RATIONALE BEHIND ADOPTION OF INTER RELAY CROPPING SYSTEM BY GROUNDNUT GROWERS

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ABSTRACT

A study was undertaken in South Saurashtra agro climatic zone of Gujarat state, to find out the relationship between the socio-economic characteristics of farmers and technological gaps in adoption of groundnut pigeon-pea inter relay cropping production technology. The ex-post-facto research design was used for the study. The study was conducted in four villages namely Motimarad and Pipliya from Dhorajitaluka of Rajkot district and Datrana and Nagalpur from Mendradataluka of Junagadh district. The study sample consisting 120 respondents which were purposively selected from selected villages. The findings revealed that selected independent variables viz. education, knowledge, social participation and yield index were negative and significantly associated with technological gap of groundnut-pigeonpea inter-relay cropping system. The direction of relationship was negative which clearly indicated that the level of technological gap decreases with increase in the level of education. The calculated 't' value for partial regression coefficient was negative and significant with knowledge index (-0.5668)and equivalent yield level (-0.1742) on technological gap of groundnut- pigeonpea inter relay crop growers, respectively. This clearly showed that by proper management of these important variables, the technological gap could be minimized considerably, which would resulted in higher production of groundnut-pigeonpea inter relay crop as well as to increase the extent of area under this system.

KEY WORDS: Correlation, groundnut, pigeonpea, relay cropping system

INTRODUCTION

India occupies the first position, both with regards to area and productivity of groundnut in the world. The oil content of the seed varies from 44 to 55 percent, depending upon the varieties and agro climatic condition. Its oil finds extension use as vanaspati ghee. It is also used in manufacturing soap, cosmetic and lubricants. Kernels are also eaten raw, roasted or sweetened which is rich in protein and vitamins A and B. Being a legume with root modules, it is capable of fixing atmospheric nitrogen, thereby improving the soil fertility. In the same

way, pulses also play important role in sustaining soil health, water management, soil ameliorative properties and nitrogen fixing ability. Efforts are, therefore, needed to reintroduce pulses in cropping system to maintain sustainability of production system.Relay cropping system is a common practice in the low level equilibrium farmers to insulate their investments against adversities of nature. The groundnut-pigeonpea inter-relay cropping system has been introduced through front line demonstration programmes from 1991-1992.This system proved that the relay pigeonpea did not reduce the yield of groundnut. Encouraging results have popularized this system among the farmers of Saurashtra region, where the main *kharif* crop is groundnut. The South Saurashtra Zone of Gujarat is characterized by the drought prone area, where the monsoon is irregular, uneven and erratic in nature. The sole crops are not always secure so far as the production is concerned.Hence, the study was undertaken with the specific objectives, to ascertain the association between dependent variable (technological gap) and their selected characteristics, and to predict the extent of variation in dependent variables caused by independent variables.

RESEARCH METHODOLOGY

The study was carried out in South Saurashtra agro climatic zone of Gujarat during the year 2005-06,because it occupies highest area as well as production in the state. In this study, ex-post facto research design was used. The South Saurashtra agro climatic Zone is consisted of 25 talukas of 4 districts of the state having common agro-climatic conditions. Out of four districts, Rajkot and Junagadh will be selected purposively,where the groundnut-pigeonpea inter-relay cropping system has already been adopted by the farmers. From the two districts, one taluka from each district was selected for the study. From each selected taluka, two villages Motimarad and Pipliya from Dhoraji taluka of Rajkot district, and Datrana and Nagalpur from Mendrada taluka of Junagadh district were selected by random sampling method. Thus, the total numbers of 4 villages were selected for the study. Total numbers of 120 farmers, 30 farmers from each selected village were selected by using purposive random sampling technique with a condition that the farmers have adopted this cropping system at least since last two years. The data were collected through specially developed interview schedules. Total 12 independent variables namely, age, education, size of land holding, annual income, cropping intensity, irrigation potentiality, knowledge, extension participation index, social participation, risk preference, occupation and yield level about the groundnut-pigeonpea inter relay cropping system were computed for determining correlation co-efficient in order to find out their relationship with the dependent variable, namely, technological gap. The formula used for measuring the technological gap was as follows:

$$T.G. = \frac{(R-A)}{R} \times 100$$

Where,

T.G. = Technological gap for each practice for each respondents

R = Recommended score for each practice

A = Adoption score of relative practice

The co-efficient of correlation ('r' values) were calculated. The research hypotheses in null form were derived for testing the association and

their significance in zero order correlation.

RESULTS AND DISCUSSION

Correlates of technological gap ofgroundnut-pigeonpea inter-relay cropping system by the farmers

The results presented in Table 1 revealed that the selected independents variable *viz*. education, knowledge, social participation and yield index were negative and significantly associated with technological gap of groundnut-pigeonpea inter-relay cropping system.

The direction of relationship of education with technological gap of groundnut-pigeonpea inter relay cropping system was negative, which clearly indicated that the level of technological gap decreases with increase in the level of education. This might be due to the fact that educated respondents had perceived this cropping system with relative case, as it is well known that education is a panacea to all the social evils. Similar findings were observed by Wangilker*et al*. (1991), Desai and Thakkar (1994) and Trivedi and Patel (1996). In case of social participation, negative relationship clearly indicated that the level of technological gap decreases with increase in the level of social participation. It might be due to that more social participation provides more in-depth information and better understanding to the respondents, which lead to develop the confidence among the farmers to adopt the improved practices. This finding is in conformity with the findings with Trivedi and Patel (1996). In knowledge, the direction of association was negative and significant, which indicated that with increase in knowledge of the respondents, the technological gap decreased. It is also due to the fact that as a result of higher knowledge of groundnut-pigeonpea production technology, the respondents might have adopted more improved technologies, which resulted in higher adoption and lower the technological gap.The similar findings were observed by Gupta (1987) and Sood (1987). In the same way, the higher the level of knowledge about the groundnut-pigeonpea inter relay crop production technologies encourage the farmers to adopt the recommended technologies would resulted in increasing crop yield.Similar findings were reported by Kher (1986), Gupta (1987), Sood (1987), Patel (1995) and Verma (2000).

Extent of variation in technological gap caused by selected independent variables

The correlation co-efficient was only gives the degree and direction of association, but does not focus on the predictive ability of independent variables, whereas multiple regression analysis determines their relative contribution and predicts the extent of variation in technological gap. The predictability of the model was calculated as the co-efficient of multiple determinations (R^2).

The results presented in Table 2 clearly indicated that the calculated 't' value for partial regression co-efficient was negative and significant at 1 per cent level of probability in case of knowledge only. The yield index (equivalent yield level) (-2.2830) was negative and significant at 5 per cent level of probability, while remaining variables did not show significant effect on technological gap of groundnut-pigeonpea inter relay crop growers.Further, it could be inferred that the total contribution of these twelve variables was 48.76 per cent of variation in technological gap of groundnut-pigeonpea inter relay crop growers.In the order of contribution that knowledge index (0.5668) was the

highest contributions on technological gap of groundnut-pigeonpea inter relay crop growers followed by equivalent yield level (0.1742), size of land holding (0.1741), risk preference (0.1720), occupation (0.1627), education (0.0895), cropping intensity (0.0768), age (0.0690), irrigation index (0.0457), social participation (0.0256), income (0.0233) and extension participation (0.0152). Similar finding was observed by Tyagi (1991) andDas *et al.*(1998).This clearly showed that by proper management of these important variables, the technological gap could be minimized considerably which would result in higher production of groundnut pigeon pea inter relay crop as well as to increase the extent of area under this system.

CONCLUSION

It can be concluded that the education, knowledge, social participation and yield index were negative and significantly associated with technological gap of groundnut-pigeonpea inter relay cropping system, and it might be due to that the level of technological gap decreases with increase in the level of education because education is a panacea to all the social evils.Farmers are more contact, they get more information which lead to develop the confidence among the farmers to adopt the improved practices.Proper management of knowledge and equivalent yield level, as a result the technological gap could be minimized considerably which would result in higher production of groundnut-pigeonpea inter relay crop as well as to increase the extent of area under this system.

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Table 1: Zero order correlation co-efficient between technological gap and selected independent variables.

n = 120

Sr. No.	**Name of Independent Variables**	**Correlation Coefficient (r)**
1	X_1 Age	0.1426 ^{ns}
2	X_2 Education	-0.4773**
3	X_3 Size of land holding	-0.0162 ^{ns}
4	X_4 Irrigation index	-0.0288 ^{ns}
5	X_5 Cropping intensity	0.1020 ^{ns}
6	X_6 Income	-0.1086 ^{ns}
7	X_7 Occupation	0.0189 ^{ns}
8	X_8 Social Participation	-0.2144*
9	X_9 Extension participation	-0.0415 ^{ns}
10	X_{10} Risk preference	-0.0323 ^{ns}
11	X_{11} Knowledge	-0.6339**
12	X_{12} Yield Index	-0.2993**

ns *= Non-significant*
*** = Significant at 0.05 level*** *** = Significant at 0.01 level***
Critical value 0.05 level = ± 0.1792 ***Critical value 0.01 level = ± 0.2353***

Table 2: Multiple regression analysis between Technological gap of respondents and their independent variables.

n = 120

Sr. No	Independent Variables	Partial 'b' value	't' Value for (d.f.= 118)	Standard Partial Beta 'b'	Rank Order
1	X_1 Age	-0.0755	-0.7950ns	0.0690	VIII
2	X_2 Education	0.3010	-0.8260ns	0.0895	VI
3	X_3 Size of land holding	1.2074	0.1741ns	0.1741	III
4	X_4 Irrigation index	0.0287	0.6150ns	0.0457	IX
5	X_5 Cropping intensity	0.0606	0.9320ns	0.0768	VII
6	X_6 Income	0.0005	-1.2520ns	-0.0233	XI
7	X_7 Occupation	4.0101	1.9430ns	0.1627	V
8	X_8 Social Participation	0.1801	-0.3390ns	-0.0256	X
9	X_9 Extension participation	0.0117	0.2040ns	0.0152	XII
10	X_{10} Risk preference	0.5475	1.9280ns	0.1720	IV
11	X_{11} Knowledge	2.7533	-6.2250**	-0.5668**	I
12	X_{12} Yield Index	0.1104	-2.2830*	-0.1742*	II

R^2 = 0.4876 ***ns= Non-significant***

*** = Significant at 0.05 level*** ***** = Significant at 0.01 level***

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