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Sustainable Cocoa Production In Southern Cameroon: Potential and Constraints Of Integrated Pest Management (IPM)

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Introduction

Cocoa is a perennial tree crop and is characterised by production (71.8%) being produced almost exclusively by developing nations in the tropics (ICCO, 2007) contributing to the economic growth and development of these countries. In Cameroon, Cocoa (*Theobroma cacao* Linn.) is a major perennial cash crops predominantly cultivated by smallholders in the humid forest zone. It is estimated that over 400,000 smallholder are producing cocoa (Losch et al., 1990) in Cameroon. It is an important source of farmer's income in these regions. Compared to other agricultural activities, cocoa has been a leading sub-sector in the economic growth and development of Cameroon. But of recent the system is under tread.

In Cameroon, pest and disease account to about 80% of yield loss in cocoa farms (Bakala and Kone, 1998) resulting to stagnant/decreasing yield, reduced income, poverty/food insecurity, deforestation and loss of biodiversity. Therefore, the success of the cocoa industry is thus very vital to the country's overall social and economic development.

The advantage of an Integrated Pest Management system (IPM) for cocoa, as with other crops is not only the reduction in the use of chemicals but can offer an economic incentive to growers by the increase in quality that can be achieved (Gockowski and Sonwa, 2008; Wandji et al, 2006). IPM focuses on long-term prevention of pests and their damage. It does not exclude the use of pesticides, but predicates that all other means must be explored and pesticide use should be considered as a last resort. The success of IPM under such conditions is often measured in financial terms, such as savings on pesticides (FAO 1993) and subsequent reductions in costs to the environment and other externalities.

Base on the above factors, the study intended to analyse the potentials and constraints to sustainable cocoa production in Southern Cameroon through the use of Integrated Pest Management (IPM) techniques. Specifically, the study probe into the following:

- Identify current Integrated Pest and Management practices by smallholders.
- Assess the factors that favour the adoption of the Integrated Pest Management (IPM) techniques.

Methodology

The information collected for this study was from the leaders of the smallholder household. In general in a single household in the study area, there is usually one leader that takes decision concerning farm activities. Agricultural household is the most common unit of production and consumption. Smallholder household membership varies from one family to another. Engberg (1988) defined household in terms of the domestic group, which has specific function of production, consumption and social, ceremonial man political interaction. Household are dynamic systems, able to act as change agents, to develop, allocate and manage resource in order to reach desired ends.

Ikiliwindi and Konye community of Meme Division in the South West Region of Cameroon, one of the major producing cocoa areas were chosen for the study where both primary and second data were collected. To attain the objectives of this study, semi structure interview was conducted to 20 smallholders using a guided questionnaire, focus group discussion with some members of common initiative groups and cooperative, direct field observation and lastly key informant interviews conducted with some stakeholders (actors) in the cocoa sector using the Participatory Rural Appraisal method and tools. The 20 smallholders that the questionnaire was administered are graduated of the farmer field school (FFS) conducted by International Institute of Tropical Agriculture (IITA) under the Sustainable Tree Crop Program (STCP). The primary data were collected from mid May to June 2008. The data collected were qualitative. Descriptive (frequency and percentage) analysis was carried out and the information's were presented in tables below.

Results and discussion

The current Integrated Pest Management Practice (IPM)

Pests and Disease are the most limiting factors to sustainable cocoa production in Southern Cameroon (Sonwa et al., 2005). Chemicals like pesticides are one of the main inputs used by smallholders in the treatment of pests and diseases (Gockowski and Dury, 1999). These pesticides are usually toxic that can harm human health and the environment or if not used significant share of their crops yield are lost (Lagnaoui et al, 2004). Pesticides are powerful tools for controlling pests. However, pesticides need to be used carefully and judiciously, especially when used in sensitive areas where human beings and living organisms are present.

The IPM was proposed to the smallholders as an alternative to curb the dilemma caused by pests and diseases. Since IPM is a complex pest control process thus special measures were taken in the introduction to the smallholders. The IPM practice was introduced through the farmer field school (FFS) conducted in the area from 2006 and 2007 by SCTP. IPM is a pest control strategy that uses a variety of complementary strategies including: mechanical devices, physical devices, genetic, biological, cultural management, and chemical management. It should be remark that IPM is an ecological approach with a main goal of significantly reducing or eliminating the use of pesticides while at the same time managing pest populations at an acceptable level. Therefore, development cost effective and environmentally sustainable integrated pest and disease management is thus a possible strategy towards promoting cocoa agro forest and achieving higher yield (Mangan and Mangan, 1998; Wandji et al, 2006).

From field data collection, it was identified that the current IPM practice introduced by IITA/STCP were as follows; shade management, clearing/weed control, pruning technique, period of harvesting, sanitation care of the cocoa tree, spraying, drying techniques, marketing and providing resistance varieties. The smallholders ranked these listed practices into classes (first, second & third) in order of importance according to time of labour and capital requirement. The first class was the most important follows by the second and third respectively. From the table 1, pruning, spraying and clearing were listed as the most activities that required or take more time of labour and capital investment from the smallholders with 50%, 25% and 15% respectively.

	Freq.	%
Pruning	10	50
Spraying	05	25
Clearing	03	15
Respond	18	90
Non respond	02	10
Total	20	100

	Freq	%
Clearing	12	60
Pruning	04	20
Harvesting	01	05
Replacement of death cocoa tree	01	05
Respond	18	90
Non respond	02	10
Total	20	100

	Freq	%
Harvesting	10	50
Spraying	06	30
Shade Management	01	10
Clearing	01	10
Respond	18	90
Non respond	02	10
Total	20	100

Source: Survey data Freq= Frequency. % = Percentage

The motivations of smallholders to engage in IPM revealed that 55% of farmers believed that production is good and yield encouraging, 25% said in future they are sure labour will be reduce and while 20% said less chemical application is required in IPM process resulting to reduce cost.

Factors Favouring the Adoption of IPM

a) Traditional knowledge of smallholders in cocoa production:

New innovations need some level of capacity from the people or community before they can be effectively adopted. Cocoa production in Cameroon has a long history from when it was introduced by the colonised masters. This area (region) is one of the entering points of cocoa in the country and the new generation of the cocoa field owners or smallholders’ leader inherited good indigenous knowledge of the cocoa production system from their parents. It should be noted that smallholders depend greatly on their past experience in cocoa production. From the study area, it can be seen that majority of the smallholder leaders interviewed had only primary education (70%), 4% secondary and 1% high school respectively (table 2). Generally in Cameroon, education level amongst farmers (rural) communities are usually low. Even with this low educational level, production rate in this region is the best in the country and account significantly to the total production of cocoa ranking Cameroon amongst the first nine cocoa producing countries in the world accounting to about 90% of the total world cocoa production (ICCO, 2007). Therefore, it could be generalised that indigenous knowledge of the smallholders plays a very important role in cocoa production.

Table 2: Level of Education of Smallholders

Level of education	Frequency	Percentage (%)
Primary school	15	70
Secondary school	4	25
High school/University	1	05
Total	20	100

Source: Survey data

* *Primary education is the first elementary education received by a person after birth in Cameroon.*

b) Favourable Climatic and Geographical Conditions:

Southern Cameroon is located at the foot of Mount Cameroon and the highest rain fall region in Africa with its dense humid tropical equatorial forest cover with a very short dry seasons and annual precipitation that ranges between 1350mm to 5000mm suitable for cocoa cultivation. Thus the studied area has a very good soil and vegetation for cocoa cultivation. Without these factors (good climate and geographical situation), the practices of Integrated Pest Management could not have been possible.

c) Current encourage price of cocoa in the world market

In general, price of a product is one of the main incentives to most producers. Higher price in the world market will stimulate smallholders to adapt to new production techniques in order to increase their yield, improve quality and to derive the extra benefits. Of recent, world market price of cocoa is encouraging and the consequence is that more forest over is being cut for the creation of new cocoa field by smallholders.

d) Marketing structure of cocoa in the study area

Good marketing system plays an important role in production because smallholders are assured that their products will be sold and they will maximise profits. The numerous license buying agents and cooperatives (85%) in the study area stimulate smallholders to search for better ways to produce more taken advantage of the marketing situation. It was observed that 55% of the smallholders interviewed prefer to sell the cocoa to licensed buying agents (LBA) while 30% to organised cooperative society in their community. The smallholders preferred the LBA because

they provide them with necessary assistant like cash, chemicals and building materials in times of real need.

6. Conclusion and Recommendations

At present the cocoa sector is under danger. Therefore, since cocoa production is the principal export cash crop of smallholders in these regions, its protection and promotion will offer significant opportunities for poverty alleviation and sustainable development

However Integrated Pest Management is considered a new technology in most developing countries like Cameroon and Sub Sahara at large. Since IPM rely greatly on the cultural and agronomic aspect, smallholders should be very careful in carrying out these operations.

The design of the same IPM techniques by donor organisations in the whole of Southern Cameroon will not be an appropriate method because there will exist some over lapses. A site related approach will be the most appropriate way of designing better IPM techniques that will be appropriate and adaptable to the particular local environment in Cameroon.

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