Name of Country or Organization:__African Union- Inter-African Phytosanitary Council___(AU-IAPSC)_____

Submission form for IPPC standard setting work programme topics

This completed form must be submitted by the International Plant Protection Convention (IPPC) Official Contact Point, preferably in electronic format, to the IPPC Secretariat (ippc@fao.org) no later than **31 August 2013**. Please use one form per topic. This submission form[1] is also available on the International Phytosanitary Portal (IPP, www.ippc.int).

Save and submit the completed submission form as: 2013_TOPIC_SUBMISSION_COUNTRY OR ORGANIZATION NAME – Proposed title of topic.doc.

Refer to the IPPC Standard Setting Procedure[2] for an explanation of the hierarchy of terms for standards (technical area, topic and subject). The current List of topics for IPPC standards is available on the IPP[3].

Submission form for IPPC standard setting work programme topics		
Proposed by: (Name of IPPC Official Contact Point)[4]		
Contact: (Contact information of an individual able to clarify issues relating to this submission) Name: ..... Position and organization:..... Mailing address:..... ..... Phone:..... Fax: ..... E-mail:.....		
Type of topic: (Choose one box only)		
A. New ISPM: [_✓_] Concept [__] Pest specific [__] Commodity specific [__] Reference	B. New component to an existing ISPM: [__] Supplement [__] Annex [__] Appendix [__] Technical Panel (technical area) [__] DP: Diagnostic protocol (subject) [__] PT: Phytosanitary treatment (topic) [__] Glossary term (subject)	C. Revision/Amendment of: [__] ISPM [__] Supplement [__] Annex [__] Appendix [__] Glossary term
Proposed title of new ISPM or component: **or** **Title of document to be revised or amended:** Guidelines for the application of Area Wide Integrated Pest Management (AW-IPM) in the management of regulated plant pests that may occur across territorial boundaries		
Summary justification for the proposal (two sentences maximum): The proposed standard will address the application of AW-IPM as a pest management tactics for regulated plant pests that pose a barrier to trade. It is intended to be of use both at local (national) and regional levels to manage plant pest (excluding		

[1] Link to this submission form on the IPP: https://www.ippc.int/index.php?id=1111210&no_cache=1&L=0
[2] Link to the IPPC Standard setting procedure: https://www.ippc.int/index.php?id=1111176
[3] Link to the List of topics for IPPC standards: https://www.ippc.int/index.php?id=207776
[4] Text in brackets () given for explanatory purposes.

pests managed under FAO/EMPRES) with a potential of establishing across territorial boundaries

Submissions should address the applicable criteria for justification of the proposal (as listed below). Where possible, information in support of the justification and that may assist in the prioritization should be indicated.
All core criteria must be addressed; supporting criteria should be addressed if applicable.

Core criteria:

Contribution to the purpose of the IPPC as described in Article I.1.

Article I on "Purpose and Responsibility" states "*With the purpose of securing common and effective action to prevent the spread and introduction of pests of plants and plant products, and to promote appropriate measures for their control, the contracting parties undertake to adopt the legislative, technical and administrative measures specified in this Convention and in supplementary agreements pursuant to Article XVI*".

Article VIII on " International Cooperation" Paragraph 1 (a and b) also makes the following provisions
The contracting parties shall cooperate with one another to the fullest practicable extent in achieving the aims of this Convention, and shall in particular:
(a) cooperate in the exchange of information on plant pests, particularly the reporting of the occurrence, outbreak or spread of pests that may be of immediate or potential danger, in accordance with such procedures as may be established by the Commission;
(b) participate, in so far as is practicable, in any special campaigns for combating pests that may seriously threaten crop production and need international action to meet the emergencies; and

It is also in line with Article 6 of the SPS Agreement of the WTO :Adaptation to Regional Conditions, Including Pest — or Disease — Free Areas and Areas of Low Pest or Disease Prevalence

1. *Members shall ensure that their sanitary or phytosanitary measures are adapted to the sanitary or phytosanitary characteristics of the area — whether all of a country, part of a country, or all or parts of several countries — from which the product originated and to which the product is destined. In assessing the sanitary or phytosanitary characteristics of a region, Members shall take into account, inter alia, the level of prevalence of specific diseases or pests, the existence of eradication or control programmes, and appropriate criteria or guidelines which may be developed by the relevant international organizations.*

2. Members shall, in particular, recognize the concepts of pest — or disease-free areas and areas of low pest or disease prevalence. Determination of such areas shall be based on factors such as geography, ecosystems, epidemiological surveillance, and the effectiveness of sanitary or phytosanitary controls.

3. Exporting Members claiming that areas within their territories are pest — or disease-free areas or areas of low pest or disease prevalence shall provide the necessary evidence thereof in order to objectively demonstrate to the importing Member that such areas are, and are likely to remain, pest— or disease—free areas or areas of low pest or disease prevalence, respectively. For this purpose, reasonable access shall be given, upon request, to the importing Member for inspection, testing and other relevant procedures

Feasibility of implementation at the global level (includes ease of implementation, technical complexity, capacity of NPPOs to implement, relevance for more than one region).

Area wide- IPM for the management of plant pests has gained wide application, in Argentina, Australia, Costa Rica, Greece, Guatemala, Mexico, Pakistan, Peru, Philippines, Portugal, Thailand and the US where the use of Sterile Insect Technique (SIT) has been incorporated in the Area wide pest management programme.. In Africa, AW-IPM has been used for the management of Tse tse fly population and opportunities are also being explored for its possible use in fruit fly management in West Africa (Chandler et al).
The application of AWIPM programmes is gaining wider importance, for example, the concept has been used in the management of fruit flies namely the Oriental fruit fly (*Bactrocera dorsalis*), Melon fruit fly (*Bactrocera cucubitae*), Solaneceous fruit fly (*Bactocera latifrons*)and Mediterranean fruit fly (*Ceratitis capitata*) (The Hawaii Fruit Fly Areawide Pest Management Programme). AW-IPM has also been successfully used in the eradication of Melon fly (*Bactrocera cucurbitae*) in the Okinawa Island of Japan (Vreysen et al , 2006)

The application of AW-IPM using the SIT for example, in combination with other suppressive pest control methods has been successful in the management of Mediterranean fruit fly (Med fly) involving Israel, Jordan and Palestinian Authority that led to a high increase in export revenue from horticultural crops. A study conducted in 1997 indicates that the annual loss from Med-fly damage to fruit and vegetables in the region amounted to nearly $ 300 million (http://www.fao.org/ag/magazine/0506sp1.htm). In an Issue Paper developed for the World Bank "*Combating Fruit Flies in*

Eastern and Southern Africa (COFESA):Elements of a Strategy and Action Plan for a Regional Cooperation Program" Dr . Ekesi of icipe, proposed Area wide management approach that is tailored to specific regions owing to fragmented production systems as well as exploring opportunities in the SIT for the management of fruit flies.

Whereas AW-IPM may be considered to require more complex logistics and intensive management approach, its benefits accrue from the fewer inputs used, and the level of pest control achieved is more effective and sustainable. The application of AW-IPM intervention strategies require proper planning, understanding the pest/habitat ecology, commitment by both planners and implementers and proper coordination at implementation by both farmers and other stakeholders (Available at. http://www.fao.org/ag/magazine/0506sp1.htm).

For an AW-IPM to be effective there has to be a felt need, normally, a public outcry on the impact of a certain pest. An enabling policy environment should complement the out-cry coupled by government (s)' willingness to fund public good. Basing on these support, the NPPO can then mobilize the technical and social support available from within or without to be able to implement the programme. The current evolution in the trends in pest management entails a multi disciplinary/ muti-sectoral approach therefore requiring collaborative efforts, in the social, political, and economic arenas to backstop science before an area-wide programme can succeed.

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Clear identification of the problems that need to be resolved through the development of the standard.

Pests are not bound by territorial boundaries: Plant pests are not bound by territorial boundaries and can spread across boundaries through natural means, moreover, the spread can be exacerbated by movement of plant and plant parts in trade as well as effects of climate change that tend to promote the extension of geographic ranges of pests. Many current pests are not distributed across their whole potential ecological range due to evolutionary, physiological, geographical and historical factors, however, changes in some of these factors could favour the expansion of pest ecological range thus posing a great challenge to their management.

***Other pest of Phytosanitary significance are not covered under the FAO EMPRES*:** Pests of this nature have drawn much international attention to the extent that the FAO of the United Nations established in the 1990s the Emergency Prevention System (EMPRES) as a special programme to address the fight against trans-boundary plant pests as their outbreaks could result in food shortages, destabilize markets and trigger trade barriers. In the area of plant pests, EMPRES focuses more on the control of the Desert locust(Available at http://www.fao.org/ag/againfo/programmes/en/empres/gemp/intro/0000-whatis.html). By virtue of its mode of dispersal, the desert locust is not normally treated as a regulated pest, this leaves a gap in the way other regulated trans-boundary plant pests are managed. Similar approach is being used in the management of other migratory plant pests such as Quelea birds and armyworms.

Some of the plant pests with distribution beyond territorial borders possessing detrimental impacts on international trade include pests of the genus *Bactrocera, Anastrepha, Ceratitis*, the Asian long-horned beetle (*Anoplophora glabripennis*) and plant diseases such as *Ralstonia solanacearum, Xanthomonas* wilt disease of Banana, and Citrus Tristeza Virus

Affected countries may encounter difficulties in management of such pest alone as re-infestation may occur from neighbouring countries and therefore concerted efforts drawn from stakeholders in a region is encouraged:

Regional cooperation is crucial in surveying, controlling and reducing the impact of such trans-boundary pests if the current trends in pest problems through trade and natural spread are to be averted. A regionally identified pest requires priorities and commitment of all stakeholders to work in a strategic, collaborative and cooperative manner thus ensuring an efficient and practical outcome.

The application of a delimitation survey for a particular pest may require that a wider area sometimes well beyond the boundaries of a country or state be covered thereby requiring cooperation among countries/states. This approach has been used in the management of the Asian long horn beetle in the states of Illinois, Massachusetts and New York of the United States.

An evaluation paper on the Community Plant Health Regime (CPHR) in the EU for example highlights the importance of natural spread of pests which would necessitate collective responsibility in management, it however cautions on the current emphasis on man assisted spread. In the same spirit, the European and Mediterranean Plant Protection Organization (EPPO) has developed an approach towards the management of invasive alien species that are of quarantine significance through regional standardization, though recommended for implementation using the application of national regulations, the regional standards provide a harmonized regional approach.

In West Africa, attempts have been made to address the impact of Fruit fly invasion at regional level under the joint collaborative efforts from , the Standards and Trade Development Facility (STDF) in collaboration with the World Bank,

European Commission, International Institute for Tropical Agriculture, The Economic Commission of West African States (ECOWAS), the West African Economic and Monetary Union (WAEMU), the Pesticides Initiative Program, and other stakeholders. This is aimed at promoting a coordinated response to the issue of the spread and control of *Bactrocera invadens* and other fruit fly species of economic importance in West Africa.
In East Africa, there is a need for a regional approach to address the issue of invasive species because some of the species affect more than one country, the water hyacinth for example , has affected Kenya, Tanzania and Uganda, and the Larger Grain Borer, (*Prostephanus truncatus*) which has severely affected Kenya and Tanzania (Hodges *et al*., 1983). To this end, there has been a move towards regional cooperation between the three East African states and harmonization of phytosanitary measures among the different countries. Strengthening of phytosanitary services, inspection and certification has also been done. This has played a big role in the prevention and control of invasive species (Chagema Kedera and Benson Kuria). A stakeholder workshop for the management of *P. truncatus* in Africa using biological control noted the need to use an intergrated approach alongside bio-control (R.H. Markham, H.R Herren, 1989)

Availability of, or possibility to collect, information in support of the proposed standard (e.g. scientific, historical, technical information, experience).
Available information in support of the proposed standard can be sourced from

Historical
History and Ecological Basis for Area wide Pest Management. Norman C. Elliott *US Department of Agriculture-Agricultural Research Service*, David W. Onstad *University of Illinois at Urbana-Champaign.* Michael J. Brewer *Michigan State University:* (*Available from http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1651&context=usdaarsfacpub*)

Scientific
Chagema Kedera and Benson Kuria: Identification of risks and management of Invasive alien species using the IPPC framework. Proceedings of a workshop in Braunschweig, Germany 22-26 Sept 2003

Chandler L.D, Ellsbury M.M and Woodson W.D : Site Specific Management Guidelines . Area wide Management Zones for Insects
Georgen G, Vayssiere J.F, Gnanvossou D and Tindo M, 2011. Bactrocers invadens (Diptera: Tephritidae) a new invasive fruitfly pest for the afrotropical region: host plant range and distribution in West and Central Africa

Hendrichs J., Kenmore.P., Robinson. A.S., and Vreysen .M.J.B 2007. Area wide Integrated Pest Management AW-IPM: Principles, Practices and Prospects 33pp

Klassen. W. : Area wide Integrated Pest Management and the Sterile Insect Technique

Klassen W, D.A.Lindquist and E.J. Buyckx 1994. Overview of the joint FAO/IAEA Division's involvement of fruit fly sterile insect technique programmes pp 3-26 *In* CO Calkins, W. Klassen and P.Liedo (eds) Fruit flies and sterile insect techniques CRC Press Boca Raton, Florida USA

Lindquist D.A. 2000. Pest management strategies: Area-wide and conventional. In: K.H. Tan (ed.). Area-wide Control of Fruit Flies and Other Insect Pests. Proc. Int. Conf. on Area-wide Control of Insect Pests and the Fifth Int. Symp. on Fruit Flies of Economic Importance, 28 May – 5 June 1998, Penang, Malaysia, Penerbit Universiti Sains, Malaysia, pp. 13-19.

The Hawaii Fruit Fly Areawide Pest Management Programme**.** Roger I. Vargas, Ronald F.L. Mau, Eric B. Jang, Robert M. Faust And Lyle Wong. Available At Http://Digitalcommons.Unl.Edu/Cgi/Viewcontent.Cgi?Article=1661&Context=Usdaarsfacpub

Vreysen J.B, Hendrichs J. and Enkerlin W.R, 2006. The Sterile Insect Technique as a Component of Sustainable Area Integrated Pest Management of Selected Horticultural Insect Pests .Journal of Fruit and Ornamental Plant Research Vol. 14 (Suppl. 3), 2006

Supporting criteria (Practical)

- **Feasibility of adopting the proposed standard within a reasonable time frame.**
- **Stage of development of the proposed standard (is a standard on the same topic already widely used by NPPOs, RPPOs or a relevant international organization).**
- **Availability of expertise needed to develop the proposed standard.**

The proposed standard draws its support from some of the already adopted ISPMs, these include

- ISPM 4 (1995): Requirements for the Establishment of Pest Free Areas
- ISPM 14 (2002): The Use of Integrated Measures in A Systems Approach For Pest Risk Management
- ISPM 22 (2005) : Requirements for the Establishment of Areas of Low Pest Prevalence
- ISPM 26 (2006): Establishment of Pest Free Areas for Fruit Flies (Tephritidae)
- ISPM 30 (2008): Establishment of Areas of Low Pest Prevalence for Fruit Flies (Tephritidae)

The IPPC provides guidance to countries, in the form of international standards, on the implementation of pest free areas and pest risk analysis (including systems approaches and other risk management measures). These standards already mentioned, provide opportunities for application of area-wide integrated pest management (AWIPM) programmes for two main reasons. First, when AW-IPM programmes are implemented according to IPPC standards, trading partners should be prepared to recognize the results of a successful AW-IPM programme as meeting requirements, for example, of a pest free area or an area of low pest prevalence. Second, these standards provide scientific and technical guidance for the design and operation of key components of AW-IPM programmes.

The proposed standard could easily be adopted because of the growing significance of trans-boundary non-migratory plant pests as a hindrance to the achievement of food security and an impediment to international trade and the variations in the extent to which regions accord importance and propose strategies for their management and controls. For example, the EPPO region has laid its areas of plant protection mission and strategies for the period 2010-2014 (EPPO Missions and Strategy 2010-2014) and has to-date accomplished the development of a number of regional standards for the management and control of introduced and regulated A2 plant pest category such as *Eichhornia crassipes*, *Bursaphelenchus xylophilus*, *Clavibacter michghanensis* subsp. *sepedonicus* to mention a few. One of its core areas of focus among others have been the promotion of the use of modern safe and effective pest control methods.

A review of the list of adopted regional phytosanitary standard of the North American Plant Protection Organization (NAPPO) does not indicate a specific standard/guideline addressing management of trans-boundary regulated pest not classified under migratory pests. In the Regional Phytosanitary Standards for Comite Regional de Sanidad Vegetal de Cono Sur (COSAVE) specific to Photosanitary measure, emphasis has also been laid on an integrated measure to mitigate pests risk during production , harvest and post harvest (https://www.cosave.org/erpfs)

The EPPO standard on Principles of Good Plant Protection (PP 2/1(2) are intended to serve as an aid for the use of individual crop specific standard by NPPOs in the region. One of its key areas of the general principle for the GPP is the application of pest control measure when a threshold has been reached warranting the control measure (2003 OEPP/EPPO Bulletin OEPP/EPPO Bulletin 33, 87-89).

Supporting criteria (Economic)

- Estimated value of the plants protected.
- Estimated value of trade affected by the proposed standard (e.g. volume of trade, value of trade, the percentage of Gross Domestic Product of this trade) if appropriate.
- Estimated value of new trade opportunities provided by the approval of the proposed standard.
- Potential benefits in terms of pest control or quarantine activities.

Economic Supporting Criteria

Countries that have applied AW-IPM technique in the management of Med fly fruit pest in their regions have benefitted from increased access to international markets with minor or no phytosanitary restrictions. This is exemplified by the Government of Chile that created a pest free zone for fruit flies by incorporating the SIT in its pest management programme (Kalssen et al, 1994). This was achieved by 1995 where the entire country had become fruit fly pest free, the resultant impact was an increase in the volumes of Chilean fruits entering the US markets without the need for quarantine treatment. Argentina and Peru are following closely with the aim of creating a fruit fly pest free zone to enhance trade (Klassen). Similar situation is now enjoyed by establishing a fruit fly free zone in some of its provinces which is now recognized by the US, Mexico can now export most of its fruits from these provinces without and suppression or post harvest treatment

Concrete data on the economic gains accruing from the application of AW-IPM in pest management is still scanty, however, an estimate for example of environmental cost of introduced pests can be used to explain what could happen when plant pests have not been effectively managed. Some of these estimates have been availed by researchers, for example Pimentel and others estimated annual environmental cost of introduced pests for various parts of the world as Australia – US $6.8 billion; Brazil – US$ 6.7 billion; India – US$ 25.0 billion; South Africa – US$ 3.0 billion; United Kingdom – US$ 6.6 billion; and the United States – US$ 58.0 billion. Pimentel, D. et al. 2001. Many scholars have conducted studies on the impact of trans-boundary pests and quantified estimated losses from their outbreak or control (State of Food and Agriculture, 2001). An extract from this work representing the impact of such pests

on crops (outside locusts, Quelea birds and armyworms) is presented in the table below

Economic impact of trans-boundary pests of phytosanitary significance

Pest/disease	Region/Country	Estimated losses from outbreaks or benefits from control	Type of impact analyzed	Source of study
Mediterranean fruit fly	USA	Potential loss of $800 million/year if it becomes established	Impact on production and trade	1
Fruit flies	Egypt	Losses of $ 100million/year	Production and trade	2
Fruit flies	Pakistan	Losses of $ 200 million/year	Production and trade	3
Carambola fruit fly	Latin America and Caribbean	Potential net benefit of control $709-938 million over 12 years (potential benefit of suppression is less than half of this amount)	Benefit and cost	4
Alien weeds	USA	Loss of $ 35 billion/year	Total economic cost	5
Alien insects	USA	Loss of $ 20 billion/year	Total economic cost	5

A modification from : The State of Food and Agriculture, 2001

Sources

1. C.E Miller, L.Chang, V. Beal, R. McDowell, K. Ortman and T.La Covey 1992. *Risk assessment of Mediterranean fruit fly.* Washington D.C. APHIS USDA
2. A. Joomaye, J. Knight and W.Routhier 1999. *Evaluation of the Peach fly problem in Egypt with recommendations for its control and eradication including a limited cost-benefit analysis.* Report on a mission to Egypt, 11-24 June 1999; Project code:C3-INT/0/069 13 01. Vienna, IAEA
3. J.M Stonehouse, J.D. Mumford and G. Mustafa 1998. Economic losses to tephritid flies (Diptera: Tephritidae) in Pakistan. *Crop Protection* 17(2): 159-164
4. USDA 1995. Economic feasibility of eradicating Carambola fruit fly (Bactrocera carambolae) from South America. Washington D.C
4. D. Pimentel, L. Lach, R Zuniga and D. Morrison 1999. Environmental and Economic cost associated with non indigenous species in the United States, Ithaca USA, Cornell University.

Supporting criteria (Environmental)

- Utility to reduce the potential negative environmental consequences of certain phytosanitary measures, for example reduction in global emissions for the protection of the ozone layer.
- Utility in the management of non indigenous species which are pests of plants (such as some invasive alien species).
- Contribution to the protection of the environment, through the protection of wild flora, and their habitats and ecosystems, and of agricultural biodiversity.

The application of some of the pest control techniques used in AW programmes such as SIT is an environmentally friendly pest management approach, and can easily be integrated with other biological control methods such as parasitoids, predators and pathogens. When properly executed, the approach can lead to a substantial reduction in the over- all volumes of pesticides used in a region, for example the application of AW-IPM in the suppression of population of False codling moth in British Colombia led to the reduction in sales of organophosphate insecticide from 18,903 kg in 1991 to 3,403 kg in 2001 (Bloem et al., 2005). This was quite beneficial to the environment.

The management of some of the world's worst invasive plant species such as the invasion of South Florida by the Melaleuca tree (*Melaleuca quinquenervia*) (causing nearly $168 Million in environmental losses every year to Florida) with adverse effects of out-competing native plants, aggravating bush fires and drawing up waters from wetlands could benefit from a area wide approach (Environment News Service, 2004).By the year 2004, the US State of Florida had considered putting in place a project that would demonstrate to public and private land owners an economically and ecologically sustainable Melaleuca control code named TAME (The Area wide Management Evaluation of *Melaleuca quinquenervia*) Available from; http://tame.ifas.ufl.edu/pdfs/brochures/TAME.pdf)

Supporting criteria (Strategic)

- Extent of support for the proposed standard (e.g. one or more NPPOs or RPPOs have requested it, or one or more RPPOs have adopted a standard on the same topic).
- Frequency with which the issue addressed by the proposed standard emerges as a source of trade disruption (e.g. disputes or need for repeated bilateral discussions, number of times per year trade is disrupted).
- Relevance and utility to developing countries.
- Coverage (application to a wide range of countries/pests/commodities).
- Complements other standards (e.g. potential for the standard to be used as part of a systems approach for one pest, complement treatments for other pests).
- Foundation standards to address fundamental concepts (e.g. treatment efficacy, inspection methodology).
- Expected standard longevity (e.g. future trade needs, suggested use of easily outdated technology or products).
- Urgent need for the standard.

Area wide IPM for the management of plant pests has gained wider application; already, the approach is being used in Argentina, Australia, Costa Rica, Greece, Guatamala, Mexoco, Pakistan, Peru, Philippines, Portugal, Thailand and the US using the Sterile Insect Technique (SIT). In Africa, AW-IPM has been used for the management of Tse tse fly population and opportunities are also being explored for its possible use in fruit fly management in West Africa (Chandler et al).
The application of AWIPM programmes is gaining wider importance, for example, the concept has been used in the management of fruit flies namely oriental fruit fly (Bactrocera dorsalis), Melon fruit fly (Bactrocera cucubitae), solanaceous fruit fly (Bactocera latifrons)and Mediterranean fruit fly (Ceratitis capitata) (The Hawaii Fruit Fly Areawide Pest Management Programme). AW-IPM has also been successfully used in the eradication of Melon fly (*Bactrocera cucurbitae*) in the Okinawa Island of Japan (Vreysen et al , 2006)

Successes in its implementation can be achieved through enthusiasm in public participation and national commitment to finance public good. Though the benefits that accrue from the implementation of AW-IPM takes long to be realized, the technique provides a viable solution to the management of widespread notorious plant pests where the availability of immediate control is far-fetched.

The application of AW-IPM using Sterile Insect Technique (SIT) in combination with other suppressive pest control methods has been successful in the management of Mediterranean fruit fly (Med fly) involving Israel, Jordan and Palestinian authority that led to a high increase in export revenue from horticultural crops. A study conducted in 1997 indicates that the annual loss from Med-fly damage to fruit and vegetables in the region amounted to nearly $ 300 million (http://www.fao.org/ag/magazine/0506sp1.htm). In an Issue Paper developed for the World Bank "*Combating Fruit Flies in Eastern and Southern Africa (COFESA):Elements of a Strategy and Action Plan for a Regional Cooperation Program*" Dr . Ekesi of icipe, proposed Area wide management approach that is tailored to specific regions owing due to fragmented production systems as well as exploring opportunities in the SIT for the management of fruit flies..

Further support is envisaged from the Joint IAEA/FAO Division of Nuclear Techniques in Food and Agriculture to the IPPC Secretariat in the development and review of ISPMs to improve phytosanitary capacity of IPPC contracting parties. Already, this collaboration has seen the development of 6 ISPMs and currently further support is extended to the development of additional three ISPMs. (Report of the International Atomic Energy Agency (IAEA) Agenda Item 12.2.4: Commission on Phytosanitary Measures, 8th Session, 08-12 April 2013, Rome)

The joint Division has also developed technical materials to support the implementation of the ISPMs,
And based upon the request of Member States during 2012-2013, the Joint Division is developing the "*FAO/IAEA Trapping Guidelines for Area- Wide Fruit Fly Progammes"*. to be aligned with the ISPM 26:2006. *Establishment of pest free areas for fruit flies (Tephritidae)* . This serves as a basis of support as well as a justification for the application of Area wide pest management programmes.

The Joint FAO/IAEA Division of Atomic Energy in Food and Agriculture promotes the application of SIT in general (widely used in AW-IPM) and in particular supported research on rearing and sterilization techniques of the Tse tse fly at its Seibersdorf laboratories in Austria, jointly conduct in support of an IAEA/Nigeria Tse tse fly project.

Diagnostic protocols are subject to additional criteria. For proposals for DPs, please elaborate on the following criteria to help the future consideration of the subject proposed:

- Need for international harmonization of the diagnostic techniques for the pest (e.g. due to difficulties in diagnosis or disputes on methodology).
- Relevance of the diagnosis to the protection of plants including measures to limit the impact of the pest.
- Importance of the plants protected on the global level (e.g. relevant to many countries or of major importance to a few countries).
- Volume/importance of trade of the commodity that is subjected to the diagnostic procedures (e.g. relevant to many countries or of major importance to a few countries).
- Other criteria for topics as determined by CPM that are relevant to determining priorities.
- Balance between pests of importance in different climatic zones (temperate, tropics etc) and commodity classes.
- Number of labs undertaking the diagnosis.
- Feasibility of production of a protocol, including availability of knowledge and expertise.

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CPM-7 (2012) agreed that all submissions of proposed topics for the IPPC Standard Setting work programme should be accompanied by a draft Specification and a literature review. This provision would not apply to proposals for diagnostic protocols, phytosanitary treatments or glossary terms.

Draft Specification

(SC approved specifications are posted on the IPP (https://www.ippc.int/index.php?id=24119) and may be referenced for examples.)

Proposed Title: **Guidelines for the application of Area Wide Integrated Pest Management (AW-IPM) in the management of regulated plant pests that may occur across territorial boundaries**

Reason for the standard (justification as to why the standard is needed, some of this can be copied from the above submission):

To-date, relevant phytosanitary standards have been developed and adopted to reduce the introduction and spread of plant pests internationally, some of the adopted standards provides a generic framework upon which NPPOs can adapt and translate in pest situations in their localities. Some closely related standards such as those developed on the establishment of pest free areas, areas of low pest prevalence, pest free production areas, have enable NPPOs significantly reduce the impact of some of the regulated pests that can potentially move in trade. The implementation of these standards are localized within the confines of the NPPO, leaving a gap in the management of plant pests with widespread geographic distribution, which still impact international trade. Their effective management is achievable when an integrated approach is used that combines scientific, economic and social factors in an area wide approach. There is therefore need for a standard to guide the institutionalization and implementation of an area wide approach in the management of such plant pests.

Purpose (explain what issue will be addressed and/or harmonized once this standard is put in place):

The purpose of the standard is to provide guidance on the management of regulated pests with widespread occurrence in a sustainable environmentally friendly manner using the Area wide Integrated Pest Management(AW-IPM) approach. Under the AW-IPM, every stakeholder under the programme is motivated, responsible , owns and works towards the achievement of a common goal .

The standard will support the penetration and sustainability of markets for countries that have otherwise dropped out due to the adverse effects of regulated quarantine and non quarantine pests. Owing to the wide spread distribution of some pests such as fruit flies and *Ralstonia solanacearum f*or example, exports from countries where such pests occur have been rejected. When populations of such pests have been suppressed to low acceptable levels, trade in plants and plant parts from such areas can be allowed as long as materials are subjected to some specified treatments.

It will enhance increased food production and directly contribute towards food and nutrition security. When the pest populations are reduced or eradicated, production costs gets lowered and farmers can re-direct their resources to boost production accordingly

Scope (this provides the boundaries or limits to what the standard should cover):

The scope of the standard is to provide guideline for the application of Area Wide Integrated Pest Management for suppression, containment or eradication of regulated plant pests with wider distribution normally across territorial boundaries. This excludes migratory pests such as locusts, army worm, Quelea birds whose management status is addressed under the FAO EMPRES

Tasks for the expert drafting group (this will help direct the work of the experts):

The Expert Drafting group should

- Take into account and consult other closely related adopted ISPM such as ISPM 4 (1995): Requirements for the Establishment of Pest Free Areas ISPM 14 (2002): The Use of Integrated Measures in A Systems Approach For Pest Risk Management ISPM 22 (2005) : Requirements for the Establishment of Areas of Low Pest Prevalence, ISPM 26 (2006): Establishment of Pest Free Areas for Fruit Flies (Tephritidae) ISPM 30 (2008): Establishment of Areas of Low Pest Prevalence for Fruit Flies (Tephritidae)
- Consult all the relevant available source of information concerning the application of Area wide pest management programmes in the management of some of the world's most notorious pests
- Provide a generic institutional/team composition for the application of AW pest management approach
- Identify and incorporate as appropriate scientific equipment for use in establishment of Buffer zones and AW programme as a whole
- Expound on the Delimiting surveys and establishment of buffer zones as applied in AW programmes
- List some of the worlds' important plant pests in which an area wide approach could be applied
- Examine the possibility of wider application of scientific techniques such as SIT, male annihilation and any other

combinations for use in an area wide approach
- Provide strategies for sustenance of a successful area wide programme

Expertise (this will provide the basis for screening nominations):
The expert drafting team should comprise of but not limited to the following
- An expert in Area wide pest management programmes
- Insect Geneticist/Breeder
- Plant Ecologist
- Expert in GIS and GPS

References (Relevant ISPMs and national, regional or international standards on the same topic and any specific references that would be relevant during drafting):
- ISPM 04 (1995) Establishment of Pest Free Areas
- ISPM 14 (2002): The Use of Integrated Measures in A Systems Approach For Pest Risk Management
- ISPM 22 (2005) : Requirements for the Establishment of Areas of Low Pest Prevalence
- ISPM 26 (2006): Establishment of Pest Free Areas for Fruit Flies (Tephritidae)
- ISPM 30 (2008): Establishment of Areas of Low pest Prevalence for Fruit Flies (Tephritidae)
- Article 1 of the International Plant Protection Convention (1997)
- Article 6 of the WTO SPS Agreement

Literature review (this section will provide a summary of the topic based on scientific and technical publications, including a referenced listed of literature reviewed. This will help provide the scientific basis for the content of the standard to be used by the selected experts during the development of the standard):

Review of the Literature

The confinement and eradication of regulated plant pest is normally costly, there is normally a time lag between the planning period, surveillance, resource mobilization and execution of an eradication programme. For some pests, this time lag may provide an opportunity for the pest to escape and establish itself outside the area of first detection. Some of these pests can spread beyond the actual perceived range, which could be across international borders, once established. Pests spreading in such a manner are normally difficult to eradicate depending on the capacities and vigilance of the countries or regions involved.

There are a number of plant pests that have attained the status of regional importance and have posed an impediment to trade. Of notable significance is the invasion of a wide area of Africa by the Invasive Fruit fly (first report in Kenya in 2003) (*Bactrocera invadens*), a polyphagous species native to Asia and now present in over 33 countries of Africa (EPPO Report: Pest Risk Analysis of B. invadens) . Similarly, *Bactrocera cucurbitae, B. latifrons,B. zonata*, and *B. invadens*, are also known to have invaded continental Africa and have been reported by some of the countries of the Near East Plant Protection Organization (NEPPO) Reference: *Regional Symposium on the Management of Fruit Flies in Near East Countries. Hammamet, Tunisia, 6 - 8 November 2012, 80pp)*

A study on host plant range on *B. invadens* conducted in West and Central Africa (Georgen et al ,2011) reveal that the pest is highly polyphagous, infesting wild and cultivated fruits of at least 46 species from 23 plant families with guava (Psidium spp.), mango (Mangifera spp.), and citrus (spp.) among the cultivated species, and the wild hosts include tropical almond (*Terminalia catappa* L.), African wild mango (*Irvingia gabonensis* (Aubry-Lecomte) Baill.), and sheanut (*Vitellaria paradoxa* C.F.Gaertn.).

Within the European Plant Protection Organization (EPPO), *Helicorverpa armigera* has widened its geographic range with distribution in the United Kingdom and other parts of Europe. It is now shifting its distribution with further north in Europe. A similar situation has been observed with the Oak processionary moth (*Thaumetopoea procecessionea*) that originally was found in south and central Europe and is now observed as far north as Denmark. (Climate Change Energy and Food: FAO, June 2008 59pp).

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In South America, the introduction and spread of the Brown citrus aphid; *Toxoptera citricida* (Kirkaldy), in Brazil and Argentina caused the loss of 16 million citrus trees (Caver, 1978). This aphid is the major vector of Citrus Tristeza Virus (CTV) with the current world wide economic impact of potentially affecting over 200 million citrus trees on sour orange rootstock which are at risk to this disease (Yokomi, 2009). The geographic distribution of *T. citricida* is wide and include South East Asia, sub-Saharan Africa, Australia, New Zealand, Pacific Islands, South America and the Caribbean and Florida (Caver, 1978) and also in the Mediterranean citrus growing region.

an effective method to manage pests of economic importance using an organized and coordinated attack on pest populations over large areas (multi-field or farm). Area-wide management is most effective when conducted against a single or small group of pests over large geographical areas that are delineated by biological criteria associated with pest colonization and dispersal potential Area wide management Zones for Insects: Available from http://www.ipni.net/publication/ssmg.nsf/0/665FAA34549462F6852579E500772F23/$FILE/SSMG-19.pdf

Within the Asian Pacific Plant Protection Commission (APPPC) region, the Asian long-horned beetle (*Anoplophora glabripennis*) a pest native to Japan, China and Korea is a devastating forest pests and has been listed among the world's worst 100 invasive species (Global Invasive Species Database: *Anoplophora glabripennis*). Introductions have been reported in the USA and Canada and infestations occurs in agricultural areas, natural forests and planted tree crops, shrubland and urban areas. Eradication programmes have been initiated and is associated with very high costs. Similarly, the pests have been introduced in some of the EPPO region in countries like Italy, Austria, France, Germany and the UK (http://en.wikipedia.org/wiki/Asian_long-horned_beetle). In China, the pest has destroyed 40% of the planted trees approximately 2.3 million hectares and within a period of 3 years (1991-93) 50 million trees had been cut down in the Ningxia Province (Global Invasive Species Database: Anoplophora glabripennis).

The management approach to plant pests with widespread distribution calls for the involvement of a number of stakeholders and sometimes joint efforts of governments in whose territories the pest organism occurs. An area wide IPM provides that option

Historically, Klassen (2000) notes that AWPM approaches are not new, because early civilizations probably worked cooperatively to control pest invasions, such as those by armyworms and locusts, at scales greater than a single landholding. The concept has been used in China for the management of the migratory locust, *Locusta migratoria maniensis*, evolving as the result of over 3000 years of experience with periodic outbreaks along the flood plains of some major rivers. The A WPM programme for the locust now has a firm scientific basis and uses modern pest forecasting and management tools, but was initiated long before the advent of the modern scientific method, and based mainly on application of cultural practices and water management along major waterways that prior experience had shown were effective as preventive tactics to control the pest (Metcalf, 1991). Klassen (2000)

Successful AW-IPM programmes

Area wide IPM for the management of plant pests using the application of sterile insect technique has gained wide application, already, the technique is being used in Argentina, Australia, Costa Rica, Greece, Guatamala, Mexoco, Pakistan, Peru, Philippines, Portugal, Thailand and the US. In Africa, AW-IPM has been used for the management of Tse tse fly population and opportunities are also being explored for its possible use in fruit fly management in West Africa (Chandler et al).

The application of AWIPM programmes is gaining wider importance, for example, the concept has been used in the management of fruit flies namely oriental fruit fly (Bactrocera dorsalis), Melon fruit fly (Bactrocera cucubitae), solanaceous fruit fly (Bactocera

latifrons)and Mediterranean fruit fly (Ceratitis capitata) (The Hawaii Fruit Fly Areawide Pest Management Programme). AW-IPM has also been successfully used in the eradication of Melon fly (*Bactrocera cucurbitae*) in the Okinawa Island of Japan (Vreysen et al , 2006)

Successes in its implementation can be achieved through enthusiasm in public participation and national commitment to finance public good. Though the benefits that accrue from the implementation of AW-IPM takes long to be realized, the technique provides a viable solution to the management of widespread notorious plant pests where the availability of immediate control is far-fetched.

The application of AW-IPM using Sterile Insect Technique (SIT) in combination with other suppressive pest control methods has been successful in the management of Mediterranean fruit fly (Med fly) involving Israel, Jordan and Palestinian authority that led to a high increase in export revenue from horticultural crops. A study conducted in 1997 indicate that the annual loss from Med-fly damage to fruit and vegetables in the region amounted to nearly $ 300 million (http://www.fao.org/ag/magazine/0506sp1.htm). In an Issue Paper developed for the World Bank "*Combating Fruit Flies in Eastern and Southern Africa (COFESA):Elements of a Strategy and Action Plan for a Regional Cooperation Program*" Dr . Ekesi of icipe, proposed Area wide management approach that is tailored to specific regions owing due to fragmented production systems as well as exploring opportunities in the SIT for the management of fruit flies..
Re-orientation of priorities and strategies in plant pest management should endeavour to keep pace with the emerging global challenges of increasing population, the impact of climate change and associated auxiliary problems such as increased occurrences and resurgences of plant and animal pests.

Send submissions to:
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