

Transformation results were confirmed with digoxigenin labelling of PCR-amplified NPT II and GUS genes. The use of young regenerated plantlets as explants for *Agrobacterium rhizogenes* has been demonstrated for the first time.

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# Pigeonpea

## Breeding/Genetics

### IPH 732 – The First Pigeonpea Hybrid for Tamil Nadu, India

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Among the pulse crops grown in Tamil Nadu, pigeonpea is the second largest in terms of area (160 000 ha) after black gram (330 000 ha). Pigeonpea is cultivated in five out of seven agroclimatic zones of this state, and covers 41% of the pulses cropped area in the northeastern zone.

In Tamil Nadu, the productivity levels of pulses in general and pigeonpea in particular have remained static over the last two decades. In order to break this yield plateau, and to incorporate disease/pest resistance, new approaches like heterosis breeding and distant hybridization were contemplated. With the identification of stable genetic male sterility a research program on hybrid pigeonpea started at ICRISAT Asia Center in 1975, and the world's first pigeonpea hybrid ICPH 8 was released for cultivation in 1991 (Saxena et al. 1992). Under the heterosis breeding program several experimental hybrids were produced at the Tamil Nadu Agricultural University (TNAU) involving the available male sterile lines (ms T 21, ms Prabhat DT, ms Co 5) and chosen pollen parents. Besides synthesizing experimental hybrids, promising hybrids from different centers of the country were also evaluated. An ICRISAT pigeonpea hybrid IPH 732 performed well consistently over years in the station trials. Based on the performance of this hybrid in station trials it was evaluated in multilocation trials (MLT) at different research stations of the University in 1990 and 1991, and in the Adaptive Research Trials (ART) in 1992.

In ART, IPH 732 gave an average yield of 0.92 t ha<sup>-1</sup> which was 7.1% higher than the control hybrid ICPH 8, 31.1% higher than variety VBN 1, and 36.5% higher than variety ICPL 87 (Table 1). In the overall performance over 46 trials including station trials, MLT,

ART, and National Trials, the hybrid IPH 732 gave a mean yield of 0.94 t ha<sup>-1</sup>, an increase of 49% over hybrid ICPH 8, and 41% over variety ICPL 87 (Table 2).

The parentage of hybrid IPH 732 is ms T 21 x ICPL 87109. This hybrid is indeterminate in growth habit, matures in 115–120 days, and is suitable for both irrigated and rainfed situations as a pure crop. It has good cooking quality, and has 22.3% protein. In 1994, IPH 732 was released for cultivation in Tamil Nadu as COH 1. This was the first pigeonpea hybrid released in Tamil Nadu.

It is hoped that this hybrid will fulfill a long-felt need of farmers of Tamil Nadu, and will help in increasing the overall productivity of pigeonpea in the state.

#### Reference

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**Table 1. Yield of IPH 732 in adaptive research trials in Tamil Nadu, India, rainy season 1992.**

District	Number of locations	Yield (t ha <sup>-1</sup> )			
		IPH 732	ICPH 8 (control)	VBN 1 (control)	ICPL 87 (control)
Nellai-Kattabomman	2	1.82	1.59	1.79	1.50
Periyar	4	0.73	0.76	0.66	0.89
Coimbatore	2	1.61	1.70	0.88	0.92
Salem	5	1.18	0.90	0.67	0.53
North Arcot Ambedkar <sup>1</sup>	2	0.28	0.24	0.30	0.21
Dharmapuri	2	0.40	0.43	0.34	0.30
Tiruchirapalli	2	0.46	0.42	0.31	0.39
Mean		0.92	0.89	0.71	0.68
Superiority over control (%)		7.1	31.1	36.5	

1. Yield loss because of flower drop during heavy rains.

**Table 2. Yield of IPH 732 in different trials in Tamil Nadu, India.**

Trial	Year	Number of trials	Yield (t ha <sup>-1</sup> )				
			IPH 732	ICPH 8 (control)	Co5 (control)	ICPL 87 (control)	VBN 1 (control)
Cooperative Station	1989	1	1.48				
	1990	1	0.44	0.37	0.35		
	1991	1	1.13	0.87	0.96		
	1992	1	1.16	0.91	1.05		
Multilocation	1990	3	0.26 <sup>1</sup>	0.22 <sup>1</sup>	0.18 <sup>1</sup>	0.18 <sup>1</sup>	
	1990 <sup>2</sup>	2	1.01	0.53	0.88	0.50	
	1991	7	0.67		0.56	0.48	
National	1990	10	1.13				
On-farm	1991	1	1.15		0.90	1.07	
Adaptive	1992	19	0.92	0.86		0.68	0.71
Total/Mean		46	0.94	0.63	0.70	0.67	0.71
Superiority over control (%)				49.0	34.3	41.0	33.0

1. Yield loss because of severe pod-borer attack.

2. Postrainy season.