

Research Article**Farmers' Participatory Varietal Selection in Groundnut: A Case Study from Tamilnadu, India****P.Vindhiyavarman, N.Manivannan, S.N Nigam and V.Muralidharan****Abstract:**

Seven Virginia bunch groundnut genotypes viz., VG 9902, ICGV 86325, ICGV 96217, ICGV 97115, ICGV 87846, ICGV 98369 and ICGV 98370 were evaluated in nine villages as mother and baby trials with local check. A detailed score chart was provided to farmers for ranking the genotypes. ICGV 87846 was significantly superior to all other genotypes for all the traits. A little early and synchronous flowering habit of ICGV 87846 may be the reason to escape the early drought. The produce of all the genotypes were exposed to the local groundnut traders for evaluation. ICGV 87846 was the most preferred by them due to its superior pod and kernel traits. The basic seeds of the farmers' and traders' preferred genotype ICGV 87846 were provided to the farmers to motivate the informal seed production systems. Hence it is evident that in the participatory breeding, new genotypes reach the release phase much faster than in conventional breeding and are better suited to farmers needs.

Introduction

Conventional plant breeding has proved to be more beneficial to farmers in high potential environments or to those who can profitably modify their environment to suit new cultivars, than to the poorest farmers who cannot afford to modify their environment through the application of additional inputs and cannot face the risk due to the replacement of their traditional well known and reliable varieties. As a consequence, low yields, crop failures and eventually poverty still affect a large proportion of humanity. Farmer's Participatory Varietal Selection is a way to overcome the limitations of conventional breeding by offering farmers the possibility to choose, in their own environment, the varieties that better suit their needs and conditions (Ceccarelli and Grando, 2007).

In Tamilnadu, Virginia bunch groundnut cultivation still exists in only one tract comprising Namakkal and parts of Salem District with an area of 35,000 ha. Very old

variety like TMV 1 is grown in different local names and only during the Kharif seasons. The farmers save their own seeds over years and hence the seed replacement is practically nil (Sivakumar and Vindhiyavarman, 1998).

With a view to introduce new varieties for that tract, a Farmers' Participatory Varietal Selection (FPVS) programme was implemented during Kharif 2008 by TNAU and ICRISAT, Hyderabad and the results are presented.

Materials and Methods

During Kharif 2008 season, seven Virginia bunch groundnut genotypes viz., VG 9902, ICGV 86325, ICGV 96217, ICGV 97115, ICGV 87846, ICGV 98369 and ICGV 98370 were selected for the study. For conducting the farmers' participatory trials, three Taluks of Namakkal district, viz., Thiruchengodu, Elachipalayam and Paramathi were selected. In each taluk three villages were selected. In each village, three mother trials and eight baby trials were conducted. The mother trial consisted of all the seven test genotypes and local check. Whereas, the baby trials consisted of two test genotypes and local check. The plot size of mother trial was 50 m² and that of

baby trail was 100 m². A detailed score chart was provided to the farmers for ranking the genotypes. Biometrical observations were also recorded by the breeders. The yield data were subjected to statistical scrutiny and the results are presented.

Results and Discussion:

The dry pod yields recorded in nine villages are presented in Table 1. ICGV 87846 was significantly superior to all other genotypes. It had recorded a mean pod yield of 1603 kg/ha as compared to 869 kg/ha by the local check. The superiority of this genotype over the other genotypes was recorded in all the villages. ICGV 87846 was developed at ICRISAT, Hyderabad. It is a derivative of the cross CS 9 (ICGV 88241) x ICGS 5 (ICGV 87121). It is a Virginia bunch type maturing in 125-130 days. A little early and synchronous flowering habit of ICGV 87846 may be the reasons to escape the early drought prevailed at Namakkal district.

A detailed score chart was provided in the regional language Tamil to the farmers and the results are furnished in Table 2. ICGV 87846 recorded the most preferred category for all the traits, where the comparisons were made.

The mean of biometrical observations recorded in FPV trials are presented in Table 3. The results revealed that ICGV 87846 is early to flower and the number of pods per plant is also high in that genotype. Besides the pod and haulms yield, the shelling outturn, hundred kernel weight and sound mature kernel percentage were also high in ICGV 87846. All these data were coincided with the visual ratings by the farmers. Hence, the farmers selected ICGV 87846 in the first season of evaluation itself.

The produces of the FPV trials were exposed to the 24 local traders for relative scoring in respect of pod and kernel characters. The mean data are presented in Table 4. ICGV 87846 along with ICGV 86325 were the most preferred for all the traits scored.

All the farmers utilized the trial produce of ICGV 87846 for multiplication. In groundnut the spread of the new varieties takes much longer time as compared to the other crops, due to rainfed nature of the crop, besides, high seed rate and low seed multiplication ratio. Hence, an informal seed system was implemented. Accordingly ten kg of seeds of ICGV 87846 was provided to 320 farmers of the nine villages and within one season each farmer had enough seeds to cover one acre of land. Hence, farmers' participatory varietal selection had several advantages. New varieties reach the release phase much faster than in conventional breeding and are better suited to farmers' needs.

References:

- Ceccarelli, S., Grando, S. 2007. Decentralized participatory plant breeding: an example of demand driven research. *Euphytica*, 155: 349 -360.
- Sivakumar and Vindhayarman, 1998. Status of spreading groundnut in Tamil Nadu. *Madras Agric. J.* 85: 452.

Table 1. Performance of Virginia Bunch Genotypes in FPV trials in Namakkal District during Kharif 2008 season

S. No.	Name of the village	No. of trials M+B	Dry pod yield (kg/ha)							Local check TMV 1
			VG 9902	ICGV 86325	ICGV 96217	ICGV 97115	ICGV 87846	ICGV 98369	ICGV 98370	
1	Goundampalayam	3+8	958	960	960	1113	1178	1038	975	870
2	Elanagar	3+8	1013	1025	1043	1165	1123	1113	1045	867
3	Mavureddypatty	3+8	1280	1225	1040	1405	1510	1355	1235	927
4	Unjanai	3+8	735	668	753	695	788	730	720	632
5	Kothur	3+8	1238	1058	1218	1328	1766	1155	1260	858
6	Kothur Agraharam	3+8	1413	1480	1210	1430	1873	1570	1598	995
7	Pranthagam	3+8	1413	1400	1388	1548	1920	1568	1443	922
8	Chinnathambipalayam	3+8	1434	1239	1123	1380	2382	2010	1386	891
9	Karumapuram	3+8	1290	1220	1258	1263	1663	1301	1043	892
Overall mean		27+72	1203	1144	1110	1253	1603	1334	1194	869

CD = 233.6

M- Mother trial B- Baby trial

Table 2 .Mean data of the scores recorded by the farmers in FPV trails

S. No	Traits	VG 9902	ICGV 86325	ICGV 96217	ICGV 97115	ICGV 87846	ICGV 98369	ICGV 98370	TMV1 (LC)
1	Germination	I	I	II	I	I	II	I	I
2	Seedling vigour	I	I	II	I	I	II	II	II
3	No. of branches	I	I	I	I	I	II	II	I
4	Profuseness in flowering	II	II	II	I	I	I	II	II
5	Profuseness in pegging	II	II	II	I	I	I	II	II
6	Ability to with -stand drought	I	III	III	II	I	I	II	I
7	Tolerance to Leaf miner	II	II	II	II	II	II	II	II
8	Tolerance to Late Leaf Spot	II	II	II	II	II	II	II	II
9	No. of pods /plant	II	II	II	II	I	I	II	II
10	Size of the pod	I	I	II	I	I	II	II	I
11	Appearance of the pod	I	I	II	I	I	II	I	I
12	Pod filling	II	I	II	I	I	II	II	II
13	Kernel size	II	I	I	I	I	I	I	II
14	Kernel colour	I	I	II	I	I	II	II	II
15	Haulm yield	I	I	I	III	I	II	II	I
16	Haulm quality	I	I	I	I	I	I	I	I
17	Pod yield	II	II	II	II	I	II	II	III

Note: I – Most preferred ; II – Moderately preferred ; III – Least preferred .

Table 3. Observations recorded in FPV trails by the breeder

S. No	Particulars	VG 9902	ICGV 86325	ICGV 96217	ICGV 97115	ICGV 87846	ICGV 98369	ICGV 98370	TMV 1 (Local check)
1	Initial plant stand /m ²	22.7	23.5	22.1	22.4	23.5	19.6	20.7	20.8
2	Days to 75% emergence	8	8	7	8	8	7	8	8
3	Days to 75% flowering	35	37	35	36	33	36	37	39
4	Final plant stand /m ²	21.1	22.3	21.0	20.2	22.0	18.5	19.6	18.9
5	Plant height (cm)	23.0	20.4	23.8	19.9	23.7	21.6	21.8	24.4
6	Number branches / plant	11.2	10.9	13.9	10.6	9.6	9.8	8.7	13.4
7	Number of pods / plant	16.8	18.5	19.7	18.8	20.9	16.2	18.5	13.6
8	Days to harvest	135	132	132	134	130	135	135	140
9	Pod yield g / plant	120.3	114.4	111.0	125.3	160.3	133.4	119.4	86.9
10	Haulm yield g / plant	180.6	171.6	166.5	187.9	240.5	200.1	179.1	130.4
11	Disease score: Late Leaf Spot (1-9 scale)	4	4	4	4	4	4	4	4
12	Insect pest score: Leaf miner (1-9)	6	6	6	6	6	6	6	6
13	Shelling outturn (%)	58.5	57.2	65.9	57.4	65.5	61.4	57.3	55.3
14	Sound mature kernel (%)	80.4	79.5	80.1	76.8	88.2	79.2	77.5	80.1
15	100-seed weight (g)	30.3	31.3	38.3	31.0	37.2	31.7	32.6	30.8

Table 4. Mean data of the scores recorded by the traders for the produce of the FPV trials

S. No	Traits	VG 9902	ICGV 86325	ICGV 96217	ICGV 97115	ICGV 87846	ICGV 98369	ICGV 98370	TMV 1 (LC)
1	Pod size	I	I	II	I	I	II	II	I
2	Pod shape	I	I	II	I	I	II	I	I
3	Pod filling	I	I	II	I	I	II	I	II
4	Pod appearance	I	I	II	I	I	II	I	I
5	Kernel size	II	I	I	I	I	I	I	II
6	Kernel shape	I	I	I	I	I	I	I	II
7	Kernel appearance	I	I	I	I	I	I	I	II
8	Plumpiness	II	I	I	II	I	I	I	II
9	Testa colour	I	I	II	I	I	II	II	II

Note : I – Most Preferred and II – Moderately Preferred