



CROP CRISIS CONTROL PROJECT (C3P) BXW TRAINING WORKSHOP REPORT

2- 6TH OCTOBER 2006

Grand Imperial Hotel Kampala, Uganda



Participants of Crop Crisis Control Project (C3P) BXW regional training workshop

Eldad Karamura (INIBAP), Turyagyenda Laban Frank (INIBAP) and Francis Maina-Mwangi (IITA)



ACRONYMS

ASARECA	Association for Strengthening Research in East and Central Africa
BARNESA	Banana Research Network for East and Southern Africa
BXW	Banana <i>Xanthomonas</i> wilt
C3P	Crop Crisis Control Project
CBO	Community Based Organization
CIALCA	Consortium for Improving Agriculture-based Livelihoods in Central Africa
CRS	Catholic Relief Services
DFID	Department for International Development, UK
FFS	Farmer Field Schools
FAO	Food and Agriculture Organization of the United Nations, Italy
Foc	<i>Fusarium oxysporum cubense</i>
IITA	International Institute of Tropical Agriculture, Nigeria
INIBAP	International Network for Improvement of Banana and Plantain, France
IPGRI	International Plant Genetic Resources Institute, Rome
IPM	Integrated Pest Management
IPDM	Integrated Pest and Disease Management
KARI	Kawanda Agricultural Research Institute, Uganda
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries, Uganda
NAADS	National Agricultural Advisory Services, Uganda
NARIs	National Agricultural Research Institutes
NARO	National Agricultural Research Organization, Uganda
NARS	National Agricultural Research Systems
NGOs	Non-Governmental Organizations
PDC	Participatory Development Communication
PME	Participatory Monitoring and Evaluation
PM&L	Participatory Monitoring and Learning
ToT	Training of Trainers

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY	- 1 -
2.0 WORKSHOP INTRODUCTION	- 6 -
2.1 Background.....	- 6 -
2.2 Objectives of the capacity building activities of C3P.....	- 7 -
2.3 Workshop objectives	- 7 -
2.4 Workshop programme	- 8 -
3.0 WORKSHOP PRESENTATIONS AND RESPONSES	- 9 -
3.1 Opening ceremony	- 9 -
3.2 DAY ONE (2 nd October 2006).....	- 10 -
Consolidation of knowledge and skills.....	- 10 -
Overview of banana pests and their management	- 11 -
Overview of banana diseases.....	- 12 -
BXW diagnostics, symptoms and spread	- 12 -
BXW management and control	- 13 -
BXW Surveillance.....	- 14 -
Policy and trans-boundary issues	- 15 -
3.3 DAY TWO (3 rd October 2006)	- 16 -
Participatory Development Communication	- 16 -
Participatory monitoring and learning (PM&L).....	- 17 -
Field visit to Mukono	- 18 -
3.4 DAY THREE (4 th October 2006).....	- 19 -
Participatory M-E on Capacity Building Activities	- 19 -
3.5 DAY FOUR (5 th October 2006).....	- 20 -
Mbarara Field Trip	- 20 -
3.6 DAY FIVE (6 th October 2006).....	- 22 -
Review of Mbarara Field Trip.....	- 23 -
Communication Tools' Development	- 23 -
National Work Plans for Capacity Building.....	- 24 -
Closing Remarks	- 25 -
4.0 REFERENCES.....	- 26 -
Annex 1. List of Participants, trainers and secretariat.....	- 27 -
Annex 2: Workshop Programme.....	- 29 -
Annex 3: Tentative Tier 2&3 capacity building schedule.....	- 32 -

1.0 Executive Summary

Banana *Xanthomonas* wilt (BXW) is a new devastating disease that is threatening food security and incomes of banana growing communities in East and Central Africa. The disease, long-known to affect Enset in Ethiopia, was first reported in Uganda in 2001. It has now spread to the D.R. Congo, Tanzania, Rwanda, and Kenya and recently Burundi. In Uganda, the disease incidence reached 70-80% within the space of the first year of its first detection. Yield losses up to 100% were recorded mainly for juice banana (Kayinja = Pisang Awak). It has been estimated that, by 2010, accumulated losses of up to US\$ 4 billion could be incurred by the banana industry for Uganda alone, if no action is taken to rectify the situation (INIBAP, 2006). The Banana Research Network for Eastern and Southern Africa (BARNESA) has declared the disease priority constraint number 1 and has urged for and facilitated the development of a regional strategy to manage/control the disease. The strategy envisages the empowerment of key stakeholders with skills and knowledge needed to control the disease in a coherent and coordinated regional effort. Low-cost BXW management technologies have been developed by research institutions but transferring them to affected and threatened farmers has faced limitations, including insufficient resources, inadequate surveillance, and incorrect application of management tools and the lack of coordination within and between countries.

The Crop Crisis Control Project, led by CRS and IITA and funded by USAID, contributes in a timely manner to the regional effort, with an overall objective of empowering country stakeholders to institutionalize coordinated agricultural disaster response mechanisms and to strengthen farmers' capacity to employ effective measures to control BXW. The C3 Project is an 18-month initiative to intensify, and provide coordination to the fight against Banana *Xanthomonas* Wilt (BXW) in six countries of East and Central Africa i.e. Burundi, Democratic Republic of Congo (DRC), Kenya, Rwanda, Tanzania and Uganda. The aim is to generate and disseminate robust diagnostic tools that will facilitate recognition, management and control of Banana *Xanthomonas* Wilt (BXW).

This report outlines the main issues of discussion and the outcomes of a 5-day regional Training of Trainers' (TOTs) workshop on BXW and provides an account of:

- a) Workshop objectives and activities
- b) Workshop proceedings
- c) The outputs delivered
- d) The follow-up actions required following the workshop.

The workshop which was held in Kampala, Uganda, at the Grand Imperial Hotel from 2 to 6 October 2006, was executed by a multi-disciplinary team of experts from NARO-Uganda, IITA, and led by IPGRI-INIBAP. It was designed to translate the goals and objectives of the C3P BXW part of the project into regional and country-specific work-plans.

Thirty (30) participants (Annex 1) attended the workshop. They were selected from the six countries (5 participants per country), on the basis of their suitability to facilitate the process of learning about BXW diagnostic tools, its management and control and to develop in-country work plans for the implementation of BXW control activities upon return to their own countries.

The overall objective of workshop was to strengthen capacity in East and Central Africa to sustainably manage Banana *Xanthomonas* wilt outbreaks taking into account the needs of various players along the production-consumption chain, including farmers and farmer organizations, traders, NGOs, extension and research teams and policy makers at the local, national and regional levels. The specific objectives were:

- To equip trainers of trainers at Tier 1 (regional level) with skills/knowledge/tools for sustainable management of BXW at the farm level and ensure that such skills and knowledge will be passed on to Tier 2 (country level) ToTs;
- To strengthen the capacity of the country teams to raise the awareness of general public including policy makers in their respective countries, of the threat of BXW and the measures that need to be taken to combat the epidemic;
- To establish an early warning/surveillance system to facilitate timely responses / actions against the BXW epidemic;
- To develop, evaluate, and disseminate information materials to stakeholders;
- To strengthen NARS capacity to introduce and demonstrate clean banana seed production technology at farmer level in respective countries

- To evaluate the effectiveness of the BXW Diagnostic and Management Guide on farm.
- To facilitate the development of the national framework (National Action Plans) by ToTs for the control and management of BXW and other banana pests and diseases

The workshop was officially opened by the Director, Kawanda Agricultural Research Institute, the lead BXW research and management institute within NARO-Uganda. Subsequently oral discussions covered banana diseases, pests and associated diagnosis and management, underlining the importance of collection and use of surveillance data and participatory monitoring and learning (PML) data in raising public awareness and reinforcing the design and execution of management/control strategies against the epidemic.

At the end of the workshop, the following were achieved:

1. 30 people were trained in BXW diagnostics and management skills, through oral presentations, working group discussions, plenary presentations and discussions, field demonstration of disease recognition and management techniques in different farming and agro ecological systems in Uganda. Participants had extensive discussions with farmers, extension staff and community leaders on disease symptoms, the corrective measures being undertaken and the strategies being employed to raise public awareness. A number of agro-ecological systems were used to demonstrate the diversity of disease impacts and associated responses. Thus Mukono district was used to demonstrate the ABB-based banana systems



Farmers demonstrate to participants the role of songs and plays in raising public awareness of the BXW threat, management and control

where the dominant mode of disease transmission is insect vector-mediated. In Mbarara, the intensively managed Matooke-based production systems were used to demonstrate approaches aimed at combating disease transmission by field tools and infected plant materials.

- At the national level, the participants discussed the strengths and weaknesses of the approaches adopted by NARO-Uganda, in the light of the political and resource mobilization situations in their own countries. At the community level farmers demonstrated an assortment of tools and approaches, including songs and plays used to raise public awareness of the BXW threat and to strengthen capacity for disease recognition and management. The strengths and weaknesses of each of these approaches were analyzed in plenary discussions to review the field demonstrations employed by farmers and other stakeholders.
- 2 The capacity of participants to design and use assessment tools was strengthened in order to facilitate: surveillance and early detection of the disease in disease-free but threatened regions; eradication of disease pockets in areas newly infected (demonstrated in Mbarara frontline region of Uganda); and management and coping strategies in endemic regions (demonstrated in Mukono district).
 - 3 Through working groups, participants prepared and made plenary presentations of the national level work plans for strengthening the capacity of the respective countries.
 - 4 Both national and cross-border linkages were strengthened. At the national level, the five participants from each country agreed to constitute themselves into a tentative/provisional national task force that would draft the national action plan and prepare and convene the national stakeholders' workshop to discuss the draft. At the regional level, the participants agreed to increase cross-border exchange of surveillance information to ensure that actions taken on one side of the border are re-enforced by those on the other side. In this regard, tools for collecting surveillance information and establishing a database were presented and discussed. At the end of the workshop, a multi-stakeholder framework, drawing in farmers, NGOs, extension, policy makers, NARIs, universities and regional and international organizations was in place to address the BXW challenge in East and Central Africa.
 - 5 A number of training materials were presented to, and discussed by, the participants. These included reference literature about the disease, posters for disease recognition and management; disease assessment and surveillance

tools both as electronic and hard copies. Participants' comments will be incorporated in the material being prepared for Tier 2 capacity building activities.

- 6 The BXW diagnosis and management competences of the participants were monitored throughout the workshop, on a range of 1 – 10, 1 being the lowest and 10 the highest. On day 1 of the workshop, the competency levels was assessed at 5 - 6 but this had risen to 9 - 10 by the last day of the workshop.

2.0 Workshop Introduction

2.1 Background

Banana Xanthomonas Wilt (BXW), caused by *Xanthomonas campestris* pv *musacearum*, has been known in the region since the 1950s on Enset and later jumped to bananas in Ethiopia where the two crop systems overlap. In 2001, a similar disease was reported in Central Uganda (Tushemereirwe *et al.* 2003) and subsequently similar outbreaks were reported in the Congo, Rwanda, Tanzania and more recently in Kenya (Karamura *et al.* 2006) and Burundi. All the diagnostic analyses have confirmed that the disease is the same through out the region. On the ground, the disease moved at a rate of 70-100 Kilometers a year in the low-lying central regions of Uganda, where whole ABB gardens were wiped out in the space of 6 months. In the neighboring Democratic Republic of Congo, the rate of spread was low for similar banana varieties but the devastation was equally severe as in Uganda. A study of the disease impact on the banana growing communities in Central Uganda estimated that up to \$ 4.0 billion could be lost by Uganda alone, over the next ten years, if nothing is done to control the disease. However the study also revealed that although up to 7% of the farmers in the study sites had abandoned banana cultivation because of BXW, they all said they would return to the crop should a solution be found for the disease epidemic.

At the regional level, the Banana Research Network for Eastern and Southern Africa (BARNESA), with the support of IPGRI-INIBAP and FAO, convened a regional workshop to draw a regional strategy for the control/management of the pandemic in the sub-region. The workshop reaffirmed BARNESA's rating of BXW as the highest priority constraint for the banana industry, threatening both food and income security of the rural communities that cultivate and depend on the crop.

The BARNESA strategy however was not implemented until the development and implementation of the Crop Crisis Control Project (C3 P), due to the lack of resources. The C3 P's overall objective is to facilitate banana stakeholders in the region to institutionalize coordinated agricultural disaster response mechanisms for the control and management of BXW. This would entail developing coordinated country and regional strategies that map out and link BXW infestations with household vulnerability and food security and, the dissemination of proven methods for coordination and

knowledge sharing regarding agricultural disasters, including the strengthening of stakeholder capacity with knowledge and skills to manage the disease epidemic.

In this regard, IPGRI-INIBAP was charged with the responsibility to generate and disseminate robust diagnostic tools that will facilitate recognition, management and control of BXW at the farm level. It was envisaged that the training of trainers (ToT) would be carried out at three levels- the regional level (=Tier 1), the country level (=Tier 2) and the community level (= Tier 3), with IPGRI-INIBAP playing key roles to ensure quality control with respect to the skills and knowledge disseminated.

2.2 Objectives of the capacity building activities of C3P

The overall objective is to strengthen the region's capacity to sustainably manage the outbreak of BXW in East and Central Africa, taking into account the needs of the various actors along the production-consumption chain (here defined to include farmers and farmer organizations, processors and traders, extension and research teams, and policy makers at the local, national and regional levels). The course module is designed to target those regions ahead of the epidemic (not yet affected); the frontline regions and the endemic regions with the knowledge, skills and tools for, respectively, prevention of, management of, and coping with the disease, in the quest to minimize the impact of the disease on the livelihoods of stakeholders in the banana sector. It also provides an opportunity to test and evaluate BXW management tools and guides at the grass-roots level and will be used to prepare the different stakeholder categories participating in the C3 Project to initiate policy dialogue at local, national and regional levels.

2.3 Workshop objectives

- To equip trainers of trainers at Tier 1 (regional level) with skills/knowledge/tools for sustainable management of BXW at the farm level and ensure that such skills and knowledge will be passed on to Tier 2 (country level) ToTs;
- To strengthen the capacity of the country teams to raise the awareness of general public including policy makers in their respective countries, of the threat of BXW and the measures that need to be taken to combat the epidemic;
- To establish an early warning/surveillance system to facilitate in and across country timely responses/actions against the BXW epidemic;
- To develop and evaluate information materials, and disseminate them to stakeholders;

- To strengthen NARS capacity to introduce and demonstrate clean banana seed production technology at farmer level in respective countries
- To evaluate the effectiveness of the BXW Diagnostic and Management Guide on farm.
- To facilitate the development of the national framework (National Action Plans) by ToTs for the control and management of BXW and other banana pests and diseases

2.4 Workshop programme

The workshop programme (Annex 2) was designed to maximize participant interaction among themselves and with farming communities affected by the BXW. Hence the course facilitators focused on stimulating discussions to enable participants to exchange experiences and analyze them in the context of what will work well where and/or when. Working group discussions followed by plenary presentations allowed the intercourse of ideas, leading to specific and general conclusions and recommendations. At the end of



Intensively managed Matooke-based production System in Mbarara

the day the presence and/or absence of learning was monitored by all participants filling in the competences form, which provided a personal assessment of individual's progressive understanding of BXW management concepts and encouraged participants to work hard to achieve their own expectations for the workshop. Given that Tier 1 would be the ultimate managers of the BXW management programme in the their respective countries, emphasis was put on imparting skills for sharing knowledge, assessing the understanding of the disease symptoms and

management options, and feed back and group management,.

About 60% of the workshop agenda was committed to developing practical experiences in various agro-ecological and socioeconomic conditions. Hence field visits were organized to target the two dominant banana systems in East and Central Africa:- the Kayinja (ABB)- and Matooke (green-cooking, AAA)-based cropping systems. In Mukono district of Central Uganda, the participants were exposed to the challenges associated with the management of the disease in an endemic region. The aim was to understand

farmer coping and / or recovery strategies. Participants visited farms, markets and had a session with the local government officials who explained the steps being taken to maintain the disease below economic injury levels.

In the predominantly Matooke cropping system, in Mbarara district, the participants visited a front line region, where the disease is still identified in pockets and where the management strategy is eradication. Hence in this region the focus is on mobilization/sensitization of all stakeholders, using a diversity of tools, including songs, drama and bye-laws. The importance of understanding the socioeconomic environment around the farmer and how this impacts on farmer decision-making with respect to the adoption of BXW interventions was underscored by comparing the farmers' responses in Mbarara and Mukono districts in post field visit assessments.

3.0 Workshop presentations and responses

3.1 Opening ceremony

The 5-day workshop was officially opened by Matthias Magunda, Director of Research of Kawanda Agricultural Research Institute (KARI). In his opening remarks read for him by Josephine Namaganda, Matthias Magunda emphasized the importance of banana and how its production is threatened by BXW. He also reminded the participants that regional cooperation was important in BXW management and control, especially since the disease doesn't respect borders. He emphasized the need to continuously review trans-boundary issues through such workshops to ensure that research technologies reach all the stakeholders in the region. Matthias Magunda applauded the support of USAID through C3P project and commended its substantial and continuing assistance given to the region in the area of agricultural research among others. He also thanked the participants for attending the workshop.

Earlier, team leaders from IITA, CRS and INIBAP made their welcoming remarks. The INIBAP-ESA regional coordinator Eldad Karamura thanked USAID for providing the resources for the C3 Project and applauded the collaboration between CRS and IITA. He explained that although BARNESA had developed a regional strategy for combating BXW, there were no resources to implement it. The USAID/CRS/IITA intervention was thus timely and the workshop was only the beginning of a long haul in the quest to address food and income security in banana-based cropping systems in the sub-region. He also thanked the governments of the six participating countries for their co-operation

in this project, and the Uganda Government in particular for the spirit of regional collaboration.

In his welcoming remarks, Danny Coyne from IITA hailed the collaboration between IITA, CRS, INIBAP and the NARS. He highlighted the various research activities being undertaken by IITA in the region on IITA target crops. On C3P, IITA is taking the lead for Cassava Mosaic Virus control/management activities in collaboration with NARS participating in the project. IITA has both upstream and down-stream activities on BXW. He hoped that it would be possible during the course of the week to visit some of the activities. Danny Coyne underlined the spirit of collaboration especially on problems of regional importance.

The CRS country representative, Mr. Ben Phillips welcomed participants to the workshop and pledged CRS support for the objectives of the meeting. As the lead project implementing organization, CRS will use its regional grass-root linkages to ensure coherent management and implementation of project activities. Turning to CRS activities in Uganda, Mr. Phillips highlighted the importance of CRS partners and the roles they are playing in reaching out to meet the needs of poor people threatened by a range of productivity constraints. He thanked the C3 Project partners and wished the participants a fruitful workshop.

3.2 DAY ONE (2nd October 2006)

Consolidation of knowledge and skills

Since Tier 1 trainees were also the ultimate resource persons at the national level, it was considered necessary to cushion the team with more information than trainees at lower tiers. It was envisaged that the training would adopt the onion peel approach, tailoring technical content to each successive training tier. Hence the regional level ToT would include a lot more technical content and would provide IPM concepts as well as the dynamics of managing a major crop system like bananas. At regional level, ToT participants were given electronic (as well as hard) copies of all the tools used in the training so that they could produce and even modify materials as the need arose. Conversely, the course content for farmers is planned to have more visual demonstration of symptoms and management techniques than the theoretical basis of disease management.

Hence at the Tier 1 workshop, the first introductory discussions provided a broad agro-ecological background about bananas, banana pests and diseases and their management in East and Central Africa. Subsequently the discussions focused on the BXW challenge in the region.

Overview of banana pests and their management

The first presentation introduced participants to banana cropping systems and banana pests. A comprehensive overview of banana pests was provided by William Tinzaara¹, an entomologist with National Agriculture Research Organization (NARO) Uganda, working on insect associated with the transmission of BXW in Kayinja-based cropping systems. In his discussion William Tinzaara highlighted the two major banana pests, weevils and nematodes. He gave an overview of the biology, pest status, damage, symptoms and management of the banana weevil. Management options discussed include cultural methods (use of clean planting material), good husbandry (mulching, pruning or de-suckering), residue management (sanitation), trapping, chemical and biological control and host plant resistance.



Black Sigatoka causes 37% yield loss in Uganda

On banana nematodes, the discussion centred on several nematode species (*Pratylenchus goodeyi*, *P. coffea*, *Rodophilus similis*, *Helicotylenchus multicinctus* and *Melodogyne spp*). It was observed that the most important nematodes in banana cropping systems in ECA region were *R. similis*, which is common in areas below 1300 masl and *P. goodeyi* common in highlands, above 1400 masl. The issuing discussion centred on nematode damage, symptoms and several management options of parasitic nematodes. It was pointed out that the role of soil pests in the transmission of BXW between plants is not yet known.

1

Overview of banana diseases

The participants were led through a general discussion/overview of banana diseases in East and Central Africa by Francis Maina-Mwangi, a pathologist at IITA. The discussion reviewed fungal, viral and bacterial diseases including Black Sigatoka, Panama Disease (*Fusarium oxysporum* f.sp. *cubense*), Armillaria corm rot (common in areas where forest has been recently cleared), Cigar end rot caused by either *Verticillium theobromae* or by *Trachysphaera fructigena* (constraint in the high altitudes e.g. Rwanda), Basal end rots, Bunchy top virus (spreading in Kivu area, DRC, Burundi and threatening Rwanda) and Banana streak virus, gradually focusing on the diversity of bacterial wilts in general and BXW in particular. Comparisons were made of three bacterial wilts (BXW, Moko and Blood disease). He wrapped up by encouraging the participants to regard diseases as part of the farming system and handle them in an integrated pest and disease management (IPDM) context.

BXW diagnostics, symptoms and spread

After introductory overviews, the discussions focused on BXW, with the aim “to strengthen capacity in East and Central Africa to sustainably manage Banana *Xanthomonas* wilt outbreaks taking into account the needs of various players along the production-consumption chain, including farmers and farmer organizations, traders, NGOs, extension and research teams and policy makers at the local, national and regional



Discharge of yellow ooze from a cut stem is one of the visual symptoms of BXW

levels”. The discussion on diagnostic symptoms was led by Jerome Kubiriba, a banana pathologist from NARO-Uganda

In his presentation Jerome Kubiriba informed members that Banana *Xanthomonas* wilt is caused by *Xanthomonas campestris* pv *musacearum*, a motile gram-negative aerobic rod bacterium that measures between 0.7-0.9µ x 1.8-2.0 with a single polar flagellum. BXW can be detected using visual assessment based on

external symptoms, cultural media, serological methods using specific antibodies and use of nucleic acid methods based on DNA.

The cheapest, quickest and the most applicable way to identify BXW, especially at the farm level is the use of visual assessment based on external/internal symptoms. Jerome Kubiriba led a discussion on the external and internal symptoms of the flower/fruit, leaves and stem, including the wilting of male buds, premature ripening of bunches, internal fruit discoloration, yellowing of leaves and the yellow ooze from the cut stem. The discussion also included the main transmission mechanisms, including insect transmission through the male buds especially in ABB-based cropping systems. The role of working tools in spreading disease was also underscored as was the use and/or movement of infected plant material such as infected suckers. Participants were able to share/contribute their experiences with the use of different diagnostic tools under various agro-ecological conditions in their countries.

BXW management and control

Michael Masanza from Ministry of Agriculture Animal Industry and Fisheries (MAAIF), currently responsible for BXW control campaigns in Uganda, led the discussion on BXW management and control on farm. The discussion envisioned the two aspects of management (1) prevention (where BXW has not entered the area) and (2) control and



Michael Masanza demonstrates tool decontamination using fire

management (where BXW is already established in an area). In unaffected gardens, farmers need to be sensitised to be vigilant, avoid introducing contaminated foreign materials (tools, suckers, plant parts etc) into clean gardens and to routinely break off male flowers with a forked stick soon after formation of last cluster, so as to eliminate natural wounds (that are attractive to insects, bats and some birds).

On the control aspects, participants agreed that the socio-economics in a given area would play an important role with respect to the adoption and use of recommended control measures. Labour requirements, value of the crop as perceived by the farmer, the convenience of application of a given recommendation; all need to be taken into account when contemplating a BXW control campaign. In general, when the disease

appears in the field, farmers need to cut down all sick plants, uproot the affected plants (so that no infected sucker is produced), chop and bury the stems, corms, leaves and any fruits of infected plant. If the farmer is unable to dig a hole and bury the material, he/she should heap the cut diseased banana pieces, cover the heap and leave them to rot for 6 months undisturbed. Farmers with BXW on their farms should sterilize their garden tools either with fire or with JIK (Hypochlorite) solution (1 Jik: 5 H₂O) to avoid carrying the disease to other plants. Participants were requested, on their return to their countries, to encourage farmers to always report diseases to authorities for quick diagnosis and control. Farmers should also be facilitated to develop monitorable indicators and how to analyse them at village meetings to assess progress of community action. In conclusion the discussion summarised management and control measures in an ABCC strategy, where:

- A – Avoid introduction of foreign materials into gardens
- B – Break off male flower buds immediately the last cluster on the bunch is formed,
- C – Cut down all infected plants, heap or bury
- C – Clean all cutting tools every after a cut in Jik or flame them and
- M – M & E of control.

BXW Surveillance

Mr Okasaai Opolot, the Commissioner for Crop Production at MAAIF led the discussion on BXW surveillance. Participants were able to distinguish between surveys (being a one time action) and surveillance (a continuous activity) and concurred that in the case of surveys, BXW may be in the country but undetected by the survey method and this may lead to fast and uncontrolled spread. Surveillance relies on both formal and informal approaches and has a better chance of detecting the disease. There is thus a need for nation-wide surveillance across the region in order to detect BXW outbreaks, determine the disease trends, map out the disease spread and distribution, and determine the severity of the disease, and to lay out strategies for effective control and enhancing awareness. The workshop agreed that for surveillance to be effective the surveillance team need to identify stakeholders (lead and key agencies) and establish the roles of each stakeholder. It is also necessary to establish a coordination system that allows a back-and-forth flow of information plus a database system that organizes information and feeds results into the decision-making processes.

It is critical that the core group identified from the key agencies are trained in BXW recognition, spread, and control and reporting protocols. In the issuing discussion, the workshop identified five surveillance options i.e. baseline surveys, target surveys, "going public", field reports (telephone calls and written reports from agricultural extension systems and local administration) and confirmatory visits by the core group. The participants agreed that for effective and prompt trans-boundary action, a central information management system to collect, manage, analyse and report the information at country and regional levels is needed.

The participants then discussed the case study of Uganda with Mr. Justus Muhangi from NARO. Mr. Muhangi outlined the key aspects of a BXW database as: data collection, analysis, management and dissemination. It is necessary to have a well designed data collection sheet to capture all the relevant information needed. The major data to be collected include: the physical location where disease data are recorded (district, Sub-county, County, Parish and Village); the GPS readings for confirmed disease sitings, details of disease outbreak, key symptoms, date of first detection, date of confirmation, incidence, affected cultivars, number of farmers affected in the area, interventions in place and relevant contacts (telephone numbers of key players in the area, for follow-up purposes). In the concluding discussions, the participants identified the major challenges in the establishment of such a database as : slow flow of information from the field, limited reports due to inadequate public awareness and high costs of surveillance. However these challenges would be lessened if the public is well sensitized and if all stakeholders commit resources to the exercise, and participatory surveillance and reporting are strengthened.

Policy and trans-boundary issues

Day one ended with a presentation and discussion on policy/trans-boundary issues with Eldad Karamura, as the discussant. The workshop discussion came up with possible causes of "pathogen pollution" in the region and observed that the phenomenon was now a frequent occurrence, probably caused by the movements of people and trade goods. Other possible causes include agricultural change as depicted by the tendency towards monoculture and commercialization; the intensification of the production systems as propelled by population pressure; diversification of production and

globalization. Equally important may be the observed changes in weather patterns, resulting into extreme environmental conditions. These changes may be irreversible, culminating in more intra-specific interaction, more recombination and more selection. Moreover the changes do not follow political borders; hence the need for cross-border collaboration.

The participants identified a number of trans-boundary activities within the sub-region. It was discovered that there is cross border trade in bananas and banana products between all countries in the sub-region. In some cases, this trade route is the only means to supply niche markets such as plantains for road side snack meals. The plantains originate from Eastern DR Congo and are transported in container lorries that plough between Eastern Congo and Mombasa on the Indian Ocean coast. It was also observed that the cross-border trade uses both formal and informal routes and policing it through formal quarantine practices would not deliver the desired results.

Apart from trade, there are also cultural exchanges across the borders that result in the exchange of bananas and banana products. Marriage, death and birth ceremonies may result into the movement of banana materials between relatives across the borders. Such informal interactions may require equally informal approaches to control the spread of disease.

In the ensuing discussion, it was recommended that cross border exchange of information was a very important component of the BXW control strategy for the region. Both local and national level policy makers need to be involved. However, there is a need to do a pest risk assessment (PRA) in order to quantitatively assess the threat and the magnitude of economic damage. Such information is useful for informing policy processes.

3.3 DAY TWO (3rd October 2006)

Day two sessions were chaired by Eldad Karamura assisted by Jerome Kubiriba

Participatory Development Communication

The presentation and discussion on the control of BXW in rural banana plantations through Participatory Development Communication (PDC) were led by Ms Nora Odoi. She highlighted the steps in PDC and importance of the approach. Below are some of the advantages of PDC approach highlighted in the workshop:

- PDC involves a two-way communication and is not just top-down
- PDC allows the farming community to take part in problem analysis in order to identify solutions and / or opportunities.
- PDC imparts full participation, mutual understanding and shared responsibility at the community level
- Interacting with the community helps to quickly identify constraints associated with some control measures to enable early adjustment in the approach, and
- Community knowledge acquired through interaction enables researchers to plan better technology development and packaging.

Some of BXW control measures that can be promoted through PDC include de-budding; community action to destroy infected plants; disinfecting used tools; rotating the field with annual or break crops (e.g. cassava); formation of community BXW task forces to spear-head and monitor community action plans for BXW control; and the development of communication tools during community interaction (e.g. fact sheets on BXW symptoms, transmission and control, guidelines for formation of BXW task forces in the community, videos on BXW symptoms, transmission and control, posters and brochures on BXW, etc.).

Participatory monitoring and learning (PM&L)

Ms Odoi, (assisted by Michael Masanza) was the lead discussant on participatory monitoring and learning (PM&L). She stressed a need for PM&L as stakeholders and farmers identify monitorable indicators which they use to assess the effectiveness of the control measures. It was concurred that all PM&L participants need to be trained in facilitation skills to foster full participation, mutual understanding, inclusive solutions and shared responsibility for control at community level. During PM&L, the communities are encouraged to participate in evaluating the progress on control and/or modifying control strategies. Farmers, in particular, need to fully participate in monitoring and evaluation in order to own the process, as data collected through farmers' testimonies can be cross-checked by others. Participants in the PML process need to be enabled to share testimonies of success (and failures) to encourage others in the community to take up control measures. PM&L gives an opportunity to capture farmers' memories in a village discussion and to document knowledge and experiences for research and development.

In this approach farmers develop monitorable indicators and record them in a book.

Farmers' monitorable records should include:

- Date,
- Activity done on the farm and who did what, where,
- Control measure implemented (e.g. number of male buds de-budded),
- Number of infected plants,
- Number of harvested healthy bunches and prices at which they are sold,
- Number of diseased bunches,
- Number of Jericans of juice or waragi, and
- Price sold and general remarks on status of the disease on the farm.

Field visit to Mukono

In Mukono, participants were exposed to BXW diagnosis and management strategies in ABB-based cropping systems. The program and the activities of the field trip were aimed at encouraging informal interactions between farmers affected by the BXW



Replanting of cleaned gardens with disease-free seed is one of the BXW coping strategies

pandemic and the workshop participants. Since, in this district, BXW is now endemic, participants were encouraged to envisage the broad pest and disease management strategy in the light of the farmers' coping strategies that they encounter on farm. In the field, the discussion centered on both external and internal visual symptoms of the disease and the differences between BXW and FOC, since the dominant variety-

Kayinja (ABB) succumbs to both diseases. A number of coping strategies were observed to include the replacement of infected banana fields with annual crops like maize and beans; the growing of manila as a cash crop and the replanting of cleaned gardens with disease-free seed.

The field trip was ended with a display of BXW sensitization strategies through songs and drama by the local communities. In the ensuing review of the field trip, participants underscored the need to integrate the management of other pests and diseases into a BXW-focused IPDM program.

3.4 DAY THREE (4th October 2006)

Participatory M-E on Capacity Building Activities

Day three was chaired by Michael Masanza and Jerome Kubiriba. Participants were introduced to tools for monitoring the training across the tiers by Eldad Karamura from INIBAP. The overall objective was to ensure that the high quality of training across tiers 1-3 is maintained in order to control and manage BXW pandemic in the region. Specifically the aim is to monitor the effectiveness of the training tools and approaches, identify the strengths and weaknesses and take corrective measures as soon as possible. In the discussion, three categories of indicators were agreed upon, namely:

- a. Those that relate to the effectiveness of training and communication tools, including but not limited to:
 - Posters, brochures, pamphlets
 - Diagnostic & Management Guide
 - Field demonstration
 - Exchange visits
 - Laboratory attachments
- b. Those that relate to the effectiveness of control measures:
 - Early de-budding/bagging
 - Sterilization of tools
 - Destruction of infected plant material
 - Use of clean planting material
 - Rotation of crops
- c. Those that show that the BXW problem has been institutionalized, including:
 - The development and implementation of action plans at national and local levels:

- Changes in resource commitment, including financial increases/allocation to BXW control programmes; changes in number of scientist/extension staff involved in BXW activities
- Changes in the number of participating institutions since October 2006 (NGOs, collaborative projects, government departments, regional organizations)
- Number of sites with preventive bye-laws enacted and operational

It was agreed that all tools need to be tested under conditions that closely mimic those of the target audience so that appropriate changes can be included to make the tools more responsive to local conditions.

3.5 DAY FOUR (5th October 2006)

Mbarara Field Trip

Day four was led by Jerome Kubiriba and involved a trip to Mbarara district. On their way to Mbarara, participants visited some sites in Kyazanga, Masaka district, a major highland banana (AAA) producing region in Uganda. The sites experienced brief



Eldad Karamura listens as a farmer explains how BXW scourge was eradicated from Rugando sub-county in Mbarara district

encounters with BXW outbreaks (pockets) which were successfully eradicated. Farmers narrated the steps taken and the mobilization efforts mounted to eradicate the disease, which had been introduced into the area through the use of contaminated harvesting tools by traders from Kampala. It was explained that in this part of the country, banana is the main cash and food crop and this was why it was relatively easy to mobilize the public to do whatever it took to ensure that the disease did not take root in the district.

In Mbarara district, the workshop participants visited several sites where the disease had been eradicated. In Rugando sub-county, the farmers explained the organization of their

campaigns against the BXW scourge. Participants were told that right from the beginning, clear objectives were set and sold to the communities who resolved to:

- Achieve eradication at any cost to ensure that the disease did not establish itself in the area;
- Cooperate with government extension agencies with respect to the execution of recommendations/actions to be carried out to control and eradicate the disease;
- Be self disciplined with respect to the execution of quarantine and other bye-law issues/requirements.

In Nyakayoojo sub-county, Mbarara district, the focus was on the mobilization/sensitization campaigns mounted to trigger community action to eradicate the disease. These approaches included drama and songs aimed at educating the public about the causes of the new disease, its symptoms and the control measures that need to be undertaken to control it. These approaches also helped to dispel mystical beliefs about the disease and to focus the public on control measures that would produce positive results.

In the discussions about the strategies observed in Mbarara, the participants pointed out that the targeting of school children could have both negative and positive sides. On the negative side, with time devoted to rehearsing BXW-related issues in songs and plays, it could impact on their academic performance. Positively, at an active learning age, the children were being introduced to the agricultural production challenges of their communities and this was perceived as a positive factor for the long term sustainability of the banana industry and agriculture in general. Moreover the children were from a diversity of banana growing households randomly distributed in the sub-county and this helped to get the message to the remote areas of the region.



Participants “going public” at Rwebikoona Banana Market, in Mbarara district

On the last day of the visit to Mbarara district, the participants led by Jerome Kubiriba, stopped at a market for a demonstration of "going public". "Going public" is an extension approach that involves meeting people/farmers wherever they are and disseminating information to them. This approach targets areas where a large number of people gather e.g markets, trading centres, churches and mosques. The idea is to communicate to people coming from a wide catchment area say an area of 20km² at one time. Two main objectives are normally achieved by "going public" namely, sensitizing people about BXW, especially its modes of spread and control, and gaining an understanding of the status of BXW in the catchment area through interactions.

For the C3P workshop, "going public" took place at Rwebikoona Banana Market in Mbarara district. This is a daily market, with people from sub-counties of Rugando, Mwizi and Nyakayoojo. On reaching the market, the participating team introduced itself to the market-master and explained the purpose of the visit to the market. They then identified a strategic area (where most people could be intercepted). BXW posters and fliers were displayed. This attracted people and the leader of the group would then introduce the purpose of the visit and explain the symptoms of BXW; how it spreads and can be controlled, as depicted on the poster. The audience was then asked to say whether they had ever seen similar symptoms. If the answer was affirmative, then they were asked where and what the farmers did/are doing about it.

There was a lively exchange between the farmers and the participants. As a result of this discussion, one farmer/trader reported to the participants that he had not seen the symptoms but had heard that similar symptoms were in Mwizi sub-county (more than 20km away from the market). The case of Mwizi was already known but the revelation showed that the approach can contribute to the surveillance of the disease and allow fast action to be taken. Such outbreaks would not be picked in a randomly sampled site, in traditionally implemented survey. After this participants traveled back to Kampala

3.6 DAY FIVE (6th October 2006)

Day five was chaired by Eldad Karamura and Maina Mwangi. The focus of the day was the finalization and discussion of the work plan proposals. Other discussions planned for the day included the review of the Mbarara field trip and Communication Tools Development.

Review of Mbarara Field Trip

Participants clearly identified the differences between the ABB and AAA banana cropping systems in Uganda by comparing the visits to Mukono and Mbarara districts. They attributed the differences in response to the disease between the two districts not only to the different crop systems but also to the differences in the socio-economic importance of the crop in the two districts. It was noted that in Mbarara eradication efforts were led by the farmers while in Mukono, the government was at the forefront of the campaigns when the outbreaks were discovered. In conclusion, it was re-affirmed



A farmer in a EXW front line region explains to participants the methods they use to eliminate EXW from Mbarara

that BXW control/management campaigns must be multi-disciplinary and multi-sectoral in conception and application to succeed as demonstrated by the Mbarara district case studies. Key players like farmers must be involved in the planning and execution of the campaigns.

Communication Tools' Development

The presentation and discussion on Communication Tools' Development were led by Ms. Nora Odoi. She emphasized the pre-requisites for developing communication tools, including the decision on the type of message to communicate to who, where, when, why and how? She argued that communication as a process needs to be planned. The need to have a two-way communication was underlined; after a message is sent there should be a feedback mechanism in place to establish whether the receiver has understood the message. During message development and its communication, there is a need to minimize disruptions (noise), otherwise communications may break down. Well developed tools only facilitate the communication process and therefore emphasis should be put on the actual communication content more than tools. Nora further indicated that combating BXW demands making use of different communication tools like posters, leaflets, radio, television, songs and drama. She highlighted six main factors to consider when choosing a communication tool:

- Ease and flexibility of use
- Costs of production
- Level of support to learning
- Portability
- Durability
- Management

She also listed examples of communication tools, including;

- Interpersonal communication tools e.g. discussion, debate
- Group media e.g. video, audio cassettes
- Mass media e.g. radio, TV, rally
- Folk Media e.g. story telling, songs, dances, poems
- Print Media e.g. newspapers, brochures, posters etc.
- ICTs e.g. computers/internet

The participants were led through steps for developing communication tools as: perfecting the message, pre-testing (for general appearance of the material, colour scheme and attractiveness etc, ease of handling the material, simplicity and clarity of text, relevance of the subject to the production constraints experienced by farmers, relevance to their information needs and interpretation, and understanding of the message) and distribution. The distribution of communication tools is an important activity in the process because communication tools must get to the intended users or else the effort is wasted. It also requires special effort in the case of farmers because of the geographical coverage needed. Communication tools may be distributed through; extension agents, agricultural shows, farmers' field days, cooperative societies, agricultural meetings/trainings and farmer groups, among others. In the ensuing discussions, the participants concurred on the strengths and weaknesses of the above tools, including their appeal to different groups of individuals and circumstances. A multimedia approach was therefore recommended.

National Work Plans for Capacity Building

The work plans discussion was led by Stella Ssengendo and centered on the development of planning tools for Tiers 2&3. The aim here is to ensure that the training



Simon Eden-Green from EG Consulting discusses technical linkages

at the regional and national levels is coordinated as much as is humanly possible, so that lessons learnt in one country can be quickly transferred to another. It was realized that in some specific aspects of BXW control/management, there may be a need for one country to reinforce activities in another country and this can only happen when there is coordination at the regional and national levels. Moreover for some NARS, there is still a need for national level

mobilization of resources (human and financial) and such countries need to adapt the experiences of others. In addition, there is a need to ensure quality control across the region through PM&L and drawing up lessons that would help the region to cope better with similar situations in the future. As a result of the foregoing, a table was drawn up to summarize the training, field trips and meeting plans for regional coordination (Annex 3).

Closing Remarks

At the closing ceremony, Mgenzi Byabachwezi (Tanzanian participant), on behalf of the



Josephine Namaganda presents certificates to participants

participants thanked the workshop organizers for a tight but well-planned programme. He acknowledged the financial support of USAID and the collaborative spirit of CRS, IITA and INIBAP. Eldad Karamura (INIBAP) and Piet Van Asten (IITA) hailed the Ugandan Government and NARO in particular for championing the fight against BXW in the region because.

In his remarks, Steve Walsh pledged full support from the CRS and its partners at the grass-roots level throughout the region. He

called for close collaboration in order to exploit the rich experiences at the regional level. He thanked the participants and their governments for agreeing to participate in the

project and predicted that the C3 Project will provide a linchpin for the cooperation of different projects in the region. Earlier Simon Eden-Green from Eden-Green Consulting discussed possible linkages between C3 project and other research activities funded by DFID-UK in the region. He underscored the need to link development activities with research in order to address information and technology gaps currently experienced in the control/management of BXW on-farm.

The workshop was closed by Josephine Namaganda, representing the Director General of NARO. After the closing ceremony, Josephine Namaganda assisted by Steve Walsh from CRS presented a "certificate of participation" to the participants.

4.0 References

1. INIBAP. 2006. Assessing the Impact of the Banana Bacterial Wilt, *Xanthomonas campestris* pv. *musacearum* (BXW) on Household Livelihoods in East Africa. Final technical report. 39 pp.
2. Karamura E.B., Moses Osiru, Guy Blomme, Charlotte Lusty and Claudine Picq (Editors). Developing a regional strategy to address the outbreak of banana *xanthomonas* wilt in East and Central Africa. Proceedings of the banana *Xanthomonas* wilt regional preparedness and strategy development workshop held in Kampala Uganda February 2005. 94 pp.
3. Tushemereirwe W., A. Kangire, J. Smith, M. Nakyanzi, D. Kataama, and C. Musiitwa. 2001. An outbreak of banana bacterial wilt in Mukono district; a new devastating disease. KARI Report. Uganda.

Annex 1.List of Participants, trainers and secretariat

NAME	TITTLE/ DESIGNATION	ORGANISATION	E-MAIL	COUNTRY
Agaba Grace	Journalist/Reporter	The New Vision	graug2002@yahoo.co.uk	Uganda
Blomme Guy	Dr/ Asst INIBAP coordinator	INIBAP	G.Blomme@cgiar.org	Uganda
Danny Fanueli Mhalu	Assist. Administrative Secretary	Regional/Admin Local Govt		Tanzania
Dionysius R.R Mabugo	Agriculture Technical Advisor	Regional Commissioners Office Kagera	drmmabugo@yahoo.co.uk	Tanzania
Eliawoni F.Marandu	C3P Project Manager Tanzania	CRS Mwanza	emarandu@crstanzania.org	Tanzania
Giriskwishaka Adelin	Ministry Staff	Plant Protection Department	giradelin@yahoo.fr	Burundi
Hakizamungu Leon	Head of Crop Protection	RADA	Hakizamungul.@yahoo.fr	Rwanda
Hatangimana Thomas	Ir/Regional Coordinator	World Vision Rwanda	thatangimana@yahoo.fr	Rwanda
Isaac Macharia	Plant Inspector	Kenya Plant Health Inspectorate Service	Macharia.isaac@gmail.com , director@kephis.org	Kenya
Karamura Eldad	INIBAP Regional	INIBAP-IPGRI	E.Karamura@inibap.co.ug	Uganda
Kataama Doreen	Extension Officer	Mukono Local Govt.	dkataama@yahoo.com	Uganda
Kimenju John	Head Crop Protection Section	University of Nairobi	wkimenju@yahoo.com	Kenya
Komi Kouma	Banana Entomologist	IITA	k.fiaboe@cgiar.org	Uganda
Kubiriba Jerome	Research Officer	NARO	jkubiriba@kari.go.ug	Uganda
Maina Mwangi	Plant Pathologist	IITA	m.mwangi@cgiar.org	Uganda
Makheti Phillip Tembu	Provincial Director of Agric. Western Province	Min. of Agric	pdawestern@nalep.co.ke	Kenya
Masanza Micheal	Research Officer	MIAAF	masanza@kari.go.ug	Uganda
Mbaka Jesca	Plant Pathologist	KARI	jnmbaka@yahoo.com	Kenya
Nahimana Melchior	Director General	IRAZ	iraz@cbinf.com , nahimanamelchior@yahoo.fr	Burundi
Mgenzi S.R. Byabachwezi	Scientist	ARDI MARUKU	msrbyabachwezi@yahoo.com	Tanzania

NAME	TITTLE/ DESIGNATION	ORGANISATION	E-MAIL	COUNTRY
Muchunguzi Perez	Research Technician	IITA	P.muchunguzi@iitaesarc.co.ug	Uganda
Muhangi Justus	Data Manager-NBRP	NARO	Jmuhangi@kari.co.ug	Uganda
Nakato Gloria Valentine	Research Assistant (C3P-Project)	IITA	nakatogv@yahoo.com	Uganda
Ndabagera Gilbert	Inspecteur Provincial	Ministere Agriculture	gilindabagera@yahoo.fr	DRC
Ndikumagenge Sebastian	DG	Minist. of Agric		Burundi
Ndungo Vigheri	Prof	Graben University	ndungovigheri@yahoo.fr	DRC
Nintije Pierre	Researcher	Univ.of.Burundi, Faculty of Agriculture	mpetero@yahoo.fr	Burundi
Niyongere Celestin	Researcher	ISABU	cniyongere@yahoo.fr	Burundi
Njukwe Emmanuel	Agronomist	IITA-Cameroon	e.njukwe@cgiar.org	Cameroon
Nshimirimana Sylvester	C3P Coordinator	CRS Burundi	snshimirimana@crs-burundi.org	Burundi
Odero Benard	Country Program Manager	CRS	bodero@crsnairobi.org	Kenya
Odoi Nora	Development Communication Specialist	NARO	doinora@kari.go.ug	Uganda
Okaasi S Opolot	Commissioner Crop Production and Marketing	MAAIF	bbwci@infocom.co.ug	Uganda
Phemba Phezo	Project Manager	CRS-CONGO	phembap@yahoo.fr	DRC
Rose Anne Mohamed	Principal Agricultural Officer	Minst. Of Agric	Roseanne.mohamed@kilimo.go.tz	Tanzania
Stella Sengendo	C3P Country Manager	CRS	ssengendo@crsuganda.or.ug	Uganda
Sylvain Hakizimana	Country Project Manager C3P	CRS Rwanda	shakizimana@crsrwanda.org	Rwanda
Turyagyanda Laban	Research Assistant	INIBAP	f.turyagyenda@inibap.co.ug	Uganda
Tinzaara William	Research Scientist	NBRP-NARO	w.tinzaara@inibap.co.ug	Uganda

Annex 2: Workshop Programme

CROP CRISIS CONTROL PROJECT (C3P)

PROGRAMME FOR BXW MANAGEMENT TRAINING WORKSHOP,

2ND - 6TH OCTOBER 2006, GRAND IMPERIAL HOTEL, KAMPALA, UGANDA

MONDAY	2nd October 2006
Time	Chair: Maina Mwangi / Nora Odoi
8.00 - 8.30 a.m	Registration of participants <i>Valentine / Florence</i>
8.30 – 8.50 a.m	Opening ceremony NARO – <i>M. Magunda/ Josephine Namaganda</i> CRS country Rep - <i>Ben Phillips</i> IITA representative – <i>Steffen Abele/ Danny Coyne</i> INIBAP representative – <i>Eldad Karamura</i>
8.50 – 9.00 am	Objectives of workshop = <i>Eldad Karamura</i>
9.30 -10.20 a.m	Banana pests (<i>William Tinzaara</i>)
10.20 - 10.50 a.m	Coffee/ tea Break with Group photo
10.50 - 11.40 a.m	Banana diseases (<i>Maina Mwangi</i>)
11.40 - 1.00 pm	BXW diagnostics and symptoms BXW management (<i>Jerome Kubiriba/ Michael Masansa</i>)
1.00 - 2.00 pm	Lunch break
2.00 - 3.30 p.m	Surveillance (<i>Okasaai Opolot</i>) GIS/data management (<i>Justus Muhanji</i>)
3.30 – 4.00 p.m	Coffee/tea break
4.00 – 5.00 p.m	Policy/transboundary issues (<i>E.Karamura/J.Kubiriba</i>)
TUESDAY	3rd October 2006
	Chair: Eldad Karamura/ Jerome Kubiriba
	Rapporteur:
8.30 - 10.00 a.m	Participatory Development Communication <i>(Nora Odoi, Carol Nankinga)</i> Participatory M&E

(Caroline Nankinga, Nora Odoi, Michael Masansa)

10.00 –10.30 a.m Coffee/tea break
10.30- 5.00 p.m Field visit to Mukono *(Caroline Nankinga)*
7.00 -9.00 p.m Get together (cocktail) *(Stella Sengendo)*

WEDNESDAY 4th October 2006

Chair: Michael Masanza / Jerome Kubiriba

Rapporteur:

8.00 - 10.00 a.m Tools for monitoring the training across the tiers
(Eldad Karamura)
10.00 - 10.30 a.m Coffee break
10.30 - 12.00 noon Work plan formulation *(Stella Sengendo)*
12.00 - 1 p.m Prepare to travel to Mbarara *(Stella Sengendo)*
1.00 – 2.00 p.m Lunch break
2.00 – 6.00 p.m Travel to Mbarara

THURSDAY 5th October 2006

Chair: Jerome Kubiriba/ Stella Sengendo

Rapporteur

8.30 am Depart from hotel
9.00 -10.00 am First stop
10.00 – 10.30 a.m Travel to next stop
10.30 – 11.30 am 2nd stop
11.30- 12.00pm Travel back
12.00 – 1 pm Stop at market for demonstration of "going public"
1.00 – 2.00 pm Lunch break
Depart to Kampala

2.00 pm

FRIDAY 6th October 2006

Chair: E. Karamura/ Maina Mwangi

Rapporteur:

8.30 - 10.30 a.m Finalize work plans- Country Groups *(Stella Sengendo)*
10.30 - 11.00 a.m Coffee
11.00 - 1.00 p.m Work plan presentations
1.00 - 2.00 p.m Lunch

2.00 – 2.30 p.m	Course Evaluation
2.30 – 2.45 p.m	Course wrap up, presentation by a participant
2.45 – 3.45 pm	Closing ceremony and certificates NARO representative – M. Magunda CRS representative - Steve Walsh IITA representative – Steffen Abele/Danny Coyne INIBAP representative - Eldad Karamura
3.45 – 4.15 pm	End of meeting refreshments Workshop organizers meeting
Saturday	7th October 2006
	Participants depart to home countries

Annex 3: Tentative Tier 2&3 capacity building schedule

Country	Activity	Presented by countries		Proposed INIBAP	
		Tier 2	Tier 3	Tier 2	Tier 3 (INIBAP PML activities only)
Uganda	Stakeholders consultation workshop	24 Oct	Training farmers 13-15 December		
	TOT workshop, field trip	22-24 Nov		4-8 Dec	5-9 Feb 2007
	CBTs training Workshop, field visit	6-8 Dec			
Rwanda		Workshop Field trip to affected areas 6 Oct	Participatory meetings; Community work Administrative meetings, 6-7 Nov	11- 15 Dec	12-16 Feb 2007
Burundi		Dec 2006-Apr 2007	Jan 2007-Jun 2007	8- 12 Jun 2007	19-23 Feb 2007
DRC		23 -26 Oct	Nov 2006-April 2007	15-19 Jan 2007	25-28 Feb 2007
Tanzania			2 nd week of Nov. 2006 (4 days) x 2 trainings	22- 26 Jan 2007	05-09 Mar 2007
Kenya		25 -27 Oct	Nov 2006 - May 2007	28- 31 Jan 2007	12-16 Mar 2007