

ageing process without loss of membrane integrity and deterioration of proteins. The extension of shelf life coupled with the retardation of textural softening should translate into decreased injury and losses during handling transport and minimise the cost of low temperature storage.

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VAMBAN-1 - A SHORT DURATION, HIGH YIELDING RED GRAM

K.S.JEHANGIR, D.PACKIARAJ, K.THIAGARAJAN, A.THIAGARAJAN, N.RAMAMOORTHY and R.RATHINASAMY.

National Pulses Research Centre, Tamil Nadu Agricultural University, Vamban 622 009.

ABSTRACT

Vamban-1 short duration, high yielding red gram is a double cross (Prabath x Hy 3A) x (T₂₁ x 102) derivative tested widely both under rainfed and irrigated conditions in Tamil Nadu and other states under Co-ordinated research programme. It is suited for intercropping with groundnut both under rainfed and irrigated conditions in all seasons. The plant is 80-90 cm tall with determinate growth habit. Its maturity ranged from 95-100 days and could be harvested along with groundnut. This cultivar recorded an yield of 840 kg/ha under rainfed condition. Under all India Co-ordinated trials, it out yielded UPAS 120 by seven per cent.

Red gram is an important pulse crop grown in Tamil Nadu mostly for grain purpose as it is widely used in vegetarian diet. The productivity of red gram could be increased considerably by growing short duration red gram as intercrop in groundnut growing areas in all seasons without reducing the area and productivity of groundnut. In Pudukkottai district, around Alangudi, Karambakudi and Keeranur taluks, growing red gram both under rainfed and irrigated crop as intercrop in groundnut is being practised. A culture called *Kurivai thuvurai* with a duration of 105-110 days, was in cultivation. Since this practice has been discontinued due to low yield and impurity of the erstwhile variety, farmers of this tract have been demanding a variety for simultaneous harvest along with groundnut both under rainfed and irrigated conditions with high yield. So after concerted efforts, a cultivar *Vamban-1* with and yield potential of 840 kg/ha as pure and 350-400 kg/ha as intercrop with groundnut under rainfed situation has been evolved and released for general cultivation in 1992.

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MATERIALS AND METHODS

Double cross was effected between four popular varieties (Prabath x Hy 3A) x (T₂₁ x 102) of central and north peninsular area and a segregant (A3-1) was isolated in 1985 to satisfy the above needs. This isolate was evaluated under station trials from 1986 and multifocation trial in 1987 *khariff* and tested in farmers' holdings since 1987 to 1990 *kharif* as culture VR1 under rainfed condition in pudukkottai district along with ICPL-87 and UPAS 120.

RESULTS AND DISCUSSION

Studies conducted both under rainfed and irrigated conditions during 1986-89 over two seasons, *Vamban-1* recorded higher yield than all the standard varieties. The grain yield under rainfed cultivation ranged from 587 to 1100 kg/ha with a mean of 850 kg/ha. The increase over the two standard varieties ranged from 7 to 100 per cent. Under irrigated condition, in intercropping trial,

Table 1. Overall performance of *Vamban-1*

Trials	Trials (No)	Mean yield (kg/ha)		
		VBN 1	ICPL 87	UPAS 120
Station trials (1986-1989)	4	857	581	650
Multilocation trials	3	806	590	587
On-farm trials	18	735	648	622
Mean		799	606	620
Irrigated intercropping trial (1987 summer)	5	384	390	339
All India trials (1987 <i>Kharif</i>)	3	938	-	876
Overall mean		707	498	612

Table 2. Screening for sterility mosaic virus

Year	Season	VBN 1	ICPL 87	UPAS 120
1986	<i>Kharif</i>	59.6	--	92.3
1987	<i>Kharif</i>	2.9	72.9	65.7
1988	<i>Kharif</i>	9.4	--	10.0
	Mean incidence	23.9	72.9	56.0
Artificial condition		70.2	80.6	80.2

Table 3. Screening for podborer and podfly incidence

Year	Season	Pests	VBN 1	ICPL 87	UPAS 120
1988	<i>Kharif</i>	Podborer (%)	27.0	26.0	20.0
		Podfly (%)	11.3	9.0	7.0
1989	<i>Kharif</i>	Podborer (%)	14.4	40.8	15.6
		Podfly (%)	6.3	7.9	8.0

Table 4. Qualitative analysis of VBN-1 red gram.

Variety	Shelling	Protein content	Methionine mg/100 mg of Protein
VBN - 1	76.5	18.88	1.23
ICPL - 87	75.5	17.58	1.32
UPAS - 120	75.3	19.27	1.04

this variety recorded the yield range of 194 to 578 with a mean of 385 kg/ha (Table 1). *Vamban-1* was tested in southern zone under All India Co-ordinated Pulses Improvement Project with UPAS 120 during 1987 *Kharif* and it yielded 940 kg/ha, out yielding UPAS 120 by 7 per cent. The

Table 5. Morphological characters of VBN-1

Plant height	- 80-90 cm
Habit	- Erect and determinate
Branching	- 4-5 branches
Pigmentation	- Green
Leaves	- Trifoliate, ovate, Green
Flower	- Yellow with few streaks
Inflorescence	- Axillary raceme, oriented towards top
Days to 50% bloom	- 70
Days to maturity	- 95-100
Pods	- Green and purple
Pod Length	- 4 cm
No. of seeds/pod	- 4
Seed	- Medium and square
Seed colour	- Brown
100 grain weight	- 67 grams

over all mean yield of this variety was 800 kg/ha as a purecrop which is 32 per cent more than ICPL 87 and 29 per cent more than UPAS 120.

This variety evaded the sterility mosaic disease when compared to checks (Table 2) and was susceptible to pod borers and pod fly (Table 3). This could be overcome by proper plant protection measure. Regarding the protein and methionine content, it is on par with UPAS 120 and ICPL 87 (Table 4). The cooking flavour of this cultivar is acceptable to vegetarian meals. It grows to a height of 80-90 cm producing 4-5 branches with axillary racemes oriented towards top (Table 5). The semi-erect nature of its phenotype avoids shading to main crop. Since the maturity period (95-100 days) is 10 - 20 days earlier than the early ruling varieties, it is amenable for simultaneous harvest with main crops, thus the field for the next crop. The medium sized, square and brown coloured grains are highly acceptable to the consumers. The cooking range of *dhal* also does not require further grinding to improve consistency of *sambar* and *curry*. In view of its outstanding performance, it has been released for general cultivation as *Vamban-1*. This will bring additional production of red gram as inter - and pure irrigated and rainfed crops.

