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## AN ANALYSIS OF TWO VARIETIES OF GROUNDNUT CULTIVATION IN KALAYARKOVIL TALUK AT SIVAGANGAI DISTRICT

### Article Particulars

Received: 03.04.2018

Accepted: 10.04.2018

Published: 28.04.2018

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### Introduction

This chapter is mainly devoted to the study of cost and return of producing two major varieties of groundnut crop namely, TMV-7 variety and VRI-2 variety in Kalayarkovil Taluk. Groundnut growers cultivating the two varieties were further classified into small farmers and large farmers. This chapter also deals with the input and output structure, and the economics of cultivating the two varieties with respect to small and large farmers. The study would provide an insight into the economics of raising the two varieties with reference to their comparative cost and profit. Thus, it would help to identify the variety of groundnut most beneficial to the groundnut growers in general.

### Groundnut in India

Groundnut is one of the most important cash crops of the semi-arid tropics. Groundnut is the main source of edible oil. It is an important crop both for oil and food, grown in many states in the country, providing employment to a large number of people and contributing to the growth of rural economy. It is grown in over 100 countries in the world and plays an important role in the economy of several countries. India accounts for 40.6 per cent of groundnut cultivated area of the world area under groundnut and 30 per cent of the world production of groundnut.

Table 1.1, shows that the area and production of groundnut of the major countries in the world. Among the major oilseeds, groundnut crops that list in terms of area, followed by rapeseed, mustard, sesamum, linseed and castor. The minor oilseeds include sunflower, soyabean, safflower and coconut.

**Table 1.1 Area and Production of Groundnut (in Shell) in the Major Countries of the World 2016**

Sl. No	Countries	Area (000ha)	Production (000 MT)
1.	World	20516	25005
2.	Africa	6074	4956
3.	Senegal	739	628
4.	Nigeria	1000	1250
5.	China	2988	8086
6.	USA	663	1509
7.	India	8550	7400

**Source:** FAO Production Year Book, 2016.

The above table shows that India, China and Africa are among the leading producers of groundnut in the world. India is to first place in area and second place in production of groundnut cultivation. India is likely to emerge as a major supplier of raw and processed groundnut because of its large production base. Although the share of groundnut in oilseeds production has been falling since the 1950s from 70 per cent to the current level of about 40 per cent groundnut is still a major crop for oilseeds economy in India. During past two years the groundnut production was averaging around 8 million tonnes. The yield in India is about 900 kg. per hectare as against an Asian average of 1,190 kg., 1,925 kg. in Japan 2,712 kg. in U.S. 6,778 kg. in Israel and best yield of 10,000 kg. per hectare in Zimbabwe.<sup>4</sup>

### Groundnut in the Major States of India

Groundnut is a major commercial crop in India. It accounts for about 50 per cent of area oilseeds and 45 per cent of oilseeds production in the country. Gujarat, Andhra Pradesh, Tamil Nadu, Karnataka and Maharashtra concentrate on groundnut 86 per cent of the area. It is grown mainly during Kharif season, but it is an all season crop. The kharif season output accounts for nearly 75 per cent of annual output. The kharif crop is grown mainly in rainfed areas having little or no irrigation facilities. The following table explains major state area, production and yield of groundnut in India.

**Table 1.2 State-Wise Area, Production and Yield of Groundnut in India 2015-16**

Sl. No	States	Area (Lakh Hectares)	Percentage	Production (Lakh MT)	Percentage	Yield (kg./per Hectar)
1.	Andhra Pradesh	24.01	28.75	20.71	23.39	863
2.	Gujarat	18.84	22.56	20.68	23.36	1098
3.	Karnataka	12.28	14.70	10.98	12.40	895
4.	Madhya Pradesh	2.74	3.28	3.07	3.47	1122
5.	Maharashtra	6.52	7.81	7.55	8.53	1158
6.	Tamil Nadu	11.29	13.52	15.75	17.79	1395
7.	Rajasthan	2.40	2.87	2.68	3.03	1116
8.	All-India	83.51	-	88.54	-	1060

**Source:** Directorate of Economics & Statistics, Department of Agriculture and Co-operation, Ministry of Agriculture, 2015-16. Among the major states, Andhra Pradesh led in area with 28.75 per cent of the total area under groundnut in India, followed by

Gujarat, Karnataka, Tamil Nadu and Maharashtra in 2015-16. In production of groundnut, Andhra Pradesh, Gujarat and Tamil Nadu maintained their ranks respectively 23.39 per cent, 23.36 per cent and 17.79 per cent of the total production under groundnut in India, followed by Karnataka, Maharashtra and Rajasthan in 2015-16. Tamil Nadu is one of the major states in groundnut cultivation.

### Research and Development for Groundnut in India

Only 20 varieties of groundnut seeds were released for cultivation before 1967. After that 64 more varieties have been developed, most of which are hybrids varieties. Many of the varieties have good resistance to pests and diseases. ICRIAT has developed ICGS 11, ICGS44 and ICGs (FDRS) 44 varieties of groundnut which give yield varying from 3.5 to 5.3 tonnes per hectare as against the national average of 800kg. The Regional Research Station of Tamil Nadu Agricultural University at Virdhachalam has identified a few drought tolerant geno-types in groundnut like ICG4790, ICBV 86754, NCAC 343 and TAG 24 in collaboration with Australian Scientists, ICAR and ICRIAT.

### Groundnut in Tamil Nadu

Among the principal crops under area of Tamil nadu and Sivagangai, groundnut occupies a second place in cultivation. The following table represents the area of the principal crops in Tamilnadu and Kalayarkovil Taluk.

**Table 1.3 Area under Principal Crops in Tamil Nadu and Kalayarkovil Taluk 2015-16**

Sl. No	Principal Crops	State Total Area of Crops (in Hectare)	Percentage	Sivagangai Total Area of Crops (in Hectare)	Percentage
1.	Paddy	2181400	38.82	87230	54.99
2.	Cholam	484223	8.60	9937	6.27
3.	Cumbam	219554	3.90	1197	0.75
4.	Maize	150548	2.68	3430	2.16
5.	Ragi	123981	2.20	203	0.13
6.	Bengalgram	6644	0.12	00	00
7.	Black gram	267771	4.76	1177	0.74
8.	Red gram	106670	1.90	4153	2.62
9.	Green gram	123361	2.19	8807	5.56
10.	Horse gram	121020	2.15	1444	0.91
11.	Sugarcane	215628	3.83	12989	8.19
12.	Cotton	267046	4.75	11367	7.17
13.	Groundnut	1188405	21.12	11003	6.94
14.	Gingelly	140796	2.50	5249	3.31
15.	Castor	27351	0.49	415	0.26

**Source:** Department of Statistics, Chennai-06.

### Importance of Groundnut

Groundnut is one of the major economic crops among the major oilseeds. It occupies 13<sup>th</sup> position in terms of food crops in world (Varnell and Mccloud, 2015). At

present groundnut accounts for 35 to 40 per cent of oilseeds production in India, but at the beginning of the planning era, it was around 60 per cent of oilseeds production. Of all the oilseeds, groundnut is a concentrated source of energy.<sup>5</sup> The significant of oilseeds, as dietary fat, (a) as the source of energy, (b) for cell structure and membrane function, (c) as a source of essential fatty acids for cell, (d) as a vehicle for all soluble vitamins and for the control of blood lipids, is now widely recognised.<sup>6</sup> It is rich in oil content (45-50 per cent) and is also a good source of protein (25-30 per cent), Carbohydrates (20 per cent). Vitamin B and E (Reddy, L.J and A.K. Kaul, 2016). "Groundnut contains 47.5 per cent fat, 26 per cent protein, 18.6 per cent carbohydrates. Fats provide 9 calories of energy per gram compared with 4 calories provided by cereals and pulses"

### Uses of Groundnut

Groundnut provides food and nourishment to human beings, fodder for the livestock and it is a legume – a property which helps in replenishing the nitrogen content in the soil without disturbing the non-renewable energies as well as the agro-ecological balance. The direct use of groundnut lies in the people's widespread habit of eating roasted, salted or boiled groundnut kernels. Groundnut flour is used for various supplementary protein diets. It is used for the manufacture of soaps, paints, perfumery, varnisher, fatty acid, glycerine and lubricants. Oilcakes and meal, obtained as residue after the extraction of the oil, are rich food stuffs to cattle, poultry and other livestock. They are used in recent years for making compound feed of high protein for animal feeds. After harvest, the plants are fed as fodder to cattle or turned into manure.

### Objectives

To find out the cost and return structure of two major ruling varieties of groundnut, Viz., TMV-7 and VRT-2 and of the two groups of farmers (small and large) under each variety;

### Sampling Technique

Multistage stratified random sampling technique was adopted for the study. Kalayarkovil Taluk as the universe, the villages selected as the stratum, the villages as the primary units of sampling and the farmer cultivating groundnut as the ultimate units. Data regarding area under groundnut in each of the seven villages in Kalayarkovil Taluk were obtained from the records of the Statistical Office, Sivagangai. All villages in Kalayarkovil Taluk which show the largest area under groundnut cultivation (33.77 per cent) has been chosen for the study. In selected all the villages are arranged in a descending order of area under groundnut cultivation. Roughly 4 per cent of the farmers were concentrated in all villages. The proportionate probability random sampling technique has been used to select 150 each in TMV-7 and VRI-2 groundnut varieties. The list of the selected all villages and the number of sample farmers in each villages are presented in TABLE 1.4.

**Table 1.4 Name of Villages and Number of Sample Farmers Selected in Kalayarkovil Taluk 2015-16**

SI No.	Name of Villages	Area under Groundnut inAcres	Number of Sample Farmers	
			TMV-7	VRI-2
1.	Susaiyarpattinam	834.65	27	27
2.	Vembani	763.32	25	25
3.	Kayaodai	707.35	23	23
4.	Valayambatti	697.32	22	22
5.	Kalakkanmaai	632.56	21	17
6.	Seeoorani	532.41	17	17
7.	Aantisoorani	291.16	15	15
	Total	4452.85	150	150

**Source:** Revenue Records – Chitta Adangal, 2015-2016.

### Collection of Data

The primary as well as secondary data were collected for the present study. In order to collect primary data, a well-designed pre-tested schedule was used. Before undertaking the main survey, a pre-test schedule was administered tentatively to five farmers in each variety to test the validity of the schedule. This pre-test schedule helped in the removal of no-response and unwarranted questions and the modified final schedule was the result.

Even though the respondents did not maintain adequate farm records and accounts, they were able to furnish the particulars in view of their long association with farming. However, to minimize recall bias, suitable cross checks and rechecks were carried out.

Direct personal interview method has been adopted to collect the data pertaining to the structures, size of household, cropping pattern, cost and returns in farming operations. Relating to groundnut and other aspects relating to the overall objectives of the study.

Secondary data relating to location, climate, rainfall, soil type, land utilisation pattern, operational land-holding, demographic features, sources of irrigation, gross area irrigated, area under major crops, production and yield of major crops, livestock census, infrastructural facilities and the like were collected from the Assistant Director of Statistics and Joint Director of Agriculture, Sivagangai.

### Method of Analysis

The selected 150 sample farmers in each variety were stratified into two groups namely small and large farmer based on the area under groundnut. The farmers of less than 5 acres were considered small farmers and farmers with 5 acres or more were considered large farmers. In the variety of TMV-7, out of 150 sample farmer, 103 farmers

(68.67 per cent) belonged to the small size and remaining 47 farmers (31.33 per cent) belonged to the large size. In the variety of VRI-2, out of 150 sample farmers, 117 (78.00 per cent) belonged to small size and remaining 33 (22.00 per cent) belonged to the large size. The analysis of variance technique was used to test the homogeneity of the two groups of farmers in each variety with respect to per acre value of net energy.

The results are given in Tables 3.2 and 3.3 for TMV-7 and VRI-2 varieties of groundnut respectively. It was found that there existed significant differences between the two groups of farmers in each variety. So they were treated as separate units for further analysis. There is also no evidence of significant difference between the sample villages in the above categories.

### The Economics of Groundnut Cultivation

The economics of cultivating the TMV-7 and VRI-2 varieties of groundnut per acre by small farmers and large farmers are presented in TABLE 1.5 and 1.6 respectively.

**Table 1.5 Economics of the Groundnut Crop Per Acre in Kalayarkovil Taluk**

Particulars	TMV-7 Groundnut					
	Small Farmers		Large Farmers		Total Farmers	
	Unit Qtls.	Value in Rs.	Unit Qtls.	Value in Rs.	Unit Qtls.	Value in Rs.
Output / Acre Main Product	11.24	7135.36	10.14	6921.41	10.71	7029.66
Gross Return		7135.36		6921.41		7029.66
Total Operating Cost (Cost A)		3677.05		3134.96		3451.23
Net Return Over Cost A		3458.31		3786.45		3578.43
Cost 'C'		5263.16		4349.78		4931.42
Net Return Over Cost C		1872.20		2571.63		2098.24
Cost of Production/Qtl. (Cost 'A')		327.14		309.17		322.24
Cost of Production/ Qtl. (Cost 'C')		468.25		428.97		460.45
Input – Output Ratio (Cost 'A')		1.94		2.20		2.04
Input – Out Ratio (Cost 'C')		1.36		1.59		1.43
Benefit – Cost Ratio (Cost 'C')		0.36		0.59		0.43

In the case of TMV-7 variety of groundnut, the yield per acre was 10.71 quintals. The gross return per acre was to the tune of Rs.7029.66. The operating cost per acre and the net return over it were Rs.3451.23 and Rs.3578.43 respectively. The total cost incurred was to the extent of Rs.4931.42 while the net return over it was worth Rs.2098.24. The per quintal operating cost amounted to Rs.322.24 and the total cost to Rs.460.45. the input-output ratio considering only the operational cost (Cost C) it was

Rs.1.43. the benefits – cost ratio worked out to be Rs.0.43. Small farmers obtained a yield of 11.24 quintals per acre. They received a gross return amounting to Rs.7135.36. The operating cost was Rs.3677.05 while the total cost was about Rs.5263.16. The net returns over operating cost and total cost were Rs.3458.31 and Rs.1872.20 respectively. The per quintal operating cost of production was Rs.327.14. The total cost of production was Rs.468.25. The input-output ratio, taking into account the operating cost alone, worked out to be Rs.1.94, while including the fixed cost (Cost C) it was worth Rs.1.36. the benefit – cost ratio was to the extent of Rs.0.36.

For large farmers, the per acre yield was as much as 10.14 quintals, while the gross return was about Rs.6921.41. The operating cost was to the tune of Rs.3134.96 and the net return over it was about Rs.3786.45. The total cost was Rs.4349.78 and the net return over it was Rs.2571.63. The operating cost and total cost of production per quintal amounted to Rs.309.17 and Rs.428.97 respectively. Considering only the operational cost, input-output ratio was about Rs.2.20, while including the fixed cost (Cost C) it was Rs.1.59. the benefits received by large farmers on each unit of cost incurred was Rs.0.59.

In comparison to large farmers, small farmers had greater per acre yield in quintals, gross return, net return over the operating cost, and the per acre and per quintals cost of production. On the other hand, large farmers had higher net return over the total cost, input-output ratios and benefits- cost ratio. It shows that the large farmers earned relatively higher profits than the small farmers.

**Table 1.6 Economics of the Groundnut Crop Per Acre in Kalayarkovil Taluk**

Particulars	VRI-2 Groundnut					
	Small Farmers		Large Farmers		Total Farmers	
	Unit Qtls.	Value in Rs.	Unit Qtls.	Value in Rs.	Unit Qtls.	Value in Rs.
Output / Acre Main Product	12.46	8865.53	12.38	9266.54	12.43	9065.23
Gross Return		8865.53		9266.54		9065.23
Total Operating Cost (Cost A)		3970.09		3356.84		3665.33
Net Return Over Cost A		4895.44		5909.70		5399.90
Cost 'C'		5561.23		4621.16		5092.63
Net Return Over Cost C		3304.30		4645.38		3972.60
Cost of Production/Qt. (Cost 'A')		318.63		217.15		294.88
Cost of Production/ Qt. (Cost 'C')		446.33		373.28		409.70
Input – Output Ratio (Cost 'A')		2.23		2.76		2.47
Input – Out Ratio (Cost 'C')		1.59		2.01		1.78
Benefit – Cost Ratio (Cost 'C')		0.59		0.01		0.78

The VRI-2 variety of groundnut yielded 12.43 quintals of groundnut per acre. The gross return per acre was worth Rs.9095.23. The total operating cost (Cost A) and the total cost (Cost C) incurred were Rs.3665.33 and Rs.5092.63 respectively. The net return over the operating cost was about Rs.5399.90, while over the total cost it was Rs.3972.60 the operational cost of production per quintal amounted to Rs.294.88 on the other hand, the total cost of production per quintal was Rs.409.70 considering Cost 'A' alone, the input- output ratio worked out to be Rs.2.47, with the inclusion of fixed cost (Cost 'C'), the input-output ratio was Rs.1.78 the benefit-cost ratio revealed that on every unit of cost incurred, the benefit received was to the extent of Rs.0.78.

Small farmers received 12.46 quintals of groundnut per acre. The gross return accrued to them was to the tune of Rs.8865.53. The total operating cost incurred was Rs.3970.09, while the per acre net return over it was worth Rs.4895.44. The total cost incurred was about Rs.5561.23. The net return received over it amounted to Rs.3304.30. The per quintal operating cost was Rs.318.63, while the per quintal total cost was Rs.446.33. Taking into account only the operating cost, the input-output ratio was Rs.2.23. inclusive of the fixed cost (Cost C), it was about Rs.1.59. the benefit accruing to small farmers on each unit of cost incurred was Rs.0.59.

Large farmers obtained a yield of 12.38 quintals per acre. The gross return received by them was as much as Rs.9266.54. The total operating cost incurred per acre amounted to Rs.3356.84, while the total cost was Rs.4621.16. the net return over operating cost and total cost were Rs.5909.70 and Rs.4645.38 respectively. The per quintal operating cost was Rs.271.15 and the total cost Rs.373.28 considering the operating cost alone, the input-output ratio was worth Rs.2.76 including the fixed cost (Cost C) it worked out to be Rs.2.01 large farmers received a benefit of Rs.1.01 on every unit of cost incurred.

The economics of raising VRI-2 variety of groundnut revealed that small farmers had a better yield per acre than the large farmers. However, the gross return accruing to the latter group was considerably larger than what the former obtained. The per acre and per quintal operating cost and total cost incurred by small farmers were greater than those of the large farmers. But the net returns over the operating as well as the total cost received by the large farmers were higher than what the small farmers received.

The input-out ratio and the benefit-cost ratio were also greater for the large farmers. Thus, despite having a larger yield and incurring a greater cost of production, the small farmers received considerably lower benefits and net returns over the cost of production. In other words, large farmers earned relatively higher profits than the small farmers. An overall view of the economics of raising the TMV-7 and VRI-2 varieties of groundnut reveal that producing the former variety of groundnut is more beneficial to groundnut growers than the latter variety. It may be noted that, as regards the returns in physical and monetary terms, VRI-2 variety does perceptibly better than the TMV-

7variety. The cost of production of this variety is also considerably lower than that of the TMV-7variety. The benefit which the VRI-2 variety attains over each unit of cost incurred is worth Rs.0.78, while for the TMV-7variety it is only Rs.0.43. the input-output ratio is also greater than that of the latter.

As far as the small land the large farmers producing the two varieties of groundnut are concerned, the latter obtained better returns in physical and monetary terms under the VRI-2 variety. The benefit received by them was also double the benefit the small farmers received.

In case of the TMV-7 variety, small farmers had better physical returns. But, it was the large farmers who received better monetary returns. The benefit they received was also twice as much as the benefits the small farmers obtained.

Thus, the large profits under both the varieties of groundnut earned better profit than the small farmers due to their ability of getting better price for their produce in the market. This is partly due to the different channels of markets selected by the farmers producing the two varieties of groundnut.

## Conclusion

In sum, the average yield per acre produced by the small farmers under the two varieties of groundnut was greater than that of the large farmers. The average man-days of human labour employed by the farmer was also more than the latter. This may be attributed to the fact that family labour is also employed by small farmers during the cultivation period.

The employment of bullock labour had been similar for both the small and large farm.It is inferred from the analysis that human labour cost constituted an important place in both varieties of groundnut. The yield per acre was found high in the case of VRI-2 compared to TMV-7. Thus, it may be inferred that VRI-2 farmers earned better profit than TMV-7variety. The large farmers had a high net return over the total cost than small farmers. The benefit was found higher in VRI-2 than TMV-7 in the study area.

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