CCP:BA/TF 09/CRS 10

December 2009

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منظمة الأغذية والزراعة للأمم المتحدة | 联合国粮食及农业组织 | Food and Agriculture Organization of the United Nations | Organisation des Nations Unies pour l'alimentation et l'agriculture | Продовольственная и сельскохозяйственная организация Объединенных Наций | Organización de las Naciones Unidas para la Agricultura y la Alimentación

COMMITTEE ON COMMODITY PROBLEMS

JOINT MEETING OF THE FOURTH SESSION OF THE SUB-GROUP ON BANANAS AND THE FIFTH SESSION OF THE SUB-GROUP ON TROPICAL FRUITS

Rome, 9 – 11 December 2009

PROJECT PROPOSAL FOR SUBMISSION TO THE COMMON FUND FOR COMMODITIES: INNOVATING PLAINTAIN PRODUCTION AND MARKETING FOR THE OFF-SEASON HIGH PRICE NICHE: AN ENTRY POINT TO IMPROVING PLANTAIN YIELDS AND PROFITABILITY FOR SMALLHOLDERS IN WEST AFRICA

1. Title of Project: Innovating plantain production and marketing for the off-season high price niche: – an entry point to improving plantain yields and profitability for small holders in West Africa

2. Potential Project Executing Agency:

Bioversity International (formerly the International Network for the Improvement of Banana and Plantain (INIBAP))

3. Working group:

1. Côte d'Ivoire:

Mrs YAO N'DRIN Thérèse, Agronomist
Mr GNONHOURI Goly Philippe, Nematologist
Dr KOBENAN Kouman, Plant Pathologist
Dr TRAORE SIAKA, Plant Pathologist
Dr ADIKO Amoncho, Nematologist
Dr KOFFI Camille, Agro-Economist
Centre National de Recherche Agronomique (CNRA)
01 BP 1740
Abidjan 01

2. Ghana:

Mr B.M. Dzomeku
Mr S.K. Darkey
Dr G.K.S. Aflakpui
Crops Research Institute
PO Box 3785
Kumasi, Ashanti

Dr D. K Afun
Kwame Nkrumah University of Science and Technology
Kumasi

3. Nigeria:

Dr. Sunday O. S. Akinyemi
Mr. S. A. Amosu
Mrs. I. B. Adeoye
National Horticultural Research Institute (NIHORT)
P.M.B. 5432, Idi-Ishin
Jericho Quarters, Ibadan

Prof. I.O.O. Aiyelaagbe
University of Agriculture (UNAAB)
Abeokuta

5. Collaborating Regional and International Institutions:

International Institute of Tropical Agriculture (IITA)
Ibadan, Nigeria

CARBAP

Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD)
Montpellier, France

6. International Collaborating Scientists:

Dr. Luis Pocasangre, Charles Staver - Bioversity

Dr Stefan Hauser, Dr. Irie Vi Broh, Dr. Lava Kumar IITA

Thierry Lescot, CIRAD

Dr Omar Diouf, CARBAP

7. Farmer Associations:

7.1 Côte d'Ivoire: there is no plantain farmer association per se. So, we are working with some leaders in plantain production

M. ENOH FOBAH
Aboisso
Phone 09 06 25 57

M AMERY MONNET
Agboville
Phone 05 61 71 45

7.2 Ghana:

Ghana National Association of Farmers & Fishermen
c/o Ministry of Food and Agriculture; PO Box M37
Accra, Ghana
Telephone: +233-(0)21-664408
Fax: +233-(0)21-682429
Email: info@gnaff.org
Website: http://www.gnaff.org

7.3 Nigeria:

All Farmers Association of Nigeria (AFAN)
C/o Oyo State Chapter
Opposite Bola Ige International Market
1st Gate, Gbagi
Ibadan, Oyo – State, Nigeria
Chairman's Tel. No. +234 803 726 8810.

Plantain – an important food and cash crop, but losing ground

Plantains are a major food crop in Africa where more than 10 million tons are produced (about 30% of the world's production). This production comes from 4 million households with limited resources. Six countries with a total population over 270 million people produce over 85% of the plantain in Sub Saharan Africa and over 90% of the plantain produced in West and Central Africa.

Plantain production in West and Central Africa (Lescot 2008)

Country	Plantain production 2007 tons	Plantain households	Population (millions)	% urban population	% Human poverty index
Cameroon	1 200 000	500 000	18	51	31
Cote d'Ivoire	1 300 000	540 000	18	45	40
Ghana	2 165 000	900 000	23	45	32
Nigeria	2 357 000	1 000 000	135	47	37
DR Congo	1 000 000	400 000	66	32	39
Guinea Conakry	400 000	160 000	10	35	52
Total (6 countries)	8 422 000	3 500 000	270	38	
Total West/Central Africa	9 003 000	3 750 000	383	37	
Total SS Africa	10 278 000	4 180 000	729	20	

In the past fifteen years, yields have increased slightly at best, while the area under production have increased, remained the same or have even declined in some countries such as DR Congo due to civil disturbances. At the same time total human population has increased and urban population has increased due to rural/urban migration. As a result, per capita plantain consumption has declined in urban areas where it has become, in some cases, a luxury product. Plantain is less commonly a food staple and has become a food for special occasions.

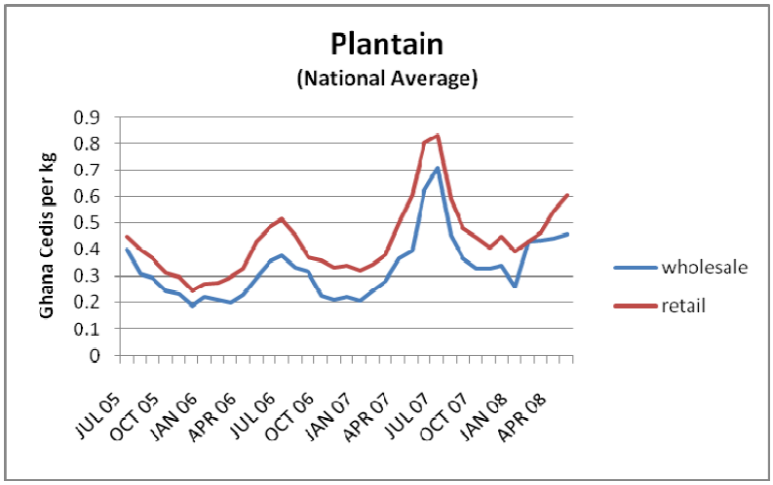
At the farm level the stagnation of yields and production has several causes. First, new pests and diseases have reached the region. Black leaf streak disease reached Sub Saharan Africa in 1978 and in the following decade rapidly spread across the continent with yield losses of 20-30% (Mobambo et al 1993). Banana bunchy top virus was first reported in the 1950s in Gabon, but in recent years has become devastating. A survey of five villages where BBTD had recently spread in lower Congo basin in the Democratic Republic of Congo showed that production declined from 75 to 100% due to BBTV (Vangu unpublished data 2007). BBTD was recently reported in Cameroon and can be expected to continue to spread into West Africa. Second, the increasing land pressure and smaller farm size have resulted in shorter bush fallow duration, a build up of weevils and nematodes and a decline in the quality of planting material. Yields after forest fallow can be 6-14 tons, while after bush fallow they are barely 2-6 tons. After forest fallow plantain also yields more harvests before field abandonment.

In spite of the increasing pest and disease presence and declining fallow periods, the technology of plantain growing in Sub Saharan Africa has changed relatively little in recent decades. Studies in Ghana, Cameroon and DR Congo indicate that the use of chemical fertilizers on plantains is extremely low. Other innovative techniques for maintaining land productivity such as organic

amendments, leguminous shrubs and systematic rotations are limited. Clean planting material is cited frequently as one of the primary constraints to increased production (MUSACO meeting 2006) and irrigation for the production of plantains is virtually unknown. Production is often scarce in certain seasons of the year when prices per finger or bunch are double or triple the price in the season of glut when growers receive quite low prices or may have no market.

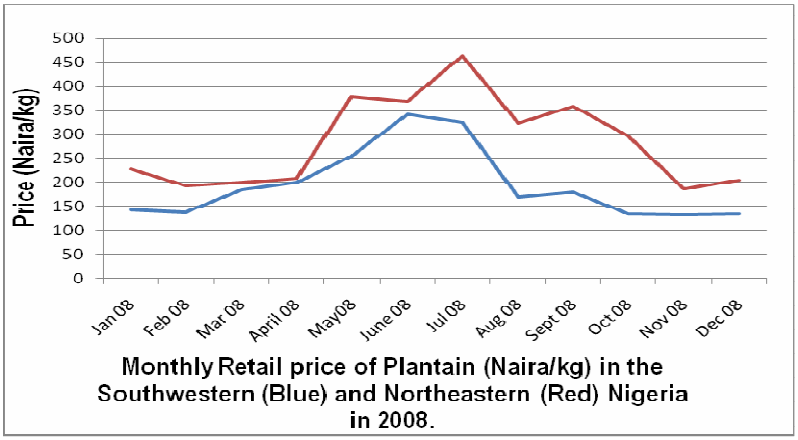
In the case of Ghana, plantain supplies increase sharply in October and November which corresponds to the low price period of the year (see below). During the high price period when plantain supplies are low prices are double or triple the price in the low price period. In a survey of plantain growers in two districts of Ghana, Eastern, Brong-Ahafo and the Ashanti regions, 73% of the growers had knowledge about when low and high prices occurred but could do little to take advantage of such periods to maximize profits (Dankyi et al., 2007).

Seasonal price fluctuation for plantain in Ghana (Lopatka et al 2008)



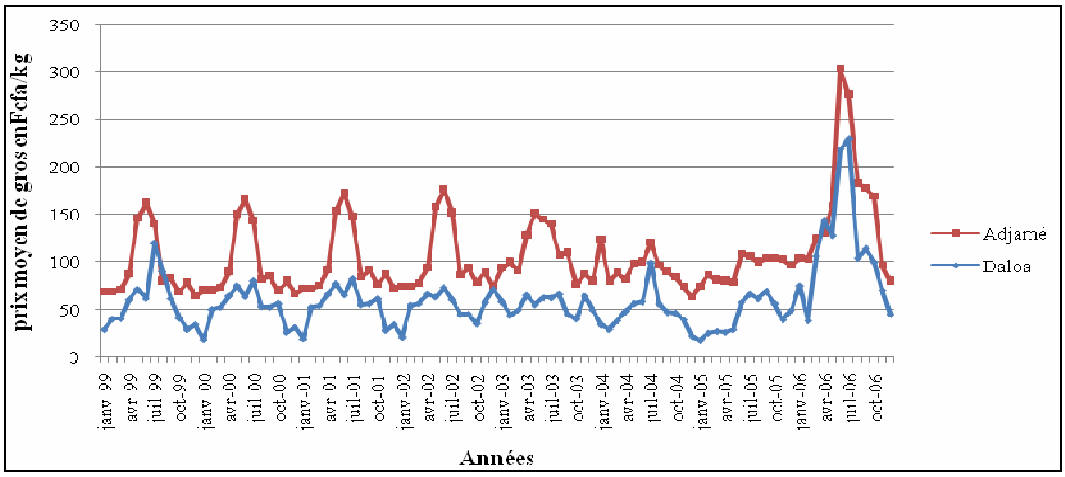
During the past 20 years in Nigeria land area under plantain has increased, but yields have been relatively stable. In spite of the increased supply, the seasonal price fluctuation has continued. As seen below, the price during the period of plantain scarcity is more than double the price during the period of glut.

Seasonal price fluctuations for plantain in Nigeria (NIHORT 2008)



In Ivory Coast, plantain prices have been relatively stable for the period 1999 – 2005, although prices increased dramatically in 2006, the last year reported. However, within the year the fluctuation is as much as 100%. The high prices each year occur between May and August with low prices in January. The high price period represents an opportunity for innovative production techniques which may not be profitable for production in other periods of the year.

Plantain prices in francs/kg during the period 1999 to 2006 – Ivory Coast (Yao, Koffi and Coulibaly)



Research efforts by both national and international research institutions have successfully focused on the development of new plantain cultivars. These improved cultivars have been proven to resist leaf diseases and have shown a yield potential of two to five times more than the landraces. New technologies for the multiplication of clean planting materials have also been developed, including macro or in vivo propagation and the preparation of highly uniform micro-corms. However, the use of disease-resistant cultivars and clean planting material, even in combination, does not alter the seasonal distribution of production and may even contribute to lower prices during the period of glut. Farmers have in general shown little interest in new technologies which increase production in periods of low prices.

Off-season Niche plantains – Innovating plantain production and marketing

The banana and plantain sectors of countries in Latin America and Asia have also been affected by increasing land use intensity and by the spread of black leaf streak and other pests and diseases which have debilitated yields. In recent decades small and medium sized growers in these countries have been able to harness such technologies as irrigation, fertilizers, uniform disease-free planting material, and locally selected and introduced cultivars to increase yields and profitability. These changes in technology have been accompanied by shorter marketing chains which have provided an increasingly reasonably priced product to urban markets throughout the year. At the same time the potential for more reliable supplies year round has stimulated a growing number of export processing industries.

A strategy to target specific technologies to groups of growers depending on market opportunities and access, input availability and natural resource endowment has been proposed by Cote et al (2008). They propose that intensification can most easily occur where markets and inputs can be easily accessed based on good road infrastructure, soils are highly productive and water for irrigation is relatively low cost. An important additional advantage is a substantial seasonal price fluctuation which can be captured through the use of specific technologies.

The technological and marketing changes in plantain in Dominican Republic illustrate a potential model for targeted intensification. The first major change in plantain production occurred in the southern area of Azua where growers began to use of high densities, uniform microcorm planting material and irrigation to produce high quality horn type plantains for export. With the arrival of black sigatoka FHIA 21 was introduced. A large processing contractor promoted the first plantings of FHIA 21 using high density annual planting, irrigation and highly uniform planting material based on microcorms. FHIA 21 quickly found its way into supermarkets at a lower price, especially since plantain is consumed primarily unripe in Dominican Republic. The high density technology has continued to spread both for processing and fresh markets with FHIA 21 playing a big role. The country is in the midst of a big change in production technology for higher price off-season markets which will smooth out the supply of plantains for the market. The uniform planting materials in combination with irrigation permit high density planting targeting high price season. When the two to three month harvest is completed, the plantation is uprooted and replanted to again target the high price season. These new technologies are becoming more generalized and may even contribute to lower plantain prices throughout the year as the technologies are applied by more and more growers. Innovative growers are now looking for additional niche markets for other types of plantains which are used in preferred dishes which cannot be made with FHIA 21.

The three largest plantain growing countries in Sub-Saharan Africa, Ghana, Cote d'Ivoire and Nigeria propose to work with small and medium-sized growers' associations to pilot production of plantains for off-season national niche markets. This proposed project will benefit innovative growers targeting the high price niche as well as urban consumers of plantains, but will also revitalize plantain production and marketing technologies in West Africa. In addition, a more dynamic public-private plantain sector will contribute to overall sector profitability and ensure a greater level of preparedness for such threats as BBTD which is spreading from Central into West Africa.

Long term goal to which the project contributes: the plantain/banana sector in West Africa contributes more fully and with greater effectiveness to changing national needs and opportunities for food security, poverty alleviation, resource conservation, income generation, and enterprise development.

Project objective to be reached by the end of four years: Growers' organizations, service providers and research organizations, in Ghana, Nigeria and Cote D' Ivoire are piloting expanded production and marketing of plantains for off-season markets for an ever expanding group of client growers and markets.

Output 1. Private-public alliance (grower associations, production service providers and traders with backstopping from research and development organizations) strengthened to guide the development of strategies, plans and services for production and marketing of plantain for the season of high prices:

Activities:

1.1 Carry out regional planning workshop, two follow-up workshops and a final evaluation workshop with three lead country organizations and invited international partners (IITA, Bioversity, CIRAD, CARBAP, CORAF);

1.2 Organize initial planning workshops and follow-up workshops at national level and in pilot zone;

1.3 Compile methods for diagnostic studies and complete training for study execution;

1.4 Identify most favored zones for off-season production based on access to water for irrigation, deep loam soils, good road infrastructure, short travel distance to major urban markets and active growers' organizations;

1.5 Inventory private and public sector production services for irrigation, clean planting material, organic amendments and chemical fertilizers;

1.6 Study mission to Latin America (production zones with 3-6 month dry seasons similar to West Africa) to observe grower production techniques, available services and marketing strategies;

1.7 Formal and participatory market study of alternative channels for marketing increasing volumes and a greater diversity of plantains during the high price season;

1.8 Self-diagnostic by growers' associations of governance and capacity for entrepreneurial undertakings;

1.9 Develop production and marketing plan targeting high price season;

1.10 Test market production from 245 hectares in each country of high density annual plantain production;

1.11 Prepare diagnostics and plans by two additional growers' associations in each country based on experiences of initial growers' groups;

Output 2. Private and public technical assistance and service providers strengthened on the effectiveness of technologies for irrigation, plant nutrition and multiplication of clean, uniform planting material from superior plants:

Activities:

2.1 Inventory existing research and grower experience with high density annual plantain production;

2.2 Technical assistance mission from Latin America;

2.3 Multiply superior and elite plants of local plantain and introduced cultivars through tissue culture and macro-propagation techniques;

2.4 Test alternative irrigation and plant nutrition packages;

2.5 Introduce, multiply and evaluate new plantain cultivars;

2.6 Monitor on-farm performance of production technologies;

2.7 Train technical assistance and service providers;

Output 3. Annual high density plantain production with low pressure, low cost irrigation and integrated nutrient management for high price season piloted by growers in three countries:

Activities:

3.1 Compile methods for grower training and train field technicians;

3.2 Organize a grower learning and experimentation groups in each country with 20 growers each, two field technicians, private sector service providers and scientists;

3.3 Develop production and investment plans with 20 growers in each country for one hectares of high density annual plantain production based on soil and water diagnostic;

3.4 Organize six field meetings by grower learning and experimentation group in each country to monitor status of plantain plots, to analyze differences and to identify good production practices;

3.5 Establish and harvest 60 hectares of high density annual plantain production by 60 growers;

3.6 Technical assistance mission from Latin America to analyze performance of plantain in growers' fields;

3.7 Organize two additional grower learning and experimentation groups in each country with 20 growers each (120 growers total), two field technicians, private sector service providers and scientists (second cycle with original growers);

3.8 Develop production and investment plans with 40 growers in each country for one hectares of high density annual plantain production based on soil and water diagnostic (second cycle with original group);

3.9 Organize six field meetings by grower learning and experimentation group in each country to monitor status of plantain plots, to analyze differences and to identify good production practices;

3.10 Establish and harvest 180 hectares of high density annual plantain production by 180 growers;

3.11 Diagnose and plan opportunities for high density annual planting of plantain by two additional grower learning and experimentation groups in each country based on other sources of funding;

3.12 Sell high quality planting material from HDAP to other growers.

Output 4. Strategies for scaling up and out the improved production of plantain for high price season planned, monitored, evaluated and disseminated by alliance of scientists, service providers, traders and growers' associations:

Activities:

4.1 Organize meetings with national and local officials to present research and development strategy, progress and evaluation of results;

4.2 Document key activities by grower associations and growers through videos, fotos, case studies, reports and theses;

4.3 Exchange visits grower to grower and grower organization to grower organization to share experiences and identify key practices.

TENTATIVE TIME LINE

	Year 1				Year 2				Year 3				Year 4			
Output 1: public-private alliance to guide sector and technology development																
Organize regional workshops																
Organize national and pilot zone workshops																
Compile methods for diagnostic studies & training																
Identify potential zones for off-season production																
Carry out production services inventory																
Study mission to LA																
Conduct formal & participatory market study																
Auto-diagnostic & selection of grower organizations																
Develop production & marketing plan for high price season																
Market plantain from HDAP (245 ha/country)																
Identify & plan for additional growers associations																
Evaluate results / draft follow-up plans																
Output 2: technical assistance and service providers equipped to work with growers on innovative production and marketing approaches																
Review research and grower experience in HDAP																
Technical assistance mission from L. America;																
Multiply selected cultivars																
Test irrigation and plant nutrition packages																
Introduce, multiply & evaluate new cultivars																
Monitor performance production technologies																
Train technical assistance and service providers																
Output 3: 300 hectares/150 growers with high density, annual production for off season national niche markets																
Compile methods and train field technicians																
Organize grower learning / exp. group per country																
Develop production & investment plans for HDAP																
Hold 6 grower crop stage meetings with each group																
Establish and harvest 60 ha HDAP																

Output 3: 300 hectares/150 growers with high density, annual production for off season national niche markets (cont'd)																	
	Technical assistance mission from LA																
	Organize two grower learning groups per country																
	Develop production & investment plans for HDAP																
	Hold 6 grower crop stage meetings with each group																
	Establish and harvest 180 ha HDAP																
	Diagnose & plan for two additional groups/country																
	Sell high quality planting material																
Output 4: coordination and monitoring for scaling up and out																	
	Document and make available lessons and approaches																
	Hold exchange visits																
	Hold strategy, progress and evaluation meetings with national and local officials																

(amounts in '000 U.S. Dollars)

Summary table: cost per output by CFC and Partner counterpart contribution

	CFC	Counterpart	Total
Output 1	378	181	559
Output 2	337	158	495
Output 3	816	392	1209
Output 4:	218	68	286
Project management	410	45	455
Total	2,160	844	3,004

Summary table: Detailed List of Inputs proposed for financing by CFC by Category of Expenditure (CFC) ('000 USD)

Summary table: Detailed List of Inputs proposed for financing by CFC by Category of Expenditure (CFC) ('000 USD)

Cat. Code	Category name	Sub-cat. Name	Total Cost
1	vehicles, machinery, equipment	Vehicles	99
		Computers	17
		Post harvest equipment	27
		Irrigation equipment	270
3	materials, supplies	Temporary field nurseries	90
		Multiplication of planting material	18
		Evaluation of irrigation and nutrition	30
		New cultivar testing	24
4	personnel national	Salary complement counterparts	102
		Communications specialist	72
5	technical assistance	Irrigation specialist	30
		Multiplication methods	30
		Participatory methods	20
		Regional coordinator	90
		Planning/monitoring/coordination	90
6	duty travel	CFC annual meeting	12
		Field review	12
		Admin supervision	12
		Travel among country partners by regional coordinator	60
		Travel study mission Latin America	30
		Exchange travel among growers	60
7	dissemination/training	Decision makers training/meetings	63
		Public private alliance building workshops	150
		Baseline and diagnostic studies	48
		Grower training	36
		Field technician training	45
		Publications and other means for dissemination	75
		Student theses	60
8	operational expenses	Vehicle operations	108
		Office communication	84
		Local admin	120
		Audits	24
		Overhead	152
	Total Budget		2160

BENEFITS AND BENEFICIARIES

Economic Impact:

The initial economic impact is targeted towards a small group of risk-taking growers in each country who will perceive handsome profits for their off-season production. The component technologies – annual replanting, clean and uniform planting material, high densities, irrigation – will be taken on as a package by other growers through the efforts of national and local growers' associations. It is expected that several hundred growers will quickly benefit from the new technologies. Thereafter, growers will make adapt different component technologies depending on their production situation. Smallholders with rain-fed seasonal production will benefit from a greater supply of clean planting material and the diversification of the plantain market. A greater overall supply of plantains throughout the year will also encourage plantain processing which is currently limited by the scarcity of raw material during 3-4 months of the year.

The proposed changes in technology and marketing will contribute to a more dynamic and pro-active plantain sector. This new dynamic will improve the availability and quality of planting material. The emerging group of stakeholders will also be in the front line to demand solutions to threats to the sector such as BBTD. The current growers of plantains (unorganized with limited investment in the crop and limited capacity to mobilize public-private alliances) will continue to play an important role in production, but are highly vulnerable and unprepared for threats such as BBTD.

Social Impact:

Plantains are an important small holder crop grown in association with perennial and annual crops. The targeting of production technology to the period of high prices will alter the current production and marketing stasis generating new opportunities for all growers to incorporate component technologies such as clean planting material and new cultivars. An overall increase of plantain on the market will benefit a larger number of producers, although prices may be lower. However, the new production technologies will contribute to a lowering of costs of production through the reduction in risk and increased productivity. Plantain prices will also decline, first in certain periods of the year, and eventually throughout the year as production technologies change. This will benefit urban consumers of fewer resources for their food budget.

Environmental Impact:

The proposed intensification of plantain production in West Africa will have two environmental impacts. Most countries report that plantain production in recent years has increased based on the increase in land under production. The proposed technologies will be based on smaller areas, but higher production per hectare, thereby altering the pressure for the expansion of agricultural lands. However, the increased production will occur based on the use of increased inputs, including water and nutrients. While no formal studies have been conducted, experience suggests that high density annual plantain production can be managed without large amounts of pesticides. Organic manures can serve as an excellent source of soil nutrients and the use of clean planting material minimize the problems of pests and diseases such as nematodes, weevils and black leaf streak.

REFERENCES

Dankyi, A., Banful, , Anno-Nyako, F., Dzomeku, B. Asafu-Agyei, J., and Haleegoah, J. 2007. Post harvest handling, processing, marketing trends and routes of plantains and bananas. (Final Report).

Lopatka, J., Topel, J., and de Vasconcellos. P. 2008. Food Staples in the Ghana School Feeding Program: Analysis of Markets, Value Chains, and Menus. UC Berkeley – Haas School of Business. International Business Development Program.

Côte, F., Tomekpe, K., Staver C., Depigny, S., Lescot, T., and Markham, R. 2008. Agroecological intensification in banana and plantain: an approach to developing more sustainable cropping systems for both smallholder farmers and large-scale commercial producers. International Society of Horticultural Science Banana and plantain in Africa: Harnessing international partnerships to increase research impact. Mombasa, Kenya. 5-9 October 2008.

Lescot, T. (2008): Banana – Estimated world production in 2006. Fruitrop 155:29-33.

Mobambo, K.N., Gauhl, F., Vuylsteke, D., Ortiz, R., Pasberg-Gauhl, C. and Swennen, R. 1993. Yield loss in plantain from black sigatoka leaf spot and field performance of resistant hybrids. *Field Crop Research*, 35, 35-42.

NIHORT. 2008. Market price survey of some horticultural crops in Nigeria. Unit Report. 15pp.

Yao, K., Koffi, C., et Coulibaly, A. Sous projet 4 : Aspects socio-économiques de la de la filière banane plantain en Côte d'Ivoire. CNRA.