Journal of Agriculture and Environment Vol. 15 No. 2, 2019: 83-89
ISSN: 1595-465X (Print) 2695-236X (Online)

ASSESSMENT OF ADOPTION OF IMPROVED GINGER PRODUCTION TECHNOLOGIES IN KAJURU LOCAL GOVERNMENT AREA OF KADUNA STATE, NIGERIA

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ABSTRACT

The study examines the adoption of improved ginger production technologies among farmers in Kajuru Local Government Area of Kaduna State. Multistage sampling was adopted. Kajuru LGA was purposively selected because of the preponderance of ginger production. In the second stage, a random selection of four extension blocks was made and eight extension cells were also randomly selected. Data were collected from 172 respondents through structured questionnaire and analysed using simple descriptive statistics. The result shows that the mean age of respondents was 32.5years and majority (82.5%) were literates. Mean farming experience was 15years. More than half (56.7%) of the respondents acquired their land through inheritance and majority (81%) got to know about improve ginger production technologies through radio. Improved production technologies such as use of herbicides ($\overline{X}$ =3.4), use of tarpaulins ($\overline{X}$=3.4), use of jute bags ($\overline{X}$=3.4) ranked highest among other production technologies adopted by the farmers. Constraints to adoption of improved ginger production technology were; lack of interest among youths ($\overline{X}$=2.6) and high cost of agrochemicals ($\overline{X}$=2.5). It was concluded that radio was the major source of awareness of ginger production technologies and use of chemicals for land treatment ranked 1st in terms of adoption and farm size not adequate being major constraint. The use of radio programme should be strengthened for information dissemination. Land tenure regulations should be modified to allow famers access to land. Chemical weed control should also be encouraged among ginger farmers.

Keywords: Ginger; extension block; adoption and technologies

INTRODUCTION

Ginger (Z*ingiber officinale* Rosc.) is an herbaceous perennial plant belonging to the order (Scitamineae) and to the family (*Zingiberaceae*). It is a root crop and a typical herb extensively grown across the world for its pungent aromatic under-ground stem or rhizome which makes it an important export commodity in world trade (Ajibade & Dauda, 2005). Ginger's origin is not well established though it is generally thought to be a native of Asia,

where it was first cultivated. It was also cultivated in the tropical regions of America. The plant is now cultivated in different parts of Nigeria, though the major producing areas include Kaduna, Nasarawa, Sokoto, Zamfara, Akwa Ibom, Oyo, Abia and Lagos states although southern Kaduna still remain the largest producers of fresh ginger in Nigeria, especially in Kachia, Jabba, Jama'a and Kagarko Local Government Areas (KADP, 2000, KADP, 2004; Bernard, 2008). The varieties produced in Nigeria are '*Taffin Giwa*' and '*Yatsun Biri*' which is higher in monoterpene and oil, giving a more pungent aroma and pungency. Therefore, it is usually preferred for the production of oils and oleoresins (KADP, 2000; ITC, 2007, Chukwu & Emehuite, 2003).

Nigeria ranked first in terms of the percentage of total hectares of ginger under cultivation but her contribution to total world output is too low compared to other countries. This could be attributed to the fact that most of production is undertaken by smallholder and traditional farmers with rudimentary production techniques and low yields. In addition, the smallholder farmers are constrained by many problems like lack of considering the farming of the crop as a business enterprise, therefore not adequately focused on profit maximizing motive. This entails a little change of the economic behaviour of the farmer, his social relationships and local knowledge with little commercialization. Therefore, improving ginger production by farmers from subsistence to commercial production is long overdue as these resource poor farmers are faced with production and post-production challenges ranging from non-use of improved varieties, manual land preparation, inadequate inputs, local processing techniques, inadequate credit/capital, which often results in low production/ha and poor ginger quality.

Based on the aforementioned problems, this study is designed to identify the sources of information of adopting improved ginger production technology; determine the level of adoption of improved ginger production technology; and ascertain the major constraints faced by respondents in adopting improved ginger production technologies in the study area.

MATERIALS AND METHOD

Study Area

The study was conducted in Kaduna state, Nigeria. The state was created on 27th May, 1967. The capital of the state is Kaduna which is located on Longitude 7.750^{o}E and Latitude 10.333^{o}N. Kaduna State has projected population of about 8,497,769.17 (NBS,2019). The vegetation cover is Northern guinea savanna type, characterized by scattered short trees, shrubs and grasses. The soil is mostly loamy to sandy type. A Substantial amount of clay is found also. There are two main climate seasons in the area; the dry and wet season with relatively high humidity. The dry season lasts from November to March while the wet season starts from April and ends in October. The average annual temperature in Kaduna state is 25.2^{0}C. About 1211mm of precipitation falls annually.

Sampling Technique and Instrumentation

Sample size of the study was arrived at using a multistage sampling technique. In the first stage, Kajuru LGA was purposively selected because of the preponderance of ginger production. The second stage involved a random selection of 4 extension block. The third stage involve random selection of 8 extension cells and the fifth stage involves random

selection of 172 respondents from extension sub cell proportionate to the population in each community as adopted by Ibrahim (2016).

The primary data for this study were generated through questionnaire using interview schedule questionnaire administration method to provide information on the socio-economic characteristics of ginger farmers, various technologies and levels of the adoption of improved ginger production technologies, source of information and the major constraints to adoption of improved ginger production technologies by the respondents in the study area.

Data Analysis

The data collected from the respondents were analysed using descriptive statistics. Adoption Scale Analysis is a scale where mean is used to adjudge level of adoption of a particular technology. Three-point Likert scale rating of Very serious (3), serious (2), and not serious (1) values were used to rate the severity of the constraints.

RESULTS AND DISCUSSION

Socio-economic Characteristics of the Respondents

The mean age of the respondents was 32 years indicating active age. This agrees with the findings of Zugu *et al.* (2005) who reported that mean age of 30 years has positive correlation with agricultural activities. Majority 90.8% of the respondents were male implying that ginger production is male dominated. Majority 92.5% of the respondents were married this may probably be because of labour associated with ginger production. This agreed with the findings of Onyemauwa (2012) who reported that 57% of their respondents were married in the study area and thus participated very well in agricultural production. Majority 65.0% of the respondents had agriculture as their major occupation. This implies that farming is the main source of their livelihood. Only 47.5% of the respondents had farming experience between 11-20 years in the study area. This implies that the respondents have been involved in farming activities for long period of time. The longer the farming experience the better a farmer would be able to solve problems attributed to farming related activities. This negates the report of Padel (2001) who stressed that, farmers who have been long in the farming activities are usually older, less educated and more resistant to change than young entrants. Majority 56.7% of the respondents acquired their land through inheritance. This indicates that half of the respondents were indigene, which may be attributed to the importance attached to land. Majority 64.2% of the respondents had household size between 6 – 10 persons. This agrees with Idiong (2005) who reported that a relatively large household size has been shown to enhance the availability of labour force.

Table 1: Socio Economic characteristic of respondents (sample size = 172)

Variables	Frequency	Percentage	Mean	SD
Age (years)				
1-20	7	5.8		
21-30	51	42.5		
31-40	43	35,8		
41-50	19	15.8		
Mean			32.5	0.31
Gender				
Male	109	90.8		
Female	11	9.2		
Marital Status				
Single	9	7.5		
Married	111	92.5		
Educational Level				
Primary	45	37.5		
Secondary	47	39.2		
Tertiary	7	5.8		
Adult	11	9.2		
Non-Formal	10	8.3		
Major Occupation	78	65.0		
Farming	78	65.0		
Trading	22	18.3		
Civil Servant	20	16.7		
Farming Experience				
1-10	7	5.8		
11-20	57	47.5		
21-30	56	46.7		
Mean			15years	0.23
Mode of Land Acquisition				
Gift	11	9.2		
Inheritance	68	56.7		
Purchase	4	3.3		
Rented	37	30.8		
Communal land	68	56.2		

Source: Field Survey Data, 2019

Source of Information on Improved Ginger production Technologies

Majority (81.7%) of the respondents received information on ginger production from radio stations and 79.2% obtained information from ADP this means that radio is the most readily available source of agricultural information by the respondents. This finding is in line with Agbamu (2006) who stated that in adoption of improved varieties, farmers are most likely to be influenced by such information sources like agricultural cooperatives, radio, and friends and neighbours

Table 2: Distribution of respondents according to their sources of information on improved ginger production technologies (n=172)

Items	Frequency*	Percentage
Extension agent	83	69.2
Mass media	59	49.2
Radio	98	81.7
ADP	95	79.2

Source: Field Survey 2019; Multiple response *

Level of Adoption of Improved Ginger Production Technologies

Improved production technologies such as use of herbicides ($\overline{X}$=3.4), use of tarpaulins ($\overline{X}$=3.4), use of jute bags ($\overline{X}$=3.4) ranked highest among other production technologies adopted by the farmers. This means that chemical methods of weeding are gradually taking the centre stage of weed control methods. Planting with 25cm×45cm between rows and 15 cm × 20 cm within rows ($\overline{X}$=3.3). This means that plant population has role to play in total output of ginger farmers. Application of a total of 600kg/ha (12 bags) of NPK 15-15-15 bags at 3 weeks after sprouting and 7 bags at 3 months after planting ($\overline{X}$=3.3). This means that fertilization is one of the key variable costs that lead to increase in output of farmers in the study area and hand weeding ($\overline{X}$=3.3) Ranked 4th.

Table 3: Distribution of respondents according to adoption scale analysis

Production technologies	I	E	T	A	WS	WM	Decision	Rank
Use of bags (20kg or 25kg)	-	16	171	220	407	3.4	Adopt	1st
Use of mats or tarpaulins	-	16	174	216	406	3.4	Adopt	1st
Using of chemicals (herbicides)	-	18	171	216	405	3.4	Adopt	1st
Hand weeding	-	24	174	200	398	3.3	Adopt	4th
Planting with 25cm×45cm between rows and 15cm×20cm within rows	1	10	210	176	397	3.3	Adopt	4th
Apply a total of 600kg/ha (12 bags) of NPK 15-15-15 bags at 3 weeks after sprouting and 7 bags at 3 months after planting	2	12	204	176	394	3.3	Adopt	4th
Ploughing and harrowing use of tractor	-	40	168	176	384	3.2	Adopt	7th
Practice shallow weeding	-	50	177	144	371	3.1	Adopt	8th
Use of fungicides	12	22	159	176	369	3.1	Adopt	8th
Use of trichoderma	5	36	159	176	376	3.1	Adopt	8th
Use of harvesting machine	10	26	159	176	371	3.1	Adopt	8th
Shake off soil, roots and wash rhizomes	5	36	162	172	375	3.1	Adopt	8th
Drilling seeds is placed4 to 8cm	53	68	51	64	236	2.0	Not Adopt	13th

Source: Field survey 2018; I=Interest, E=Evaluation, T=Trial; A=adopt; WS=Weighted Sum; WM= Weighted Mean; *Values in parentheses are percentages.

Constraints to the Adoption of Improved Ginger Production Technologies

The variables in Table 4 with equal mean were ranked same. The following constraints were perceived as serious; lack of interest among youths ($\overline{X}$ =2.6), This may probably be because of drudgery associated with farming activities, cost of agrochemicals ($\overline{X}$ =2.5), This may be because rural farmers are resource poor and cannot afford to buy the required number of chemicals to treat their farm land, drought factor ($\overline{X}$ =2.0), this might be a problem because farmers may likely not having readily irrigation facilities to augment the short rainfall.

Table 4: Distribution of Respondents According to their Major Constraints to Adoption of Improved ginger production technologies

Constraints	Very serious	Serious	Not Serious	WS	WM	Decision	Rank
Lack of interest among youths	77(64.2)	33(27.5)	10(8.3)	307	2.6	VS	1st
High cost of agrochemicals	66(55.0)	45(37.5)	9(7.5)	297	2.5	VS	2nd
Lack of adequate knowledge of improve practice	61(50.8)	45(37.5)	14(11.7)	287	2.4	VS	3rd
Inadequate finance	60(50.0)	39(32.5)	21(17.5)	279	2.3	VS	4th
High cost of labour	65(54.2)	29(24.2)	26(21.7)	279	2.3	VS	4th
High cost of fertilizer	62(51.7)	35(29.2)	23(19.2)	279	2.3	VS	4th
Poor government support	54(45.0)	32(26.7)	34(28.3)	260	2.2	VS	7th
Low level of knowledge and awareness	48(40.0)	44(36.7)	28(23.3)	260	2.2	VS	7th
Insufficient land for cultivation	52(43.3)	36(30.0)	32(26.7)	260	2.2	VS	7th
Poor attitude of the farmer	46(38.3)	47(39.2)	27(22.5)	259	2.2	VS	7th
Lack of farming experience	44(36.7)	46(38.3)	30(25.0)	254	2.1	VS	11th
Lack of storage facilities	43(35.8)	46(38.3)	31(25.8)	252	2.1	VS	11th
Inefficient extension service delivery	36(30.0)	52(43.3)	32(26.7)	244	2.0	VS	13th
Poor transportation	40(33.3)	40(33.3)	40(33.3)	240	2.0	VS	13th
Poor marketing of product	41(34.2)	36(30.0)	43(35.8)	238	2.0	VS	13th
Drought factor	46(38.3)	25(20.8)	49(40.8)	237	2.0	VS	13th
Old age of the farmer	29(24.2)	46(30.0)	45(37.5)	224	1.9	NS	17th
High cost of farm tools	25(20.8)	53(44.2)	42(35.0)	223	1.9	NS	17th
Religion and tradition	23(19.2)	53(44.2)	44(36.7)	219	1.8	NS	19th
Low level of education	29(24.2)	36(30.0)	55(45.8)	214	1.8	NS	19th
Tedious of the technology	26(21.7)	40(33.3)	54(45.0)	212	1.8	NS	19th
Short life cycle of production	11(9.2)	39(32.5)	70(58.3)	181	1.5	NS	22rd
Scarcity of improved seed	3(2.5)	55(45.8)	62(51.7)	181	1.5	NS	22nd
Weak market information	-	56(46.7)	64(53.3)	176	1.5	NS	22nd
Inadequate irrigation	-	43(35.8)	77(64.2)	163	1.4	NS	25th
Poor soil fertility	-	53(44.2)	67(55.8)	173	1.4	NS	25th
Smallness farm size	-	39(32.5)	81(67.5)	159	1.3	NS	27th

Source: Field Survey, 2019; WS = Weighted sum; WM= Weighted Mean; NS=Not Serious; S= Serious; VS= Very Serious; *Values in parentheses are percentages

CONCLUSION

The study concludes that the radio was the major source of awareness of ginger production technologies and use of chemical for land treatment rank 1st in terms of adoption and farm size not adequate being major constraint. It was recommended that; the use of radio programme be strengthened for information dissemination; chemical method of weed control should be encouraged by the ginger farmers to reduce drudgery associated with farming of

ginger production; and problem of land tenure should be looked into so that the ginger farmer can get access to land.

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