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Technological gap in Groundnut Production Technology in Prakasham District of Andhra Pradesh

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ABSTRACT

The investigation was conducted in five major groundnut growing villages of Prakasham Dist. More than half (56.00%) of the groundnut farmers were in medium category of technological gap. Huge technological gap was observed with respect to gypsum management (71.33%), Potash management (68.33%), Manures use (59.29%), Phosphorous management (57.14%), Nitrogen management (54.28%), need based pest and disease management (53.33%), seed rate (52.00%) and spacing (50.00%). Innovativeness, extension contact, mass media use and training undergone were the variables found to have negative and significant relation at 0.01 level with technological gap.

Groundnut has a distinct position among the oilseeds as it can be consumed and utilized in diverse ways. It is a rich source of edible oil (44-55%), high quality protein (22-32%) and carbohydrates (8-14%) and hence, it is valued both for edible oil and confectionery purposes (Hadiya *et al*., 2014). It is grown worldwide in more than 100 countries and is considered as the world's fourth largest source of edible oil and the third most important source of vegetable protein. India is the largest groundnut growing country accounting for 40.00 per cent of the world's groundnut area and 34.00 per cent of the world's production (Kapse *et al.*, 2007). Seventy percent of the area and seventy five percent of the production has been concentrated in the four states of Gujarat, Andhra Pradesh, Tamil Nadu and Karnataka. Groundnut occupied second largest both in area and production in Andhra Pradesh (GOI, 2008). In Prakasham district groundnut is cultivated in an area of 8222 ha with a production of 14.875 tones and productivity of 1809kg/ha.

However, the yield levels in the district are low and have remained stagnant for the past few decades. This was only due to less adoption of improved groundnut production technology. In spite of the various efforts, the improved technology is not generally accepted by the groundnut farmers in all respects. As such there always appear to be a gap between the recommended technology by the scientists and its use at farmer's level. This technological gap is major problem in the efforts of increasing groundnut production in the country. Thus, it is very much essential to ascertain the technological gaps in groundnut production. It would be useful to develop sequential concept of groundnut production technologies with a special reference to the identification of factors responsible for the technological gaps. The personal, socio economic and psychological characteristics of growers directly influence the extent of adoption of improved agricultural technology. Hence, the present investigation was undertaken with the objectives to study the level of composite technological gap of groundnut production technology, to ascertain correlates of technological gap in groundnut production technology and to analyze the constraints in groundnut cultivation.

MATERIAL AND METHODS

Ex-post facto research design was adopted for the study. The study was conducted during 2015-16 in Prakasham district of Andhra Pradesh. Considering maximum area under groundnut cultivation as criteria, five villages' *viz*., Kothapatnam, Ethamukkala, Vajjireddypalem, Vetapalem, and Chinaganjam were selected. From each selected village, 20 farmers growing groundnut were selected by simple random sampling procedure, thus, making the total sample size 100. All the groundnut recommended package of practices included in the schedule were administered to the respondents after pre-testing and the responses were obtained on a three point continuum as fully

adopted, partially adopted and not adopted and scores of 2, 1 and 0 were assigned, respectively. Any remarkable deviation from adoption of normal recommendation was treated as partial adoption. The maximum score that a respondent could obtain was 34 and minimum was zero. The actual score was deducted from maximum score of the respondents to find out the technology gap of recommended practice of individual. Technology gap has been defined as the proportion of gap in the adoption of practices recommended and it expressed in percentage (Ray *et. al.,* 1995). The package of practices recommended by ANGR Agricultural University, Andhra Pradesh was considered as standard for calculating gaps.

The technological gap of a particular practice expressed in percentage was:

$$\text{Technological gap} = \frac{\text{Maximum possible score} - \text{Actual score obtained}}{\text{Maximum possible score}} \times 100$$

The data on adoption levels of groundnut farmers were collected by using pre tested schedule employing personal interview method. The respondents were divided into three categories *viz.,* low, medium and high based on their mean technological gap and standard deviation. The responses were scored, quantified, categorized, tabulated and analyzed using mean, standard deviation, frequencies and percentage. Correlation analysis was carried out to assess the relationship between profile characteristics of farmers and their technological gap. Each groundnut farmer was also interviewed by posing open ended questions so as to unearth constraints he/she has experienced and analyzed by calculating frequencies and percentages.

RESULTS AND DISCUSSION

Technological gap in groundnut production technology

It is evident from Table 1 that, more than half (56.00%) of groundnut farmers belonged to medium category of technological gap followed by high technological gap of 26.00 per cent and 18.00 per cent belonged to low technological gap category. The reason for medium and high technological gap was due to partial adoption of seed rate, seed treatment, manure use, gypsum management, 'N', 'P' and 'K' management. The findings are in conformity with the findings of Shriram and Chauhan (2000) and Kapse *et al*. (2007).

From Table 2 it could be inferred that there was no technological gap with respect to soils, varieties, land preparation and sowing method. Cent per cent of the farmers of Prakasham district were cultivating TAG 24 groundnut variety, as this particular variety gives them good yields and fetching reasonably good price in market over the other high yielding varieties. Further, farmers as a result of their farming experience have themselves realized the usefulness of these practices also, hence most of the respondents were convinced about the profitability and practicability of these recommendations. Highest (71.33%) technological gap was observed with respect to time of application of gypsum to the groundnut crop. This is attributed to farmers' poor knowledge on the right time of gypsum application and its contribution for increased yields. Even though farmers are aware of the importance of gypsum for groundnut crop they were applying in insufficient quantity and at initial land preparation stage, which is not serving the purpose of gypsum application at peg penetration stage. Huge (68.33%) technological gap was recorded in terms of potash fertilizer management. The major reason for this trend was that majority of the farmers were unaware of the importance of potash fertilizer management in groundnut cultivation due to which they were applying insufficient quantities and most of the times not using potash fertilizers. Almost sixty per cent of the gap was observed in manure use by the groundnut farmers, this was due to insufficient manure availability and high cost involved due to decreased animal population. Farmers used more than recommended 'N' and 'P' fertilizers ultimately resulting to a gap of 54.28 % and 57.14% respectively. This is mainly because of the competition among the farmers for higher production. Further, application of complex fertilizer was prime cause for technological gap in respect of major fertilizers application. Regarding need based pest and disease management, wide technological gap (53.33%) was observed due to lack of awareness on integrated pest and disease management, indiscriminate use of chemical insecticides and fungicides without bothering about the compatibility and necessity of the use ultimately resulting in increased cost of cultivation. Another reason for this trend was incorrect knowledge of the farmers on identification of pest and disease symptoms.

More than fifty per cent (52.00) gap was recorded with respect to seed rate used by the farmers. They were using almost 2-3 times more seed than recommended. The reason farmers expressed was more prevalence of rot diseases in their area which is hindering them to maintain optimum plant population at initial stages itself. Another probable reason for this problem was farmers were not adopting seed treatment fully. Using increased seed rate ultimately resulted in measurable technological gap in spacing (50.00%). Regarding seed treatment, high technological gap (47.86) was found due to lack of knowledge and also non-availability of *Trichoderma viride* locally at the time of sowings. Considerable gap (42.00%) was observed with respect to Zinc management as the farmers were not adopting recommended quantity. The findings of the present study are in consonance with the Kapse *et al*. (2007), Patil *et al.* (2011) and Jahagirdar *et al.* (2012).

Relationship between personal and socio – economic characteristic of groundnut farmers and their technological gap

Perusal of Table 3 revealed that innovativeness, extension contact, mass media use and training undergone were the variables found to have negative and significant relation at 0.01 level with technological gap in groundnut crop. This clearly establishes that increasing extension contact by the farmers encourage them to adopt modern agricultural technology to greater extent. Further mass media use expose farmers to latest technologies and leads to higher adoption. This ultimately leads to reduced technological gap. Innovativeness is another variable which makes the farmers to think new and adopt recent technologies. Trainings under gone might have helped farmers to have correct knowledge on recommended groundnut production technology. Manipulation of these variables will be very effective in minimizing the technological gap and these variables will help extension workers to modify their endeavors accordingly for better socio-economic growth of the farming community by organizing exhibition, field tours, farmers discussion, farmers field school and by exposing them to changing agricultural world through specialist which ultimately results in more adoption and minimizing the technological gap. It was found that age, education, land holding, farming experience, social participation and economic motivation were not significantly related with technological gap in groundnut cultivation which indicated that there was no association between them.

Constraints expressed by the farmers in groundnut production

From Table 4 it could be inferred that sent per cent of the groundnut farmers expressed that stem rot incidence and more prevalence of micronutrient deficiencies were the major constraints in groundnut cultivation. The reason behind for these constraints was continuous cultivation of groundnut crop season after season and year after year without balanced fertilizer management. More than ninety (93.00%) of the farmers felt using more seed rate to maintain optimum plant population is one of the reasons for increased cost of cultivation. Non availability of high yielding varieties alternate to TAG 24 with competent yields and market price was the another constraint expressed by the great majority of the farmers (89.00%). More than seventy per cent (72.00%) of the farmers felt low yields was the problem. Two thirds (66.00%) of the farmers felt that sprouting of TAG 24 variety is another reason for their decreased yields. Other major constraints expressed by the farmers were root or stem rot incidence (63.00%), insufficient groundwater availability (59.00%), and high demand for labourer during harvesting and lack of storage facilities (54.00%). Below fifty per cent of the farmers perceived that continuous cultivation of groundnut for three years depleting nutrients (46.00%), increased cost of cultivation (41.00%), insufficient manure availability (35.00%) and nematode incidence (33.00) were the constraints experienced by the farmers.

It could be inferred from the study huge gap was recorded in gypsum, nitrogen, phosphorus, potash, manure, micronutrient, need based pest and disease management, seed rate and seed treatment aspects. In turn these are the factors contributing for decreased yields as well as increased cost of cultivation. Hence there is every need to utilize the correlates *viz*., innovativeness, extension contact, mass media use and training programmes to create awareness and to convince the farmers by the field level extension functionaries more efficiently to reduce the technological gap identified in groundnut cultivation.

Table 1: Distribution of respondents according to their overall technological gap

(n=100)

Category	Frequency	Percentage
Low(<27.87)	18	18.00
Medium(27.87-45.93)	42	56.00
High(>45.93)	26	26.00
	120	100.00
	Mean= 36.90	SD=9.03

Table 2: Technological gap in adoption of recommended groundnut cultivation practices

(n=100)

S.No	Recommended practices	Technological gap
1.	Sowing time	7.86
2.	Soils	0.00
3	Varieties	0.00
4	Land preparation	0.00
5	Seed rate	52.00
6	Seed treatment	47.86
7	Spacing	50.00
8	Sowing method	0.00
9	Sowing depth	27.86
10	Manures	59.29
11	N Fertilizers Management	54.28
12	P Fertilizers Management	57.14
13	K Fertilizers Management	68.33
14	Gypsum Management	71.33
15	Zn management	42.00
16	Iron management	38.66
17	Need based pest and disease management	53.33

Table 3: Correlation of personal and socio –economic characteristic of groundnut farmers with technological gap

(n=100)

S. No.	Independent variable	"r" value
1	Age	0.103
2	Education	0.125
3	Land holding	0.111
4	Farming experience	0.026
5	Mass media use	-0.468**
6	Innovativeness	-0.657**
7	Social participation	0.165
8	Economic motivation	0.081
9	Extension contact	-0.536**
10	Trainings undergone	-0.369**

** Significant at 1 percent

Table 4: Constraints expressed by the farmers in Groundnut production

(n=100)

S. No.	Constraints	Freq	Per cent
1	Stem rot incidence	100	100.00
2	More prevalence of micro nutrient deficiencies	100	100.00
3	Using more seed rate to maintain optimum plant population as there was severe rot problem at initial stages	93	93.00
4	Non availability of HYV alternate to TAG 24	89	89.00
5	Low yields	72	72.00
6	Sprouting problem in TAG 24	66	66.00
7	Root rot occurrence	63	63.00
8	Insufficient ground water availability	49	59.00
9	High demand for laborer during harvesting	54	54.00
10	Lack of storage facilities	54	54.00
11	Three crops per year making nutrient poor	46	46.00
12	Increased cost of cultivation	41	41.00
13	Insufficient manure availability	35	35.00
14	Nematode problem	33	33.00

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