ASSESSMENT OF FARMERS' ADOPTION OF IMPROVED AGRICULTURAL TECHNOLOGIES IN SOYABEAN PRODUCTION IN MICHIKA LOCAL GOVERNMENT AREA OF ADAMAWA STATE, NIGERIA

A.O. Ani* & U.C. Undiandeye

Department of Agricultural Economics and Extension, University of Maiduguri, P.M.B. 1069, Maiduguri, Nigeria

ABSTRACT

This study assesses the adoption of improved farm practices by soyabean farmers in Michika Local Government Area of Adamawa State, Nigeria. It describes the package of technologies for soyabean production in Adamawa State. The instrument used for collecting data for the study was a questionnaire. A total of 96 soyabean farmers served as respondents. The data were analysed by use of frequencies, percentages and regression analysis. The study revealed that farmers' age and educational levels were significantly related to adoption, while farm yield and extension visits were not. The results also indicated that farmers mostly adopted correct planting time and weeding frequency among other technologies.

Keywords: Assessment, farmers, adoption, improved technologies, soyabean

INTRODUCTION

The process of increasing the efficiency of agricultural production through agricultural modernization depends mainly on the extent to which farmers can incorporate improved agricultural practices into farming operations (Ani and Kwaghe, 1997). For any nation to overcome the problems of domestic food production and improve her economy, she has to move from traditional agriculture to a modernized one. A nation, which is dependent upon traditional agriculture is inevitably poor and as a result spends much of its income on food importation (Okoye, 1988).

Nigerian agriculture as well as that of the developing countries of the world is characterized by the presence of small- scale peasant farmers. It has been reported that the peasant farmers and their families produce 90 per cent of the staple food requirements of Nigeria's population (Olayide, 1976; Lele, 1981). Ijere (1986) views small- scale farmers as holders of land acres ranging from 0.01 - 5.99 hectares. In some cases, these farmers may own up to three or more of such farms in different locations.

Therefore, any attempt to increase productivity requires complete transformation of present Nigeria's agricultural situation to a more advanced stage, where new improved technologies will be employed. Unfortunately, the adoption of innovations by farmers has been very low. According to Onucheyo (1998) the state of our agriculture today is most uninspiring. The grave picture reflected in bad food situation, abandoned farms and farm machinery, poor state of irrigation projects and rundown agricultural training institutions is a testimony to the magnitude of the problem.

Adamawa State of Nigeria is blessed with great agricultural potentials necessary for the production of food crops. Among many of the crops produced in this state are soyabean, groundnut, cassava, maize, rice, sorghum and millet. However, one of the most important agricultural issues confronting Adamawa State, is the diffusion of innovations and the adoption of recommended farm practices by farming population, partly due to lack of awareness among farmers of the immense significance of the effect of such recommended practices. An average farmer in Adamawa State is faced with many problems ranging from their production resources such as land, labour and capital to their socio-economic status, which is very low. In addition, capital investment in farming tools and

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*Correspondence

equipment is low. Expenditures on purchased inputs like fertilizers, pesticides and improved seeds and seedlings usually account for an insignificant percentages of the total cash expenditure.

The focus of this study was to assess the farmers' adoption of new agricultural technologies in soyabean production in Michika Local Government Area of Adamawa State, Nigeria. The specific objectives include:

i)   To determine farmer's level of adoption of new farm technologies.

ii)   To determine how adoption is related to some socio-economic characteristics of the farmers.

However, in order to come up with better results in this study, a hypothesis was formulated. It was stated thus "The socio-economic characteristics of the farmers in Michika Local Government Area are not related to their adoption of improved technologies on soyabean production."

METHODOLOGY

The target population for this study was soyabean farmers in Michika Local Government Area of Adamawa State, Nigeria. Criteria used in selecting the villages (for the study) from the local government were based on the information gathered from agricultural officers and extension agents in the study area. Two of the four agricultural development areas of the local government were purposely chosen based on the fact that these two agricultural areas produced more soyabean than the other two.

Subsequently, four villages were chosen from these two developmental areas using purposive sampling procedure. The villages chosen were Kapale, Futueles, Wotu and Michika. In each of these villages 25 soyabean farmers were selected using simple random sampling techniques. This therefore, brings the total respondents to 100.

The instruments used in collecting data for this study were questionnaire as well as oral interview. However, out of 100 copies of the questionnaire distributed to elicit information from the respondents, 96 were returned and used for analysis.

Data were analysed using tables, frequencies and percentages. Simple regression analysis was employed for testing the relationship between selected variables and adoption of improved technologies in soyabean production. This was done at 1% confidence level. However, technologies that have 60% and above respondents affirming, "now using" indicate high adoption for such technologies; while those (technologies) having 40% - 55% and below 40%, imply average and low adoption respectively.

RESULTS AND DISCUSSION

Level of adoption of improved farm technologies

Table 1 presents data on the level of adoption of recommended technologies as it concerns soyabean production. The result shows that about 63% of the respondents were using improved seeds, indicating high adoption. However, 37% never used it from the oral information gathered and the reason that may be given for not using the improved seeds could be that the seeds were not within the reach of such farmers or that the seeds were costly that some farmers cannot afford to buy them.

However, 75% of the respondents were using the right planting time (high adoption); about 21% never used the time and about 4% discontinued using the right time. When the respondents who discontinued the practice were asked why they discontinued, they maintained that it did not make any difference in terms of yield, when they planted at the recommended period and outside the period.

The information on the use of the right type of fertilizer (Single Super Phosphate, SSP) revealed that about 44% of the respondents were using the right fertilizer (average adoption) and as many as 56% never used it and none discontinued the use. The oral information gathered indicated that, the number that never used it could be attributed to infrequent visits by extension agents to farmers to create awareness on the use of the fertilizer in question. Therefore, ignorance on the part of the farmers could be said to have played a significant role in this regard.

Similarly, 42% of the respondents had adopted the right spacing (average adoption), 31% and 27% had discontinued and never used the technology respectively. On weeding frequency, 69% of the respondents adopted the practice (high adoption) while 27% discontinued the use and 4% never used it. Oral interview of some farmers revealed that they did not have specified time for weeding; and what they did most of the time was to remove the weeds as they emerge.

Data on inter-crop requirements (rotation) show that only about 25% of the respondents indicated having adopted the proper rotation and/or intercrop (low adoption) with crops such as cotton, maize and groundnut. About 62.5% of farmers never used this technology, while about 12.5% of the respondents discontinued intercropping/rotation after some time.

Information on adoption of the proper harvesting time (Table 1) shows that only very few respondents (25%) had adopted the right harvesting period (low adoption), 33% who adopted before now discontinued and as many as 42% never adopted.

It has been observed that farmers may be desirous of adopting new practices but may be constrained by inadequate information about that particular innovation which may in part be caused by the inability of the extension

personnel to reach the farmers. It has been reported that most farmers stick to old practices because of financial considerations, as they cannot afford the cost of innovations, risks involved, ignorance of existence of innovations and their conservative attitudes (Onyewaku, 1988). These could as well be major reasons why some farmers adopted and others did not in this study, as far as soyabean production is concerned.

Table 1. Percentage distribution of soyabean farmers according to adoption of recommended technologies in Michika Local Government Area

Recommendations	Adoption level	Frequency	Percentage of farmers
Use of improved seeds	Never used	36	37.0
	Discontinued	-	-
	Now using	60	63.0
Planting time	Never used	20	21.0
	Discontinued	4	4.0
	Now using	72	75.0
Use of fertilizer (SSP)	Never used	54	56.0
	Discontinued	-	-
	Now using	42	44.0
Using appropriate spacing	Never used	26	27.0
	Discontinued	30	31.0
	Now using	40	42.0
Weeding frequency	Never used	4	4.0
	Discontinued	26	27.0
	Now using	66	69.0
Intercrop requirement	Never used	60	62.5
(Rotation)	Discontinued	12	12.5
	Now using	24	25.0
Harvesting time	Never used	40	42.0
	Discontinued	32	33.0
	Now using	24	25.0

Influence of socio-economic characteristics of respondents on their adoption of improved soyabean technologies

One hypothesis was tested in the study, namely, that "there is no significant contribution of the farmers' socio-economic characteristics in predicting the adoption of selected improved soyabean technologies. The socio-economic characteristics considered include the farmers age, their educational level, farm yield and extension visits.

A summary of the regression analysis is given in Table 2. Adoption constituted the dependent variable (Y) while the other variables - age, educational level, farm yield and extension visits constituted the independent variables designated by X_1, X_2, X_3, and X_4 respectively. The result indicated that the relationship between adoption level and the variables X_1, and X_2, (farmers' age and educational level) were highly significant with values of 94% and 91% respectively. This agrees with the work of Abalu (1980), which emphasized that high literacy level shoots up adoption, while the work of Akinola (1986) maintained that young farmers tend to be more flexible in their decision and adopt new ideas more readily than older farmers. It is probable to assert that as farmers' age rises or as they grow older, they would want to hold on to their traditional methods of production, and are very difficult to convince to use modern methods of production. Added to this is that the growing recognition of the contribution of education to farmers as one of the essential elements of the agricultural development processes, the mere economic growth in terms of capital accumulation could not alone account for true agricultural development in Nigeria. There is need therefore, to recognise that a major part of economic growth lies in investment in the development of agriculture through education.

However, the variables - yield (X_3) and extension visits (X_4) were statistically not significant with values of 26% and 15% respectively. The insignificance of yields in relation to adoption could be attributed to the fact that the crop is widely consumed in the area (possibly because of its nutritional value) and so most farmers attempt growing it. Oral interview conducted, revealed that the probability that adoption depended on the farm yields was not also significant as a result of the fact that soyabean relatively yields well in the study area.

According to the work conducted by Onu (1991) extension visit is one of the main factors influencing positively the adoption of improved technologies. This disagrees with the present study. The reason for this could

be that there was high level of literacy among soyabean farmers in the study area. Therefore, they may not have needed more education on their farming practices.

Table 2. Summary of regression analysis of adoption with selected socio-economic characteristics of farmers

Independent variables	Regression coefficient	R^2	Change in R	F-ratio
Farmers age (X₁)	0.9428	0.2700	0.2700	82.252*
Educational Level (X₂)	0.9167	0.6700	0.1518	20.410*
Farm yield (X₃)	0.2632	0.1900	0.0869	1.186 NS
Extension Visits (X₄)	0.1527	0.1145	0.0667	0.972 NS

*   =   Significant at 0.01 level
NS =   Not significant

CONCLUSION AND RECOMMENDATIONS

The high rate of population growth in Nigeria has led to continuous land fragmentation and degradation, which in turn has rendered the traditional method of farming ineffective. There is the need therefore, for enlightening the farmers about the use of improved agricultural technologies, which will ensure high yields per unit land area in order for Nigeria to feed herself.

This study assessed farmers' adoption of improved agricultural technologies in soybean's production in Michika Local Government Area of Adamawa State, Nigeria. More importantly, an attempt was made to examine how the differences in some key socio-economic variables affected the degree of adoption of recommended production innovations by soyabean farmers.

The study revealed that the adoption of improved technologies by farmers is at times selective due to the fact that there is unavailability of new technologies especially inputs at the right time; incompatibility of new technologies with the existing practices (this must have informed their discontinuing some practices after sometime); lack of information from extension workers due to infrequent visits. Therefore, technological support aimed at sustaining agricultural growth, should incorporate the development of an efficient, effective and well connected agricultural research and extension system capable of continually generating newer agricultural technologies that will be more conveniently accommodated by farmers.

In general, farmers always see recommended practices as disaggregate of specific material items from which to select and adopt only desired practices, whereas research institutes consider recommendations as a "package" which farmers should adopt. This often results in the selective and partial adoption of practices.

Based on the foregoing, it is necessary to suggest that there should be re-orientation of the technology generation and dissemination system by research institutes, which takes farmers and their ecological zones into consideration. Moreso, there should be provision of rural infrastructures like roads so as to enable farmers obtain their inputs at affordable price and at the right time.

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