.2 to 11.2 g. The mean *dha1* protein content in ICPL 87119 seeds is 21.2% compared with 22.2% in seeds of the control cultivar C 11. A taste panel of 10 members at ICRISAT Center found ICPL 87119 to be generally acceptable and rated it high in general acceptance (3.3 on a 1-4 scale, where 1 = unacceptable, and 4 = excellent) in comparison with the control cultivars C 11 (2.6) and BDN 1 (3.1).

Performance

The yield performance of ICPL 87119 was evaluated at ICRISAT Center and other Indian locations in the Medium-duration Pigeonpea Advanced Lines Yield Trial (MPAY) during the 1987/88 cropping season. ICPL 87119 was entered in the ACT 2 trial of AICPIP in the 1989/90 cropping season because of its superior performance. It was tested in the central and south zones of India between the 1989/90 and the 1991/92 cropping seasons. In the central zone, the weighted mean seed yield of ICPL 87119 over 16 locations was 20% higher (1.51 t ha⁻¹) than that of the control variety C 11 (1.26 t ha⁻¹). Similarly, in the south zone the weighted mean seed yield over five locations was 1.54 t ha⁻¹ compared with 1.28 t ha⁻¹ of the control C 11 (Table 1). This also represents a 20% yield advantage over the control C 11.

ICPL 87119 was evaluated for fusarium wilt and sterility mosaic resistance in a combined wilt and sterility mosaic screening nursery at ICRISAT Center between the 1989/90 and 1991/92 cropping seasons. The mean wilt incidence for ICPL 87119 was 2% compared with 56% in the control C 11 and 97% in the wilt-susceptible control ICP 2376 (Table 2). Similarly it had about 2% sterility mosaic incidence compared with 100% susceptibility to the diseases of both controls (C 11 and ICP 8863). It has also shown resistance to both diseases at other endemic areas of Karnataka, Maharashtra, and Gujarat states in India.

On the basis of its resistance to wilt and sterility mosaic, and its high yield at several locations, ICPL 87119 was identified for release as a cultivar in the central and south zones of India by the All India Kharif Pulses Workshop held at the Rajendra Agricultural University, Dholi, Bihar, in May 1992. It has also been recommended as a donor parent for fusarium wilt and sterility mosaic resistance at the national level.

This is the first known medium-duration variety that combines resistance to the two most devastating pigeonpea diseases—fusarium wilt and sterility mosaic.

Table 1. Mean yield performance of ICPL 87119 in the All India Coordinated Pulses Improvement Project (AICPIP) ACT 2, 1989/90 to 1991/92 cropping seasons.

Zone/genotype	Cropping season			Weighted mean	Superiority over the control (%)
	1989/90	1990/91	1991/92		
<i>Central Zone</i>					
	No. of locations				
	6	5	5	16	
	Seed yield (t ha ⁻¹)				
ICPL 87119	1.34(1) ¹	2.04(1)	1.20(4)	1.51	20.1
Control (C 11)	0.85(19)	2.03(2)	0.98(8)	1.26	
<i>South Zone</i>					
	No. of locations				
	2	2	1	5	
	Seed yield (t ha ⁻¹)				
ICPL 87119	1.61(2)	1.20(3)	2.08(1)	1.54	20.3
Control (C 11)	1.52(3)	0.92(7)	1.51(6)	1.28	

1. Figures in parentheses indicate ranks.

Table 2. Reaction of pigeonpea line ICPL 87119 to fusarium wilt and sterility mosaic compared with the reactions of three controls in the screening nursery, ICRISAT Center, 1989/90 to 1991/92 cropping seasons.

Season	Fusarium wilt incidence (%)			Sterility mosaic incidence (%)		
	ICPL 87119	C 11	ICP 2376	ICPL 87119	C 11	ICP 8863
1989 90	4	43	90	2	100	100
1990 91	0	50	100	3	100	100
1991 92	2	76	100	2	100	100
Mean	2.0	56.3	96.6	2.3	100.0	100.0

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 to 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. It serves as a world center for the improvement of grain yield and quality of sorghum, pearl millet, finger millet, chickpea, pigeonpea, and groundnut, and acts 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.

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