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Research Article

Impact Assessment on Improved Groundnut Varieties and Technologies in Cuddalore District

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ABSTRACT

India is the second largest groundnut producer in the world. India shares 22 per cent of groundnut production in the world production. Area under groundnut cultivation in India is 7 million/ha. Production and productivity of groundnut is 8.5 million tonnes and 1.2 million tonnes/ha respectively. Tamil Nadu Agricultural University has released groundnut varieties and technologies. This study was carried out in Cuddalore district where groundnut cultivation is predominant. Out of 13 blocks, 4 blocks and 3 villages from each block were selected for the study. Totally 120 respondents were selected through proportionate random sampling method.

The extent of adoption was assessed by obtaining responses from the farmers for dichotomous questions (Adoption and Non-adoption) and score was provided for each responses. The impact was calculated with two point continuum scale viz., agree and disagree with score value of 2 and 1 respectively. The weightage mean score was calculated for each impact and same was ranked based on the scores.The study revealed that 80 percent of farmers adopted TNAU released groundnut varieties. Most of the farmers also adopted TNAU released groundnut technologies and recommended practices. These varieties and technologies released from TNAU has created impact on 3 aspects namely economic impacts, social impacts and personal impacts. Increase in yield and income were recorded with the highest score in economic impacts, increase in organisational participation was recorded with highest score in social impacts and increase in outside contact was recorded with highest score in personal impacts.

Keywords: *Groundnut, Wonder nut, Cashew, Oil*

INTRODUCTION

Groundnut is popularly known as 'king of oilseeds', 'wonder nut' and 'poor man's cashew'. They are excellent plant based source of protein and high in various vitamins, minerals and plant compounds.

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It contains 25.2 percent of protein, 48.2 percent of oil, 11.5 percent of starch, 4.5 percent of soluble sugar, 2.1 percent of crude fibre and 6.0 percent of moisture.

India is the second largest groundnut producer in the world. India shares 22 per cent of groundnut production in the world. Area under groundnut cultivation in India is 7 million ha. Production and productivity of groundnut is 8.5 million tonnes and 1.2 million tonnes/ha respectively. In Tamil Nadu, area under groundnut cultivation is 3,72,023 ha out of which 70 percent of groundnut is grown in rain-fed condition and 30 percent of groundnut is grown in irrigated condition. In Tamil Nadu, area under groundnut cultivation is 3,72,023 ha out of which 70 percent of groundnut grown in rainfed condition and 30 percent of groundnut grown in irrigated condition. Production is 9,31,671 tonnes and productivity is 2.50 tonnes/ha. Majority of groundnut area is covered in North eastern zones (Cuddalore, Villupuram, Thriuvannamalai, Vellore, Kancheepuram, Tiruvallur and Ariyalur districts).

In this context, the present study was conducted with the specific objectives as follows.

1. To assess the extent of adoption of improved ground nut varieties and technologies.
2. To assess the socio economic impacts of improved groundnut varieties and technologies.

MATERIALS AND METHODS

The study was carried out in Cuddalore district of Tamil Nadu state. Cuddalore was purposively selected as it has more area under groundnut cultivation (11,100 ha). Oilseed research station is present in Virudhachalam in Cuddalore district through which farmers were able to know about new varieties and technologies. Cuddalore district consist of seven taluks and thirteen blocks. Among those blocks, four blocks were purposively selected for this study viz., Kurinjipadi, Cuddalore, Parangipettai and Virudhachalam. Three villages from each block were selected. Total sample size of 120 respondents of groundnut growers were selected using proportionate sampling method (n=120).

By reviewing the relevant literature and consulting with experts and scientists 18 recommended practices were chosen for the adoption test. The dichotomous responses such as ‘adopted’ and ‘non-adopted’ were given by farmers. Based on this scores 1 and 2 were provided for responses ‘adopted’ and ‘non-adopted’ respectively. Scoring procedure followed by Jayabalan (2002) was used.

Impact study is a research conducted to observe and understand the effects of introduction of a varieties and technologies. Majority of the farmers adopted TNAU released varieties and technologies which resulted in impacts on farmers in all aspects. Three types of impacts viz., economic impacts, social impacts and personal impacts were analysed in this study. The impact was calculated with two point continuum scale viz., agree and disagree with score value of 2 and 1. The mean scale was calculated for each impact and same was ranked based on the weightage mean score. Scoring procedure followed by Akila (2015) was used.

FINDINGS AND DISCUSSION

Table 1: Extent of adoption of improved groundnut varieties (n=120)

S.NO	Varieties adopted	No of respondents	Percentage (%)
1.	VRI 2	87	72.50
2.	VRI 8	10	8.33
3.	TMV 10	1	0.83
4.	CO 7	1	0.83
5.	GG 7	14	11.66

6.	JL 24	8	6.66
7.	K 6	5	4.16
8.	WESTERN 44	1	0.83
9.	Local variety	4	3.33
* Multiple responses			

Table 2: Distribution of respondents according to the extent of adoption of TNAU recommended groundnut technologies/ practices. (n=120)

S.NO	Technologies / Practices	Recommendations	No of respondents	Percentage (%)
1.	Soil type	Red sandy and Clay loam	120	100
2.	Season of sowing	June – July October – November	120	100
3.	Field preparation	Chisel plough	101	84.2
4.	Micro nutrients	a) TNAU Mn mixture @7.5 kg/ha	33	27.5
		b) TNAU groundnut rich @5 kg/ha	8	6.7
		c) Gypsum @400 kg/ha	106	88.3
5.	Fertilizers	a) NPK – 10:10:45	118	98.3
		b) ZnSO4 @25 kg/ha	29	24.2
		c) Borax @10kg/ha	14	11.7
6.	Seed rate	120 kg/ha	117	97.5
7.	Spacing	30*10	115	95.8
8.	Seed treatment	a) *Trichoderma viride*	46	38.3
		b) *Rhizobium* (TNAU 14)	0	0
		c) Thiram @2g/kg	0	0
9.	Sowing	Kovai seed drill	0	0
10.	Intercrop	Sesame, cumbu, cowpea, blackgram, redgram and sunflower.	91	75.8
11.	Irrigation	a) Drip	7	5.8
		b) Sprinkler	8	6.7
		c) Border	107	89.2
12.	Weeding	Fluchloralin @ 2 l/ha	56	46.7
13.	Pesticides			
	A) Red hairy caterpillar	a) Quinalphos @25kg/ha	86	71.7
		b) NPV $1.5*10^{12}$	4	3.3
		c) Light traps	13	10.8
	B) Tobacco caterpillar	a) Methomyl 750 ml/ha	97	80.8
		b) NSKE 5%	80	66.7
		c) Trap crop	10	8.3
	C) Pod borer	Carbofuran	32	26.7
	D) Virus	Triton	0	0
	E) Aphids	Imidachloprid @100 ml	75	62.5
	F) Termites	Thiamethoxane @125 g/ha	1	0.8
14.	Diseases			
	A) Rust	Mancozeb @ 1000 g/ha	49	40.8
	B) Early leaf spot	Chlorothaonil @ 1000 g/ha	89	74.2
	C) Late leaf spot	Hexaconazole @ 1500 ml/ha	42	35.0
	D) Combined infection of rust and spot	Calotropis leaf extract 10%	4	3.3
	E) Bud necrosis	AVP principles Quinalphos @ 1400 l/ha	7	5.8
15.	Mulching	Polythene film	0	0
16.	Harvesting	TNAU groundnut stripper	8	6.7
17.	Post harvest technology	a) Grading and sorting	2	1.7
		b) Groundnut decorticator	10	8.7
18.	Value addition	a) Groundnut oil	67	55.8
		b) Groundnut milk	0	0
		c) Peanut butter	0	0
		d) Oil cakes	67	55.8

From the table 1, it could be found that 80 percent of groundnut growers have adopted TNAU released groundnut varieties viz., VRI 2, VRI 8, TMV 10 and CO 7 Remaining 20 percent of groundnut growers adopted other varieties. Majority of the groundnut growers in the research area adopted VRI 2 variety (72.5%) followed by GG 7 (11.66%), VRI 8 (8.33%), JL 24 (6.66%) and K 6 (4.16%), CO 7 (0.83%), TMV 10 (0.83%) and WESTERN

44 (0.83%). This might be due to the fact that the yield and oil content of TNAU released groundnut varieties was high. Adoption of VRI 2 was found to be high compared to other varieties.

From the table 2, it is found that all the farmers have adopted recommended soil type and season of sowing in time (100%). Majority of groundnut growers had adopted spacing (95.8%), seed rate (97.5%), recommended NPK application (98.3%), gypsum application (88.3%), border irrigation (89.2%) and control measure of tobacco caterpillar (80.8). Sixty to seventy five percent of the groundnut growers adopted NSKE per cent spray for tobacco caterpillar (66.7%), chemicals spray for control of red hairy caterpillar (71.7%) and cultivated pulses and oilseeds as intercrop (75.8%). More than half of the respondents (55.8%) involved in value addition of their produce viz., groundnut oil and oilcake. More than one third of the respondents adopted control measures of the diseases of rust (40.8%), late leaf spot (35.0%), seed treatment (38.3%) and weedicide application (46.7%). One fourth of the respondents adopted the other technologies namely control of pod borer practices (26.7%), $ZnSo_4$ application (24.2%) and TNAU Mn mixture application (27.5%). Other technologies viz., application of TNAU groundnut rich (6.7%), borax application (11.7%), NPV against red hairy caterpillar (3.3%), trap crop (8.3%), control measure of bud necrosis (5.8%) and termite (0.8%). None of the groundnut growers of the study area had not adopted mulching, virus control measures, biofertilizer application and value added products viz., groundnut milk and peanut butter.

Table 3: Distribution of the respondents according to their overall adoption of TNAU released groundnut varieties and recommended technologies/ practices.

S.NO	Category	Number	Percentage (%)
1.	Low	14	11.7
2.	Medium	91	75.8
3.	High	15	12.5
	Total	120	100.0

With the respect to the adoption level of the groundnut growers, it was observed from the table 3 that 11.7 percent of the respondents belonged to the low adoption level category while 75.8 percent of the respondents belonged to medium adoption level and 12.5 percent of the respondents belonged to the high adoption level. Asaithambi (2003) who reported that majority of respondents had medium level adoption.

Table 4: Impacts of adoption of TNAU released groundnut varieties and recommended technologies/ practices

S.NO	Impacts	Weightage mean score	Rank
a)	**Economic impacts**		
	Increased yield	1.75	1
	Increased income	1.75	2
	Investment on other farming practices	1.70	3
	Increased savings	1.28	4
	Repaid debts	1.18	5
	Bought additional land	0.45	6
b)	**Social impacts**		
	Increased organizational participation	1.78	1
	Increased opinion leadership	1.05	2
	Increased recognition in village	0.83	3
c)	**Personal impacts**		
	Increased outside contact	1.98	1
	Increased consultation with fellow farmers	1.95	2
	Increased confidence level	1.86	3
	Increased decision making ability	1.83	4
	Increased opportunity to know about technologies	1.50	5
	Subscribed for farm journal and general publication	0.16	6

It could be observed from the table that there was six economic impacts, three social impacts and six personal impacts expressed by the groundnut growers due to the adoption of TNAU released groundnut varieties and recommended technologies/ practices.

Out of six economic impacts, increase in yield ranked first and second with the weightage score 1.75 followed by investment on other farming practices, increased saving, repaid debt and purchase of additional land with the weightage mean score of 1.70, 1.28 , 1.18 and 0.45 respectively. Increased income was possible because of adoption of improved varieties VRI 2, VRI 8, GG 7, JL 24, WESTERN 44, CO 7 and TMV 10 which enabled them to obtain increased yield compare to local varieties.

Three different social impacts were noticed among the respondents. They were able to increase their organisational participation which ranked first with mean weightage score of 1.78 followed by able to became opinion leader and obtain social recognition with mean weightage score 1.05 and 0.83 respectively.

With the respect to the personal impacts, there were six personal impacts reported by the respondents. Increased outside contact was ranked first with mean score value 1.98 followed by increased consultation with fellow farmers, increased confidence level and increased decision making ability with mean weightage score value of 1.95, 1.86 and 1.83 respectively. Other impacts were they had an opportunities to know and experienced about latest technologies and able to subscribe farm journal.

CONCLUSION

It could be concluded that majority of the respondents have adopted improved varieties compared to local varieties. Out of these improved varieties, TNAU released groundnut varieties are highly preferred due to their higher yield and oil content. With respect to the technologies, certain technologies viz., soil type, season of sowing in time, seed rate, NPK application, trap crop, red hairy caterpillar control measures and bud necrosis control measures were highly adopted by the respondents. Hence it is suggested that efforts should be taken to promote those technologies that have not reached the farming community through extension wing of Universities, KVK and also through Department of Agriculture by using group approach and individual approach viz., on farm demonstrations, trials, field days and meetings etc.

Increased income and increased yield were expressed as economic impacts which were ranked first and second among the economic impacts. Increased organisational participation ranked first among the social impacts and increased outside contact ranked first among the personal impacts. It could be concluded that all the impacts reported by the groundnut growers were found to be desirable impacts.

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