

ATTITUDE OF FARMERS TOWARDS CULTIVATION OF BAMBARA GROUNDNUT IN NORTH-EAST BOTSWANA

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Abstract

A survey was conducted in July 2005 to determine the attitude of farmers in the North-East region of Botswana towards the cultivation of hybrid variety of Bambara groundnut in Botswana and also to determine the relationship between the attitude of the farmers and some socio-cultural variables. Proportionate stratified random sampling method was used to select 10 farmers in nine extension areas of the north-east region of Botswana. A total number of 90 farmers were thus selected to participate in the study. A questionnaire was developed by the researcher and used to collect data. Respondents were asked to indicate their responses on a six-point likert type scale. The statements were validated and the reliability estimate calculated and found to be 0.81. The socio-cultural variables used in the study were considered relevant in the light of some theoretical considerations. Results showed that farmers have a favourable attitude towards the cultivation of hybrid variety of Bambara groundnut. In most cases negligible relationships were found between the attitude of the farmers and the socio-cultural variables examined.

Introduction

Bambara groundnut (*Vigna subterranean* (L.) Verdc) also called 'Jugobean' in most of the Southern African countries including Botswana is an indigenous crop in Africa. It has the advantage of being able to adapt to a wide range of soils and climatic conditions, which makes it suitable for production in semi-arid areas of Botswana. In Botswana, farmers grow Bambara groundnut on a small scale for consumption. In some cases, farmers may sell some of their produce in market to earn some pocket money. The crop is normally intercropped with other crops such as sorghum or maize in Botswana and can provide food security simply because of its tolerance to various environmental stress typical of the country. Bambara groundnut is commonly referred to as an underutilized crop and efforts are being made to popularize it in Southern African countries, (Amarteifio, 2003). It is a well-balanced food and compares favourably with other common legumes in terms of the important macronutrients such as protein and carbohydrates. Its lysine content is comparable to soybean, hence, it has potentials for utilization in the formulation and production of weaning foods. Realizing the numerous advantages of Bambara groundnut to food security and balanced diet in Southern African countries, the European Union (EU) under the International Cooperation with Developing Countries (INCO-DEV) is interested in promoting the cultivation of this crop in many Southern African countries. The success of this endeavor to encourage the cultivation of Bambara groundnut will in the final analysis, be judged by the farmers' responses and reactions. This is because failure of many farmers to cultivate some crops that could improve their quality of life such as improved varieties of cotton and cocoa in the South West Nigeria, the cultivation of

improved sorghum in Northern Nigeria and the cultivation of cassava in Swaziland have been attributed to several socio-cultural variables such as conservatism, ignorance, customs and traditions, beliefs and values, all of which are associated with attitudes. (Abalu, 1983; Mijindadi, 1985; Subair and Dlamini 1992; Subair, 2000: and Agwu, 2004).

Purpose And Objectives Of The Study

The purpose of this study was to investigate the attitude of farmers towards the cultivation of Bambara groundnut in North-East Botswana, and to determine the relationship between the attitude of the farmers and some socio-cultural variables. As a result of this, the following specific objectives were developed: (1) To determine the attitude of farmers towards the cultivation of Bambara groundnuts in North-East Botswana. (2) To determine if there is any relationship between the attitudes of the farmers and certain socio-economic variables.

Methodology

Area of Study and Sampling Technique

The descriptive survey method, using mailed questionnaire was employed in gathering data for the study. The study was conducted in July, 2005 in the North East District of Botswana. The research data were collected from the farmers in the following nine Extension areas in the North East District of Botswana, Masunga, Kalakamati, Makaleng, Zwenshambe, Mosojane, Mapoka, Tsamaya, Siviya and Moroka. The questionnaires were mailed to the District Extension Officer who gave each Village Extension Workers in the above 9 Extension areas 10 questionnaires to administer with the selected farmers. The proportionate stratified random sampling technique was adopted. In selecting the ten farmers used for the study. The North East District Extension area was chosen because it is the largest producer of Bambara groundnut in Botswana. (Chui and Luzani, 2003) A total of 90 farmers were thus selected for the study.

The farmers were asked to rate their level of agreement with each of the 12 statements on a 6 point likert type scale; 1, = strongly agree (SA), 2, = agree (A), 3, = slightly Agree (SLA), 4, = Slightly disagree (SLP) 5, = disagree (DA), and 6, = strongly disagree (SDA). The second part of the questionnaire attempted to collect data on demographic characteristics of the farmers. Prior to data collection the instrument was reviewed for content validity by a panel of four Lecturers in the department of Agricultural Education and Extension. Their suggestions were incorporated in the instrument which was later certified valid before use.

The instrument was pre-tested with forty farmers from Barolong District where Bambara groundnut is also grown. The Crombarch's alpha reliability coefficients were computed for the twelve attitude statements and was found to be 0.81, indicating a good degree of reliability.

The Socio-Cultural Variables

The following seven variables were considered relevant in the light of theoretical consideration: age, education, marital status, farm size, occupation, social participation and tenure status. The justification for the choice of seven variables was based on the following theoretical consideration: In Redfile's (1973) model of rural urban continuum, the people at the urban pole would be higher in education, general knowledge, and have contacts with extension agents and would have high socio-economic status. Also, according to Agwu (2004), when a new element of change is introduced, in some farming communities, income, size of operational holdings, and literacy are some of the factors which could affect the rate of acceptance of improved practices by farmers.

Results And Discussions

Objective 1: Attitude of farmers towards cultivation of Bambara Groundnut

Table 1 shows the attitude of the farmers in North East Botswana towards the cultivation of Bambara groundnut. The respondents were asked to indicate their perceptions regarding twelve attitudinal statements which are connected to the cultivation of Bambara groundnut. The 6-point likert type scale was anchored as follows: 1= (strongly disagree), 2 = (disagree), 3 = (slightly disagree), 4 = (agree), 5 = (slightly agree), 6 = (Agree).

In order to discuss the data, the mean of 3.5 above was used to denote agreement while the mean below 3.5 was used in denote disagreement. The results on table 1 revealed that the mean rating of the 12 attitudinal statements ranged from 4.18 to 4.02, indicating that farmers in the North-East of Botswana are favourably disposed to the cultivation of Bambara groundnut. When the means of the 12 attitudinal statements were ranked, it was found that the statement: 'Planting the hybrid variety of Bambara is particularly a useful practice' came first with a mean of 4.18. The statements: (1) 'Planting the hybrid variety of Bambara groundnut involves a simple technique' and (2) 'Most farmers in the North-East area should join their colleagues in adopting the hybrid variety of Bambara groundnut' both came second with a mean of 4.17. From the above point of view, it is quite clear that the farmers were overwhelmed with the development of the new hybrid variety of Bambara groundnut. Again the fact that the farmers rated highly the statements: 'The use of hybrid variety of Bambara groundnut is a good practice' and 'most farmers in the area should adopt the hybrid variety of Bambara groundnut' all pointed to the fact that the hybrid variety possessed certain characteristics that are much more superior to the variety of Bambara groundnut they were planting before the hybrid variety was introduced.

The ratings of the remaining attitudinal statements were very close and completely indicated farmers' support for the hybrid variety of Bambara groundnut. The overall mean of this domain was 3.79 indicating that the farmers have a favourable attitude towards the cultivation of the hybrid variety of Bambara groundnut in the North-East area of Botswana.

Table1. Mean Scores and Ranking of the Attitude Statement towards cultivation of Bambara Groundnuts.

		Mean	S.D	Rank
1	The foreign exchange earning capacity of the nation can be boosted by planting Bambara groundnut	4.13	.49	6
2	The use of hybrid variety of Bambara is a good practice	4.17	.27	2
3	If my neighbour seeks my opinion on increasing his farm income I will definitely advise him to cultivate hybrid Bambara	4.02	.38	12
4	Planting of the hybrid variety of Bambara is not risky	4.15	.48	4
5	Planting of the hybrid variety of Bambara is the only way to increase farm income	4.13	.73	6
6	If the neighbouring farmers want to form a cooperative society for the purpose of planting Bambara I will join the cooperative society	4.15	.92	4
7	Most farmers in this area should join their colleagues in adopting the hybrid bambara groundnut	4.17	.75	2

8	Planting of hybrid variety of Bambara is said to be a good practice, the economic situation of most farmers does not permit it	4.12	.24	10
9	Planting of hybrid of Bambara is said to be a god practice but trials have to be made to proved its worth before adoption	4.13	.78	6
10	Planting the hybrid variety of Bambara involves a simple technique	4.13	.21	6
11	Planting the hybrid variety of Bambara is entirely a new practice and so I was reluctant to adopt it	4.18	.42	1
12	The use of hybrid variety of Bambara can improve the Socio economic conditions of the farmers	4.12	.92	10
Overall Means		3.79		

Objective 2. Relationship Between selected socio-cultural variables and the attitude of farmers towards cultivation of hybrid variety of Bambara groundnut.

The data collected and presented in Table 2 reveals the relationship between selected socio-cultural variables and the attitude of farmers towards cultivation of hybrid variety of Bambara groundnut.

To describe the inter-correlation coefficient of relationships among the socio-cultural variables examined in the study, Davis (1971) descriptors as indicated below were used:

Coefficient	Descriptors
.70 or higher	very strong relationship
.50 to .60	substantial relationship
.30 to .49	moderate relationship
.10 to .29	low relationship
.01 to .09	negligible relationship

Regarding the age of farmers, the data showed a negligible relationship ($r = 0.01 - 0.04$) between the selected socio-cultural variables and the attitude of farmers towards the cultivation of hybrid variety of Bambara groundnut. The implication of this is that age did not influence the responses of the farmers on their attitude towards the cultivation of the hybrid variety of Bambara groundnut, because the relationship found between them was negligible ($r_s = 0.01 - 0.03$).

Regarding the educational level of farmers, a moderate relationship ($r_s = 0.32$) was found between the attitudes statements: 'Planting the hybrid variety of Bambara involves a simple technique' and the level of education of farmers.

This findings point to the fact that those who are literate among the rural farmers tend to find recommended technologies easier than those who are illiterate. Agwu (2004) found out that those who are able to read instructions on a particular cultural operation tend to benefit more from a new technology than those who are unable to read. On the other hand, a substantial relationship ($r_s = 0.50$) was found between the altitude statement: 'Planting the hybrid variety of Bambara is entirely a new practice and so I was reluctant to adopt it' and the level of education of the farmers. The implication of this is that educated farmers also fear to adopt a new technology unless they are convinced that the technology will be of great benefit to them. This is pointing to the fact that Abalu (1983) found out that farmers regardless of education will not risk a new technology unless they are convinced that the technology is good for them. Also a

substantial relationship ($r_s = .51$) was found between farmers level of education and the statement: ‘The use of hybrid variety of Bambara can improve the socio-economic conditions of farmers’. This finding points to the fact that educated farmers believe that hybrid varieties if adopted can improve the socio-economic status of farmers. All other statements recorded a negligible relationship ($r_s = .01 - .04$) between education and the attitude of farmers towards the cultivation of hybrid variety of Bambara groundnut.

Regarding farm size of the respondents, a moderate relationship ($r = .32$) was found between the attitude statements: ‘planting the hybrid variety of Bambara involved a simple practice’ and the farm size of respondents. This means that farmers are moderately disposed to increasing their farm size should the technology released be simple to practice. Agricultural researchers should take note of this finding and make their technologies as simple as possible for farmers to adopt.

Again regarding farm size, a low relationship ($r = .10$) was recorded for the statement ‘planting the hybrid variety of Bambara is entirely a new practice and so I was reluctant to adopt it.’ This finding indicate that a new practice is most likely to enjoy an overwhelming majority among the rural farmers. This finding is also rooted in the Adopter’ categories which specified that about 16% of rural populace who are referred to as innovators could try a technology when newly released. A substantial relationship was found between farm size and the statement ‘The use of hybrid variety of Bambara can improve the socio-economic conditions of farmers. ($r = .54$) This finding show that the respondents are willing to expand their farm size of Bambara groundnut so as to increase their socio-economic conditions. All the remaining attitude statements recorded a negligible relationship between farm size and the attitude of farmers towards cultivation of hybrid Bambara groundnut.

A negligible relationship was found between all the 12 attitude statements and farmers tenure status, occupation and social participation among colleagues, ($r = .01 - .03$). This is an indication that the three socio-cultural variables did not affect the attitude of farmers towards cultivation of Bambara groundnut.

Table 2. Relationship between Attitude of farmers and some socio-cultural variables.

		Age	Gender	Educ	Farm Size	Tenure status	Occupational	Social participation
		R	rpb	rs	p	p	rs	R
1	The foreign exchange earning capacity of the nation can be boosted by planting Bambara groundnut	.03	.02	.01	.03	.02	.01	.03
2	The use of hybrid variety of Bambara is a good practice	.04	.02	.02	.04	.01	.01	.02
3	If my neighbour seeks my opinion on increasing his farm income I will definitely advise him to cultivate hybrid Bambara	.01	.03	.02	.02	.03	.03	.01
		Age	Gender	Educ	Farm Size	Tenure status	Occupational	Social participation

		R	rpb	rs	p	p	rs	R
4	Planting of the hybrid variety of Bambara is not risky	.04	.02	.03	.03	.01	.01	.02
5	Planting of the hybrid variety of Bambara is the only way to increase farm income	.02	.03	.02	.01	.02	.03	.01
6	If the neighbouring farmers want to form a cooperative society for the purpose of planting Bambara I will join the cooperative society	.03	.01	.01	.02	.01	.02	.03
7	Most farmers in this area should join their colleagues in adopting the hybrid bambara groundnut	.01	.02	.03	.02	.02	.03	.02
8	Planting of hybrid variety of Bambara is said to be a good practice, the economic situation of most farmers does not permit it	.04	.01	.02	.01	.02	.01	.03
9	Planting of hybrid of Bambara is said to be a god practice but trials have to be made to proved its worth before adoption	.03	.01	.02	.01	.03	.01	.02
10	Planting the hybrid variety of Bambara involves a simple technique	.03	.02	.04	.32	.01	0.3	.01
11	Planting the hybrid variety of Bambara is entirely a new practice and so I was reluctant to adopt it	.02	.01	.50	.10	.02	.01	.03
12	The use of hybrid variety of Bambara can improve the Socio economic conditions of the farmers	.03	.02	.51	.54	.03	.02	.2

Conclusion

The study revealed the following conclusions:

1. Farmers in the North-East of Botswana are favourably disposed to the cultivation of hybrid variety of Bambara groundnut.
2. The use of hybrid variety is seen as a useful way of improving production by the farmers.
3. Innovations that are simple to practice are highly adopted by farmers.
4. Age did not influence the attitude of farmers towards the cultivation of the hybrid variety of Bambara groundnut.
5. Gender did not influence the attitude of farmers towards the cultivation of the hybrid variety of Bambara groundnut.
6. Education has a moderate influence on the attitude of farmers towards the cultivation of the hybrid variety of Bambara groundnut.
7. Those farmers who are literate have more tendency to adopt recommended practices than those farmers who are illiterate.
8. Most farmers are not favorably disposed to using a new recommended practice although farmers who are educated seem to be more willing to try a new recommended practice than those who are not educated.
9. Farmers, regardless of education tend to consider new techniques too risky to adopt at the initial stage of release.
10. Educated farmers believe that the cultivation of hybrid variety of Bambara groundnut can help to improve farmers socio-economic conditions.
11. A moderate relationship tend to exist between farm size and the cultivation of hybrid variety of Bambara groundnut.
12. Farmer's tenure status, occupation and social participation do not influence the attitude of farmers towards cultivating the hybrid variety of Bambara.

Implications of the Study

This study implies that socio- economic factors do not appear to have a very strong influence on technologies that are developed to suit the aspiration and yearning of farmers. The hybrid varieties being developed by researchers are highly cherished by farmers, despite the fact that they are aware that their seeds are not viable. This implies that rural farmers in developing countries are beginning to appreciate that the best source of planting materials is from the seed multiplication departments of the Ministry of Agriculture or the seed manufacturing companies. Hitherto, rural farmers in developing countries tend to shy away from hybrid varieties simply because they could not use part of the seeds as planting materials. This study implies that the rural farmers now have confidence that hybrid varieties can improve their socio-economic status, hence the money for the purchase of hybrid planting materials will not be as problematic as formerly envisaged.

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