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REGULAR ARTICLE

PRELIMINARY BOTANICAL ASSESSMENT OF PRODUCTION CHALLENGES OF CASHEW (*ANACARDIUM OCCIDENTALE* L.) IN LAFIA, NASARAWA STATE, NIGERIA

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ABSTRACT

The aim of this study was to investigate the production and challenges of cashew farming in Lafia, Nigeria. The study area was divided into five zones. Fifty semi-structured questionnaires were administered to the farmers. The results showed that only males are engaged in cashew farming and slightly above 95% are married and just about 44% are aged between 21-40 y. Over 95% of farmers disclose that cashew production is seasonal; slightly above 73% disclose that diseases and pests are major challenges in cashew cultivation. Over 64% are of the opinion that these diseases and pests are responsible for yield reduction. Slightly above 52% disclose that yellow cashew is the most tasty and best for consumption. 52% of the farmers agree that 2017 is their best year of harvest because they were more involved in the management. 44% of farmers disclose that they do not apply chemicals and cultural practice in controlling diseases and pests, however majority agree that chemicals are useful in weed control. There was no agreement about the flowering and fruiting periods of cashew as 57% believe that cashew trees flower once, during the dry season and 65% disclosed that flowering occurs between January and March each year.

Keywords: Cashew farming, Diseases and pests, Lafia, Weed control

INTRODUCTION

Cashew (*Anacardium occidentale* L.) is one among the tropical nut crop originated from Central and Southern America [1]. Cashew crop was brought in to Asia and Africa by the Portuguese in the colonial era a nd the crop has spread widely ever since, becoming a major export commodity crop for several countries. There is a growing interest in cashew crop in several countries especially with multiple uses of its different parts [2, 3]. In the 16th century, the crop was introduced to Africa at the same time as India, through trade mission by the Portuguese explorers [4, 5] and spread to remaining parts of Nigeria [6, 7].

The cultivation of cashew was quickly adopted by several communities in the country and the crop currently grown in many states of Nigeria [8] with a signigicant production [8]. Value-addition through local kernel processing was the outcome of the establishment of large plantations in the country. However, there is a steady decrease in the production of cashew due to many factors like lack of expertise [9]. As part of production improvement the genetic basis and varieities are being collected and assembled in Nigeria [10, 11].

There is low level use of cashew in spite of its avowed nutritional qualities and there are a number of challenges which may be responsible for its continued underutilization. Production of cashew is mostly limited by pest and diseases [12]. These pests and diseases result in loss of yield and market value. Lack of knowledge and skills in the processing and management of cashew products is also one of the major limiting factors in the production and utilization of cashew fruits in Nigeria [13]. In Lafia, Nigeria, there is a lack of awareness on cashew production, potential uses and economic value, post-harvest handling and preservation of cashew apple. In view of these challenges in the production and marketing of cashew product, some questions are obvious, such as mode of production, challenges encountered during production, storage (pre and post-harvest diseases). Therefore, this work investigated the production challenges of cashew in Lafia, Nasarawa State, Nigeria.

MATERIALS AND METHODS

This study was carried out using the method adopted by [14]. Fifty semi-structured questionnaires were administered to farmers in five locations that represents the entire Lafia metropolis namely: Lafia North–Ombi 1, Angwa nungu and Azuba communities; Lafia Central–Gimare; Lafia East–Akurba communities; Lafia West–Araho i.e. Tudun wada and Lafia South–Gandu.

Data were collected from the farmers during several visits to the farms aimed at interacting with them using the

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questionnaires as a guide. Additional tools used for the exercise include an audio device for recording and a digital camera for capturing notable features of the farms visited. The services of an interpreter was sought to translate the discussions. The data collected were expressed as percentages and presented in frequency tables and figures.

RESULTS

Demography of farmers in lafia

Out of the fifty (50) questionnaires administered to cashew farmers in the study areas, 23 were recovered comprising (1) south, (4) central, (5) west, (6) east and (7) north. All twenty-three (23) farmers, a perfect score are males, indicating that only males are engaged in cashew farming in Lafia (Table 1). Only one farmer (4%) is aged below 20 y, five farmers (22%) are aged above 60 y, seven farmers (30%) are aged between 41–60 y and ten farmers (44%) are aged between 21–40 y (Table 2). Two farmers (9%) are part-time farmers since they are engaged in other vocations, another two farmers (9%) are also engaged in some business ventures, five farmers (22%) are engaged in other occupations while fifteen (61%) are exclusively farmers (Table 3). Only one (1) farmer or 4% farms on a 16–20ha piece of land, three (3) farmers or 13% farm on a 6–10 ha piece of land, four (4) farmers or 17% farm on an 11–15 ha piece of land and fifteen (15) farmers or 65% farm on a 1–5 ha piece of land (Table 4).

The phenology of cashew in lafia

Four (4) farmers (17%) reported that cashew flowers during the rainy season. Six (6) farmers (26%) reported flowering occurs in both rainy and dry seasons but thirteen (13) farmers (57%) reported that cashew trees flower in the dry season alone (Table 5). In Lafia South, 17.5 baskets of cashew fruits were produced per plot and 262.5 baskets from entire farm. In Lafia Central, 56 baskets of cashew fruits were produced per plot and 2,884 baskets from the entire farm. In Lafia North, 161 baskets were produced per plot and 72,933 baskets from the whole farm. In Lafia West, 170 baskets were produced per plot in and 66,470 from entire farm while in Lafia East, 458 baskets were produced per plot and 123,660 baskets in the whole farm (Table 6).

Table 1: Gender distribution of cashew farmers in lafia

Location	Gender		Total
	Male	Female	
Lafia North	7	0	7
Lafia Central	4	0	4
Lafia East	6	0	6
Lafia West	5	0	5
Lafia South	1	0	1
Total	23	0	23
Percentage	100.00	0.00	100.00

Table 2: Age distribution of cashew farmers in lafia

Location	Age distribution of farmers				Total
	Below 20	21–40	41–60	Above 60	
Lafia North	0	3	2	2	7
Lafia Central	0	2	0	2	4
Lafia East	0	3	3	0	6
Lafia West	0	2	2	1	5
Lafia South	1	0	0	0	1
Total	1	10	7	5	23
Percentage	4	44	30	22	100.00

Table 3: Other occupation of cashew farmers in lafia

Location	Occupation of farmers				Total
	Farming	Business	Farming/Business	Others	
Lafia North	6	0	0	1	7
Lafia Central	1	0	0	3	4
Lafia East	3	2	1	0	6
Lafia West	4	0	1	0	5
Lafia South	0	0	0	1	1
Total	14	2	2	5	23
Percentage	61	9	9	22	100.00

Table 4: Size of cashew farmland in lafia

Size	1-5 (h)	6-10 (h)	11-15 (h)	16-20 (h)
Frequency of occurrence	15	3	4	1
Percentage occurrence	65%	13%	17%	4%

Table 5: Season of flowering of cashew plants in lafia

Location	Season of flowering			Total
	Rainy	Dry	Both	
Lafia North	2	5	0	7
Lafia Central	0	4	0	4
Lafia East	1	1	4	6
Lafia West	1	3	1	5
Lafia South	0	0	1	1
Total	4	13	6	23
Percentage	17	57	26	100

Table 6: Average number of baskets produced from cashew farms in lafia

Location	Average production	
	Plot (baskets)	Whole farm
Lafia North	161	72,933
Lafia Central	56	2,884
Lafia East	458	123,660
Lafia West	170	66,470
Lafia South	17.5	262.5
Total	862.5	266,209.5

The pathology of cashew in lafia

Six farmers (26%) reported that there were no pest/diseases in their farms while seventeen farmers (74%) acknowledged the presence of pests/diseases on their farms (Table 7). The farmers also expressed their views on the effects of diseases on yield reduction, marketability and roughing of infected crops (Table 8). Also the farmers reported several methods of controlling the diseases in their respective farms in which 44% do not adopt any disease management practices (Table 9). 4% of the farmers uses both chemicals/physical weeding methods to control weeds on their farms, while 26% uses chemicals only and 44% do not use any weed control treatment (Table 10).

Table 7: Presence or absence of diseases/pests on cashew farms in lafia

Location	Disease and pests on farm		Total
	Yes	No	
Lafia North	5	2	7
Lafia Central	4	0	4
Lafia East	3	3	6
Lafia West	4	1	5
Lafia South	1	0	1
Total	17	6	23
Percentage	74	26	100.00

Table 8: Effects of diseases/pests on cashew farms in lafia

Location	Effects of diseases/pests				Total
	Reduction of yield	Reduction in marketability	Destruction of infected plant	All of the above	
Lafia North	3	0	0	2	5
Lafia Central	3	0	0	1	4
Lafia East	1	0	0	2	3
Lafia West	3	0	0	1	4
Lafia South	1	0	0	0	1
Total	11	0	0	6	17
Percentage	65	0.00	0.00	35	100.00

Table 9: Control of pests/diseases on cashew farms in lafia metropolis

Location	Control of pests/Diseases				Total
	Chemicals	Cultural practices	Destruction of infected plants	No management practices	
Lafia North	5	0	0	2	7
Lafia Central	2	1	1	0	4
Lafia East	0	2	0	4	6
Lafia West	2	0	0	3	5
Lafia South	0	0	0	1	1
Total	9	3	1	10	23
Percentage	39	13	4	44	100.00

Table 10: Weed control practices on cashew farms in lafia

Location	Weed control on farms				Total
	Application of chemicals-herbicides	Weeding	Both chemical and weeding	No treatment	
Lafia North	3	2	0	2	7
Lafia Central	2	0	1	1	4
Lafia East	1	2	0	3	6
Lafia West	0	1	0	4	5
Lafia South	0	1	0	0	1
Total	6	6	1	10	23
Percentage	26	26	4	43	100.00

Table 11: Storage practices of cashew apples used by farmers in lafia

Location	Storage			Total
	Commercial storage	Personal storage	No storage	
Lafia North	0	3	4	7
Lafia Central	0	1	3	4
Lafia East	0	6	0	6
Lafia West	0	2	3	5
Lafia South	0	1	0	1
Total	0	13	10	23.00
Percentage	0.00	57	43	100.00

Postharvest and storage challenge of cashew production in lafia

Ten (10) farmers (44%) do not have storage facilities for their produce while thirteen (13) farmers (57%) use personal storage facilities for their cashew produce (Table 11).

The variety of cashew cultivated in lafia

There are up to four varieties of cashew grown in Lafia and they have different shapes which include oblong, slim and elongated/big (Table 12). There are different colours of the fruits and this include green, red, yellow and multi-colour (Table 13). The best year of harvest differs from farmer to farmer. 4% reported 2014 was the best year of harvest while about 52% reported that 2017 was the best year (Table 14). The reason for best harvest was accrued to public enlightenment, absence of poachers, proper management and use of protection and conservation practices.

Environmental effect on cashew production in lafia

According to the farmers, there are different environmental factors that affect cashew production in Lafia. These factors include drought, soil infertility, erosion, high winds and soil infertility (Table 15). All the farmers do not receive any support from government and non-governmental organizations (Table 16).

Table 12: Shapes of cashew fruits identified on the farms in lafia

Location	Shapes of cashew apple				Total
	Elongated/big	Oblong	Slim	Unable to describe	
Lafia North	2	0	0	5	7
Lafia Central	1	0	0	3	4
Lafia East	1	1	0	4	6
Lafia West	0	0	1	4	5
Lafia South	1	0	0	0	1
Total	5	1	1	16	23
Percentage	22	4	4	70	100.00

Table 13: Colour of cashew varieties cultivated by farmers in lafia

Location	Common variety					Total
	Yellow	Red	Green	All of the above	Unable to describe	
Lafia North	4	1	0	1	1	7
Lafia Central	1	3	0	0	0	4
Lafia East	6	0	0	0	0	6
Lafia West	1	2	1	0	1	5
Lafia South	0	1	0	0	0	1
Total	12	7	1	1	2	23
Percentage	52	30	4	4	9	100.00

Table 14: Comparative year of best harvest of cashew products cultivated in lafia

Location	Year of best harvest					Total
	2017	2016	2015	2014	2013	
Lafia North	1	2	3	1	0	7
Lafia Central	2	1	1	0	0	4
Lafia East	5	0	1	0	0	6
Lafia West	4	0	1	0	0	5
Lafia South	0	0	0	0	1	1
Total	12	3	6	1	1	23
Percentage	52	13	26	4	4	100.00

Table 15: Abiotic factors on cashew farms in lafia

Location	Abiotic factors								Total
	Erosion	Drought	High wind	Soil infertility	Erosion /High wind	High wind/Soil infertility	Erosion/High wind/Soil infertility	No physical problem	
Lafia North	2	1	3	0	0	1	0	0	7
Lafia Central	0	0	1	0	1	0	2	0	4
Lafia East	0	0	0	1	0	2	0	3	6
Lafia West	0	0	2		1	1	1	0	5
Lafia South	0	0	1	0	0	0	0	0	1
Total	2	1	7	1	2	4	3	3	23
Percentage	9	9	30	4	9	17	13	13	100.00

Table 16: Presence or absence of government and non-governmental support on cashew farms in lafia

Location	Government support		Total
	Yes	No	
Lafia North	0	7	7
Lafia Central	0	4	4
Lafia East	0	6	6
Lafia West	0	5	5
Lafia South	0	1	1
Total	0	23	23
Percentage	0.00	100.00	100.00

DISCUSSION

The high involvement of males in cashew farming in Lafia is different from what was reported in literature where young men and women engage in cashew farming [15]. This may also have a cultural implication considering that women are not permitted to engage in certain vocations in this part of the world. The large amount of land devoted to cashew farming in Lafia is commendable compared with a similar work by Topper et al. [16] where less than 20% available lands are cultivated for cashew but majority are

cultivated for other crops which are intercropped with food crops. The seasonality of cashew flowering and fruit production in Lafia also agrees with previous reports [17]. In a similar work done earlier [18], seasonal effect was shown in production i.e. March of each year. Most varieties of cashew plant fruit once in a season while others produce twice or more. The use of chemicals in controlling diseases by some farmers in Lafia is supported by previous work [19], who recommended the use of chemicals as a disease/pest control method in cashew farms. Weed control generally in cashew farms do not present a formidable challenge since cashew trees have a consistent canopy and shade which prevent the establishment of weeds around the trees. This maybe the reason cashew farmers do not seem overly concerned about the challenge of weeds invasion on their farms. This finding shows that the level of farming in Lafia is at the subsistence level where the products are sold off as soon as they are harvested. Also results showed that cashew fruit produced in the study area have different shapes. This is in agreement with the result of earlier work [20], who reported various shapes of cashew fruits which include pear-shaped, oblong to ovate, elongated about 5–11.25 cm in length, with waxy, yellow, red or red-yellow skin and sometimes green. Also, another study [21] reported that the criterion for classifying cashew is the colour of the apple and shape.

CONCLUSION

This study has been able to assess the production and challenges of cashew farming in Lafia. It is discovered that most of the farms are inherited and are managed by illiterate married farmers. Farmers are faced with pest/diseases which they tried to control by the use of chemicals. The common variety of cashew grown on cashew is yellow type having sweet taste. The farmers do not receive any support such as fertilizers and pesticides from the government and non-governmental organizations.

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