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## **A Study on the extent of adoption of ANGRAU Technologies in Groundnut crop by Farmers of Rayalaseema Zone of Andhra Pradesh**

**K. Raghavendra Chowdary<sup>1\*</sup>, Vemaraju<sup>2</sup>, M. Tejaswini<sup>3</sup> and M. Reddi Kumar<sup>1</sup>**

<sup>1</sup>*Krishi Vigyan Kendra, Kalikiri, India.*

<sup>2</sup>*Department of Agronomy, COH, Vellanikera, Kerala, India.*

<sup>3</sup>*Department of Agricultural Extension, OUAT, Bhubaneshwar, India.*

### **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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### **ABSTRACT**

Globally India ranks first in area and second in production. India, accounts for 31 % of the total groundnut area in the world with 26.4 Mha with a total production of 37.1 million MT. The average productivity is 1400 kg/ha. The annual global export of groundnuts is of two million MT valued at 2,600 million US \$. In the present study, an attempt was made to find out the extent of adoption of ANGRAU technologies in Anantapur and Chittoor districts of Andhra Pradesh. *Ex-post facto* research design was selected as an appropriate research design to investigate the variables influencing extent of adoption of ANGRAU technologies in groundnut cultivation. Two districts were selected purposively from Andhra Pradesh based on the highest area under groundnut cultivation. The names of the selected districts were Anantapur and Chittoor. Two mandals from each district were purposively selected based on the highest area of cotton cultivation thus constituting four mandals. Three villages from each mandal were selected by following simple random sampling procedure. The sample constituted to a total of twelve villages. From each of the selected village, ten farmers were selected by following lottery method of simple random sampling procedure. The

sample constituted to a total of 120 respondents. Study showed that overwhelmingly (88.00%) of the members had adopted tractor drawn sowing, followed by two-thirds (66.00%) had adopted K-6 variety and seed treatment, 52.00 per cent had adopted Integrated pest management, 46.00 per cent adopted water management practices, 38.00 per cent had adopted water management practices, 28.00 per cent had adopted fertilizer management, 23.00 per cent had adopted Dharani variety, 18.00 per cent had adopted K-9 and 12.00 per cent of the respondents adopted sub soiler for land preparation and Anantha gorru for sowing of seed and groundnut stripper and minute (3.33%) had adopted recommended varieties of SAU.

**Keywords:** ANGRAU technologies; groundnut cultivation; fertilizer management; land preparation.

## 1. INTRODUCTION

The groundnut, also called peanut or monkey nut, 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 16<sup>th</sup> 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 [1]. It is also known as the 'wonder nut' or the 'poor man's cashew nut'. Groundnut is an important oilseed crop grown in India. Globally India ranks first in area and second in production. India, accounts for 31 % of the total groundnut area in the world with 26.4 Mha with a total production of 37.1 million MT. The average productivity is 1400 kg/ha. The annual global export of groundnuts is of two million MT valued at 2,600 million US \$. [2]. Groundnut crop in India are mainly grown in certain states like Gujarat, Andhra Pradesh, Tamil Nadu Karnataka and Maharashtra. The state of Andhra Pradesh has about one-third of the acreage of groundnut crop is cultivated in an area of 6.66 lakh ha in India and is in the third in position by contributing 17 per cent of the whole production [3]. Total ground nut production in India accounts for 9.18 MT and Andhra Pradesh accounts for 1.04 MT [4]. The productivity of ground nut stands at 883 kg/ha for Andhra Pradesh. The irrigated area of groundnuts in the state has risen from 12.4 lakhs hectares in 1955-56 to 17.66 lakh hectares in 2018-19 and the production has increased from 10.7 lakh tons in 1955-56 to 104 lakh tons in 2018-19 [5].

In Andhra Pradesh it is mainly cultivated in Rayalaseema districts viz., Anantapur, Cuddapah, Kurnool, Chittoor districts and some mandals of Nellore district. Anantapur district

ranks first in Andhra Pradesh in terms of area of acreage at 7.64 lakh ha followed by Chittoor district accounts 1, 89, 000 hectares and production of groundnut crops at Anantapur 7.5 lakh tones and Chittoor district stands at 1,31,000 tons while the productivity levels of groundnut crop in Anantapur district stood at 992 Kg per ha the district was 2696 kg per hectare [5]. So it is imperative to study and critically analyse the extent of adoption of ANGRAU technologies followed by farmers in groundnut cultivation. In the present study, an attempt was made to find out the extent of adoption of ANGRAU technologies in Anantapur and Chittoor districts of Andhra Pradesh.

## 2. RESEARCH METHODOLOGY

*Ex-post facto* research design was selected as an appropriate research design to investigate the variables influencing extent of adoption of ANGRAU technologies in groundnut cultivation. Andhra Pradesh state was purposively selected for the study, since the researcher belongs to the state and was familiar with local language and culture. Two districts were selected purposively from Andhra Pradesh based on the highest area under groundnut cultivation. The names of the selected districts were Anantapur and Chittoor. Two mandals from each district were purposively selected based on the highest area of cotton cultivation thus constituting four mandals. Three villages from each mandal were selected by following simple random sampling procedure. The sample constituted to a total of twelve villages. From each of the selected village, ten farmers were selected by following lottery method of simple random sampling procedure. The sample constituted to a total of 120 respondents. The structured interview schedule was developed and was pre-tested on non-sampled respondents. The interview was conducted personally by the investigator with the farmers individually. The data thus collected were processed, tabulated and analyzed by

using frequency, percentage and mean weight score. The main objectives of this study were to study the extent of adoption of ANGRAU technologies in groundnut crop.

## **2.1 Extent of Adoption of Technology**

The extent of adoption was measured for the recommended cultivation and post harvest practices for cotton. The extent of adoption was measured as per cent of adoption of recommended practices as given below:

$$\text{Extent of adoption} = \frac{\text{Actual practice}}{\text{Recommended practices}} \times 100$$

Based on mean and standard deviation adopters are further classified into low, medium/moderate and high.

## **3. RESULTS AND DISCUSSION**

Study showed that overwhelmingly (88.00%) of the members had adopted tractor drawn sowing, followed by two-thirds (66.00%) had adopted K-6 variety and seed treatment, 52.00 per cent had adopted Integrated pest management, 46.00 per cent adopted water management practices, 38.00 per cent had adopted water management practices, 28.00 per cent had adopted fertilizer management, 23.00 per cent had adopted Dharani variety, 18.00 per cent had adopted K-9 and 12.00 per cent of the respondents adopted sub soiler for land preparation and Anantha gorru for sowing of seed and groundnut stripper and minute (3.33%) had adopted recommended varieties of SAU.

From the Table 1 it could be inferred that cent per cent of the cotton farmers adopted recommended seed rate followed by an overwhelming (92.08%) of the farmers had adopted recommended practice of spacing followed by majority (87.08%) adopted pest management practices, more than three-fourths (70.41%) adopted disease management practices, more than half (53.33%) adopted weed management, 52.5 per cent adopted water management and harvesting practices, nearly one-third (32.50%) adopted nutrient management, 15.83 per cent adopted fertilizer management and very few (9.00%) adopted value addition.

From the Table 1 it could be inferred that majority (88.00%) of the farmers adopted tractor drawn

sowing, the probable reason might be that awareness of farmers on tractor drawn sowing due to training programmes and demonstrations conducted by extension staff of KVK and DAATTC. The other reason might be due to greater dependence on farm machineries due to shortage of labor and increased cost for engaging farm labors for agriculture related activities. Followed by two-thirds adopted K-6 variety. The possible reason for the high adoption could be attributed to increased awareness and effective dissemination of the technology to farmers by extension functionaries of ANGRAU. High adoption of any technology is consistent with greater awareness of that technology. The other reason might be APSSDC also plays a major role in K-6 groundnut seed multiplication and distribution in the state. Very few farmers have adopted recommended practice value addition this might be due to lack of awareness, lack of interest and non-availability of infrastructure for processing of groundnut. The other reason might be due to inadequate seed production indigenous cotton varieties for sale and supply to farmers.

### **3.1 Constraints Perceived by the Groundnut Growers on the Extent of Adoption of ANGRAU Technologies**

Garrett's ranking method used to find out the most significant factor which influences the respondent. The orders of merit given by the respondents were converted in to rank by using the formula. As per this method, respondents are allowed to rank their preferences on which they perceived more and the outcomes of such ranking have been converted into score value with the help of the following formula:

$$\text{Percent Position} = \frac{100(R_{ij} - 0.5)}{N_j}$$

$R_{ij}$  = Rank given for  $i^{th}$  item by the  $j^{th}$  sample respondents

$N_j$  = Total rank given by  $j^{th}$  sample respondents

With the help of Garrett's Table, given by Garrett and Woodworth (1969), the percent position estimated is converted into scores. Then for each factor, the scores of each individual are added and then total value of scores and mean values of score is calculated.

**Table 1. Distribution of groundnut farmers according to their extent of adoption of recommended practices in groundnut cultivation**

		Extent of Adoption of Groundnut Technologies (n=120)		
S.No.	ANGRAU Technology	Adoption (%)	Non-Adoption (%)	Discontinuance (%)
1	Land Preparation			
	a. Sub Soiler	12	88	--
2	New Varieties			
	a. Dharani	23	--	12
	a. K-6	66	--	--
	a. K-9	18	--	14
	a. Kadiri Amaravathi	07	--	06
	a. Others	06	--	05
3	Sowing			
	a. Anantha Gorru	12	--	--
	a. Tractor drawn sowing	88	--	--
	a. Control tack system of Planting	--	--	--
4	Seed Treatment	66	--	08
	(Imidachloprid @ 2 ml / kg seed followed by Tebuconazole 2ds @ 1g or Mancozeb @ 3 gm / kg seed)			
5	Fertilizers ( 20N + 40 P2O5 + 50 K2O kg/ha)	28	92	14
6	Water Management (400 to 450 mm depth of water)	38	50	12
7	Weed Management (Pre-emergence application of Pendimethalin @ 2.5 to 3 l./ ha, post emergence herbicides by spraying Imazethaphyr @ 750 ml/ha)	46	34	20
8	Integrated Pest Management	52	44	04
9	Harvesting			
	a. G.nut Stripper	12	--	--
	b. Dry pod thresher	--	--	--
	c. Fresh pod Thresher	--	--	--
	d. Decorticator	9	--	--
10.	Value Added products	06	94	--

**Table 2. Constraints perceived by groundnut growers on the extent of adoption of ANGRAU technologies**

ANGARU technologies	G.S.	A.S.	Rank	Constraints for non-adoption
Land preparation	15705	65.44	II	Non-availability of machinery, lack of awareness, lack details about its functioning principles.
varieties	11705	45.44	IX	Low market prices, long duration, weight loss on storage.
Sowing methods	10924	42.35	X	--
Seed treatment	11920	49.67	VII	Lack of knowledge about seed testing procedure, complex to follow.
Fertilizer	15516	64.65	IV	Difficulty in applying

<b>ANGARU technologies</b>	<b>G.S.</b>	<b>A.S.</b>	<b>Rank</b>	<b>Constraints for non-adoption</b>
management				recommended dosage of fertilizers labor problem
Irrigation management	12660	52.75	V	
Weed management	12120	50.75	VI	Lack of visible results
IPM	11824	46.50	VIII	lack of interest and visible results
Harvesting methods	15405	61.44	III	Non-availability, lack of awareness, lack details about its functioning principles.
value addition	15900	66.65	I	lack of awareness and Interest and processing facilities.

#### **4. CONCLUSION**

29.33 per cent of the respondents adopted ANGRAU technologies in Groundnut crop. Majority (88.00%) of the farmers adopted tractor drawn sowing, followed by two-thirds adopted K-6 variety.

#### **COMPETING INTERESTS**

Authors have declared that no competing interests exist.

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