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Technologies Needs of Arable Crop Farmers of Oyo and Ekiti States of South-Western, Nigeria

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ABSTRACT: *In ensuring food production in the face of food insecurity, appropriate production technologies are inevitable. This study therefore investigated the technologies needed by arable crop farmers of Oyo and Ekiti States in South-western Nigeria. The study employed multistage sampling techniques to select 235 respondents. Quantitative data for study was collected using structured interview schedule while qualitative data was collected during Focus Group Discussion. Quantitative data was analysed with frequency distributions, percentages, mean and ranking as descriptive statistical tools, while Ordered probit regression and T-test inferential tools were used to draw inferences between the variables. The information from quantitative data was used to explain the findings. Results of the analysis revealed that the mean age of the respondents was 45.56 years, both male (76.2%) and female (23.8%) farmers were sampled with different educational background, while 15.7% had no formal education and with 21.44 mean years of farming experience. Majority (66.8%) engages in farming as primary occupation with maize (99.1%), cassava (91.5%), and leafy vegetables (40.4%) as the main arable crop cultivated in the area. Agronomic best practices (WMS = 1.86) and inputs technologies (WMS = 2.07) were ranked first and second on the level of needs of the identified arable crop production technologies, Finance (WMS = 1.88) and inadequate farmland (WMS = 1.81) were ranked as highest in the challenges to the use of arable crop production technologies among the farmers. Ordered probit analysis result established that age (z = 4.41***), sex (z = 1.92**), years of farming experience (z = -2.45**), extension contact (z = -1.72*), and farm size (z = 2.09**) exhibited significant relationship with the level of need of different identified arable crop production technologies among the arable crop farmers in the study area. The study therefore, recommends the need to encourage arable crop production by ensuring appropriate application of different arable crop technologies coupled with adequate training of rural farmers through extension service; the technology providers should align the technologies with the arable crop farmers' need as it would encourage efficient utilization of such technologies among different users.*

KEYWORDS: technology needs, arable crop farmers, production technology

INTRODUCTION

The advances in technology within agriculture have made a tremendous contribution to the lives of every human being in the world today, both economically and socially. The introduction of new technologies and scientific methods has made a monumental impact on the farming sector in recent decades (Insight, 2009). But despite technological advancement, the prevalence of food insecurity is still well known in the world, especially the developing countries including Nigeria. The estimated population of the world is 7.2 billion people. The world population has steadily risen from a total of 4.4 billion people in 1980 to reach a figure of 6.9 billion in 2010, it is projected that this number will reach 9.6 billion by the year 2050 (Parke, 2013). Growth rates are set to increase more in the less developed countries, which are predicted to increase from 900 million inhabitants to1.8 billion in less than 40 years' time. India and Nigeria will account for the bulk of this population growth (Matthews, 2022). With the world's population rapidly growing, the need to increase the current efforts at feeding everyone has become more expedient than ever before as the global hunger is on the rise. Food and Agriculture organization of the United Nations (FAO) stated that if the predicted global population figures become a reality, then world food production will need to rise by 70%. Food production within the developing world will also need to double (Parke, 2013). It should be noted that arable crop constituted bulk of the staple food consumed by majority of the population in both developed and developing countries including Nigeria. Therefore, there is the need to deploy modern technologies that promotes high production.

Despite the increase in the size of farmland cultivated as experienced in recent time among crop farmers as a result of efforts of States' Agricultural Development Project (ADP) and other non-governmental organizations (NGOs), the farmers' output was not commensurate with the size and quantum of inputs when compared to the possible outputs suggested by scientists. The output is basically low as most of the farmers still relied on their primitive knowledge due to non-accessibility to the production technologies recommended and used by most farmers. However, to meet these challenges, there is need for concerted efforts among different stakeholders through a thorough and scientific investigation of required production technology needs among the arable crop farmers. Arable crop farmers in the South Western-Nigeria provide bulk of staple food that is consumed locally and major food crop supplies to other regions in the country. The local farmers are constrained mainly by the aforementioned challenges which drastically affect food production and as such, provision of modern technologies are inevitable in order to bring about improvement in the level of arable crop production in the region and Nigeria at large.

It is on the above premise that this study was conducted to assess the technologies needed by arable crop farmers of Oyo and Ekiti States of South-Western, Nigeria. Specifically, the study described the socio-economic characteristics of arable crop farmers; identified the types of arable crop cultivated in the area; examined the sources of recommendations available to crop farmers; and determined the level of needs of identified production technologies. The study

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also determined the relationship between the personal socio-economic characteristics of the farmers and their level of needs of identified production technologies

METHODOLOGY

The study was carried out in Oyo and Ekiti States of South-western, Nigeria. The two States are from South-West geopolitical zone of Nigeria, the zone lies between latitude 6.00°N and 9.00°N and between longitude 2.00°E and 7.00°E. The climate in the two States favours the cultivation of major crops like maize, yam, cassava, vegetables, millet, rice, plantains, cocoa, palm produce, cashew among others. Multistage sampling technique was adopted for the study. In the first stage, 12% of the Local Government Areas (LGAs) were randomly sampled from the two States. Therefore, 3 LGAs from Oyo State and 2 LGAs from Ekiti State were selected for the study. Thereafter, 15% arable crop farmers were randomly selected from the three LGAs in Oyo State amounted to 154 and from two LGAs in Ekiti State which translate to 81 respondents. In all a total of 235 arable crop farmers made up the sample size of the study. Quantitative data were collected with the use of adequately validated and reliable structured interview schedule and qualitative data collected through Focus Group Discussion (FGD). The data collected were summarized with frequency counts, percentages, mean and ranking as descriptive statistical tools.

Ordered probit regression and T-test inferential tools were used to make inference between the measured variables. The technologies level of needs by the crop farmers were measured on 4-point Likert like rating scale measurement of Highly Needed (4), Needed (3), Slightly Needed (1) and Not Needed (0). Thereafter composite score of each identified technology need was used to re-categorized level of need into 3-level of High (3), Moderate (2) and Low (1) with mean (x) ±SD and this correspond to censoring values of 3, 2, and 1 respectively used for the Ordered probit regression analysis. This is implicitly stated as:

Y = Level of technology needs (3 = high, 2 = moderate, 1 = low)
x_1 = Age (years)
x_2 = Sex (Dummy, 1= male, 0 = female)
x_3 = Marital status (Dummy, 1 = married, 0 = unmarried)
x_4 = Religion (Dummy, 1 = Christianity, 0 = Islam)
x_5 = Educational status (Years spent in school)
x_6 = Household size (Actual no. of persons)
x_7 = Years of farming experience (years)
x_8 = Extension contact (Dummy, 1 = yes, 0 = no)
x_9 = Farm size (ha)

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RESULTS AND DISCUSSION

Socio-economic characteristics of the respondents

The pooled data result in Table 1 revealed that similar proportion of 33.2% and 32% were within the age ranges of greater than 50 years and 41 – 50 years respectively, while 14% were within the age of less than and 30 years with the mean age of 45.56 years. The above findings indicated that most (64.3%) of the farmers sampled for the study are in their active age range of 50 years or less. Farmers within the age range sampled are expected to explore every opportunity associated with the application of improved technologies in order to record increased arable crop production. Though the age of the farmers may determine their technological information need. Farmers in different ages have certain differences on information needs (Zhao, 2007). Older farmers pay more attention to agricultural market information, administrative information and information about people's livelihood, while younger farmers are more concerned about labour information.

About, 87% of the farmers were married while only 12.8% were single. This implies that majority of the farmers are responsible as they have to work hard to get resources and food needs of their households. Married individuals are more concerned with seeking information on climate change and fending for food for than singles or divorced individuals who may tend to consider their personal wellbeing alone (Yohanna, 2007). In addition, majority (76.2%) of the farmers in both States were male, while only 23.8% were female. The result implies that males are more involve in arable farming than their female counterparts. Arable crop productions were mostly carried out by men.[9] Moreover, more than half (61.7%) were Christians and 37.4% were Muslims, with 2.5% Traditionist from Ekiti State. This implies that arable crop production is not subjected to religion bias. On educational level, 32.5% (Oyo State) and 44.4% (Ekiti State) with pooled of 29.8% have a tertiary education. Only 22.1% (Oyo State) and 3.2% (Ekiti State) has no formal education. The result above implies that majority of the farmers sampled are educated at different levels of formal education. The farmers' educational background suggests that they should be able to read and have a clear understanding on type of technologies need for specific arable crop. Education is one of the important factors that influence farmer's decision to bear the risks associated with new technologies and modern information sources (Mittal and Mehar, 2016).

Table 1. Distribution of respondents by socio-economic characteristics

Socio-economic characteristics	Frequency (percentage)		
	Oyo (n = 154)	**Ekiti (n = 81)**	**Pooled (N = 235)**
Age (years)			
≤ 30	17(11.0)	16(19.8)	33(14.0)
31 – 40	25(16.2)	18(22.2)	43(18.3)
41 – 50	54(35.1)	27(33.3)	81(32.0)
> 50	58(37.7)	20(24.7)	78(33.2)
Mean	46.84	43.12	45.56
Sex			
Male	115(74.7)	64(79.0)	179(76.2)

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Female	39(25.3)	17(21.0)	56(23.8)
Marital status			
Married	133(86.3)	72(88.9)	205(87.2)
Unmarried	21(13.6)	9(11.1)	30(12.8)
Religion			
Christianity	82(53.2)	63(77.8)	145(61.7)
Islam	72(46.8)	16(19.8)	88(37.4)
Traditionalist	-	2(2.5)	2(0.9)
Educational level			
No formal	34(22.1)	3(3.7)	37(15.7)
Primary	35(22.7)	7(8.6)	42(17.9)
Secondary	50(32.5)	36(44.4)	86(36.6)
Tertiary	35(22.7)	35(43.2)	70(29.8)

Source: Field Survey, 2022

Enterprise and occupational characteristics

Table 2 revealed the result on the enterprise characteristics includes the years of farming experience and 26.4%; 25.5% and 25.1% (pooled results) of the farmers indicated above 40 years; 31 – 40 years and 21 – 30 years of farming experience respectively. The mean year of farming experience was 21.44 years. The result implies that all the farmers sampled are not novice but had different years of farming experience. The variation in their years of farming experience may be due to age differences and years they venture into arable crop production association; of course their years of faming experience should enhance their knowledge and understanding of the techniques required for arable crop production. It was further revealed that farmers engage the services of both family (17.4%) and hired (22.6%), (61.2% pooled) as source of labour for different activities involved in arable crop production. On the primary occupation, most (66.8%) of the respondents (pooled result) indicated farming as primary occupation, 22.6% and 6.4% indicated trading and civil service as primary occupation, while 12.3% (Ekiti State) were artisan.

The result implies that most of the respondents engage in farming as primary occupation. The primary occupation of the respondents is expected to determine their level of need for different arable crop production technologies. The fact that they live in rural area may be responsible for their occupation to be farming. Over 70% of Nigerian population are rural dwellers where farming activities is the major occupation (Mark, 2011). At the same time, most (82.5%) (Ekiti State) indicated that their farmland was inherited pooled of 71.9%, while 16.2%, 7.7% and 4.3% indicated rent, lease, and borrow as mode of farmland acquisition for arable crop production respectively. The result implies that farmers acquired their farmland through different methods though majority cultivates on inherited farmland. The variation in the mode of land acquisition could be due to whether or not they are indigenes, purpose of cultivation such as subsistence or commercial farming and access to other required production inputs apart from farmland such as capital, entrepreneur, fertilizer and tractor.

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The result on the contact with extension services revealed that all (100%) the farmers indicated to have contact with extension services and 35.7%, 21.7%, and17.9% indicated once in a month, while 23.8% indicated not regular as the frequency of extension contact. The result implies that all the farmers have access to extension services though with different frequency of extension contact. The variation in the frequency of contact may be due to availability of extension agent which could depend on the number of assigned farmers within his or her jurisdiction. It is expected that farmers that have extension contact are better informed on the application of production technologies. Extension contact has a direct influence on the adoption behaviour of farmers. The greater the degree of contact of farmers with extension personnel, the greater is the possibilities of farmers being influenced to adopt agricultural innovations.

Table 2. Distribution of respondents by enterprise characteristics

Enterprise characteristics	Frequency (percentage)		
	Oyo (n = 154)	**Ekiti (n = 81)**	**Pooled (N = 235)**
Years of farming experience			
≤ 10	41(26.6)	5(6.2)	46(14.6)
11 – 20	5(3.2)	3(3.7)	8(3.4)
21 – 30	35(22.7)	24(28.6)	59(25.1)
31 – 40	25(16.2)	35(43.2)	60(25.5)
> 40	48(31.2)	14(17.2)	62(26.4)
Mean	24.13	16.33	21.44
Source of labour			
Family	27(17.5)	11(13.6)	41(17.4)
Hired	45(29.2)	8(9.9)	53(22.6)
Both	82(53.2)	62(75.3)	144(61.3)
Primary occupation			
Farming	116(75.3)	41(50.6)	157(66.8)
Trading	31(20.1)	22(27.2)	53(22.6)
Civil servant	7(4.5)	8(9.9)	15(6.4)
Artisan	-	10(12.3)	-
Method of land acquisition			
Inheritance	127(82.5)	42(51.8)	169(71.9)
Lease	2(1.3)	16(19.8)	18(7.7)
Rent	15(9.7)	23(28.4)	38(16.2)
Borrow	10(6.5)		10(4.3)
Extension contact			
Yes	154(100.0)	81(100.0)	235(100.0)
Frequency of contact			
Once in a month	4(2.6)	38(46.9)	42(17.9)
Once in two months	72(46.8)	12(14.8)	84(35.7)
Once in three months	33(21.4)	18(22.2)	51(21.7)
Once in a year	-	2(2.5)	2(0.9)
Not regular	45(29.2)	11(13.6)	56(23.8)

Source: Field survey, 2022

Types of arable crop cultivated and farm size

The farmers sampled cultivated varieties of arable crops (Table 3). The pooled results revealed that 99.1% and 35.3% indicated maize and cowpea as grains crop cultivated, other include soybean

(11.5%), guinea-corn (0.9%) and rice (6.8%) respectively at the same time, 91.5%, 67.7%, and 34.9% indicated cassava, yam, and cocoyam, while 40.4% and 36.2% cultivated leafy vegetables and tomatoes/pepper. The result above implies that the farmers in the selected States cultivate different types of arable crops. Furthermore, 42.6% and 21.7% cultivates less and equal to 2 hectares and 5 – 6 hectares of grains farmland with mean of 4.17. Also, 34.5% and 23.8% cultivates less and equal to 2 hectares and greater than 6 hectares of farmland of tubers (cassava, yam, cocoyam with mean of 4.48 hectares, while 68.9% and 11.9% cultivates less and equal to 2 hectares and 3 – 4 hectares of farmland of leafy vegetables with the mean of 0.63 hectares. The result implies that all the farmers cultivate different hectares of farmland. The variation in the type of crops and size of farmland cultivated may be due to differences in the purpose of cultivation (subsistence and commercial farming) and their access to different crop production technologies especially improve seed varieties, fertilizer among others. The spread of new technologies has been impressive, particularly improved "modern varieties" (MVs) of grains (Rob, 2005).

Table 3. Distribution of respondents by types of arable crop cultivated and farm size

Arable crops	**Frequency (percentage)**		
*Grains	Oyo (n = 154)	Ekiti (n = 81)	Pooled (N = 235)
Maize	154(100.0)	79(97.5)	233(99.1)
Rice	5(3.2)	11(13.6)	16(6.8)
Cowpea	66(24.9)	17(21.0)	83(35.3)
Guinea-corn	-	2(2.5)	2(0.9)
Soybean	26(16.9)	1(1.2)	27(11.5)
***Tubers**			
Yam	115(74.7)	44(54.3)	159(67.7)
Cassava	142(92.2)	73(90.1)	215(91.5)
Cocoyam	15(9.7)	37(45.7)	85(34.9)
Sweet potatoes	5(3.2)	25(30.9)	30(12.8)
***Vegetables**			
Tomatoes/pepper	48(31.2)	37(45.7)	85(36.2)
Leafy vegetable	52(33.8)	43(53.1)	95(40.4)
Farm size (ha)			
Grains			
≤ 2	39(25.3)	61(75.3)	100(42.6)
3 – 4	31(20.1)	10(12.3)	41(17.4)
5 – 6	46(29.9)	5(6.2)	51(21.7)
> 6	38(24.7)	5(6.2)	43(18.3)
Mean	4.97	2.64	4.17
Tuber			
≤ 2	27(17.5)	54(66.7)	81(34.5)
3 – 4	45(29.2)	9(11.1)	54(23.0)
5 – 6	38(24.7)	6(7.4)	44(18.7)
> 6	44(28.6)	12(14.8)	56(23.8)
Mean	5.22	3.07	4.48
Vegetable			
≤ 2	123(79.9)	39(48.1)	162(68.9)
3 – 4	26(16.8)	2(2.4)	28(11.9)
5 – 6	4(2.6)	15(18.5)	19(8.1)
> 6	1(0.6)	25(30.9)	26(11.1)
Mean	0.55	0.78	0.63

Source: Field survey, 2022; *: Multiple responses

Level of need of arable crop production technologies

In this study, 4-point Likert like rating scale of Highly Needed (3), Needed (2), Slightly Needed (1), and Not Needed (0) was used to measure the levels of need of arable crop production technologies, while weighted mean score (WMS) was computed and the identified technologies were ranked accordingly. Table 4 revealed that soil testing technology has the highest WMS of 2.44 and was ranked first (1st), followed by weed control technology (WMS = 2.37; 2nd). Post-harvest handling technology (WMS = 2.25; 3rd); storage (WMS = 2.22; 4th); chemical application (WMS = 2.22; 4th). On the other hand, shifting cultivation, mixed cropping and crop rotation technologies were ranked least with WMS of 1.54 (23rd); 1.55 (22nd) and 1.61 (21st) in that others. Meanwhile, on the ranking of the identified categories of arable crop production technologies, agronomic best practices technology was ranked first (WMS = 2.12), followed by inputs (WMS = 2.07; 2rd); value addition technology (WMS = 2.03; 3rd), while soil management technology was ranked least (WMS = 1.86; 4th).

The above result implies that the level of need of the technologies listed varied among farmers in the study area. However, it is obvious that despite the variations, primary motive was to ensure improved output. New technologies are needed to push the yield frontiers further, utilize inputs more efficiently and diversify to more sustainable and higher value cropping patterns (Sabita, 2014). The variation in their level of technological needs could be further explained in line with the differences in the choice of arable crop cultivated, purpose of cultivation which could be subsistence or commercial production, farm size and access to require production inputs such as fertilizer, improved seed/seedlings and most especially funds and entrepreneurial skill. Adopting of a sustainable farming technology involves a large capital investment and that; large farms are in a better position to adopt it than in small farms. However, not all new technologies require large investments and small farms may in fact be in a better position to adopt certain technologies (Jyri and Outi, 2000).

Therefore, the above result suggests that majority of the farmers are highly interested in the agronomic best practices technology. Hence, agronomic best practices would lead to appropriate application of production inputs which is expected to influence the farmers' output of different arable crops under cultivation.

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Table 4. Distribution of respondents by the level of need of identified arable crop production technologies

Arable crop production technologies	Frequency (percentage)							
	Level of need							
	Highly Needed	**Needed**	**Slightly Needed**	**Not Needed**	**WMS**	**Rank**	**Pooled Mean**	**Rank**
Soil management								
Soil testing	162(68.9)	39(16.6)	10(4.3)	24(13.2)	2.44	1st		
Fertility management	92(39.1)	109(46.4)	5(2.1)	29(12.3)	2.12	7th		
Land preparations	87(37.0)	66(28.1)	49(20.9)	33(14.0)	1.88	18th		
Crop rotation	62(26.4)	74(31.5)	45(19.1)	54(23.0)	1.61	21st	1.86	4th
Mixed farming	63(26.8)	56(23.8)	63(26.8)	53(22.6)	1.55	22nd		
Shifting cultivation	54(23.0)	74(31.5)	53(22.6)	54(23.0)	1.54	23rd		
Agronomic Best Practices								
Planting spacing	73(31.1)	84(35.7)	48(20.4)	30(12.8)	1.85	19th		
Climate smart agriculture	101(43.0)	91(38.7)	7(3.0)	36(15.3)	2.09	10th		
Weed control	128(54.5)	74(31.5)	24(10.2)	9(3.8)	2.37	2nd		
Harvesting	105(44.7)	73(31.1)	24(10.2)	33(14.0)	2.06	13th		
Post-harvest handling	140(59.6)	46(19.6)	16(6.6)	33(14.0)	2.25	3rd		
Storage	127(54.0)	65(27.7)	11(4.7)	32(13.6)	2.22	4th	2.12	1st
Upland and Swamp land rice production	135(57.4)	36(15.3)	13(5.5)	51(21.7)	2.09	10th		
Yam minisett	100(42.6)	51(21.7)	42(17.9)	42(17.9)	1.89	17th		
Chemical application	119(50.6)	66(28.1)	32(13.6)	18(7.7)	2.22	4th		
Inputs						6th		
Seed and seedlings	120(51.1)	42(17.9)	58(24.7)	15(6.4)	2.14	7th		
Seed sorting	115(48.9)	67(28.5)	19(8.1)	34(14.5)	2.12	16th	2.07	2nd
Seed treatment	108(46.0)	55(23.4)	39(16.6)	33(14.0)	2.01	15th		
Seed variety	103(43.8)	61(26.0)	49(20.9)	22(9.4)	2.04	10th		
Value Addition								
Processing	118(50.2)	47(20.7)	44(18.7)	26(11.1)	2.09	10th		
Packaging	98(41.7)	45(19.1)	51(21.7)	41(17.4)	1.85	19th	2.03	3rd
Branding	107(45.5)	57(24.3)	49(20.9)	22(9.4)	2.06	13th		
Marketing	130(55.3)	40(17.0)	29(12.3)	36(15.3)	2.12	7th		

Source: Field survey, 2022; Figures in parentheses are percentages; WMS: Weighted Mean Score

Challenges associated with the use of arable crop production technologies

This objective was measured on 3-rating scale of major challenge, minor challenge, and not a challenge. Thereafter, weighted mean score (WMS) was computed and ranked accordingly (Table 5). The result in Table 5 revealed that financial challenge had the highest WMS of 1.88 and was ranked first (1st), followed by inadequate farmland (WMS= 1.81; 2nd), high cost of production inputs (WMS= 1.78; 3rd), weather problem (WMS= 1.78; 4th) respectively, while misinterpretation/misapplication of recommended technologies, irregular visit/supervision of farmers by technology provider/EAs, untimely availability of inputs were ranked least with the WMS of 1.38 (9th), 1.42 (8th), 1.46 (7th), and 1.54 (6th) respectively.

The result implies that the farmers were been constrained by some challenges which affect adequate production of different identified arable crops grown in the sampled States. The variation in the ranking order may be due to the differences in their years of farming experience, farm size, and perception towards different identified challenges associated with arable crop production. This result was corroborated by the farmers during FGD in the selected villages of the sample States as most farmers shouted finance as major challenge that constrained crop production in the area alongside with other challenges which include high cost of inputs, inadequate farmland especially the depletion of soil fertility, untimely availability of farm inputs among others. The main constraints associated with technologies application to crop production are the availability of capital, knowledge of how to use the technology and market risks (Gerard, 2000).

Table 5. Distribution of respondents by challenges to the use of arable crop production technologies

Challenges	Frequency (percentage)				
	Categorization of challenges				
	Major	Minor	Not a challenge	WMS	Rank
Inadequate farmland	145(94.0)	8(5.2)	1(0.6)	1.81	2nd
Inputs scarcity	115(74.7)	39(25.3)	-	1.68	5th
High cost of production inputs	141(91.6)	13(8.4)	-	1.80	3rd
Untimely dissemination of recommended technologies	84(54.5)	70(45.5)	-	1.46	7th
Misinterpretation/misapplication of recommended technologies	70(45.5)	84(54.5)	-	1.38	9th
Irregular visit/supervision of farmers by technology provider/EAs	83(53.9)	71(46.1)	-	1.42	8th
Untimely availability of inputs	103(66.9)	43(27.9)	8(5.2)	1.54	6th
Financial challenge	137(89.0)	17(11.0)	-	1.88	1st
Weather problem	143(92.9)	11(7.1)	-	1.78	4th

Source: Field survey, 2022; WMS: Weighted Mean Score

Ordered probit regression analysis

The result of Ordered probit and marginal effect regression estimate from the fitted model in which the response variable was the level of needs of arable crop production technologies, while the explanatory variables were the selected socio-economic characteristics of the crop farmers. The estimate revealed from the results in Table 6, an LR Chi^2 of 64.86, pro> of 0.000 and pseudo R^2 of 0.2222. The coefficient of age was positive and statistically significant at 1% ($p<0.01$), which suggests that increase in the age of the farmers would lead to the likelihood of increase in level of needs of identified arable crop production technologies by 0.3%. Also the coefficient of sex was positive and statistically significant at 5% ($p<0.05$), it implies that sex of the crop farmers would increase the likelihood changes in their level of technologies needs by 2.0%. The result further revealed that coefficients of years of farming experience and extension contact were negative and statistically significant at 5% and 10% ($p<0.05$ and $p<0.1$) which implies that decrease in the either of the variables would lead to likelihood decrease in the level of needs of crop technologies by 0.2% and 0.3%.

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On contrary, the coefficient of farm size was positive and statistically significant at 5%, which suggests that increase in the number farmland cultivated by the farmers would lead to increase in the likelihood of level of needs of identified arable crop technologies among the sampled farmers by 3.0%. The above scenarios imply that all the aforementioned socio-economic variables especially age, sex, years of farming experience, extension contact and farm size have decisive influence on the level of needs of arable crop production technologies among the farmers of the selected States.

Table 6. Test of significant relationship between the selected socio-economic characteristics of the respondents and level of need of arable crop production technologies using Ordered probit regression analysis – Marginal effect

Socio-economic Variables	Coefficient (dy/dx)	Standard Error	z-value
Age	0.011	0.003	4.41***
Sex	0.039	0.020	1.92**
Educational status	0.000	0.003	0.20
Household size	-0.010	0.010	-1.01
Years of farming experience	-0.004	0.002	-2.45**
Extension contact	-0.005	0.003	-1.72*
Farm size	0.062	0.030	2.09**

Source: Data Analysis, 2022; *: Significant at 10%; **: Significant at 5%; *: Significant at 1%; dy/dx is for discrete change of dummy variable from 0 to 1**

T-test analysis

Table 7 revealed the t-value to be negative (-0.466) and statistically insignificant. The result implies that there is no significant difference between the levels of need of identified arable crop production technologies among the farmers of the selected States. This may be true because the two States share similar background in terms of extension service and geographical zone and vegetation. The above result corroborates the responses of the farmers during the FGD as farmers in both States shouted dare need of arable crop production technologies.

Table 7. Test of significant differences between the levels of need of identified arable crop production technologies using T-test analysis

State	Mean	Std Error Mean	t-value	df	Sig(2-tailed)	Remark
Oyo/Ekiti	-0.037	0.079	-0.466	80	0.642	NS

Source: Data Analysis, 2022

CONCLUSION AND RECOMMENDATIONS

Conclusively, this study revealed that farmers in both sampled States are of different age groups where male farmers constituted the highest proportion of the respondents and they were married with little percentage being single. Majority of the farmers are literate with different educational background and years of farming experience. The farmers cultivated varieties of arable crop s such as grains, tuber, and vegetables resulting in d different level of needs of arable crop production technologies where majority indicated agronomic best practices and inputs technologies. Extension institutions are the major source of recommendations on available production technologies to crop farmers in the study area though with different frequency of visitation. Socio-economic characteristics like age, sex, marital status, educational status, household size and extension contact have decisive influence on the level of needs of identified arable crop production technologies.

The study therefore recommend the need to encourage arable crop production by ensuring appropriate application of different arable crop technologies coupled with adequate training of rural farmers through extension service; the technology providers should align the technologies with the arable crop farmers' need as it would encourage efficient utilization of such technologies among different users; it is very important that the technology providers should take cognizance of the socio-economic factors of arable crop farmers during the recommendation of technologies to crop farmers; and both government and NGOs should come to the aids of crop farmers by ameliorating some of the challenges militating against arable crop production through timely distribution of arable crop production inputs like fertilizer, seeds; encouragement of VEAs in order to improve on the frequency of visitation to farmers in ensuring appropriate application of different recommendations

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