1-**Project title**	**REGIONAL INITIATIVE ON THE FIGHT AGAINST FRUIT FLIES IN WEST AFRICA**
2-Themes 2 & 3	Theme2: the emphasis is to train mango growers, preferably through their associations to monitor fly populations in their orchards and to control these populations in order to limit economic damage to their fruit productions. Theme 3: The training also aims at sensitizing exporters to the implications of quarantine regulations in the markets they target in the EU, to the risk of interception and destruction of infected fruit shipments..
3-Starting date	01 October 2008
4-Completion date	31 December 2009
5-Requesting organizations	1) The International Institute of Tropical Agriculture (IITA) Headquarters IITA-Nigeria Ibadan, PMB 5320, Ibadan Oyo State, Nigeria Tel: +234 2 7517472, (0)8039784000, (0)8055055954, (0)8034035281, (0)8034035282, (0)8034035283 Fax: INMARSAT: 873761798636 Relevant contact person: Jean-François Vayssières 2) Centre de coopération internationale en recherche agronomique pour le développement (CIRAD) Persyst Department TA B-95 rue Jean-François Breton, 34398 Montpellier cedex 5 Tel :+33 4 67 61 55 57 , +33 4 67 61 59 93, Relevant person contact : Marie-Noelle Ducamp-Collin
6-Implementing organizations	IITA, Cotonou Station Contact person Jean-François Vayssières, jvayssieres@cgiar.org CIRAD, Montpellier Contact person : Marie-Noelle Ducamp-Collin marie-noelle.ducamp-collin@cirad.fr
7 -Project background and rationale	See **appendix 1**
8 –Project management	See **appendix 2**
9- Project objectives	The project main objectives are: - to train the personnel of the Plant Protection Directorates (direction de la Protection des Végétaux, or DPV in francophone countries) in the detection of fruit flies species and the monitoring of population growth. to help propagate fruit flies population detection and control methods with growers of commercial fruit plantations. In so doing the Project will contribute to improving market access for regional fruit productions, whether for national of regional trade to help fruit exporters comply with commercial export standards for mango (and other fruit as the case may be)
10-Project outputs	Thanks to the regular trapping of fruit flies in the Pilot Orchards, data bases on respective prevalence of species in the eight countries will be available at the end of period.

	Five technical brochures to be designed and published in January 2009 Training of trainers workshops: 1 in each country: workshop reports available in February 2009 Growers workshops: one in each AEZ. Workshop reports available in April 2009 Exporters workshop: one in each country. Workshop reports available in April 2009 Trial Spot treatment with Success Appat in POs: report available in August 2009 MAT trials in Benin: report available end 2009 M&E and regional coordination: quarterly report
11 Project activities	See **appendix 3** (Logical Framework) attached.
12 - Timetable	See **appendix 5** (Monthly Timetable and Outputs) attached
13 Private / Public sector cooperation	The Project will rely on a close cooperation between public entities (plant protection agencies, national agriculture research services and the private sector through growers and exporters associations.
14. Budget	The total project cost is USD 694,540. It will be co-financed by the WTO (SDTF window) and the World Bank under a Multi-Donor Trust fund set up to finance its ag. diversification and agribusiness related activities. A detailed budget is annexed . See **appendix 4** (Financial Proposal)

SDTF Grant Application Form

Annex 1: Background and rationale for Phase 2

Background

Fruit flies have become an increasingly prevalent pest of fruit productions in most of West Africa, affecting not only the burgeoning mango export industry, but also other fruit (citrus, papaya, guava) that matter for domestic consumption. A new species, *Bactrocera invadens*, which originated from Sri Lanka and migrated westward across sub-Saharan Africa, is now prevalent in most West African countries. Since this species is particularly phytophagous and prolific, it has tended to displace endogenous species and consequently is causing increased damages to fruit productions. The phenomenon has reached such proportions, and the economic impact has become so serious, that international development agencies together with the plant protection agencies of the concerned countries have started exploring ways to bring a regional response to a regional phenomenon. In late 2007, the European Union commissioned a team of experts to do a scoping study on the damages inflicted by fruit flies on West Africa fruit production[1] together with the design of an Action Plan for a coordinated regional response.

In addition, a few bilateral donors () have been involved in the fight against this plague in specific countries (e.g. USAID in Senegal and Ghana) but there had been no attempt, so far, at bringing a regional response given the sheer magnitude of the task and the large resources that would have to be mobilized for a significant impact to be felt. This is why the EU-sponsored study was considered both highly relevant and timely. The report, which became available in May 2008, provides an in depth analysis of the specific national situation of the eight countries reviewed as regards both the prevalence of the various fruit flies species and the economic damages inflicted to fruit production. The report's findings and the regional Action Plan were officially presented by the consultants to participating countries and endorsed by the Regional organizations (WAEMU and ECOWAS) on the occasion of a workshop held in Bamako (Mali) on July 29-31, 2008.

A pilot program financed by the WB in 2008 (Phase 1)

In the meantime, aware of the urgency of the situation in the field, and wanting to start bringing some form of regional response in time for the 2008 West African mango season, the World Bank commissioned the International Institute of Tropical Agriculture (IITA) to design and implement a regional pilot program of fruit fly population monitoring, based on the applied research methodologies developed at their research station of Parakou in Northern Benin. This project has been implemented by the CIRAD-IITA regional project "Mango fruit fly control in west Africa".

Thus, for the 2008 mango season, IITA could benefit from financial support provided by the World Bank, which earmarked some of the funding received under the EU-funded All ACP Commodity Program to finance its horticulture- related activities. This funding enabled IITA and

[1] This report, known as the Italtrend Report (after the name of the consultancy firm which was commissioned by the EC) covered Benin, Burkina Faso, Gambia, Ghana, Guinea, Ivory Coast, Mali and Senegal.

CIRAD, to start Phase 1 of a regional training program that encompassed seven countries in the sub-region. Although activities started late due to administrative hurdles, fruit fly trapping methodologies (centered around the use of GF-120, also known as Success Appat) were disseminated through a series of workshops involving the plant protection personnel in the seven concerned countries, with field activities deployed around 45 pilot orchards chosen in 15 of the most important agro-ecological zones for mangoes in the sub-region. To support this educational effort, a series of five technical brochures were designed by IITA and CIRAD, in both French and English, and distributed at the various workshops and sent to the national Plant Protection Agencies.

Rationale for the continuation of the program in 2009 (Phase 2)

Phase two, for which financing is presently being requested, intends to continue and deepen this regional sensitization and training work, and going one step further with the training of farmers associations in fruit fly damages mitigation techniques. In 2009 the Program will cover eight countries, adding Togo to the Phase 1 seven participants (Benin, Burkina Faso, Côte d'Ivoire, Ghana, Guinea, Mali and Senegal).Thus, before and during the 2009 mango season (February-August), there will be a general scaling up of the didactic effort through training of trainers (funded by STWF), who, in turn, will be training farmers, preferably through their associations, when they exist. A new set of five technical brochures, destined to trainers, exporters and educated farmers will be produced by the IITA-CIRAD project in complement to the existing set of five brochures that were produced in 2008.

As scientists and plant protection authorities recognize, long term control of fruit flies populations is mainly focused on Integrated Pest Management techniques (sensu lato). In this respect IITA-CIRAD will be disseminating throughout the region the use of the weaver ant as a natural agent to control fruit fly populations.

However this 2009 Program is more ambitious as it aims at delivering the methodology at the producer level, preferably through their associations, or in case there are no associations existing around the pilot orchards, through individual farmers likely to become group leaders.

At this stage, the World Bank cannot possibly assume alone the financing of the requested budget because its allocation under its AAACP TF is limited and does not allow for one single activity to reach such level of funding requirement. This is why IITA and CIRAD are presently requesting another proposal with the WTO under its Standards and Trade Development Facility.

It is important to maintain the momentum that has been gathered though the 2008 exercise and carry it forward in 2009: DPV personnel has to be kept motivated, and clusters of growers, gathered around the 45 pilot orchards in 15 AEZ (Agro-Ecological Zones), have to be kept on board in order to propagate further the trapping and area treatment methodologies.

Summary of proposed activities

In the attached Technical Proposal for Phase 2 (Annex 3, logical framework), the various activities of IITA-CIRAD project that will be implemented, have been described, their respective timelines, the objectives of the Program, the results to be achieved, and as a set of performance indicators. Annex 4 presents the STDF Financial Proposal, and Annex 5 shows a monthly timetable with expected outputs with STDF funding only.

It has to be reemphasized that Phase 2 will use and consolidate the network of 45 pilot orchards (3 in each of the 15 chosen Agro-ecological zones) that has been set up during Phase 1.

In order to have maximum impact in 2009, it is estimated that the exercise should span a period of 15 months, i.e. December 2008 till February 2010. The first half of this second phase are funded by WB and the second by STDF.

Continuation of activities that had been initiated during Phase 1

- Detection trapping activities will be continued, with a view to optimize their performance as a monitoring tool;
- ToT workshops also involving the owners of pilot orchards so as to have an impact on fruit quality improvement at market level;
- Area treatment with GF-120 (Bait Application Technique);
- Propagation of the use of the weaver ant for the biological control of fruit flies in pilot orchards and other surrounding orchards.

New activities to be initiated during Phase 2 (with WB funding)

- Conception design and production of a new set of 5 training brochures around the following themes: (i) the main mango cultivars in West Africa and their relative importance; (ii) the various fruit fly fighting methodologies and IPM package; (iii) socio-economic aspects of mango production in West Africa; (iv) calculating the fruit fly economic damage threshold; and (v) promoting cultural control of fruit flies through enhanced orchard hygiene.

Additional comments on proposed activities

The choice of GF-120

After two consecutive years of testing GF-120 in their pilot orchards in Northern Benin, it has come to the conclusion that the very positive results recorded in the Borgou region (80% less damage in treated orchards, compared to nearby untreated orchards with same cultivars) warrant the dissemination of the use of GF-120 region wide. During Phase 1, dissemination of the use of this product has started by the IITA-CIRAD project at extension level, and Phase 2 proposes to disseminate its use even further.

The intended participants in the series of training sessions and workshops have to be sensitized and mobilized with enough anticipation given that these sessions have to be held before the mango season gets in full swing (March 2009) and farmers become very busy in their orchards. Also production delays at Dow Agrosciences, manufacturers of GF-120, make it necessary to place orders in October for a late December 2008 / early January 2009 delivery.

Phase 2 is intended as an interim program that allows maintaining the momentum started during the 2008 season, while preparing the ground for the much larger Action Plan that has been proposed as an outcome of the EU-funded scoping study.

A stronger network of focal points

The Phase 1 experience showed how important the role of local coordinators is in ensuring the success of a project with a regional coverage. These focal points play an important role in keeping the momentum going and are the interface agents between the program and the local stakeholders be they industry of public services. In 2009 the designation of these focal points will be reviewed in close consultation with each country's agriculture ministry and leading associations, and their remuneration will be adjusted to reflect increased responsibilities.

Inclusion of Togo among participating countries

During the 2008 season, Togo made repeated requests to get included in the WB-sponsored fruit fly initiative, and it has been decided to add Togo to the existing eight countries, this making a total of eight beneficiary counties for Phase 2.

Expected impact of the Project:

The most recent estimates of economic damages inflicted by the various fruit fly species commonly present in West Africa were reported by the Italtrend report recently commissioned y the EC. The reported estimates on mango production, gathered from numerous interviews with scientists, growers associations and plant protection personnel in all countries covered by the study, vary (depending on areas, cultivars and specific period) between 30% and 80% of production. The authors of the report have also reported, in all the eight countries investigated, varying degrees of economic damages inflicted by fruit flies to other fruit of commercial importance (citrus, papaya guava), and also vegetables (cucurbitacae) are also reported to be significantly affected by flies.

An interim program pending the implementation of the EC Action Plan

The proposed Phase 2 must be seen as an interim program, needed to maintain the momentum that has been created during Phase 1 in 2008, before the EC-sponsored Action Plan becomes operational. At this stage, it is not expected that this could happen before late 2009 at the earliest, which would be too late for the 2009 mango season in West Africa.

This Phase 2 program has been designed in close alignment with the EC Action Plan as proposed in the Italtrend Study. As a matter of fact the Italtrend's team visited IITA's Cotonou station on several occasions in the course of their missions in West Africa, and they had numerous scientific exchanges with Dr. JF Vayssieres, in charge of the IITA-CIRAD fruit fly regional project. The activities proposed by IITA and CIRAD for the 2009 mango season are in line with the major premises of the EC Action Plan and a number of activities can be seen as precursors to what will be developed, both at the national level and regionally, but on a much larger scale by the EC Action Plan, once it will have been funded.

IITA-CIRAD's proposed Phase 2 Program in largely compatible with the regional approach recommended by the Italtrend study. In order to illustrate this compatibility, we reiterate here below Italtrend's six major recommendations for the regional Action Plan, and describe how the IITA-CIRAD team planned or existing interventions in these areas will contribute to the AP objectives:

7.1 Support to formation of National Fruit fly control committees

The 2008 exercise has confirmed the importance of having at national level an active public /private body to promote fruit fly issues within the country's stakeholders. Besides Senegal, which already has an active national Committee, Dr JF Vayssières and Dr A. Sinzogan have also initiated the creation of a similar committee in Benin in 2008. In the other countries, the setting up and maintaining of national committees will be an important responsibility of the focal points recruited by the Program.

7.2 Support to organization of pest management research and development

In this area, Phase 1 has seen the emergence of a regional approach in terms of R&D, with IITA taking the lead in coordinating contacts and exchanges with other relevant scientific institutions:

WARDA-Cotonou, CIRAD in Réunion Island and Montpellier, ICIPE in Nairobi, the Belgian Museum in Tervuren. The protocols designed by IITA to carry out dissemination of chosen R&D applications are obviously the same in all countries, in order to generate data that are compatible and will serve to set up a regional data base.

7.3 Support for regional development and dissemination of information and training products
In 2008, a set of five training brochures have been designed and published by IITA and CIRAD in both French and English. They have been widely distributed at the various workshops held during the mango season. Another set of five, on different aspects of the fight against fruit flies, will be produced as part of Phase 2.

7.4 Support for regional pest assessments and deployment of pest management technologies
In this area, the IITA-CIRAD team is currently developing standardized sampling protocols to measure fruit fly inflicted damages to fruit production (contribution of respective individual fruit fly species on each mango cultivar) and the prevalence of parasitoids on these species. Success Appat (GF-120) is now registrated in CILSS countries. Also it is important to note that Spinosad (the toxicant used in the GF-120 bait also called Success Appat) has been approved for use in organic agriculture, which makes its use possible for area-wide bait application technique (BAT) in organic orchards.

7.5 Support for regional development of fruit fly taxonomy and identification
IITA has been collaborating closely for a number of years with the Royal Museum for Central Africa (Tervuren, Belgium, Dr. de Meyer) to expand the "African Fruit Fly Database". Regular contribution to this database is very important to keep an updated diagnostic tool for the identification of the Asian fruit fly species already established in sub-Saharan Africa (such as *bactrocera invadens),* in compliance with IPPC and WTO rules.

7.6 Support to the development of fruit inspection and phytosanitary management capacity
The WB-financed Phase 1 also contracted CIRAD France to conduct a pilot post harvest using the hot water treatment at the fruit terminal of Bobo Dioulasso in Burkina Faso. If found satisfactory (the report is being compiled at CIRAD headquarters in Montpellier, France), the use of this post harvest treatment technique could be extended to other packing stations in the sub-region.
IITA, through their pilot stations located in Northern Benin and Northern Cameroun, also participate in a detection network to detect arrival of new species such as *Bactrocera zonata*. As per the Italtrend recommendation, this could be expanded to become a systematic regional pest risk assessment for exotic fruit fly quarantine threats.

It is then expected that by mid 2009 the Action Plan proposed under the EU-funded Italtrend study, which has recently been endorsed by both WAEMU and ECOWAS, will have obtained sufficient donor commitment to be implemented. This, in turn, will permit a massive regional scale up of some of the very techniques that will have been developed, at pilot orchard level, under IITA-CIRAD's Phase 1 and Phase 2 programs

STDF – Grant application Form
Regional Initiative on the fight against fruit flies in West Africa
Appendix 2: project management structure

The management of the Project will be entrusted to IITA's head scientist on fruit fly research, Mr. Jean-François Vayssières, CIRAD scientisit, hosted by IITA and based at the IITA Cotonou Station, Benin.

In turn Mr. Vayssières will recruit a team to be based at the IITA office in Cotonou, Benin, that will be dedicated to the implementation of this Phase 2 project.

The team will comprise:

- Two assistants with relevant background in R&D, applied research and field experience will back up Mr. J.F. Vayssières (each on will cover four countries)

Each of them will have the following responsibilities:

- Preparing the ground, in their respective countries for main activities as listed in the PET (training sessions, workshops etc.)
- Regularly following up with the respective focal points the timely implementation of the local action plan that will have been agreed at the beginning of the Project with each focal point in each of the eight countries;

A secretary also able to do book keeping

In Montpellier, one CIRAD scientist will be the main contact to develop training material on post-harvest fruit fly control, Mme Marie-Noelle Ducamp-Collin.

Project Steering Committee:

It is envisaged that a Project Steering Committee will be formed to oversee the Project's implementation. This Steering Committee will be comprised of three members:

- A CGIAR representative (as the main financiers to IITA)
- A representative from another scientific institution (e.g. ICIPE)
- A World Bank representative

The PSC will meet (in person or virtually) at least twice a year to oversee the implementation of the Project.

OBJECTIVES	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
General programme Goal To promote mango value chain by productivity increase, quality improvement and trade through the effective management of FF in WA.	Increase in quantity of good quality mango for export in the pilot project sites by the season 2009.	National statistics; data requests from other countries; published impact data.	Socio-economic and political conditions remain favourable for production and export of mangos.
Project purpose (a) Access of producers to opportunities for growing FF free quality mango. (b) Improve trade with Europe and USA through compliance with standards for quality mangos.	(a) Significant reduction in FF infestation in pilot project sites, capacity increased for mango FF management. (b) Effect of FF larvae decreased in mango to be commercialised from PO; distribution of mango FF /country.	(a) Production records from project pilot sites. (b) Survey records from pilot project sites /AEZ.	Sustained demand for quality fruit. Demand for database for the distribution of mango FF.
Outputs (a) Effective and efficient options for FF management are available to mango growers in WA (b) Workshops for trainers, growers and exporters.	(a) Methods adapted, improved, developed and used by growers. (b) Different workshops timely organised.	(a) Number of publications and reports. (c) Number of workshops timely held.	Techniques for FF management are appropriate and adapted to WA mango FF. All stakeholders timely identified.
1. Improving capacity of the team (in Cotonou) to reach our objectives	Two assistants appointed for R4D and training activities in the 8 WA countries.	(a) Production records from PO, number of technicians and growers trained /AEZ. (b) Number of reports… (c) Survey records from PO/AEZ.	(a) Each assistant will be in charge of 4 WA countries. (b) Each assistant will be responsible of trimestrial reports of activities.
1 bis. Improving capacity of the team (in Cotonou) to reach our objectives	One comptable-secretary appointed.	Comptable situation reports of the project.	Monthly comptable reports.

1 ter. Improving capacity of the team (in Cotonou) to reach our objectives	One driver appointed.	Assisting all experiments in Benin (detection, MAT, Ants…)	Vehicule from IITA available.
2. Providing materials for pilot-orchards (PO) for the continuation of 2008 activities.	Situation of mango FF infestations collected and provided at each WA country	60 thermohygrometers, 250 traps, 50 000 attractants-DDVP (WB and OMC funds).	Database for the distribution and population fluctuations of mango FF.
3. Training of trainers = 1st level.	Training of 20 trainers (of fruit sector) per country.	8 countries: Benin, Faso, Ghana, Guinea, Mali, Côte d'Ivoire, Senegal, Togo.	All the trainers identified in November-December 2008.
4. Training of growers (through their associations) = 2d level.	Training of growers: 3 growers of PO / AEZ + 22 other growers / AEZ => 25 growers / AEZ / country.	8 countries: Benin, Faso, Ghana, Guinea, Mali, Côte d'Ivoire, Senegal, Togo.	All the growers identified in November-December 2008.
5. Training of exporters (of private sector)) = 3d level.	Training of exporters in each capital (the 10 or 12 most effective and motivated ones).	8 countries: Benin, Faso, Ghana, Guinea, Mali, Côte d'Ivoire, Senegal, Togo.	All the exporters identified in November-December 2008.
6. Monitoring of different activities in each WA country.	Appointement of a « focal point » in each WA country.	Each « focal point » in charge of monitoring activities of his own country.	All the « focal points » identified in November-December 2008.

Annex 4: Financial Proposal (in $US)

Objectives	Functions or activities	Staff salaries	Materials costs	Travels costs	Workshops costs	Total (US $)
1. Improving capacity of the team (Cotonou) to reach our objectives.	Two assistants appointed for R4D and training activities during 15 months.	16 800				**16 800**
1 bis. Improving capacity of the team to reach our objectives.	One comptable-secretary appointed during 15 months..	2800				**2 800**
1 ter. Improving capacity of the team to reach our objectives.	One driver appointed during 15 months..	1 600				**1 600**
2. Providing materials for the continuation of 2008 trapping activities in (PO).	Monitoring of detection trapping in each country during 8 months..	30 000	12 000			**42 000**
3. Training of trainers = 1st level.	Training of 20 trainers (of fruit sector) per country.			5 000	35 000	**40 000**
4. Training of growers (through their associations) = 2d level.	Training of 25 growers / AEZ / country.			15 000	60 000	**75 000**
5. Training of exporters (of private sector)) = 3d level.	Training of 10 or 12 exporters / country.			5 000	35 000	**40 000**
6. Monitoring of different activities in each WA country.	Appointement of a « focal point » in each WA country during six months.	36 000				**36 000**
Total						**254 200**
Unexpected (10%)						**25 420**
Total						**279 620**

Annex 5: Timetable with 0utputs (O) in 2009-2010

	12/08	01/09	02/09	03/09	04/09	05/09	06/09	07/09	08/09	09/09	10/09	11/09	12/09	01/10	02/10
Funding											*OMC*	*OMC*	*OMC*	*OMC*	*OMC*
1. Two assistants appointed for R4D and training.											**X**	**X O**	**X**	**X**	**X O**
1 bis. One comptable-secretary appointed.											**X**	**X O**	**X**	**X**	**X O**
1 ter. One driver appointed.											**X**	**X O**	**X**	**X**	**X O**
2. Monitoring of FF detection trapping / each country.									**X**	**X**	**X**	**X**	**X**	**X**	**X**
3. Training of 20 trainers / country.				**X O**											
4. Training of 25 growers / AEZ / country.					**X O**	**X O**									
5. Training of 10-12 exporters / country.						**X O**									
6. Appointement of a « focal point » / each country.								**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**