

Impact of Technology on Groundnut Production of the Chittoor District

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ABSTRACT--- The patterns of the use of technology are a major area of study for enhancing the yields as well as productivity levels of the groundnut crop as well as its impact on farmers. Therefore, it is essential to analyse the technological innovations and how they have helped in realizing the goals. Scientists have invented several kinds of techniques of groundnut production to raise the yields of the crop. Each and every technology has its own unique contribution towards increasing the yield which can have an effect on the production costs as well as the overall income of the farmers.

Extension and research institutions play a key role in the transfer of technology to the farmers and their adoption of the same. Studying the different technologies used by farmers will help in assessing their overall effects. The resulting analysis provides an insight into the levels of adoption as well as the effectiveness of the technologies of production presently in use.

This research will also help scientists and technicians develop new technologies on an as-needed basis for use of farmers in areas where they can maximize productivity and net income while minimizing the production costs. Therefore, it is essential in this regard to do a study and assess the perceived impact of different technologies using various indicators such as cultivation costs, yield and net income of groundnut production

Keywords---Groundnuts, Yielding, Productivity.

INTRODUCTION

The groundnut, also called peanut, is a legume which originated in South America. It spread through colonial Portuguese influence to Brazil, southern Bolivia and then to northwestern India in the 1500s. The Portuguese colonists introduced the plant to Africa from where it was introduced into North America. India received the crop during the first half of the 16th century from one of the Pacific islands near China where it was introduced earlier from either Central America or South America.

The groundnut is called the 'king of oilseeds' due to its high oil content. It is also known as the 'wonder nut' or the 'poor man's cashewnut'. India plays a major role in groundnut production in the world as it the highest acreage of the crop and is second in its production (FAO, 2014). Groundnut crops in India are mainly grown in certain states like Tamil Nadu, Andhra Pradesh, Karnataka, Maharashtra and Gujarat.

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The state of Andhra Pradesh has about one-third of the acreage of groundnut crops in India and is in the third position by contributing 18.81% of the whole production. The irrigated area of groundnuts in the state has risen from 12.4 lakhs hectares in 1955-56 to 17.66 lakhs hectares in 2014-15 and the production has increased from 10.7 lakh tons in 1955-56 to 26.04 lakh tons in 2014-15.

Chittoor district ranks second in Andhra Pradesh in terms of area of acreage at 1,89,000 hectares and production of groundnut crops at 1,31,000 tons while the productivity levels of irrigated groundnut crop in the district was 2696 kg per hectare (2014-15).

OBJECTIVES

1. To do a study of selected characteristics of the profiles of groundnut farmers.
2. To do a study of the effects of technologies of production of groundnut crops according to the perception of the groundnut farmers.
3. To do an analysis of the indicators of impact of various technologies used by the farmers.
4. To understand the problems in using the technologies of production and the solutions to the same as suggested by the farmers.

MATERIALS AND METHODS OF GROUNDNUT PRODUCTION TECHNOLOGIES

Assessment of impact is an innovative area of research in the discipline of Extension, and there is little available information with regard to the subject under study. Therefore, relevant reviews on groundnut production technologies have been presented as follows:

Venkataramana *et al.* (2010) showed that groundnut farmers were using improved seeds/varieties, seed rate, spacing and sowing methods, seed treatment and fertilizer application in their fields.

Tekkale (2011) showed that groundnut cultivated by ICRISAT technology regarding water management became successful in showing maximum plant height, number of branches, number of matured and raw pods and shelling percentage than conventional groundnut cultivation.

Ramakrishna *et al.* (2009) showed that improved production technologies gave higher yields at all locations. The pod yield was 1.22/ha in 2002 and 1.64t/ha in 2003



compared to 0.77t/ha and 1.02t/ha respectively with farmers’ practice.

Wesley showed that the cost of cultivation can be retarded by Rs. 2500/hectare by use of improved implements like groundnut planter, power tiller sprayer, weeding by tractor, and mechanical thresher as also precise and timely operations can be performed with maximum field capacity.

PROBLEMS PERCEIVED BY FARMERS

Reddy (2009) showed that several problems faced by groundnut farmers can be overcome by supporting the farmers financially and supplying needed subsidized inputs.

Dubolia and Jaiswal (2010) considered that lack of knowledge, lack of money, high cost of inputs, lack of implements, less manpower were the key factors for not adopting the improved technologies of groundnut cultivation.

Raju and Murthy (2010) showed that the major problems encountered by the betel cultivators were diseases and pests, poor economic status of farmers, lack of varieties to withstand cyclonic rains, high cost of fertilizers, lack of good rains, poor contact of extension worker with farmers and low price for farm produce.

Vaster revealed that groundnut farmers were in a state of not knowing exactly about seed sowing manures and fertilizers and plant protection measures in non-command areas.

FARMERS SUGGESTIONS TO OVERCOME THE ABOVE PROBLEMS

Intensification of adult education programs, evolving of drought, pest and disease resistant varieties, creation of credit facilities for needy farmers were some of the suggestions given by groundnut farmers for increasing the groundnut production.

Rajaram observed that 70.83% of the groundnut farmers suggested provision of institutional credit followed by remunerative price (67.50%) and provision of seed at subsidized price (66.67%).

Sangeetha reported that that majority of the cotton farmers suggested provision of proper credit facilities (66.67 %), followed by provision of remunerative price (62.50 %), elimination of middle men (58.33 %), improved extension activities (41.67 %), regulation of input costs at the time of peak requirement (37.50 %), creating awareness of latest technologies (29.17 %), educating the farmers about institutional financing (25.00%), generation of low cost technologies (16.67%) and development of less labour intensive technologies (8.33%).

Venkataraman showed that availability and supply of improved seeds and fertilizers for subsidized prices at the village level, conducting demonstrations, development of high yielding, short duration and disease resistant varieties, conducting training programs, increase the price for the farm produce, providing crop insurance and strengthening the cooperative institutions for providing financial assistance to the farmers were the suggestions given by respondents to overcome constraints in kharif groundnut cultivation.

Naik revealed that providing high quality seeds for the subsidized rates, regulation of input cost, providing

remunerative prices, creation of proper institutional finance, crop insurance were the major suggestions given by the groundnut farmers.

Trade revealed 90.3% of pomegranate farmers suggested remunerative prices for the farm produce followed by three fourths suggested maintenance of reasonable commission rates.

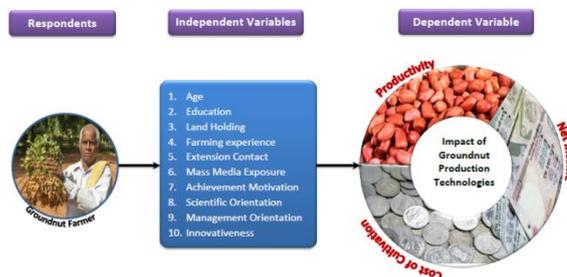


Fig 1: Conceptual model of the study



Fig 2 : Map showing Rayalaseema region of Andhra Pradesh



Fig. 3 : Map showing Chittoor district of Rayalaseema region

THE GROUNDNUT PRODUCTION TECHNOLOGIES

‘Impact of groundnut production technologies’ was put into use through various technologies of cultivation of



groundnuts as acknowledged by the groundnut farmers in terms of increased yields, reduction in costs and higher net income. Before assessing the indicators of impact, the non-adoption and adoption of technologies was taken from the cultivators by asking them about the current status of the adoption or non-adoption. If the cultivator had started using the technology, then he would be asked his opinion of the efficiency of the technology in terms of indicators of impact. If the cultivator had not started using the technology, then it was not considered for measurement of indicators. An impact score of zero was given.

The combination of technologies adopted under different categories of groundnut farmers

A total of thirty technologies that were selected were given ranks depending on the impact as opined by the cultivators of groundnuts. To obtain the ranking, percentages of impact were assessed for each technology by using the formula,

IMPACT PERCENTAGE:

It is the perceived impact of groundnut production technologies measured in terms of percentage. It was taken as follows

$$\text{Impact percentage of each technology} = \frac{\text{Sum of actual score obtained from 30 respondents}}{\text{Sum of maximum possible score for 30 respondents}}$$

SUGGESTIONS GIVEN BY THE GROUNDNUT FARMERS

The respondents were asked to put forward suggestions to solve the problems in their perception in the adoption of technologies for groundnut cultivation. The cultivators were then given an open-ended question about the suggestion.

CHARACTERISTICS OF THE PROFILES OF THE GROUNDNUT CULTIVATORS& RESULTS

The respondents were distributed different categories based on their selected profile characteristics and were presented in the following tables and interpreted through frequencies, means, percentages and standard deviation.

The table below shows that the majority of groundnut cultivators (52.50%) came from the middle age category after which came the young (25.83%) and the old (21.66%).

Distribution of respondents according to their age

S. No.	Category	Frequency	Percentage
1.	Young Age	10	25.83
2.	Middle Age	10	52.50
3.	Old Age	10	21.66
	Total	30	100.00

The reason for distribution might be that the agriculture in the present situation is regarded as a profitable enterprise in particular as the groundnut crop is a remunerative one for the farmers. Farmers who were young or of middle age were motivated to cultivate groundnuts by adopting the latest production technologies and thus get good incomes. Older

people might have given responsibility of cultivation to their offspring.

Education: The results shown in the below table indicate that the majority (23.33%) of the respondents were educated up to middle school level followed by illiterate (20.00%), functionally literate (13.33%), primary school (13.33%), high school (12.50%) and Intermediate (10.83%) categories and 6.66% were educated up to college level.

Distribution of respondents according to their education

S.No.	Category	Frequency	Percentage
1.	Illiterate	25	21.00
2.	Functionally literate	14	12.33
3.	Primary school	16	13.33
4.	Middle school	28	23.33
5.	High school	15	12.50
6.	Intermediate	13	10.83
7.	College level	8	6.66
	Total	120	100.00

Ranking of groundnut production technologies based on impact by the groundnut farmers	Groundnut production technologies	Impact percentage	Rank
1	Optimum time of sowing (Kharif: June-July , Rabi: November–December)	81.94	I
2	Chemical control (sucking pests :Dimethoate, monographs/ methyl o demeton; defoliators: Methyl parathion /quinalphos)	80.37	II



3	Chemical control for diseases (DithaneM45/ Carbendazim/ Hexaconazole)	79.72	III
4	Varieties (Kharif: Abhaya, K-6, TPT-4, Narayani, Vemana, Kadiri-9, Rabi, kadiri-4, T.A.G-26, Greeshma, k-6, k-7)	75.37	IV
5	Crop rotation (with non leguminous crops)	73.98	V
6	Seed treatment (Mancozeb/ Trichoderma viridae 3g/kg+Chloropyrifos-6.5ml/kg)	71.20	VI
7	Seed management (pre emergence) (Pendimethalin 30% @ 1.3-1.6l/acre, Butachlor 50% @ 1.25-1.5 l/acre)	64.37	VII
8	Neem seed kernel extract (5% solution)	61.94	VIII
9	Fertilizer management (Kharif :16-20 Kg/acre, Rabi: 16-20 Kg/acre)	56.94	IX
10	Summer ploughing (deep ploughing)	56.20	X

	ring April-May)		
11	Seed management Post emergence (Imazetapyr 10%-300ml or Quizaloprop ethyl 5% 400ml/200 liters of water)	50.09	XI
12	Water management (number.of irrigations: 8-9times or sprinkler irrigation)	49.25	XII
13	Gypsum application (200kg/acre along with FYM 5t/ha)	46.11	XIII
14	Seed rate (Kharif -50-60kgs/acre, Rabi 70-80kgs/acre)	45.27	XIV
15	Borax application (@4 kg/acre)	43.79	XV

Problems encountered by groundnut farmers

S.No.	Problem	Frequency	%	Rank
1.	Non availability of improved seed	101	83.16	I
2.	Lack of remunerative price	93	75.50	II
3.	More cost of seed	77	63.16	III
4.	More cost of labour at harvest	66	57.00	IV
5.	Pests and diseases	64	58.33	V



6.	Less credit facilities	63	55.50	VI
7.	Insufficient extension activities	60	54.00	VII
8.	Non availability of inputs in time	56	49.66	VIII
9.	Non availability of gypsum	53	42.16	IX
10.	Lack of training	49	41.80	X

	measures			
6.	Provision of proper institutional finance and crop insurance	84	70.00	VI
7.	Extension activities and training	79	65.83	VII
8.	Timely supply of inputs	73	60.83	VIII
9.	Gypsum availability	65	54.16	IX
10.	Supply of manures and organic fertilizers	59	49.16	X

The Suggestions of the Participants regarding the Problems Associated with Groundnut Production

Suggestions of the groundnut cultivators

S.No.	Suggestions	Frequency	Percentage	Rank
1.	Provision of improved seed at correct time	114	95.00	I
2.	Provision of remunerative price	102	85.00	II
3.	Provision of improved seed at subsidized rates	98	81.66	III
4.	Development of farm machinery especially for harvesting	91	75.83	IV
5.	Training on identification and control of pests and diseases and pest forecasting	87	72.50	V

CONCLUSION

In India, the groundnut production areas are mainly practiced in the states of Andhra Pradesh, Gujarat, Karnataka, Maharashtra and Tamil Nadu. The nation exports various groundnut products such as groundnut kernels, shells, handpicked selected (HPS) groundnut and oil cakes. Andhra Pradesh possesses about 1/3 of the area of groundnut cultivation in the country and occupies the third position in production contributing 18.81% of the total production in the country. The area for groundnut cultivation in the state has increased from 12.4 lakh hectares to 17.66 lakh hectares in between the years 1955-2008 and the production has increased from 10.7 lakh tons to 26.04 lakh tones in the aforementioned time period. Chittoor district from Andhra Pradesh holds second rank in the area of cultivation and production of groundnut with 1,89,000 hectares and 1,31,000 tons respectively (2008-09). In 2008-09, the area under irrigated groundnut totaled 1700 hectares. The production of rabi groundnut in the district totaled 2696 kgs per hectare.

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