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CROPPING PRACTICES OF COCOA FARMERS IN NIGERIA

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ABSTRACT
Cocoa has played an important role in the economy of Nigeria in 70's until the oil boom. The production started to decline in the 80's due to many factors including insect pest and diseases and non adoption of improved farming practices. The objective of the study was to ascertain the cropping practices and income of cocoa farmers in the study area. Simple random sampling technique was used to select four cocoa growing communities and 120 cocoa farmers. Most of the farmers are small scale farmers as 62% had less than 5 hectares of cocoa farms. Half of the respondents had cocoa trees that are still within productive age while 86.7% planted their cocoa with irregular spacing. Most (61.7%) and 61.8% of the respondents had kola nut and mango trees as intercrops. Majority (60.0%) of the farmers used improved varieties which are resistance to insect pest and diseases. Majority (75.0%) of the farmers were still using Copper Sulphate (fungicide) and 50.8% are still using Gammalin 20 EC which are banned pesticides. Most (46.7%) of the respondents used between ₦500 and ₦10, 500 to hire labour for weeding. Half (50.0%) of the respondents earned between ₦1,000 and ₦10, 000 in 2008 from their sales which is very low income for farmers to practice improved cropping practices. PPMC result should reflect the r value and p value i.e. ((r=0.305, p<0.05) and positive relationship exists between amount of money spent on labour and the farmers' income. Farmers need training on recommended pesticides and improved cropping practices that would reduce cost of production and increase their income.

KEY WORDS: Intercrops, varieties, pesticides, weeding, cost, revenue

INTRODUCTION

The Nigerian cocoa economy has a rich history which is well documented in literature. The contributions of cocoa to the nation's economic development are vast and have been reported by many authors (Olayide, 1969; Olayemi, 1973; Abang, 1984 and Folayan, *et al*., 2006). In terms of foreign exchange earnings, no single agricultural export commodity has earned more than cocoa. In addition, it is an important source of raw materials, as well as source of revenue to governments of cocoa producing states. Cocoa remains, however, significant in terms of internal revenue generation, and at the grower level is important in terms of employment and income (Ajobo, 1980). It also remains a major export crop; in 1998 a revenue of 7459.3 million Naira (US$ 53,280 at 140 per US$) was derived from dried cocoa beans (half of the income attributed to the total export of major agricultural products) (CBN, 1998). Evidence has shown that the growth rate of cocoa production has been declining, which has given rise to a fall in the fortunes of the sub-sector among other reasons (Nkang, *et al*., 2006). According to Folayan et al., 2006, cocoa production in Nigeria witnessed a downward trend after 1971 season, when its export declined to 216,000 metric tons in 1976, and 150,000 metric tons in 1986, therefore reducing the country's market share to about 6% to 5th largest producer to date. Bateman *et al*,. 2004 indicate that farmers need reliable, available remedies for pest and disease control that could increase production. Crop growing practices have proven very useful and in some settings are often the first line of defense against diseases and insects. However, growers can often be reticent about their adoption. Vos *et al.*, 2003 identified several crop growing methods that could be adopted by cocoa growers to address the problems of poor cocoa quality and quantity including: a) pruning and shade management, b) soil nutrient management, c) pest management, d) pest-resistant cocoa varieties, and e) weed control. According to Dongo *et al*., 2009 two years ago, the Nigerian Government set up an Inter ministerial Action Committee to look at the pesticide usage on cocoa with appropriate terms of reference to articulate strategies that will ensure that maximum residue levels (MRLS) and Good Agricultural Practices (GAP) are in line with the European Union Standards. The Cocoa Research Institute of Nigeria (CRIN) and the Sustainable Tree Crops Programme of the International Institute of Tropical Agriculture (IITA/STCP) are involved in enhancing the capacities of the Nigerian farmers through the Farmer Field Schools (FFS) to enable them take informed decisions on integrated crop production management practices for improved cocoa production in terms of quantity and quality. This study was carried out to ascertain the cropping practices of cocoa farmers and their various methods of ensuring good agricultural practices in cocoa farm in the study area.

OBJECTIVES

1. To ascertain the farm characteristics of the respondents
2. To examine the cropping pattern of the respondents
3. To ascertain the cost of labour used by the respondents
4. To determine the revenue generated from respondents' cocoa farms

MATERIALS AND METHODS

The study was carried out in Edo State, South-South Nigeria with particular reference to five communities in two Local Government Areas, *viz*: Okada, Iguomo, Egbeta and Ogbese in Ovia North East Local Government Area of Edo state which were randomly selected for the evaluation of cocoa farmers practices in the state. Thirty farmers were selected from each village using simple random technique from the village list of cocoa farmers. The State is dominated by the moist tropical forest with low land rain forest accounting for 76.5% of the total land area (Formecu, 1999). Approximately, the area is located between longitude 44° and 45°E and between latitudes 17° 15" and 8° 5" N.

RESULTS AND DISCUSSION

Result on Figure 1 reveals that majority (62.0%) of the farmers have between 1 and 5Acres which indicates that they are smallholder farmers. Farms sizes as categorized by STCP Nigeria Baseline Survey in 2001 are; Small 0.4 to 6 acres, Medium 6.1 to 12 acres, Large 12.1 + acres categories.

Most of the agricultural farms are on small –scale cultivation varying from 0.1 to 10 ha, making the farmers peasant in nature (Ochai S., 1995, Ogunfiditimi T. O.,1983, Olayide, S. O., 1980). This is an indication of the still important role of food crop production for meeting household food demands among smaller, land-scarce households. In contrast those households more abundantly endowed with land choose to invest in cocoa land assets. The lack of forested land for conversion to cocoa, averaging only 0.2 ha per farm implies that expansion of the cocoa sector in Nigeria will have to rely on further intensification of existing cocoa systems possibly with some conversion of fallow lands to cocoa land.

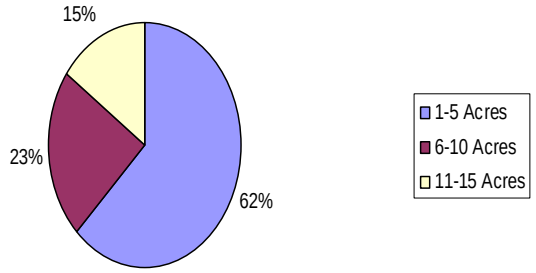

Figure 1:Size of farms in Acres

In Table-1 majority (50.00%) of the respondents cocoa trees are between 16-30 years which indicates that their farms are still very productive and would need more protective measures against pest and diseases. This is not in agreement with Akinwale (2008) findings that "The cocoa trees are becoming old and so are the farmers" and that about forty years ago a young Nigerian would have taken over his father's cocoa plantation but now he is more likely to be looking for an oil-related job in the big city. Also, Adegeye (1997) reported that one of the many factors responsible for the decline in cocoa production in South-western Nigeria is the ageing cocoa farms. Many farms are over 40 years old and such farms constitute as much as 60% of the cocoa farms in the country today.

TABLE 1: Age of cocoa trees

Age of trees	Frequency	Percentage
1-15	42	35.0
16-30	60	50.0
31-45	18	15.0
Total	120	100.0

Source: Field survey, 2009

In table-2 majority (86.7%) practice irregular spacing which indicates that the farmers in the study area need to be trained on recommended spacing for cocoa. Fruit trees may be incorporated in cocoa as a replacement for food crops after the year when cocoa (hybrid variety) has started fruiting and food crops have been harvested. It is recommended that fruit trees like *Cola nitida* and *Citrus sinensis* are planted at a spacing of 24 x 24m, totalling 7 fruit trees/ha each, in association with cocoa planted at 3.1mx3.1 m (giving a total of 1040 trees/ha) to give good agricultural practice. (Asare, 2007).

TABLE 2: Spacing pattern of cocoa trees by the respondents

Spacing	Frequency	Percentage
10ftx10ft(3.1x3.1)	16	13.3
Irregular Spacing	104	86.7
Total	120	100.0

Source: Field survey, 2009

Most (61.7%) and 61.8% of the respondents had kola nut and mango trees as intercrops and many of them grow other tree crops which indicates that they rely more on tree crops as intercrops with cocoa than arable crops in the study area(Table 3). The findings of this study is in line with that of Beer et al., (1997) who reported that fruit trees such as, *Mangifera indica* (mango), *Citrus sinenses* (oranges), *Persea americana* (avocado), *Irvingia gabonensis* (bush mango), *Garcinia kola*, *Cola nitida*, *Elaies guineensis* (oil palm) etc are integrated in cocoa plantations.

Some of these trees regenerated naturally in most cases and its seedlings were protected by farmers because of its important contribution to family income. Other tree species that are prominent in cocoa farms according to Leakey and Tchoundjeu (2001), Duguma et al. (2001), Sonwa et al. (2001) and Asare (2006) were C. sinensis, M. indica, A. occidentale, P. guajava and P. Americana and other exotic tree species cultivated by farmers to provide edible fruits in addition to shade for cocoa.

Majority (60.00%) of the farmers used improved varieties which could prevent outbreak of diseases as most of these varieties are resistance to insect pest and diseases and also give them high yield and increase farmers income. Cultivars tolerant of the fungal diseases are largely unidentified or have not been propagated in sufficient quantities." Resistance breeding for the disease is currently the major priority in West Africa where the virulent *P. megakarya* is proving difficult to control. Active research is underway throughout the world on genetic resistance to control black pod disease of cocoa. (Badaru and Aikpokpodion, 2001).

TABLE 3 : Intercrops in respondents' cocoa farms (n=120)

Intercrops	Frequency	Percentage
Plantain	40	33.3
Cassava	32	26.7
Orange	53	44.2
Pear	25	20.8
Kola nut	74	61.7
Oil palm	18	15.0
Mango	68	61.8
Cashew	58	56.7
Duca nut	14	11.7
African star apple	23	19.2
Yam	23	19.2
Cocoyam	33	27.5

Source: Field survey, 2009

TABLE 4: Varieties of cocoa planted by the respondents

Varieties	Frequency	Percentage
Amenlonado	6	5.0
Amazon	72	60.0
Amelonado	5	4.2
and Amazon	37	30.8
Do not know		
Total	120	100.0

Source: Field survey, 2009

Majority (75.00%) of the farmers still use Copper Sulphate (fungicide) while (50.83%) are still using Gammalin 20 EC (Insecticide) which is an indication that they lack information on the use of recommended pesticides (Table 5). According to Heong and Escalada, 1997b; Burleigh *et al*., 1998 showed the pesticide use patterns of the farmer, which in many cases in developing countries is a major component of pest management. The use of chemical pesticides (copper and metalaxyl-based fungicides) is short term solutions, but generally most reliable and popular with farmers because of their quick, effective action. But it is now known that with non-target effects and resistance of the pathogen, the risks to human lives and to the environment is so great that there is no longer any question about the necessity for changing to crop protection techniques which are less dependent on chemicals (Sengooba, 1992). According to Mosudi (2008) the residue analysis of the blood of some farmers involved in his study in south western Nigeria had residues of diazinon, endosulfan, propoxur and lindane in their blood. The aforementioned insecticides are the chemicals used by the farmers for mirid control on their cacao farms. This is indicative of occupational exposure to Endosulfan, lindane, diazinon and propoxur which are all WHO Category II insecticides ((WHO, 1992; Pesticide News, 2000a). Farms, which do not apply chemical input, have been able to maintain some level of profitability, extensive farmers should be encouraged to try to get a higher price for their product, which could actually be called 'organic cocoa'. Farmers, who apply chemical inputs, must consider the aspect of profit making and quality of cocoa due to chemical residues in the product, coupled with the problem of environmental pollution through chemicals (Opeyemi et al, 2005).

TABLE 5: Farmers status in the use of pesticides (n-120)

Pesticides	Use before		Still using	
	Frequency	Percentage	Frequency	Percentage
Perenox	5	4.17	31	25.80
Cocobre sandox	2	1.67	7	5.83
Brestan	-	-	10	8.30
Copper sulphate	2	1.67	90	75.00
Bordeaux Mixture	-	-	7	5.83
Ridomil plus	2	10.53	64	53.33
Gammalin 20 EC	-	-	61	50.83
Unden	-	-	31	25.83
Basudin	1	0.83	73	60.83
Elucron	-	-	7	5.83
Dursban	1	0.83	-	-
Grammoxone	-	-	42	35.00
Gramorone	-	-	4	3.33
Asulux 40	-	-	1	0.83
Round up	-	-	14	11.67

Source: Field survey, 2009

In Table 6 majority (46.67%) of the respondents spent between N500 and N10500 for labour which indicates that they have limited capital to hire labour to maintain their farms. Weeding is the The removal of unwanted plants from a cocoa farms is an important operation and can affect yield positively. Insects and diseases multiply more on unweeded cocoa farms. Weed can affect cocoa trees through its effect on the metabolic rate of the cocoa trees; it indirectly influences the nutrient status of the soil. The micro-climate, in turn, influences the incidence of pests and diseases.(ICCO, 2005). In table 6 most (46.7%) of the respondents used between N500 and N10,500 to hire labour for weeding which is an indication that the farmers are small scale farmers as indicated in their small farm size

TABLE 6 Amount spent to hire labour for weeding

Amount(N)	Frequency	Percentage
500-10500	56	46.7
10501-20500	13	10.8
20501-30500	12	10.0
30501-40500	9	7.5
40501-50500	9	7.5
50501-60500	6	5.0
60501-70500	7	5.8
70501-80500	8	6.7
Total	120	100.0

Source: Field survey, 2009

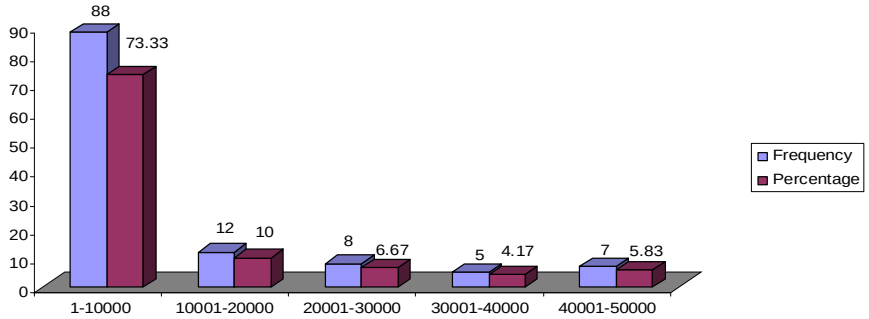

FIGURE 2: Revenue of farmers in 2008
Source: Field survey, 2009

It has been ascertained that the farmers are small holding farmers which conforms with the revenue generated from their farms. In figure 2 many (50.0%) of the respondents earned between ₦1,000 and ₦10, 000 in 2008 from their sales which is very low income for farmers to be able to control pest infestation. Today, cocoa-farming remains a labour intensive and demanding source of income but also one that offers a natural competitive advantage to the regions in which it is grown (ICCO, 2006).

In table 7 the result shows that labour used for weeding is significantly related to revenue generated from cocoa ($r=0.305$, $p<0.05$). This implies that cost of labour used by the respondents affect their revenue from cocoa.

TABLE 7: Relationship between cost of labour used for weeding and revenue generated from cocoa farms in the study area

Cocoa revenue	r	P	R^2	Decision
Cost of labour used for weeding	0.305	0.018	0.59	S

Source: Field survey, 2009

CONCLUSION

The farmers had between 1 and 5Acres of cocoa farms which indicates that they are smallholder farmers but their farms are still very productive and would need more protective measures against pest and diseases. Most of the farmers practice irregular spacing which indicates that the farmers in the study area need to be trained on recommended spacing for cocoa.

They mostly used trees especially kola as their intercrops and improved cocoa varieties which could prevent out break of diseases as they are resistant to insect pest and diseases and also give them high yield and increase their income. They used banned pesticides which could affect the crops, the users and the environment. The farmers earn low revenue which could be because they own small farms and spend more on labour.

RECOMMENDATIONS

Farmers in the study area need to be encouraged to increase their farm land and training of the farmers is recommended to enhance good agricultural practices like spacing and use of recommended pesticides. This will improve their cropping pattern, increase their yield and income.

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