

TRAINING NEEDS OF FARMERS FOR ORGANIC FARMING IN NIGER STATE, NIGERIA

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ABSTRACT

The study examined the training needs of farmers for organic farming in Niger State, Nigeria in order to assist agricultural extension personnel develop appropriate extension programming on organic farming. To achieve the study objective, 316 respondents were proportionately and randomly selected from three Local Government Areas in the State. Validated interview schedule with reliability coefficient of 0.84 was used for gathering data and data gathered were analyzed using descriptive statistics and correlation analysis. The results indicated that 55.7% of the respondents were within age range of 35-54 years. Application of green manure was the commonest technique of organic farming practised by the respondents in the study area for crop production. On animal production, finding revealed that there was high level of practise of organic farming techniques by the respondents. Major constraint faced by respondents in organic farming was lack of knowledge of appropriate predators for pest control (59.2%). Areas of training need of the respondents were packaging/labeling of organic foods/products, biological pest control methods and crop rotation techniques. The result further showed that educational level ($r = 0.281$), farm size ($r=0.293$) and family size ($r=0.275$) had significant relationship with the training needs of the respondents. Hence, collaborative and multi-disciplinary research term was recommended to help organic farmers with issues like use of manure and finding the best biological pest control methods. It was also suggested that farmers should be adequately trained by extension agents on packaging/labeling of organic products, biological pest control methods and other areas of organic farming using suitable teaching methods and materials.

Keywords: Training needs, Farmers, Organic agriculture, Technique, Niger State

INTRODUCTION

Organic agriculture is a system of farming that relies on ecosystem management rather than external agro-allied companies inputs. Thus, in organic agriculture, the use of synthetic inputs such as inorganic fertilizers, agro-chemicals, veterinary drugs, genetically modified seeds and breeds, commercial livestock feeds, preservatives, additives and irradiation are eliminated.

According to Bourn and Prescott (2002), the goals of organic agriculture include maintaining bio-diverse crops; keeping soil healthy and fertile for future; reducing pollution; minimizing food contamination; producing high quality products; avoiding use of commercial fertilizers and chemicals in farming; recycling nutrients; and support ecological wholeness. Common farming techniques used to accomplish these goals are crop rotation, green and compose manure, planting of cover crops, biological pest control, animal manure and use of natural feeds (Worthington, 2001).

United States Department of Agriculture (2002) reported that organic agriculture has many socio-economic benefits. Nutritionally, organic foods are safer and have higher amounts of minerals, vitamins, less heavy metal, quality protein and less nitrates. More so, organic foods are friendlier to the environment because they do not contaminate water and use less fossil fuel in the production process. Furthermore, the reduced amounts of agro-chemicals in organic foods protect children and other consumers from cancer, allergies, birth defects, nerve damage, genetic mutation and asthma diseases. Economically, organic farming has also assisted small-scale farmers by providing them another opportunity to compete with large scale farmers.

Presently, organic food business is the fastest growing sector in agricultural economy. Global spending on organic foods has already reached \$25 billion and expanding acreage dedicated to organic farming indicates that this will continue to be a growing market in the future (Hunter, 2002). In United States alone, over \$7 billion was realized from the sales of organic food in 2001, with an expected 20-24% annual growth, that amount could be over \$25 billion by 2010 (Long, 2002).

However, organic agriculture is a knowledge demanding practice which is commercially driven by global market and regulated by international standards of production. In order for developing countries like Nigeria to benefit fully from the socio-economic opportunities offered, there is the need to address the organic farming skills gap that exists among farmers. It is against this background that this study was carried out to examine the training needs of farmers for

organic farming in Niger State, Nigeria. The findings of the study would assist extension agencies in the development of appropriate plan of work and teaching methods/materials that will enable them to deliver high quality extension programming on organic farming. The ultimate beneficiaries of these efforts will be the farmers whose livelihoods will improve. The specific objectives of the study are to:

- i. describe the socio-economic characteristics of the respondents;
- ii. ascertain the techniques of organic farming practised by the respondents;
- iii. identify constraints of organic farming in the study area;
- iv. determine the organic farming training needs of the respondents; and
- v. determine the relationship between socio-economic characteristics and training needs of the respondents.

METHODOLOGY

The study was carried out in Niger State, Nigeria. The State is located in Guinea Savanna Ecological zone of Nigeria between Latitudes $8^{\circ} 22^1$ and $11^{\circ} 30^1$ N and Longitudes $3^{\circ}30^1$ and $7^{\circ}20^1$ E. Annual rainfall of the State ranged from 1,600mm in the South to 1100mm in the North with average monthly temperature range of about 23° C to 29° C. Common means of livelihood of the people is crop and livestock farming (Niger State Geographic Information System, 2007). In order to get a representative sample for the study, multi-stage sampling technique was adopted for the study. At the first stage, three Local Government Areas (Lapai, Mariga and Rafi) one from each agricultural zone in the State were randomly selected. At the second stage, four villages were randomly selected from each Local Government Area to obtain 12 villages. At the third stage, 10% of the farmers in each village were randomly selected. In all, a total of 316 respondents were sampled for the study from a sampling frame of 3,160 farmers established through village heads with the assistance of village extension agents attached to the localities sampled.

Content validity of the data collection instrument (interview schedule) was ensured through expert consultation. The validated interview schedule which was subjected to Cronbach's Alpha reliability test ($r=0.84$) was used for data collection in June, 2015. Data were collected on socio-economic characteristics, techniques of organic farming, constraints of organic farming and training needs. Age and educational level were measured in years, while sex was measured as

male or female. Farm size was measured in hectares. Similarly, family size and extension contact were measured in numbers. Techniques of organic farming and constraints faced were determined by asking the respondents to indicate the methods of organic farming they practised regularly and the problems they faced in the use of such methods. Training needs were measured using 4-points Likert scale of great need = 4, some need = 3, little need = 2 and no need = 1. In order to determine areas of training need, the value of the scale (1+2+3+4) were summed up to get 10 which was divided by 4 to obtain 2.5 (mean). Any area of organic farming with a mean score of 2.5 and above suggests major need of training and any area with mean less than 2.5 was regarded as minor need of training. Objectives one, two, three and four of the study were achieved using descriptive statistics (frequency, percentage and mean) while objective five was achieved using inferential statistics (correlation analysis).

RESULTS AND DISCUSSION

Socio-economic Characteristics of Respondents

Result in Table 1 revealed that a total of 55.7% of the respondents were within the age range of 35-54 years. This implies that majority of the respondents in the study area were in their productive years. Table 1 also indicated that one quarter (25.6%) of the respondents acquired secondary education with only 15.2% of them with tertiary education. Education attainment is necessary for improving agricultural practices and production. Umar *et al.* (2009) corroborated this by affirming that education influences the adoption of improved agricultural practices.

Furthermore, findings in Table 1 showed that almost 50.0% of the respondents in the study area had farm sizes of between 1-2 hectares. This suggests that most farmers in the area were small-scale farmers. In a related study, Ndanitsa *et al.* (2011) reported that majority of the farmers in Niger State practised small-scale farming. The family sizes of 45.3% of the respondents in the study area were between 6-10 persons. The large family sizes are expected to provide unpaid family labour to the respondents for the production of organic products. Sex composition of the respondents in Table 1 revealed that 76.3% were males. This implies that males dominate farming activities in the area. Table 1 shows that 52.8% of the respondents had access to extension services. This is an indication that more than half of the respondents in the study area received extension services which can greatly improve the practice of organic agriculture.

Table 1: Socio- economic characteristic of respondents

Socio-economic characteristics	frequency	percentage
Age		
15-24	14	4.4
25-34	72	22.8
35-44	80	25.3
45-54	96	30.4
55-64	43	13.6
65-74	11	3.5
Education level		
No formal education	98	31.0
Primary education	89	28.2
Secondary education	81	25.6
Tertiary education	48	15.2
Farm size (Ha.)		
≤ 1	72	22.8
1.1-2	155	49.1
2.1-3	68	21.5
3.1-4	21	6.6
Family size		
≤ 5	86	27.2
6-10	143	45.3
11-15	38	12.0
16-20	32	10.1
21-25	17	5.4
Sex		
Male	241	76.3
Female	75	23.7

Extension contact

Yes	167	52.8
No	149	47.2

Source: Field survey, 2015

Techniques of Organic Farming Practised by Respondents

Finding in Table 2 indicated that 87.1% of the respondents in the study area applied green manure technique instead of synthetic fertilizer in their farms, while about 80.0% of the respondents applied animal manure in their farms to improve soil structures. Similarly, 61.4% and 46.2% of the respondents planted cover crops and practised crop rotation techniques, respectively, to maintain soil organic matters, confuse pest and prevent diseases in their farms. Compose manure was applied by 12.0% of the respondents in the study area. However, only 2.5% of the respondents used dogs as a biological pest control technique as opposed to synthetic pesticide.

All (100%) of the respondents eliminated the use of preservatives, additives and radiation in livestock production, while use of natural feeds for livestock as against commercial feed was practised by 90.8% of the respondents. Similarly, 83.3% and 79.4% of the respondents, respectively, adhered to the organic agriculture restriction on use of antibiotics or growth hormones and use of genetically modified breeds in livestock production. On the whole, findings revealed that there was higher level of compliance by respondents with organic agriculture standard on livestock production than crop production in the study area.

Table 2: Distribution of respondents according to techniques of organic farming practised

Technique*	Frequency	Percentage
Crop rotation	146	46.2
Green manure	275	87.1
Compose manure	38	12.0
Cover crops	194	61.4

Biological pest control	8	2.5
Animal manure	252	79.7
Use of only natural feeds	287	90.8
None use of antibiotics or growth hormones in livestock production	263	83.3
None use of genetically modified breeds	251	79.4
None use of preservatives	316	100.0
None use of additives	316	100.0
None use of radiation	316	100.0

Source: Field survey, 2015

*Multiple responses

Constraints Faced in Organic Farming

Table 3 showed that almost 60.0% of the respondents lacked knowledge of appropriate predators for pest control in organic farming, while 52.5% of the respondents indicated that making compost manure is too labourious. This finding agrees with Bourn and Prescott (2002), who earlier observed that organic crop production requires more labour than the conventionally grown farm produce. Similarly, 50.3% of the respondents reported that they had challenge of inadequate knowledge on crop rotation technique in terms of crop combination. On the other hand, the problem of insufficient market for organic products was reported by 43.7% of the respondents in the study area.

Table 3: Distribution of respondents based on constraints faced in organic farming

Constraints*	Frequency	Percentage
Inadequate knowledge on crop rotation techniques	159	50.3
Compose manure is labour intensive	166	52.5
Lack of knowledge of appropriate predator for pest control	187	59.2

Insufficient market for organic products	138	43.7
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Source: Field survey, 2015

*Multiple responses

Training Needs of Respondents

The mean figure of 3.71 in Table 4 shows that most of the respondents in the study area were in need of training on packaging and labeling of organic foods/products to enable them produce organic products that would meet international standard and regulations. Furthermore, the mean value of 3.35 revealed that most of the respondents in the area required training on biological pest control methods in terms of how and type of predators to use for pest control. Similarly, the mean score of 2.62 indicated that majority of the respondents were in need of training on crop rotation techniques to educate them on the appropriate crop combination for crop rotation practice. Also, mean value of 2.52 suggested that most of the respondents in the area required training on improved compose manure making techniques in order to reduced drudgery. The general inference that can be drawn from these findings is that majority of the respondents needed training in various aspects of organic farming to enable them benefit from the financial and environmental opportunities offered by organic farming.

Table 4: Distribution of respondents according to their training needs

Training needs*	Mean	Remark
Crop rotation techniques	2.62	Major need
Green manure	2.23	Minor need
Compose manure	2.52	Major need
Planting of cover crops	1.54	Minor need
Biological pest control methods	3.35	Major need
Application of animal manure	2.32	Minor need
Using of natural feeds for livestock	1.25	Minor need

Packaging and labeling of organic foods/products 3.71 Major need

Source: Field survey, 2015

*Multiple responses

Relationship Between Socio-economic Characteristics of Respondents and their Training Needs

The results of the correlation analysis in Table 5 reveal that educational level ($r=0.281$) had significant relationship with the training needs of the respondents in the study area. In a previous study, Umar *et al.* (2013) reported that educational level of farmers influenced their capacity building needs. Furthermore, farm size ($r=0.293$) and family size ($r=0.275$) had significant relationship with the training needs of the respondents. This shows that farmers with large farm sizes and correspondingly large family sizes needed more training on organic farming than their counterparts with less, because they would have sufficient family labour needed to practice organic agriculture which is labour intensive.

Table 5: Correlation between socio-economic characteristics of respondents and their training needs.

Socio-economic characteristics	Correlation coefficients
Age	0.187 ^{ns}
Educational level	0.281*
Extension contact	0.196 ^{ns}
Farm size	0.293*
Sex	0.172 ^{ns}
Family size	0.275*

Computed from field survey data, 2015

*Significant

ns-Not significant

CONCLUSION

From the findings of the study, it was concluded that there was high level of practise of organic farming techniques in livestock than crop production in the study area. Lack of knowledge of predator animals for pest control, high labour requirement and inadequate information on crop

rotation techniques were the major challenges of organic farming in the area. Aspects of major training needs of respondents on organic farming were packaging/ labeling of organic products, biological pest control methods, crop rotation and improved compose manure techniques, while educational level, farm size and family size had significant relationships with the training needs of the respondents.

RECOMMENDATIONS

There is need for the extension agencies to popularize organic farming in the study area with emphasis on techniques such as crop rotation, compose manure and biological pest control methods to enable farmers maximize economic and environmental benefits of organic agriculture.

Organic farming being a multifaceted concept, collaborative and multidisciplinary research term was recommended to assist organic farmers with issues like soil fertility, use of regulated manures and finding the best biological pest control methods.

In order to improve organic farming in the study area, the training needs of the respondents have to be addressed. Specifically, the farmers should be trained by extension agents on packaging/labeling of organic farm products, biological pest control methods, crop rotation and compose manure techniques, using appropriate teaching methods and materials such as demonstration, posters, slides, DVDS and monographs.

The issue of certification of organic products has to be attended to by a regulatory body to enable organic farmers have access to market where they can sell organic product at premium prices.

Educational level, farm size and family size of the respondents should be considered when training the farmers on organic farming.

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