

# PIP SURVEY

January 2012



## Questionnaire on crop protection and PIP tools





Created in 1973, the COLEACP is an inter-professional association that represents and defends the interests of African, Caribbean and Pacific (ACP) producers/exporters and European importers of fruit, vegetables, flowers and plants.

Through the PIP Programme, funded by the European Union and implemented since 2001 at the request of the ACP Group of States, the association encourages and helps its members and other private sector stakeholders (e.g. retailers) ensure that the horticultural trade contributes towards achievement of the Millennium Development Goals. Horticultural exports help to reduce poverty, especially among disadvantaged groups such as smallholders or rural women whose opportunities for income generation are limited. Furthermore, developments in the horticultural export sector in ACP countries have a knock-on effect, also benefiting production for local and regional markets.

## SUMMARY AND CONCLUSIONS

In 2010, PIP Market Access Component issued a questionnaire to ACP export companies covering three main themes. The primary aim was to obtain feedback on their experience and opinions of the PIP Crop Protocols and Plant Protection Guides in order to ensure that they fully meet the needs of PIP beneficiaries. The survey also explored the main plant protection products (PPPs) used by these companies, as well as information on production-related problems and needs for technical assistance. Thirty two companies responded.

The survey revealed a wide range of PPPs currently in use on export crops. PIP is in the process of evaluating the potential impact of changes to EU regulations in terms of the likely future availability of PPPs on crops imported into the EU. A good understanding of the PPPs currently available and used will help PIP to identify and direct R&D at potential problem areas where key products could be withdrawn.

The questionnaire also explored production problems with which companies need additional support. The aim was to provide feedback to the PIP Training Unit and Country Managers, as well as to make any necessary adjustments to the Crop Protocols and Guides. The findings supported lines of work that are already in progress, for example to tackle pesticide registration on minor crops. General and specific technical assistance needs were also identified to address crop and pest problems. Of particular significance was the interest of companies in integrated and alternative pest management strategies, perhaps to meet buyer demands, or to address particularly difficult pest problems.

Some companies, who were very recent beneficiaries of the programme, mentioned the need for support in core areas of PIP business such as pesticide safe use, food safety, hygiene, and GAP. Others requested support in the sustainability arena, including carbon footprinting, social accountability and environmentally sensitive production. The Crop Protocols and Guides are currently directed primarily at pest management, but survey respondents highlighted the need to put more emphasis on general agronomic practices (fertiliser, irrigation, varieties, cultural control, etc) in addition to pest control.

Some questions raised were dealt with by PIP immediately on receipt of the query. Other requests for information or technical assistance that fell outside the remit of PIP, or were of a very local nature (e.g. names of suppliers, local products names) were passed on to relevant national bodies such as extension offices or commodity/exporter associations.

Several respondents mentioned the need for more information on MRLs, and in response PIP now provides and regularly updates information on EU and CODEX MRLs on the programme website. Some of the feedback indicated that PIP needs to highlight to beneficiaries all the information that is available from the programme in terms of technical documents as well as via the website.

The survey also revealed information on serious or emerging pest problems where there are currently few available and affordable control options and additional research is needed. PIP is using this information to guide internal activities. Examples include: control of mealy bug in papaya, identification and testing of a solar protectant in pineapple, technical assistance to use pheromones traps for *Tuta absoluta*. Based on survey feedback, PIP is also now working on simplified and locally translated versions of the Crop Protection Guides, as well as simplified technical itineraries for training farmers and farm workers.

PIP has also shared information on research needs with other research or funding agencies (e.g. PAEPARD, ENDURE) and is actively collaborating with other national and international agencies (e.g. FAO) in combined efforts to address difficult problems such as fruit fly and mealy bug.

## 1. INTRODUCTION

In 2010, PIP Market Access Component issued a questionnaire to 207 export companies in ACP countries that had signed a memorandum of support with the programme. The questionnaire covered three main themes.

The primary aim was to obtain feedback from these companies on their experience and opinions of using PIP tools and publications. The questions focused specifically on tools developed by the “Market Access: Regulations and R&D Team” and covered the PIP Crop Protocols, Guides to Good Crop Protection Practices, and information services such as the MRL database. The objective is to use this feedback to improve the tools in terms of (for example) their design, content, or accessibility, so that they better meet the needs of PIP beneficiaries.

The questionnaire also explored the main plant protection products (PPPs) used by these companies. PIP is in the process of evaluating the potential impact of changes to EU regulations in terms of the likely future availability of PPPs for the main export crops. A good understanding of the PPPs currently used will help PIP to identify potential problem areas where key products could be withdrawn.

Finally, the questionnaire asked companies about production problems, including pests, with which they need additional support. The aim was in part to provide feedback to the PIP Training Unit and Country Managers, as well as making any necessary adjustments to the Crop Protocols and Guides. However, it was also an opportunity to identify emerging or serious pest problems for which there are few or no available and affordable control options. PIP is using this information on research needs to guide internal R&D activities, as well as sharing it with other research or funding agencies.

## 2. METHODOLOGY

The questionnaire was given to 207 companies during PIP meetings, field visits or training sessions. A total of 32 companies returned the questionnaire, spread among 9 countries (number of companies in parenthesis): Burkina (9); Cameroon (3); Ivory Coast (1); Ghana (4); Kenya (8); Mali (1); Senegal (3); Tanzania (1); and Uganda (2). These included some companies that had been in receipt of PIP support during Phase 1 of the programme, as well as some companies that were new beneficiaries.

Between them, these companies produced a wide variety of fruit and vegetable to supply local and regional as well as EU (and other) markets (See Appendix 1). Note that company names have been modified to protect confidentiality.

## 3. FINDINGS AND CONCLUSIONS

### 3.1 Plant Protection Products in Use

Respondents were asked: “For each crop produced (commercialized), list the pests and diseases found during production or during post-harvest, and name the Plant Protection Products (PPP) used”. The wide list of product cited by respondents is given in Appendix 2. This information will be cross-checked against the list of products that may be lost under the EC Directive 91/414 review process.

### 3.2 Difficult Pest or Production Problems

Respondents were asked if they have any particular crop-related problems that are difficult to solve, and to describe any additional information or technical support that they need. A summary of responses is given below, and full responses in Appendices 3 and 11. Some of information collected, specific to the topics covered, is included in the relevant sections of the report (below).

#### • General Issues and Requests for Support

- More information on carbon footprinting (Kenya, Ghana) and on sustainable production, including new requirements on environment, social accountability, ethical trade and organic production (Ghana, Kenya)
- PIP could help to develop software that pulls together data on all important aspects of production. This could then be used to organise data for certification: GlobalGAP, FLO, Carbon Trust, and Rainforest Alliance (Ghana). Training to give a better understanding of audits and auditor requirements for EU markets (Kenya), especially GLOBALGAP, would also be beneficial.
- PIP provides technical advice on PPPs, but it would be helpful if, alongside this, information could be given on suppliers of key products. Also, a list of suppliers of suitable equipment for pesticide and fertilizer applications, land preparation, etc. (Ghana, Tanzania) would be valuable.
- The lack of locally registered products for minor crops was highlighted as a real problem (e.g. avocados in Kenya). Better coordination is needed between industry and government departments to assist with PPP registration, particularly with biopesticides (Kenya).
- More technical support is needed on alternative methods of pest and disease control (including biocontrol) (Kenya, Ghana, Burkina), especially for difficult pests such as nematodes (Senegal). There is a need for increased availability of biopesticides (Burkina).
- There is a need to reduce negative environmental impacts, as well as addressing existing environmental problems, such as degraded soils (Cameroon).
- Many respondents identified a need for assistance to address difficult pest problems, and details are given in later sections. However, the need for more technical assistance on general agronomic practices was also mentioned by many respondents. Some of these covered general aspects of management (e.g. fertiliser, crop rotation, irrigation, cultural control), and others cited very specific topics such as hydroponic production (Senegal), soil classification (Ivory Coast), seed quality (Burkina), and crop rotation on smallholder plots (Kenya).

- **Avocado**
  - High levels of flower and fruit abortion, and a high incidence of disease (anthracnose and cercospora) during the wet season (Kenya)
  - Need help with techniques to apply chemicals to very tall trees (Kenya)
  - False codling moth (Kenya)
- **Papaya**
  - In Ghana, mealybug is having a very serious effect on the papaya industry. 95% of papaya farms are said to be affected. PIP is already acting on this problem, in collaboration with others, including FAO.
- **Pineapple**
  - EU MRLs have restricted the availability of selective herbicides for use on pineapple. This makes it difficult to ensure effective weed control and gives rise to ants/mealybug attacks (Ghana)
  - Technical advice is needed to address some production and pest problems –including disease and nutrient management. (One element of this – sun damage – has now been addressed by PIP through facilitating trials and links with a company producing a solar protectant – Purshade). (Ghana)
  - Production-related technical assistance and training needed, for example soil types vs pineapple varieties (Ivory Coast)
- **Mango**
  - Fruit fly (Ghana, Kenya, Mali). Training is needed for early detection (Mali, Burkina).
  - Technical assistance is needed to address a variety of production problems - there is a general lack of capacity among producers, resulting in low yields etc. (Burkina). This includes aspects such as pruning
- **Vegetables in general**
  - Disease control in the rainy season. In particular, there are no pesticides registered for root rot in vegetable. (Kenya)
  - Need for more training of smallholders to ensure good practice and ensure that exports comply with EU MRLs and food safety requirements
  - Need increased availability of PPPs (Burkina)
  - Help is needed with scouting, e.g. pea pod borer in Tanzania
  - Breeding and grafting of Solanaceae and Cucurbitaceae (Senegal).

### 3.3 Difficult-to-Meet MRLs

Respondents were asked if they have difficulties meeting the MRLs fixed by their destination markets (including regulations, as well as specific buyer requirement, for example for zero residues, or MRLs lower than the official MRLs, or active substances prohibited by the buyer). If so, they were asked if they needed any specific assistance to address these difficulties. A summary of responses is as follows (unedited responses are given in Appendix 4):

- In Senegal respondents said that meeting the requirements of their Dutch and German buyers is particularly difficult (all 3 responding companies). They set a maximum of 70% of the EU MRL for each active ingredient, and a maximum of 80% of the sum

of MRLs. For some crops there is also a maximum number of active ingredients that leave detectable residues (5 on tomato). It is very difficult to meet these requirements, especially at times of high incidence of TYLCV.

- In Kenya, no significant MRL issues were identified at the current time, but there could be problems in the future as product withdrawals come into force, for example the endosulfan ban coming into effect in 2011. The suitability and effectiveness of alternatives need to be tested and verified.
- In Ghana, ethophon residues are still a problem. At certain times of the year it is difficult to achieve a good effect, which leads sometimes to over application and MRL exceedences. Unfortunately, ethophon cannot be avoided as it is essential with MD2 to ensure that it is supplied in the condition required by clients.
- None of the respondents in Burkina, Mali or Tanzania identified MRL-related problems. In Burkina, Mali, and Cameroon, this was said to be due to the fact that respondents were largely growing organic crops. For the remainder, availability of suitable products and application of GAP minimise potential problems.
- In Uganda producers have problems meeting MRLs (which they felt to be due to high pest incidence, rather than poor practice). In Ivory Coast, respondents identified the need for more training in IPM. In Cameroon, problems with smallholder outgrowers were mentioned, and the need for additional training in GAP
- Some specific requests for technical assistance were made to PIP:
  - i. Some issues were dealt with by PIP immediately on receipt of the query (e.g. clarification whether Hyvar X and diuron are permitted on export pineapple)
  - ii. Trials and lobbying of PPP companies to make products available for post-harvest fungicides on pineapple, as well as post-harvest waxes (Ghana)
  - iii. Help to identify insecticides, herbicides and nematicides permitted on fair trade certified pineapple (Ghana)
  - iv. Training of farmers on MRLs and PPPs application (Senegal, Burkina, Kenya)
  - v. Capacity building on MRL requirements (Kenya)

### 3.4 Efficacy Problems

Respondents were asked if they experience efficacy problems with any PPPs, and additional assistance needed to resolve them. The responses are summarised below, and full responses given in Appendix 5:

- Fake products and poor quality of formulations were identified as problematic in Ghana, Burkina, and Cameroon. Better control/analysis of formulations was said to be needed for pesticides and fertilisers.
- Some pests are difficult to control with the available PPPs. Those mentioned included nematodes on pineapple (Kenya) and tomato (Senegal); banana diseases (Burkina), bean rust (Burkina); mealy bugs (Ghana, Ivory Coast) and pineapple wilt (Ivory Coast). Assistance from PIP was mentioned to identify and source products for nematode control in pineapple and tomato, and information (with guides, brochures) for control of mealy bugs.
- Resistance problems were highlighted, for example aphid resistance to pyrethroids. Others identified decreasing efficacy (eg. insecticides in Kenya and Burkina), again perhaps due to resistance. EU regulations have restricted the active ingredients that can be used, and removed some of those most effective; this makes resistance

management difficult as there are few products to alternate (e.g. pineapple in Ghana). Training for producers in resistance management was specifically requested in Burkina and Kenya.

- Resistance problems might be exacerbated by the use of reduced dose applications, for example in Uganda, where this practice was cited and said to be the result of the high cost of PPPs
- In general, technical assistance is needed to meet residue requirements while at the same time achieving adequate control. In particular, help is needed to achieve increased efficacy of fungicides, especially in wet conditions.
- Efficacy problems were also mentioned in biocontrol products (including *Bacillus thuringiensis* that has been used for 3 years in Senegal, but with unreliable results). There was a request for advice for producers on application methods, dose rate and timing for Bt (Senegal). Producers in Burkina cited a need for assistance to find an alternative to Success Appat, as well as more training in IPM

### 3.5 Availability of PPPs

Respondents were asked if the available/registered PPPs in their country allows them to address all the “uses” needed and, if not, what additional problems need to be considered?

Responses are summarised below, and full responses given in Appendix 6:

- The lack of locally registered products for use on horticultural crops was said to be a problem in several countries. For example:
  - In Ghana, few substances are registered for use on specific horticultural crops, though they are registered for use on other crops (e.g. chlorpyrifos is registered for vegetables and citrus, but not pineapple). Post-harvest fungicides for pineapple and mango are not listed on the Ghana approved pesticides list. There are no selective herbicides for pineapple, and the non-selective herbicides are not efficient for all weeds.
  - Of the 86 pesticides registered in CILSS, few are specifically for horticulture
  - In Kenya there are very few products registered for use on avocado; some pests are not covered, so producers use PPPs registered for other crops. New products are also needed to support an IPM strategy, e.g. registration of more pheromone attractants
  - In Burkina there are no specific products registered for use on banana, as well as a shortage of products for use in organic systems. In particular, control methods are needed in organic mango for red ants and mealy bug
  - In Cameroon there is a general shortage of registered products for horticulture New products are needed using pheromone attractants (*Kenya*)

- The lack of locally registered products causes significant problems, particularly for companies seeking GLOBALGAP certification (Ghana, Senegal)
- Even when products are registered, they are not necessarily available (or affordable) on the local market (Senegal, Cameroon). Also, even when registered products are available, the range is often very small, thus limiting options available in a resistance management strategy.
- In Uganda there is a particular problem with the national system whereby registration is not done according to crop. The most effective PPPs are thus not registered specifically for horticulture. A specific request was made for PIP to help Uganda to develop a crop-specific approved products registration list

### 3.6 Non-chemical control methods

Respondents were asked if they had any particular problems or needs concerning the use of alternative methods of pest control (e.g. cultural, natural enemies, biopesticides). Results are summarised below and full responses given in Appendix 7.

There was a real interest among respondents in using alternative (non-chemical) methods of pest management. Some particular cases were cited where respondents feel that new alternatives (or integrated pest management) are particularly important:

- *Phytophthora* (Ghana);
- fruit flies on mango (Ghana, Mali, Kenya, Burkina)
- post-harvest moulds on pineapple (Ghana)
- nematodes in pineapple (Ghana) and tomatoes (Senegal)
- false codling moth (Kenya)
- pheromone-based methods (Kenya)
- insect pests, thrips and mites for crops such as hot pepper (Burkina, Mali, Kenya, Uganda)
- pests in greenhouse tomatoes (Cameroon)
- *Fusarium* control (Tanzania)

Respondents identified some specific areas where support from PIP or other agencies could support implementation of alternative management strategies:

- “In Ghana fruit fly on mango, and nematodes and post-harvest moulds on pineapple, are the most prominent examples where we are looking for alternative control. PIP could support with professional advice support trials”.
- More training is needed on identification of biological agents/natural enemies (Kenya) and basic training in IPM (Ghana) and biocontrol (I. Coast)
- PIP trials to test alternative methods for control of *Phytophthora* (Ghana)
- In Senegal, some alternative control methods for nematodes have been tested already. Now training and developing local expertise is needed.
- Technical assistance in using pheromones traps for *Tuta absoluta* (Senegal)
- Assistance with registration of biological control agents (Kenya)
- Acquisition & multiplication of natural enemies of thrips and white fly in hot pepper (Kenya, Uganda)
- Research/technical assistance on resistant varieties as well as cultural control techniques in beans and mango (Burkina)

### 3.7 Pest Identification

Respondents were asked if they experience problems in pest/disease identification, and any additional assistance they need in this respect. Complete responses are given in Appendix 9:

- Problems are experienced, particularly for pests that are uncommon. Disease problems were mentioned most frequently, including fungal, bacterial and viral disease in general (Burkina); also rots, wilt and phytophthora in pineapple (Ivory Coast, Ghana)
- Additional training in pest identification would be helpful (Uganda, Burkina, and others), as well as better understanding of lifecycles (Senegal). In Senegal, it was recommended that capacity building in pest identification needs to be done in collaboration with the national authorities
- A guide /manual for identification of pests in horticulture would be very welcome (Burkina). In particular, tools that could be used by (and during capacity building of) farmers and farm workers. Simplified and locally translated versions of the PIP Crop Protection Guides were suggested, giving pictures and easy identification of the main pests and diseases (*Burkina, Tanzania, Senegal*).
- Help is needed in particular for identification of fruit fly species (Burkina, Kenya). In Kenya, for example, at present, the only source of information is the Nairobi Museum, but this is impractical and expensive.

### 3.8 Information on EU Regulations

Respondents were asked if they receive sufficient information from PIP about EU regulations, and if this is delivered in a form that is easily understood. Responses are summarised below, and full responses given in Appendix 8:

- Positive feedback was received from Ivory Coast, Mali, Uganda, Burkina, and some companies in Kenya on the quantity and quality of information
- Some companies had only recently begun to work with PIP, and were not fully aware what was available
- In Burkina one company said that information is received and is understandable; another said that more information on MRLs would be useful, especially for bean exports to the EU. Another had not yet received this information from PIP.
- Some companies said that more specific information on regulations and MRLs would be useful; another said that the website was helpful for this information

### 3.9 PIP Crop Protocols, Guides and Tools

Respondents were asked if they experience difficulties understanding the information provided in the PIP Crop Protocols and Guides. Full responses are given in Appendix 10.

In general, for those companies who are in receipt of PIP support and familiar with the PIP Crop Protocols and Guides, comments were positive. However, some useful feedback and suggestions were received:

- Most farmers know chemicals by their trade name and do not know the active ingredient. It is therefore difficult to relate trade name with active ingredient – especially as there are sometimes many products in the market with same active ingredient but with

different trade names. This is very confusing for farmers. PIP could help by including trade names in the Guides (Ghana).

- Simplified technical itineraries (tools) that trainers could use when training farmers and workers would be very welcome (*Burkina*)
- Some specific training for trainers on using the Crop Protocols and Guides
- The information in the protocols guides is sometime very theoretical. Verification and demonstration in the field would be beneficial (Burkina)
- It would be helpful to have more training tools to transfer information to workers and farmers, perhaps using videos (Senegal) or PowerPoint (Burkina)

## APPENDIX 1: LIST OF RESPONDING COMPANIES INDICATING PRODUCE SUPPLIED AND DESTINATION MARKET

Company names have been modified to protect confidentiality

Crop	Company	Local market	Regional market	EU market	Other markets
Avocado	Kenya 3			X	
Avocado	Kenya 4			X	
Avocado	Uganda 1			X	
Asparagus	Senegal 1			X	
Aubergine	Uganda 1			X	
Aubergine	Uganda 2			X	
Baby-corn	Kenya 1			X	
Baby corn	Tanzania 1			X	
Baby corn	Kenya 7			X	
Baby corn	Kenya 8			X	
Baby corn	Kenya 2			X	
Baby aubergine	Kenya 1			X	
Baby aubergine*	Uganda 1			X	
Baby carrot	Kenya 1			X	
Banana	Kenya 4	X			
Banana	Burkina 2	X			
Banana	Uganda 1			X	
Banana	Uganda 2			X	
Beans (green)	Burkina 4	X		X	
Beans (green)	Burkina 5			X	
Beans (green)	Senegal 2			X	
Beans (green)	Burkina 3	X			
Beans (sim)	Uganda 1			X	
Beans (green)	Burkina 6			X	
Beans (green)	Burkina 9	X		X	
Beans (runner)	Kenya 2			X	
Beans (fine)	Kenya 2			X	
Beans (fine)	Kenya 5	X		X	Middle east
Beans (runner)	Kenya 6			X	
Beans (fine)	Kenya 6			X	
Beans (French)	Kenya 7			X	
Beans (fine)	Kenya 8			X	
Beans (fine)	Tanzania 1			X	
Bean (green)	Cameroon 3	X	X		
Bean (green)	Senegal 3	X		X	
Broccoli	Kenya 2			X	
Cabbage	Senegal 3	X	X		
Carrot	Cameroon 3	X	X		
Carrot	Senegal 3	X	X		
Cherry tomato	Senegal 1			X	
Cherry tomato	Cameroon 1	X	X		
Chilis	Kenya 2			X	
Chilis	Senegal 2	X		X	
Chilis	Tanzania 1			X	

Chilis	Uganda 1			X	
Chilis	Uganda 2			X	
Coconuts	Cameroon 3			X	
Coconuts	Ghana 4			X	
Corn	Senegal 2	X			
Corn (sweet)	Senegal 1			X	
Courgette-zucchini	Cameroon 3	X	X		
Curry leaves	Kenya 8			X	
Ginger	Cameroon 1	X		X	
Hibiscus	Burkina 8			X	USA
Jackfruit	Uganda 1			X	
Lettuce	Cameroon	X	X		
Mango	Kenya 4	X		X	Middle East
Mango	Burkina 1	X		X	
Mango	Burkina 2	X		X	
Mango	Burkina 4		X		
Mango	Ivory Coast 1			X	
Mango	Mali 1	X	X	X	
Mango	Uganda 1			X	
Mango	Burkina 7	X	X	X	Switzerland
Mango	Burkina 8			X	USA (Dried)
Mango	Burkina 9			X	
Mango	Cameroon 1	X		X	
Mango (Keit, Kent)	Ghana 4			X	
Mango	Senegal 3	X		X	
Mangetout	Kenya 1			X	
Melon	Cameroon 3	X	X		
Okra	Uganda 1			X	
Okra	Uganda 2			X	
Okra	Kenya 7			X	
Onions	Burkina 3	X	X		
Onions	Burkina 5	X	X		
Onions	Burkina 6		X		
Onions	Senegal 2	X			
Onions	Senegal 3	X	X		
Papaya	Ghana 3	X		X	
Papaya	Cameroon 1	X		X	
Papaya	Ghana 4			X	
Pineapple	Ghana 1	X		X	Middle East
Pineapple	Kenya 3	X		X	Middle East
Pineapple	Ghana 2	X		X	Middle East
Pineapple	Cameroon 3			X	
Pineapple	Cameroon 1	X		X	
Pineapple-cayenne	Cameroon 2			X	
Pineapple MD2	Ghana 4			X	
Pineapple SC	Ghana 4			X	
Pineapple Queen	Ghana 4			X	
Pineapple sugar loaf	Ghana 4			X	
Potatoes	Burkina 5	X			
Potatoes	Senegal 3	X	X		
Potatoes	Kenya 7	X			

Sweet potatoes	Uganda 1			X	
Peanuts	Senegal 2	X			
Peanuts (fresh)	Senegal 1	X		X	
Peas (Snow)	Kenya 2			X	
Peas (snow)	Kenya 5	X		X	Middle East
Peas (snow)	Kenya 7			X	
Peas (Snow)	Tanzania 1			X	
Peas (Garden)	Kenya 1			X	
Peas (garden)	Kenya 6			X	
Peas (Garden)	Kenya 2			X	
Snow peas	Kenya 8			X	
Peppers	Cameroon 3	X	X		
Sesame	Burkina 8			X	Canada
Sugar snap	Kenya 2			X	
Sugar snap	Kenya 5	X	X	X	
Sugar snap	Kenya 6			X	
Sugar snap	Kenya 7			X	
Sugar snap	Kenya 8			X	
Sugar cane	Uganda 1			X	
Tomato	Burkina 3	X	X		
Tomato	Burkina 5	X	X		
Tomato	Burkina 6		X		
Tomato	Senegal 2	X		X	
Tomatoes	Kenya 7	X			
Turnip	Cameroon 3	X		X	

\*garden eggs



## APPENDIX 2: CROP PESTS AND CROP PROTECTION PRODUCTS USED TO CONTROL THEM BY QUESTIONNAIRE RESPONDENTS (LISTED BY CROP)

Avocado		
Crop Pest	Plant Protection Products	Active Ingredient
Cystate weevils	Pesthrin	Pyrethrins
Mosquito larvae	Pesthrin, Thionex	Pyrethrins, Endosulfan
Mites	Dynamec	Abamectin
Fruit Fly	Nu-Lure + insecticide	Endosulfan
False codling moth		
Anthraxnose	Topsin	Copper Oxide, Copper hydroxide, Copper Oxychlorid Thiophanate-methyl
Cercospora	Topsin	Copper Oxide, Copper hydroxide, Copper Oxychloride Thiophanate-methyl
Phytophthora (fruit rot)	Ridomil	Fosetyl-Aluminium Metalaxyl Mefenoxam + Mancozeb
Fruit fly	Decis	Deltamethrin Protein hydrolysate + Malathion
Stink bug		Deltamethrin Organophosphates
Scale insects	DC-Tron Plus	Mineral oil
Mites		Dimethoate

Cabbage		
Crop Pest	Plant Protection Products	Active Ingredient
Plutella	Neemix Biobite	? ?
Thrips	Decis	Deltamethrin

Banana		
Crop Pest	Plant Protection Products	Active Ingredient
Yellow Sigatoka		Copper oxide, Copper hydroxide, Copper oxychloride
Cigar end rot		Copper oxide, Copper hydroxide, Copper oxychloride
Nematodes	Nemacur Marshal Achook Rugby Bumper	Fenamiphos Carbosulfan Neem Cadusafos Propiconazole (Triazoles)
Weevils	Leybacid Miral Mocap	Dimethoate Fenthion Isazophos Ethoprofos
Thrips	Decis	Deltamethrin

Papaya		
Crop Pest	Plant Protection Products	Active Ingredient
Mealybugs	Sulphur	Sulphur Chlorpyrifos-ethyl Deltamethrin
Fruit fly		Chlorpyrifos-ethyl Deltamethrin, Cypermethrin
Anthrachnose		Folpet Triadimenol Metalaxyl Mancozeb, Copper
Red spider mites	Sulphur	Sulphur

Chillies		
Crop Pest	Plant Protection Products	Active Ingredient
Powdery mildew	Thiovit	Sulphur
Thrips	Tracer Decis	Spinosad Deltamethrin
Aphids	Brigade	Bifenthrin

Mango		
Crop Pest	Plant Protection Products	Active Ingredient
Powdery mildew	Thiovit	Sulphur
Anthrachnose	Topsin	Copper Oxide, Copper hydroxide, Copper oxychloride Thiophanate-methyl Maneb Folpet Triadimenol Metalaxyl Mancozeb Copper
Bacterial spot	Topsin	Copper Oxide, Copper hydroxide, Copper oxychloride Thiophanate-methyl
Fruit fly	Decis Success appat Methyl eugenol	Deltamethrin Spinosad Protein hydrolysate + Malathion
Scales	DC Tron plus	Mineral oil
Weevils	Leybacid	Dimethoate Fenthion
Cochineals	Actara 25 WG	Thiametoxam
Termites	Pychlorox 480 EC	Chlorpyrifos-ethyl
Locusts		Organophosphates
Thrips		

Runner Bean		
Crop Pest	Plant Protection Products	Active Ingredient
Rust	Sporekill	Didecyldimethylammonium chloride (Broad spectrum sanitation and water treatment solution for use in agriculture & horticulture)
Spider mite	Brigade	Bifenthrin
Caterpillars	Avaunt	Indoxacarb
Leaf miner	Avaunt	Indoxacarb

Pineapple		
Crop Pest	Plant Protection Products	Active Ingredient
Ants & Mealybug	Dursban	Chlorpyrifos-ethyl
Ants & Mealybug	Pirical	Chlorpyrifos-ethyl
Ants & Mealybug	Dimex, Pyrinex/Pyricol	Dimethoate, Chlorpyrifos-Ethyl Carbosulfan
Cochineal		Chlorpyrifos-ethyl
Mealy Bug	Folimat	Diazinon Chlorpyrifos-ethyl Deltamethrin Omethoate
Symphylides		Carbosulfan
Phytophthora	Alliette	Fosetyl – AL Metalaxyl-M Mancozeb
Phytophthora	Ridomil Gold	Mefonoxam
Phytophthora	Ridomil Gold Plus, Alliete/ Athlete	Mefonoxam, Fosetyl-Aluminium
Nematodes	Diafuran	Carbofuran
Nematodes	Rugby	Cadusafos
Nematodes	Marshal	Carbosulfan
Weeds	Glyphader, Round-up	Glyphosate
Weeds	Hyvar X	Bromacil
Weeds		Diuron
Weeds	Round - Up	Glyphosate
<i>Postharvest Treatments :</i>		
Fungus on fruit penduncle	Mirage	Prochloraz
Salmonella, Shigella etc.	Puri-Chlor	Calcium-Hyperchloride 70%
Ripening agent	Mat 480	Ethephon

Broccoli		
Crop Pest	Plant Protection Products	Active Ingredient
Black rot	Kocide	Copper
Caterpillars	Belt	Flubenoxuron

Snow peas		
Crop Pest	Plant Protection Products	Active Ingredient
Powdery Mildew	Thiovit	Sulphur
Thrips	Tracer	Spinosad
Aschocyta	Kocide df Ortiva/Quadris	Copper Hydroxide Azoxystrobine
Aphids	Actara Pirimor	Souffre Abamectine Thiamethoxam Pirimicarbe
Cutworms/Leaf miner		Deltamethrin
Leaf miner/mites	Dynamec 1.8 EC	Tebuconazole
Rust/Powdery mildew	Folicur 250 EW Fugaran OH	Tebuconazole Copper hydroxide

Green Beans (continued)		
Crop Pest	Plant Protection Products	Active Ingredient
Fusarium/root rot ( <i>F. solani f.sp. phaseoli</i> )	SYSTHANE 240 EC DITHANE M 45	Miclobutanil (240 g/l) Mancozeb (800 g/kg)
Graisse du haricot ( <i>Pseudomonas Syringue pv phaseolicola</i> )	SYSTHANE 240 EC	Miclobutanil (240 g/l)
Pourriture du collet ( <i>Corticium rolfsii</i> )	DITHANE M 45 SYSTHANE 240 EC	Mancozeb (800 g/kg) Miclobutanil (240 g/l)
Weeds ( <i>Digitaria horizontalis</i> , <i>Dactyloctenium aegyptium</i> , <i>Paspalum scrobiculatum</i> ,...)	GLYPHALM 360 SL KALACH 360 SL ROUNDUP 360 SL ROUNDUP 450 TURBO Lutte mécanique	Glyphosate (360 g/l) Glyphosate (360 g/l) Glyphosate (360 g/l) Glyphosate (450 g/l)

Tomato		
Crop Pest	Plant Protection Products	Active Ingredient
Helicoverpa	DECIS 25 EC Laser 480 SC Dursban 4 EC Karate max 2.5 WG	Deltamethrin (25 g/l) Spinosad (480 g/l) Chlorpyrifos-ethyl (480 g/l) Lambda cyhalothrin (25 g/l)
White fly		Thiacloprid Pymetrozine Deltamethrin
<i>Aphis craccivora</i>	PACHA 25EC	Lambda cyhalothrin (15 g/l) Acetamipride (10 g/l)
<i>Aphis gossypii Glover</i>	DECIS 25 EC KARATE MAX 2,5 WG DURSBAN 4 EC	Deltamethrin (25 g/l) Lambda cyhalothrin (25 g/l) Chlorpyrifos-ethyl (480 g/l)
<i>Aculops lycopersici</i>	DECIS 25 EC LASER 480 SC DURSBAN 4 EC KARATE MAX 2,5 WG	Deltamethrin (25 g/l) Spinosad (480 g/l) Chlorpyrifos-ethyl (480 g/l) Lambda cyhalothrin (25 g/l)

Tomato (continued)		
Crop Pest	Plant Protection Products	Active Ingredient
Viral diseases (TYLC, PVMV, TMV, CMV, TSWV)	DECIS 25 EC LASER 480 SC DURSBAN 4 EC	Deltamethrin (25 g/l) Spinosad (480 g/l) Chlorpyrifos-ethyl (480 g/l)
Vector control	KARATE MAX 2,5 WG	Lambda cyhalothrin (25 g/l)
Seed treatments (Pythium sp., Phytophthora sp.)	SYSTHANE 240 EC DITHANE M 45	Miclobutanil (240 g/l) Mancozeb (800 g/kg)
Fruit rot ( <i>Rhizoctonia solani</i> )	IPPON 500 SC DITHANE M 45	Iprodione (500 g/l) Mancozeb (800 g/kg)
Nematodes ( <i>meloidogyne sp</i> )	FURADAN 5G	Carbofuran (5 g/l)
Weeds ( <i>Portulaca quadrifida</i> , <i>P. oleracea</i> , <i>Physalis angulata</i> , <i>Physalis micrantha</i> )	GLYPHARM 360 SL KALACH 360 SL ROUNDUP 360 SL ROUNDUP 450 TURBO Mechanical control	Glyphosate (360 g/l) Glyphosate (360 g/l) Glyphosate (360 g/l) Glyphosate (450 g/l)
Heliothis		Bacillus thurengiensis Lambda-cyhalothrine Imidaclopride Deltamethrin Cypermethrine Bifenthrin Indoxacarbe
Bacteria ( <i>pseudomonas</i> & <i>Erwinia sclerotium</i> )		Deltamethrin
Bacterial wilt	Nordox	Copper
Alternaria/Oidium		Difenoconazole Chlorothalonil Metalaxyl/ Azoxystrobin Mancozeb
Alternariose	IPPON 500 SC DITHANE M 45	Iprodione (500 g/l) Mancozeb (800 g/kg)
Fusariose		Thiophanate-methyl
Nematodes		Cadusafos
Weeds		Metribuzin Haloxypol
Mites		Sulphur Abamectine

Potato		
Crop Pest	Plant Protection Products	Active Ingredient
Butterflies, moths	Lampride	?

Onion		
Crop Pest	Plant Protection Products	Active Ingredient
<i>Thrips tabaci</i>	PACHA 25EC Decis	Lambda cyhalothrin (15 g/l) Acetamipride (10 g/l) Deltamethrin
<i>Spodoptera sp. S. littoralis</i>	DECIS 25 EC LASER 480 SC DURSBAN 4 EC	Deltamethrin (25 g/l) Spinosad (480 g/l) Chlorpyrifos-ethyl (480g/l)
White fly ( <i>Bemisia tabaci</i> )	DECIS 25 EC LASER 480 SC DURSBAN 4 EC	Deltamethrin (25 g/l) Spinosad (480 g/l) Chlorpyrifos-ethyl (480g/l)
<i>Jacobiasca libica</i>	DECIS 25 EC DURSBAN 4 EC KARATE MAX 2,5 WG	Deltamethrin (25 g/l) Chlorpyrifos-ethyl (480g/l) Lambda cyhalothrin (25 g/l)
<i>Agrotis ypsilon</i>	DECIS 25 EC LASER 480 SC DURSBAN 4 EC KARATE MAX 2,5 WG	Deltamethrin (25 g/l) Spinosad (480 g/l) Chlorpyrifos-ethyl (480g/l) Lambda cyhalothrin (25 g/l)
<i>Grillotalpa Africana</i>	Mechanical control	
<i>Alternaria (A. porri)</i>	IPPON 500 SC DITHANE M 45	Iprodione (500 g/l) Mancozeb (800 g/kg)
Mildew ( <i>Pernospora destructor</i> )	SYSTHANE 240 EC DITHANE M 45	Miclobutanil (240 g/l) Mancozeb (800 g/kg)
Racine rose ( <i>Phoma terrestris</i> )	DITHANE M 45	Mancozeb (800 g/kg)
Soft rot ( <i>Pseudomonas &amp; Erwinia spp</i> )	IPPON 500 SC DITHANE M 45	Iprodione (500 g/l) Mancozeb (800 g/kg)
<i>Ditylenchus dipsaci</i>	FURADAN 5G	Carbofuran (5 g/l)
Weeds ( <i>Cyperus rotundus</i> )	GLYPHALM 360 SL KALACH 360 SL ROUNDUP 360 SL ROUNDUP 450 TURBO Mechanical control	Glyphosate (360 g/l) Glyphosate (360 g/l) Glyphosate (360 g/l) Glyphosate (450 g/l)
Bacteria ( <i>Pseudomonas &amp; Erwinia sclerotium</i> )		Deltamethrin

Sweet Potato		
Crop Pest	Plant Protection Products	Active Ingredient
Defoliating caterpillars		Dimethoate
Foliar spots		Copper Benomyl
Tuber wet rot		Dicloran

Sim Beans		
Crop Pest	Plant Protection Products	Active Ingredient
White mould		Trichoderma
Leaf and pot spot, blight, foot rot		Dicofol Deltamethrin
Legume pod borer		Cypermethrin Endosulfan

Suriname aubergines		
Crop Pest	Plant Protection Products	Active Ingredient
Bacterial wilt		
Powdery mildew		Azoxystrobin
Root knot nematode		Azadirachtin
Leaf spot		
Late blight		Chlorothalonil, Azoxystrobin
Bollworm		Lambda cyhalothrin Spinosad
Aphids		
Thrips		Azadirachtin, Fatty acid, Lufenuron

Eggplants (aubergines)		
Crop Pest	Plant Protection Products	Active Ingredient
Cutworms, bollworms, fruit borers	Bulldock	Betacyfluthrin
Thrips, whiteflies, aphids	Thunder	Imidacloprid
Red spider mite		Abamectin
Nematodes	Mocap	Ethoprofos
Damping off, bacterial wilt	Nordox	Copper
Leaf spot, late blight	Antracnol Milraz	Propineb Propineb+Cymoxanil
Powdery mildew	Orius	Tebuconazole

## APPENDIX 3: DIFFICULT PEST PROBLEMS

Respondents were asked: "On your crops, do you have any particular agronomic/plant protection problems that are difficult to solve? If so, for which problems do you need additional support from PIP, and what kind of support?". The raw data (responses) are listed below:

### • Ghana

- Mealy bug is wiping the papaya industry; already 95% of papaya farms are destroyed. Can PIPI be of help?
- The EU Commission has banned all for us on the local market available selective herbicides for farming of pineapple. We have no idea now how to keep the farm inside the pineapple plots weed free, which is essential in order to reduce Ant/Mealy Bug attacks.
- Water spotting on pineapple, might be related to a lack of nutrients, need technical advice on fertilisers
- Deformed fruits/short crownson pineapple MD2 related to intense sun shines; technical advice on how to protet fruits
- Fruit rot on pineapple, might be due to fusariose, need diagnosis and technical advice.
- Fruit fly on mango
- Anthracnose

### • Kenya

- Beans – Bacterial diseases in wet season
- We have issue with root rot diseases in some of our company farms. Most of the root rot pesticides are not registered for vegetables. I would like PIP to assist on ways to eliminate this issue.
- We have issue with MRLs from our farmers. I wish PIP would assist in training small scale farmers' as well on food safety so that we can improve on food safety for Export and also our local markets.
- Fruit Fly and False Codling Moth. – Require suitable controls and liaison with Government departments to register products with Pheromone content.
- Few Commercial Avocado Farms in Kenya, therefore economic viability of registration of products by Suppliers is questionable considering the rigmarole required to register. Reticence by Suppliers to register products. Products are available in other Avocado producing Countries, but reticence to assist with registering in Kenya.
- High level of flower and fruit abortion – avocado?
- High incidence of diseases particularly anthracnose and cercospora leaf spot during the wet season on avocado
- Difficulty in applying chemicals to very tall trees
- Inadequate knowledge on effective chemicals and alternative methods of disease and pest control
- Trace elements issue, need of training and training materials on crop nutrition
- No
- No

### • Senegal

- Expertise sur les méthodes alternatives à la lutte contre les nématodes (association de lutte physique, biologique et chimique)

- Formation et appui technique à la mise en place de culture hors-sol
- Formation et appui technique à la mise en place et conduite d'une pépinière de greffage de solanacées et cucurbitacées
- Nous cherchons une alternative aux traitements Cadusafos sur les nématodes en tomates.
- Nous sommes inquiets par l'absence de prophylaxie pour la mineuse de la tomate *Tuta Absoluta*.
- Les attaques des nématodes et des termites ainsi que les viroses
- Nous avons besoin une disponibilité de voile agrile pour la protection des cultures ; formation pour l'identification, la prévention, et les produits pour lutter contre les attaques ci-dessus

#### • Burkina

- As the objective is a production « bio », limited choice of PPPs
- Thus, usage of conventional techniques
- Amount of product recommended is very low (5000L/ha) when you have 28.000 ha to treat.
- Oui pour la banane car les producteurs ont une total méconnaissance de l'importance des problèmes phyto.
- Oui au niveau des maladies fongiques, appui du PIP souhaitable.
- Sur haricot vert, il y a un souhait de produits spécifiques, mais les produits actuels ne posent pas de problèmes : 0 refus
- Oui, problème techniques liés aux maladies de la pomme de terre notamment, la rouille, les pourritures humides et aqueuses des tubercules, les tâches noires et pourritures sèches sur les tubercules, pourriture du collet. Besoins d'appui dans ce sens.
- Appui technique : nouveaux itinéraires, BPA
- Recherche de nouveaux PPP
- Les problèmes techniques rencontrés sur les différents sites de production (Bam, Sourou) sont essentiellement liés à :
  - La multitude des pieds de maïs sur les parcelles de haricot vert, servant ainsi de refuges aux nuisibles ;
  - L'enherbement excessif observé sur certaines parcelles, source de compétition (eau, air, nourriture, lumière) avec les plantes cultivées et de réservoirs aux parasites.*Cela nécessite une sensibilisation et un encadrement de proximité des producteurs.*
- Problèmes rencontrés : baisse productivité manguiers, attaques parasitaires et méconnaissance des réglementations UE en matière de LMRs.
- Taille des manguiers : appui à la formation car la maîtrise est insuffisante.
- Epandage des engrais : besoin de formation sur épandage et période d'application ; besoin de formation spécifique sur le sujet.

#### • Ivory Coast

- Manque de connaissances par rapport aux caractéristiques du sol et de la variété d'ananas adapté à ce type de sol, besoin de formation collective dans le domaine

#### • Mali

- Mouches de fruits
- Formation des agents de station en détection de piqûres et mouches sur les fruits
- Dotation de la station en loupe, monoculaire

- Tanzania

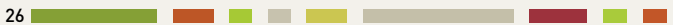
- Pea pod borer issue: the caterpillar damages the pea pod by feeding on the seeds. Eggs are laid during the night by the moths and the caterpillars spend most of their time in the pods, therefore a technical support ( for scouting and detecting the presence of the pest) is needed to solve this problem as it has caused rejection of the production in the market.
- Fusarium Wilts: there is no PPP effective against this disease; the only working method is a long crop rotation, which is difficult to apply by the small scale farmers. A technical support is also needed.

- Uganda

- The costs of the PPP are very high usually leading to hiked producer budgets.
- PIP should help with such funding of the PPPs budget.
- None

- Cameroun

- Non
- Excès d'azote ds le sol dans la region du Centre ; taches noires sur les fruits à l'arrivée chez l'importateur en saison des pluies



## APPENDIX 4 : DIFFICULTIES COMPLYING WITH MRLS

Respondents were asked: "Do you have difficulties meeting MRLs (fixed by the destination market for your crops) or specific requirements from buyers (« 0 » residues requirements or MRL lower than official ones, active substances forbidden by the importer). If so, please describe your situation. Do you need any support from PIP and if so, what kind of support?"

The raw data (responses) are listed below:

### • Senegal

- Les marchés allemand et hollandais ont les exigences suivantes :
  - Maximum 70 % of the MRL per active compound plus maximum 80% of the sum of the MRL's
  - Maximum 80 % of the sum of the ArfD of all the detected active substances
  - Maximum number of detected residues depending on the crop: for Tomato 5 active ingredients.
- Dans la lutte contre le TYLCV en culture de tomate (maladie non présente chez les producteurs de l'UE sauf les DOMTOM), il est difficile de respecter ces seuils surtout au moment des fortes attaques (mars-avril).
- Non
- Il serait bien de former nos producteurs sur les LMR et la connaissance des PPP

### • Kenya

- No, MRL levels in order. Endosulfan ban coming into effect in 2011, and presently is a front line control product. Effective alternatives are being tested but suitability still in question.
- No MRL issues in the recent past
- Require capacity building on MRL requirements
- No
- Yes, would like to know how the MRL levels are developed and be able to know the toxicity and the persistence of different products in regards to the mode of action of the active ingredients

### • Ghana

- At certain periods of the year it is difficult to achieve a full transformation of the ripening agent Ethephon, which leads sometimes to MRL readings higher than permitted. Unfortunately, MD2 pineapple will not change internal colour and soften to a condition which is acceptable from clients. Without Ethephon, the fruit flesh will remain white and crispy without flavours.
- Needs clarification on the use of Nyvar X and diuron. Are they banned or of restricted use?
- Post-harvest fungicides on pineapple: there are certain substances available which are not traditionally considered as post-harvest fungicides but have a fungistatic effect and help suppressing mould. Most of these substances are based on organic acids. Could PIP support and professional supervise trials with those substances? Could PIP help lobbying with chemical traders to make those substances available on the market in Ghana? Post harvest waxes: could PIP do a market search to find a more suitable product and help us getting it available in our market?

- Need for insecticides, herbicides and nematicides (no one allowed under fair-trade certification) on pineapple: could PIP do a market search and help us identifying approved active ingredients?

- **Burkina**

- No as the production of mangoes is classified as “bio”.
- No
- Non pour le moment. Mais sans doute nécessité d’un appui si développement de nouvelles m.a.
- Non : *aucun problème lié au respect des LMRs n’a été notifié par le marché de destination de nos produits (UE) à nos jours ; Cela se justifie par :*
  - *le choix des produits proposés aux exploitants (produits homologués par le Comité Sahélien des Pesticides/CSP) ;*
  - *le choix des produits par rapport à leur rémanence ;*
  - *le respect du délai de traitement préconisé avant récolte.*
- Formation sur les réglementations de l’UE en matière de LMRs
- Non

- **Ivory Coast**

- Oui, besoin de formation sur al lutte intégrée

- **Mali**

- Non

- **Tanzania**

- No

- **Uganda**

- Yes, the importers require the lowest MRL and this cannot be achieved in my country due to the prevalent nature of the pests and diseases.
- None

- **Cameroun**

- Non, cultures bio
- Pb de ‘déverdissement’ du fruit
- Oui, pour les productions issues des petits producteurs (dépassé LMRs), besoin de formation

## APPENDIX 5 : EFFICACY PROBLEMS

Respondents were asked: "Do you have any efficiency problems with products that you use to control pests and diseases? If so, what kind of problems and would you need any support from PIP to solve these problems? What kind of support?"

### • Ghana

- Need analysis of products used particularly some generic pesticides for its efficacy. One is not too sure of the active ingredients.
- Need support to test for heavy metals in fertilizers being used in the country.
- Some very effective insecticides for pineapple farming (i.e. Cypermetrin) have been banned by the EU commission. Therefore, chemicals cannot be alternated in order to avoid building up resistance of pest on the remaining pesticides used.
- No (on pineapple & mango)

### • Kenya

- Nematodes in Pineapples – sourcing and identifying less potent chemicals.
- The recommended rates of chemical application is sometimes not effective
- Low efficacy of the chemicals recommended for disease and insect control. This is so particularly when one uses protective chemical like copper fungicides yet the season is excessively wet. So a support would be required on how to achieve low residues and at the same time be effective
- Support on capacity building of workers would be desirable
- Resistance of aphids to pyrethrinoids: need of training on resistance management
- Products used are efficient
- Some products become inefficient

### • Burkina

- Support needed:
  - To choose the adequate PPPs (cf 'bio' exigence)
  - To find an alternative to Success appat because of the technical reasons (BPA), of commercial reasons (AO market), of the lack of support from Dow AgroSciences
- Oui pour la banane, il y a un besoin de PPP avec référence Ghana et Côte d'Ivoire
- Pour les maladies oui.
- Non pour les ravageurs, pas de problème actuellement. Les BPA conseillées dans les guides ont aidés mais la compréhension de ces BPA a mis un certain (habitudes acquises), mais il faudrait sensibiliser au risque d'apparition de résistance.
- Non
- Parfois problème d'efficacité liés aux importations frauduleuses de produits de contrefaçon
- L'efficacité peut être parfois affectée par la résistance
- Non car le problème d'efficacité des produits a été résolu par l'implication du Laboratoire National de Santé Publique (LNSP) qui analyse et atteste la qualité des produits avant leur mise à disposition aux utilisateurs.
- Utilisation de l'huile de neems contre certains parasites des manguiers (production bio) s'est avérée inefficace.
- Oui, Problèmes rencontrés campagne hv 2009/2010 avec la DELTAMETHRINE qui n'a pas été efficace pour le DYSDERCUS (taches blanchâtres sur toutes les gousses) ; problèmes également avec la ROUILLE. Formation aux producteurs peut être sur les techniques culturales aux semis (espacement) pour éviter chaleur et humidité.

- Ivory Coast

- Oui, sur cochenilles farineuses et le 'wilt' en ananas
- Besoin d'appui: brochure+recherche sur la matière active adéquate pour lutter contre ce ravageur

- Mali

- Non

- Sénégal

- Nous utilisons depuis trois ans le *Bacillus thuringiensis*, les résultats sont pas réguliers, nous souhaiterions un conseil sur l'application, le dosage, le stade de traitement...
- Oui, pour le cas de la mangue, les pesticides utilisés ne tuent que les mâles, nous voulons des alternatives plus efficaces, de même que pour les produits contre les nématodes et virus.

- Tanzania

- No

- Uganda

- Yes, the costs involved in purchasing the drugs are high and there's a great temptation of improper application of less drugs.
- PIP should help us subsidise on the prices of the drugs.
- Honour us with grants to fund our budgets.
- None

- Cameroun

- Non
- Non
- Yes, sometimes 'fake' products

## APPENDIX 6: AVAILABILITY OF PLANT PROTECTION PRODUCTS

Respondents were asked: "Do available/registered PPPs in your country allow you to cover all uses that you need? If not, which registered uses are missing?"

### • Ghana

- Most products are registered for general use but not specific for pineapple. Need support to update pesticides list with EPA. Some chlorpyrifos are not registered for pineapple but for vegetables and citrus and use of it is questioned by GlobalGAP auditor.
- No, there is no herbicide available with selective properties and the remaining allowed non-selective herbicides are only two, which also cannot treat all kinds of weed efficiently.
- Post-harvest fungicides for pineapple and mango in Ghana are not listed on the Ghana approved pesticides list.

### • Senegal

- Dans la « liste des pesticides autorisés par le Comité sahélier des Pesticides » (session de Mai 2008, seulement 18 produits commerciaux homologués pour le maraîchage et le maïs sur 86 produits soit seulement 21% dont 5 spécifiques pour le maraîchage et 2 pour le maïs. Ceci est insuffisant et dans la certification Globalgap, le principal certificat exigé par les importateurs, le respect de la réglementation nationale en matière d'autorisation d'utilisation est un point majeur à se conformer (point CB 8.1.2 du référentiel).
- Non, certains produits sont introuvables dans le marché local et sont tellement chers, ils ne sont pas à la portée des producteurs.

### • Kenya

- New products using Pheremone attractants.
- There are very few products in the market specifically for avocado
- They do not cover all the needs. Some pests do not have registered chemicals thus one is forced to use chemicals registered for other crops
- Yes (for beans, sugar snaps and snow peas)
- Yes (for beans, sugar snaps and snow peas, potatoes, tomatoes)

### • Burkina

- No, there is a need to register the products as the market will be oriented AO
- Aucun PPP spécifique n'est homologué sur banane d'où problème important
- Les produits sur le marché sont suffisants
- Oui mais souhait de diversification. Résistances possibles envisagées
- Oui mais pas à 100%. Nécessité de nouvelles molécules adaptées/spécifiques
- Oui : *Les produits homologués (par le CSP) sont disponibles et couvrent tous les besoins de traitements phytosanitaires des cultures vivrières et maraîchères.*
- Il manque des produits contre cochenille farineuse, les fourmis rouges et les mouches de fruits (mangue bio)
- Pas de soucis (h.vert et mangues) sauf phénomène de résistance de ravageurs.

- Ivory Coast

- Oui, ils couvrent les besoins

- Mali

- Pas de traitement phyto

- Tanzania

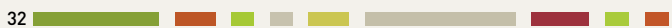
- Yes

- Uganda

- Yes, the available PPPs in my country allow me to cover all uses that I need.
  - PPPs in Uganda are not registered based on crops. Most of the effective PPPs are not registered specifically for horticulture crops. We would be grateful if PIP supports Uganda in developing a crop specific approved products registration list.

- Cameroun

- Non, production bio
  - Produits existent mais très chers et rares
  - Non, il y a un pb de disponibilité des produits homologués.



## APPENDIX 7: ALTERNATIVE METHODS OF CONTROL

Respondents were asked: “Do you have any particular needs regarding alternative methods of control (eg. physical control, natural enemies, etc.)? If so, what are they, and do you need support from PIP? What kind of support?”

### • Ghana

- Use of biological agents or trials by PIP on biocontrol of phytophthora.
- Need training in IPM practices.
- Fruit fly on mango and nematodes as well as post-harvest moulds on pineapple would be the most prominent examples where we are looking for alternative control. Here PIP could support with professional advice and support trials.

### • Senegal

- Nous sommes en phase de test de combinaisons de plusieurs lutttes alternatives contre les nématodes. Est-il possible d’avoir une expertise, un financement partiel et une formation sur la lutte intégrée et les méthodes alternatives existantes et efficaces.
- Nous souhaiterions une aide pour la mise en place de pièges phéromones pour la capture en masse des *Tuta Absoluta*, seul moyen de lutte efficace à ma connaissance.
- Nous souhaiterions une aide pour l’accès à des voiles agriles, des protections physiques (barbelés), arbre de protection...

### • Kenya

- First Team need to be trained on proper identification for example in case of biological agent eg natural enemies for the method to be manageable.
- Biological Control for Fruit Fly, False Codling Moth, and Mosquito bugs. Pheromone based control methods.
- Assistance with registration, and funding of Biological controls.
- Natural enemies for major insect pests like thrips and mites. Need support to acquire these natural enemies.
- Yes. Biological control. We need training in Biological control and IPM since we are informed that some of these biological are available, and some can be reared at farm level but we don’t have enough technical knowhow.
- IPM strategy: natural enemies for production in the farm; need support in establishing an entomology site.
- Yes, multiplication of natural enemies

### • Burkina

- Real interested by alternative methods
- Sur mangue, il y a un réel intérêt car pour le moment uniquement Success Appat
- Il ya un intérêt mais l’utilisation de ces techniques, mais cela exige une formation spécifique
- Certains encadreurs ont reçu des formations sur les méthodes de lutte intégrée.
- Certains produits alternatifs tels que les extraits de neem sont utilisés mais sur haricot donnent une odeur
- Très intéressé mais dans ce cas estime la démonstration et la formation indispensable.
- Surtout intéressé par les ennemis naturels.
- Oui un besoin technique sur la lutte intégrée

- Les techniques de protection physique et biologique sont recommandées et préférables à la lutte chimique qui utilise de nombreuses quantités de molécules chimiques, souvent nocives pour l'homme, les animaux et l'environnement.
- En plus, ces techniques permettent d'obtenir des produits sains et de très bonne qualité commerciale.
- A ce niveau, un appui du PIP pour la recherche et la diffusion de molécules naturelles et efficaces dans le contrôle des principaux nuisibles des cultures maraîchères serait très bénéfique sur le plan socio-économique et environnemental.
- Oui, besoin de formation sur la bonne utilisation des produits disponibles (Manèbe et Success Appat)
- Si méthodes de luttés alternatives sur manguiers contre la mouche de sfruits existe, alors besoin d'appui.

- **Ivory Coast**

- Oui, besoin de méthodes alternatives (+ avantages, inconvénients)

- **Mali**

- Utilisation de piège, lutte contre les mouches de fruits

- **Tanzania**

- No

- **Uganda**

- Acquisition and multiplication techniques of natural enemies especially for Thrips and white flies in hot pepper.

- **Cameroun**

- Oui, techniques de lutte et de gestion en culture bio
- Pas de besoins particulier mais aimerait avoir moins d'impact sur l'environnement. Donc est désireux d'apprendre de nouvelles méthodes
- Oui, souhait de développement de tomates sous serre en culture bio, besoin d'un appui à la mise en place et aux techniques

## APPENDIX 8: PIP INFORMATION SERVICES

Respondents were asked: "Do you receive enough information from PIP regarding European regulations on pesticides and its development? If not, why? Do you experience any problems understanding this regulation? If so, do you need extra support from PIP? What kind of support?"

### • Burkina

- Ils sont occupés à découvrir les guides et IT
- Sur mangue actuellement oui
- Oui mais une forme simplifiée est souhaitable pour la rendre accessible aux encadreurs
- Oui mais parfois problème communication mail. Un guide est un + utile.
- Pas de problème pour comprendre la régulation européenne
- Oui et pas de difficulté de compréhension
- Nous disposons de quelques informations sur la législation européenne en matière de pesticides et les LMRs. Nous utilisons plus la réglementation sous régionale (CILSS) à travers le Comité Sahélien des Pesticides (CSP) qui homologue et définit la liste des pesticides autorisés dans son espace.
- Un appui du PIP pour une meilleure connaissance de la législation européenne en matière de pesticides et les LMRs est nécessaire en ce sens que les cultures ci-dessus citées, notamment le haricot vert est produit pour l'exportation dans l'espace UE.
- Oui, ns recevons une revue mensuelle
- Appui nécessaire pr une formation sur les itinéraires techniques du manguier.
- Non, pas de réception de documents PIP.

### • Ivory Coast

- Oui les informations sont suffisantes et évolutives, pas de problème de compréhension, le niveau est bon.

### • Mali

- Oui

### • Sénégal

- Non
- Non, c'est notre première contact avec PIP, on nous a nouvellement mis au courant par notre boîte mail.

### • Tanzania

- We haven't yet received information from PIP regarding EU regulation on pesticides and its evolution. We will appreciate getting this information.

### • Uganda

- We do receive information from PIP.
- We understand and can interpret this information and we have applied it on the farms. As a result, our products have been readily accepted on the market.
- Yes, we do need extra support in terms of training especially and funding us so that we train other farmers who don't have a chance to get trained directly by PIP and yet we buy from them many products.
- The information received is Ok

### • Cameroun

- PIP non connu, nouveau
- PIP non connu, nouveau
- Vient juste d'intégrer le PIP n'a pas encore signé de protocole

- **Ghana**

- So far no information regarding pesticides have been made available to us by PIP. We have initially been informed that PIP will provide information software which has not been released to us yet.

- **Kenya**

- No. Since most of the information are in the News Letter and need a password to open.
- No. We learn them (regulations) from local seed manufacturers.
- Yes
- Yes
- No, need support to cover emerging pests and diseases identification, and also training on fertilizers

## APPENDIX 9: PEST AND DISEASE IDENTIFICATION

Respondents were asked: "Do you have problems identifying pests and diseases on your crops? What kind of support would you require from PIP?"

- **Burkina**

- Non mais fiches techniques simplifiées souhaitées : cible les planteurs
- Un manuel de reconnaissance des ravageurs serait utile
- Pas particulièrement, les documents des guides sont une aide mais une forme simplifiée utilisable sur le terrain est nécessaire et si possible traduite en langue locale
- Non mais les guides nous ont aidés.
- Oui, nous avons des problèmes pour identifier les maladies fongiques, bactériennes et virales
- La Direction de la Protection des Végétaux (DPV), à travers ses services techniques, apporte un appui dans l'identification et la reconnaissance des principaux ravageurs et maladies des cultures maraîchères.
- Un appui (financier) du PIP pour la confection et la diffusion d'un catalogue illustratif des principaux ravageurs et maladies des cultures maraîchères (haricot vert, tomate, oignon) est très souhaitable.
- Non
- En partie, sur hibiscus
- Oui, pb de reconnaissance des ravageurs, besoin de formation ou de documentation.

- **Ivory Coast**

- Oui, problème pour reconnaître les serpents, le wilt, le phytophthora

- **Mali**

- Non

- **Sénégal**

- Nous souhaitons faire des fiches de reconnaissance des ravageurs et les vulgariser auprès de nos employés ainsi qu'au niveau des paysans sous contrat SOCAS.
- Oui, problèmes d'identification, savoir leur cycle biologique.
- Appui, formation, matériel d'identification (loupes etc...).
- Mettre en relation avec les services techniques de l'état ( DPV ,DH )

- **Kenya**

- No

- **Tanzania**

- We will appreciate if we get a well simplified vegetable insect pest and diseases compendium with pictures to guide in insect pest and diseases identification for effective control.

- **Uganda**

- Yes, some pests are strange and new.
- We need laboratory support and may be inspection of the farm by PIP specialists.
- None

- **Cameroun**

- Non, pas trop de pb de ravageurs en culture bio
- Non, pas besoin d'appui particulier
- Oui, pour l'ensemble des cultures. Intéressés par la formation à la reconnaissance des ravageurs.

- **Ghana**

- We are not certain about the cause of fruit rot in pineapple. We also observe tip die back on pineapple leaves for which we have not been able to identify the cause.

## APPENDIX 10: CROP PROTOCOLS AND GUIDES

Respondents were asked: "Do you have any problems understanding information included in the Crop Protocols and Guides to Good Crop Protection Practices? If so, which parts of these documents are unclear?"

- Ghana

- I not have these documents.
- Majority of farmers know chemicals by their trade names and do not know their active ingredient. It is therefore difficult to relate the trade name and the active ingredient. To make the matter worse there are very many products in the market with same active ingredient but with different trade names thus confusing farmers
- Crop protocols have not been made available to us.

- Burkina

- Non
- Non (Ces IT ont permis de mieux comprendre certains problèmes avec une répercussion positive au niveau de l'encadrement) mais des IT simplifiés pour les encadreurs serait un plus.
- Non mais un document simplifié serait utile pour les encadreurs
- Question à poser aux agents d'encadrement mais des plaquettes simplifiées seraient les bienvenues.
- Non
- Ces problèmes peuvent être résorbés par les appuis techniques apportés par les services de la Direction de la Protection des Végétaux et les Directions Régionales de l'Agriculture de l'Hydraulique et des Ressources Halieutiques.
- Non
- Non

- Ivory Coast

- Non, le niveau de compréhension est bon

- Mali

- Non

- Sénégal

- Non
- Nous n'avons pas encore de documents, mais nous souhaitons les avoir.

- Tanzania

- We haven't received yet Crop protocols and guides to good protection practises

- Uganda

- N.A
- None

- Kenya

- We have not received them yet.
- No
- No

- Cameroun

- PIP non connu
- Non
- Reconnaissance des ravageurs

## APPENDIX 11: ADDITIONAL TECHNICAL SUPPORT

Respondents were asked: "What other kind of technical information or technical support would you like to receive from PIP at agronomical level?"

### • Ghana

- Latest information of EU MRL's (updates)
- Carbon foot printing
- Information of sustainable production new rules on Environment, social accountability, ethnical trade organic.
- Information on Hygiene and food safety.
- Assistance with Biological Controls and product testing.
- Technical guide book
- Capacity building on disease and pest management
- Training on MRL and how to meet the requirements
- Certification
- PIP could involve itself to get software which can provide integrated data collection for all important aspects of framing, considering special requirements for certification bodies i.e. GlobalGAP, FLO Fairtrade, Carbon Trust and Rainforest Alliance and release such software to Members of the PIP programme.
- PIP could provide purchase sources as well for technical solutions, which are promoted, f.e. for the flower induction of pineapple with Ethylene enriched activated carbon etc.
- PIP could hand out a list of producers who can provide suitable equipment for Pesticide applications, Fertilizer applications, Land preparation, etc.

### • Burkina

- Pas pour le moment
- Des informations sur les techniques d'irrigation et les fertilisations seraient les bienvenues
- Nous avons rédigé des modules de formation (Power Point) le PIP pourrait nous aider à les mettre en forme
- Evaluation de la qualité des semences
- Les itinéraires techniques des guides sont théoriques, une vérification sur le terrain serait souhaitable = démonstration
- Nous souhaiterions avoir un appui/précisions techniques sur le terme phytopharmaceutique (teneur). ??? J'ai expliqué ce que veut dire ce mot mais souhait d'informations techniques sur les produits utilisés : spectre d'activité, mode d'action, utilisation correcte, toxicité.
- Au niveau agronomique, les appuis techniques souhaités sont entre autre :
  - Assurer un appui rapproché des exploitants, en rapprochant l'encadrement agricole des parcelles de production ;
  - Renforcer la capacité technique des agents d'encadrement agricole des coopératives de production maraîchère et des producteurs par l'organisation de formations techniques soit dans les sites de production soit par des continues dans des centres spécialisés tels l'Agrhymet de Niamey au Niger.
- Examiner le volet de la transformation et des appuis pour la mise en marché (mangues bio)
- Appui/info sur l'évolution des recherches sur les semences plus résistantes aux ravageurs; et sur les techniques culturales du haricot vert et de la mangue.

- Ivory Coast

- Il nous faudrait des informations techniques sur la composition et la texture des différents types de sols, et les différents traitements

- Mali

- Non

- Sénégal

- Des modules de formations sous forme de kit (rétroprojecteur ou vidéo projecteur) nous permettant de faire des sensibilisations sur le terrain
- Hygiène et Sécurité des produits phytosanitaires
- Reconnaissances des ravageurs et prophylaxie de traitement....
- Formation sur les bonnes pratiques agricoles. Promouvoir la lutte intégrée

- Kenya

- Crop rotation regime on ¼ h farms plots
- Staff training on:
  - Safe use of pesticides (spray operators)
  - Audits/requirements of all EU markets and regulations
- Fertilizers and pesticides recommendation trainings

- Tanzania

- Updated information on GLOBALGAP regulations, European regulations on pesticides and their review. Technical support we would like to get from PIP are:
  - More training on safe and effective use of pesticides
  - Training on safe and effective use of fertilizers
  - Post harvest techniques for fresh vegetables
  - Acquisition of PPE and spray equipment (knapsack sprayers).

- Uganda

- Training
- Financial support
- Product growing guides for our range of crops with special emphasis to pests and diseases found in Uganda.

- Cameroun

- Restoration des sols en bio
- Formation en hygiène, IT, USP et techniques de protection de l'environnement et de diminution de l'impact des cultures sur l'environnement.
- Formation à la reconnaissance des ravageurs







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