

Table 4. Quality analysis of *capsularis* jute varieties

Variety	Quality parameters		
	Root content (%)	Fibre fineness (Tex)	Fibre tenacity (g/tex)
KTC-1	10.00	1.20	15.50
JRC 7447	48.00	2.10	14.40
JRC 212	25.00	1.30	13.10
JRC 321	10.00	1.30	14.30

7447, JRC 212 and JRC 321 were 7.40, 13.82 and 15.13 per cent respectively.

Under ART conducted at farmers field in different Jute growing districts of Bihar during 1991-1993 along with national checks, the fibre yield of new culture ranged between 2715 and 3294 kg/ha (Table 3). It recorded a mean fibre yield of 3025 kg/ha as against 2744, 2552 and 2425 kg/ha recorded by JRC 7447, JRC 212 and JRC 321 respectively. The increase in fibre yield over JRC 7447, JRC 212 and 321 were 10.24, 18.53 and 24.74 per cent respectively. In fibre quality analysis, the selection KTC-1 recorded less root content, more fineness and high fibre tenacity as compared to the national checks (Table 4). Besides this culture is moderately resistant to major pests like yellow mite, *Apion*, Bihar hairy caterpillar and

root rot and stem rot diseases in comparison to the national checks.

Based on the above desirable features, the new culture KTC-1 was released as Rajendra Sada Pat-1 for general cultivation in Jute growing tracts of Bihar by 1994 *Kharif* Research Council Meeting of Rajendra Agricultural University, Bihar, Pusa. The morphological and fibre characteristics of Rajendra Sada Pat-1 are as follows:

Plant height (cm)	360-390
Basal diameter (cm)	2.0-2.3
Pigmentation grade	'0' i.e. Full green type
No. of days taken to 50% flowering	125-130
Reactions to major pests and diseases	: Moderately resistant
Suitable sowing time	1st week March to 1st week April
Yield potential	30-35 Q/ha in 125-130 days
Fibre fineness	1.20 (Tex)
Fibre tenacity	15.50 (g/tex)
Root content	10.00%

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CO H 1: THE FIRST PIGEONPEA HYBRID FOR TAMIL NADU

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ABSTRACT

The pigeonpea hybrid Co H 1 was developed using genetic male sterile line ms T 21 as female parent and ICPL 87109 as male parent. This short duration hybrid matures in 115 to 120 days and is photo insensitive. It is suitable for both irrigated and rainfed conditions. It gives an average grain yield of 936 kg/ha. The *dhal* has got higher protein content of 22.3 per cent with good cooking quality and over all acceptability.

KEY WORDS : Genetic male sterility, Co H 1, Hybrid pigeonpea, Tamil Nadu.

Grain legumes are the important source of protein for our people who are mostly vegetarians. The economy of the Indian people can't afford the costly animal protein as an alternative source for their daily consumption. The production and productivity of pulses in general has remained almost static for past two decades. Among the

P. occupiens second place in area, production and productivity in India. In order to break the yield plateau, heterosis breeding was attempted. Having observed the appreciable degree of heterosis for yield and other attributes and taking advantage of the high degree of natural out crossing in pigeonpea (0-70%), synthesis of hybrids was taken up, which

Table 1. Overall performance of the hybrid Co H 1

Trial	Season/Year	Yield (kg/ha)				
		Co H 1	ICPH 8	Co 5	ICPL 87	Vamban 1
Station Trial	K'90	443	373	347	-	-
Station Trial	K'91	1125	869	959	-	-
Station Trial	K'92	1164	909	1050	1095	-
Multilocation trial (3 locations)	K'90	264	220	180	181	-
Multilocation trial (2 locations)	R'90	1014	527	881	499	-
Multilocation trial (7 locations)	K'91	665	-	559	475	-
Co-op Hybrid pigeonpea trial	K'89	1482	-	-	-	-
National trials (10 centres)	K'90	1125	-	-	-	-
Adaptive Research Trials (20 locations)	K'92	924	863	-	677	705
OFT at Timmampalayam	K'91	1151	-	904	1056	-
Mean		936	627	697	666	705

K : Kharif; R : Rabi; OFT : On-farm trials

Table 2. Reaction of Co H1 to pests and diseases

Hybrid/Entry	Pest score		Disease score	
	Pod borer (%)	Pod fly (%)	Root rot (%)	Sterility mosaic (%)
Co H 1	32.8	13.5	57.1	41.7
ICPH 8 (Check)	36.5	15.3	Not tested	48.0
Co 5 (Check)	35.3	19.6	43.5	96.0

pigeonpea hybrid Co H 1. This short duration hybrid was the first to be released by a State Agricultural University and the second in the world, the first being ICPH 8 from ICRISAT, Patancheru, Hyderabad.

MATERIALS AND METHODS

The female parent of this hybrid, which is a genetic male sterile line *viz.*, ms T 21 and the pollen parent ICPL 87109 were sown in the ratio of 4:1 and the seed production was taken up. The performance was tested in station trials (ST) during *kharif* 1990. It was tested under multilocation trials (MLT) during *kharif* 1990 and *kharif* 1991. As the performance of this hybrid was good, it was promoted to adaptive research trial (ART) stage and was tested in farmers field during *kharif* 1992.

Table 3. Protein content in the hybrid and parents

Hybrid/Parent	Protein (%)	Methionine (Mg/100 mg protein)
Co H 1	22.31	0.98
ms T 21 (Ovule parent)	19.69	1.05
ICPL 87109 (Pollen parent)	19.03	1.01

RESULTS AND DISCUSSION

The ST conducted during 1990-92 reveal that this hybrid out yielded the check hybrid ICPH 8 by recording 27 per cent higher yield. In the MLT conducted during *rabi* 90 it has recorded a mean yield of 1,014 kg/ha, which was 92 per cent increase over the hybrid ICPH. 8. During *kharif* 91 MLT this hybrid has recorded 19 per cent and 40 per cent increase yield over CO 5 and ICPL 87 respectively (Table 1). In the overall performance, the hybrid COH 1 recorded a mean yield of 936 kg/ha, which is 49 per cent increase over the hybrid ICPH 8, 34 per cent over variety Co 5, 41 per cent over variety ICPL 87 and 33 per cent over Vamban 1. This hybrid is found to be less affected by pod borer and pod fly when compared to checks. It is also found to be tolerant to sterility mosaic disease (Table 2).

Regarding protein content, it has got higher protein (22.3 per cent) than the parents (Table 3). In the organoleptic traits and cooking quality, it is found to be superior to its parents (Table 4).

Table 4. Organoleptic traits and cooking quality of hybrid and parents

Character	Co H 1	ms T 21	ICPL 87109
Mean score in organoleptic traits	6.1	6.0	5.2
Ranking	I	II	III
Cooking time (minutes)	14	13	18
Increase in weight (g)	70	65	60
Increase in volume (ml)	83	73	74

This hybrid is indeterminate in habit, grows upto 105 cm height with 10-12 branches. The flower colour is yellow with red to dark red veins.

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The pods are 4.5 to 7.5 cm long with 4 to 6 seeds. The seeds are light brown in colour and 100 seeds weigh about 9.8 to 10.7 g. This hybrid released during 1994 as Co H 1, will fulfill the longfelt need of the farmers of Tamil Nadu.

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RESEARCH NOTES

EMBRYO RESCUE IN INTERSPECIFIC HYBRIDS OF COTTON

Interspecific hybridisation involving wild and cultivated species of *Gossypium* is gaining importance to improve the quality of cotton fibre as well as to breed varieties resistant to pests and diseases through introgression. Some of the wild species are known to possess such desirable characters but cross incompatibility between certain species of *Gossypium* is an obstacle frequently encountered. Plant tissue culture technique is a potential tool for breeding new varieties at a comparatively shorter time. Hybrids between diploid and tetraploid *Gossypium* species are useful for introducing improved agronomic and quality traits into commercial cotton. The present paper deals with interspecific hybridization and embryo rescue.

The flower buds of appropriate size in the field grown plants of *Gossypium hirsutum* (MCU 9) were emasculated and pollinated with pollen from *G. raimondii*, *G. armourianum* and *G. harknessii* respectively. Emasculatation and pollination were carried out at the Cotton Breeding Station, Tamil Nadu Agricultural University, Coimbatore during the year 1985. *In vitro* culturing of the embryos was

done at Tissue Culture Unit, School of Genetics, Tamil Nadu Agricultural University, Coimbatore. Naphthalene acetic acid (0.1 %) was applied at the peduncle base of the pollinated flowers (Table 1) to prevent early shedding of capsule.

The developing bolls were harvested after 3 days of anthesis for ovule culture and after 15 days of anthesis for embryo culture. The embryos were excised aseptically in a laminar flow chamber and cultured on Murashige and Skoog's agar medium supplemented with casein hydrolysate, Indole acetic acid, Naphthalene acetic acid, Benzylaminopurine and Kinetin. The cultures were incubated in darkness for 3 days and then subjected to light and dark cycle of 14/10 h a day. All the experiments were conducted at a temperature of $25 \pm 2^\circ\text{C}$, relative humidity of 65-70 per cent and light intensity of 2000 lux (Table 2).

MS basal with ki 0.5 mg + IAA 1.5 mg/l was found to be the best for better root and shoot growth of the seedlings from embryo (Gill and Bajaj, 1984). In 2,4-D, the embryo either not

Table 1. Effect of NAA on boll retention in incompatible crosses of *Gossypium*

Crosses	With NAA			Without NAA		
	Flowers crossed (No.)	Bolls retained (No.)	Bolls retained (%)	Flowers crossed (No.)	Bolls retained (No.)	Bolls retained (%)
<i>Gossypium hirsutum</i> x <i>G. raimondii</i>	140	60	43	140	2	1.4
<i>G. hirsutum</i> x <i>G. harknessii</i>	160	42	26	160	1	0.6
<i>G. hirsutum</i> x <i>G. armourianum</i>	60	22	37	60	1	1.7