Joint FAO/IAEA Programme
Nuclear Techniques in Food and Agriculture

INTERNATIONAL GUIDELINE FOR TRANSBOUNDARY SHIPMENTS OF IRRADIATED STERILE INSECTS

International Guideline for Transboundary Shipments of Irradiated Sterile Insects

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Contents

Preamble

A Consultants Group Meeting was held to prepare an International Guideline of Transboundary Shipment of Sterile Insects, and to draft an International Standard on Phytosanitary Measures (ISPM) for Transboundary Shipment of Sterile Insects to be submitted to the Commission of Phytosanitary Measures (CPM) of the IPPC in 2023. The meeting took place in Vienna at the Joint FAO/IAEA Centre of Nuclear Techniques in Food and Agriculture, from 13 to 17 June 2022.

The Consultants Group (see **Appendix 1**) followed-up on a recommendation given in 2001 by a similar group of consultants, to draft an ISPM aimed at facilitating transboundary shipments of sterile insects. This as a response to the growing interest and demand from National Plant Protection Organizations (NPPOs), Veterinary Services and Public Health Organizations of FAO and IAEA Member States for alternatives to pesticide use and the increasing interest, also from the private sector, in the application of the sterile insect technique (SIT).

As the SIT becomes more commercial, the need for guarantees that the sterile insects can be safely and legally shipped is essential to encourage financial investments in commercial sterile insect mass-rearing facilities. Also, international regulations are required to reduce the need for independent development of national regulations that may hinder the insect control programmes.

This document contains guidelines for transboundary shipment and importation of irradiated sterile insects (either as a consignment in transit or for entry in the country of destination). Producers/shippers and importers of sterile insects may be private businesses as well as government, parastatal, joint venture or international organizations.

It is suggested to keep the Joint FAO/IAEA Insect Pest Control Sub-Programme informed of any difficulties in compliance with the procedures or gaps in understanding of the procedures. Contact with the Joint Sub-Programme can facilitate awareness of new developments in operation procedures available in guidelines and manuals (Contact us: W.R.Enkerlin@iaea.org).

1. Introduction

The sterile insect technique (SIT) has been successfully used in large-scale programmes to prevent, contain, suppress, and eradicate insect pests in many countries throughout the world. Since the SIT is species specific, it enables pest control without the risk of introducing potentially invasive insect species into ecosystems, threatening their biodiversity. Unlike insecticides and other control methods, efficiency of SIT increases as the population density of the target pest decreases.

This method relies on the sustained and area-wide release of large numbers of sterile insects over areas infested or at risk of infestation with the target pest. Before release, sterile insects are mass-reared, sterilised, packed, shipped, been fed and matured, and are then loaded into delivery vehicles for aerial or ground release.

One such pest prevention programme is the Mediterranean Fruit Fly Preventive Release Programme in California, the United States of America (USA), in which sterile Mediterranean fruit flies or 'medflies' (*Ceratitis capitata*) are released weekly, by air, over large areas at risk of introduction of this invasive pest. Sterile insects have also been used in biological containment barriers, such as the medfly barrier located along the Mexico−Guatemala border. Over one billion sterile medflies are released along this border every week to prevent their spread to the medfly-free areas north of the barrier. In the Okanagan−Kootenay Sterile Insect Release (OKSIR) programme to suppress codling moth (*Cydia pomonella*) in Okanagan, British Columbia, Canada, sterile moths are continuously released over apple orchards to manage the pest, as a safe, eco-friendly replacement for organophosphate insecticides. To eradicate the New World screwworm (*Cochliomyia hominivorax*) from Central America, sterile flies were released throughout the whole region. The SIT method has also been used to eradicate tsetse (*Glossina austeni*) populations on Unguja Island, Zanzibar, between 1994 and 1997. An operation to eradicate Glossina palpalis *gambiensis* in Senegal is ongoing. The SIT approach is also being used to eradicate incipient outbreaks of invasive pest species, such as the cactus moth (*Cactoblastis cactorum*) in the Yucatan Peninsula, Mexico, the Australian painted apple moth (*Teia anartoides*) in New Zealand, a major medfly outbreak in the Dominican Republic in 2017, a major recent outbreak of the New World screwworm in the Florida Keys, USA, in 2018 and in Libya in 1992.

The return on investment provided by past and current SIT programmes is unquestionable, with benefit-to-cost ratios ranging from USD 2.80 for each dollar invested in the case of a medfly population suppression programme in South Africa, to as much as 1000 to 1 in the case of a medfly prevention programme in Chile (Enkerlin 2021).

The SIT has been applied for more than 65 years against several insects which are key plant pests, such as fruit flies and moths, and key livestock pests, some of which are vectors of zoonotic diseases, including New World screwworm and tsetse (Enkerlin and Pereira 2022). More recently, the SIT package has been developed against Aedes aegypti and Aedes albopictus mosquitoes, vectors of human diseases such as dengue, chikungunya and Zika. Pilot trials are under way in several countries (Bouyer *et al.* 2020; Lees *et al.* 2021).

Regulated insect species are being suppressed and/or eradicated through the SIT. While the majority of insect species being treated with SIT are regulated, the fact that they are sterile prevents establishment and therefore eliminates the risk. The optimal level of sterility is species specific and is achieved by following established operating procedures.

The SIT presented in this guideline specifically uses ionising radiation − gamma rays, X-rays, or electron-beam (e-beam) processing − to sterilise mass-reared insects of the target pest population so that they cannot produce offspring when they are released in the field and mate with their wild counterparts. Insects sterilised using ionising radiation do not have any residual radiation.

Transboundary shipments of irradiated sterile insects have taken place on a regular basis since the SIT was first developed. Currently, this includes tephritid fruit fly pests, moths, new world screwworm, tsetse and mosquitoes. The SIT is under development for other species that may be included in future transboundary shipments. In 2022, the total number of sterile insects shipped was estimated at over 1 trillion in more than 20 000 shipments to 32 recipient countries from 23 sterile insect production facilities. During a period of almost 60 years, only very few problems associated with shipping live sterile insects across borders have been recorded. This includes one case in 2003 of non-irradiated New World screwworm that were shipped to a specific location for field release. There were no significant consequences because of the effective implementation of a contingency plan (For history of Transboundary Shipments of Sterile Insects from 1963–2022 see **Appendix 2**. For further updates see: https://nucleus.iaea.org/sites/naipc/dirsit/SitePages/HISTORY%20OF%20TRANSBOUNDARY%20SHIPMENTS%20OF%20STERILE%20INSECTS.aspx?WikiPageMode=Edit&InitialTabId=Ribbon.EditingTools.CPEditTab&VisibilityContext=WSSWikiPage).

There is no report of any shipment of sterile insects having been rejected by plant protection or animal health authorities.

The objective of this guideline is to facilitate the formulation of more appropriate and harmonized regulatory frameworks for safe and timely transboundary shipments of irradiated sterile insects for SIT development and application.

2. Scope

This guideline is intended to assist competent authorities, organizations and facilities shipping insects sterilized using ionising irradiation to follow established operating procedures thus assuring safe shipment while facilitating transboundary shipments.

3. Hazard analysis

The probability of hazards occurring from transboundary movement of sterile insects is negligible if established operating procedures are followed (**Figure 1**). Detailed information available in: www.iaea.org/sites/default/files/guideline-for-packing-sept2017.pd.

The sterile insect production and post-production process may be reviewed to ensure compliance with established operating procedures. Sterile insect production facilities operate under very high standards. Even when it is not a requirement for insect mass-rearing, some facilities have pursued an ISO9001 Certificate (**Figure 2**). Some countries do not have specific regulations or a clear pathway to accept shipment of sterile insects, others only require labelling and documentation, and still others are regulating sterile insects under their biological control measures.

Figure 1. Irradiation of fruit fly pupae following established operational procedures.

Figure 2. ISO9001 granted to the sterile Mediterranean fruit fly production facility in Guatemala.

4. Operational procedures

4.1 Packing at mass-rearing facility for long distance shipping

After irradiation sterile pupae or adults are placed in a container such as a carton box, polyethylene bag or a petri dish and are loaded into secure styrofoam or cardboard shipping boxes for long distance transboundary transportation to release centres or release areas. Although in general terms packing and shipping procedures are similar, there are some differences depending on the sterile insect species.

Fruit flies

As an example, the shipping box used to hold the 4-litre bags of fruit fly pupae is constructed of double-walled corrugated cardboard of 74 × 34 × 34 cm^3 with a top and bottom full overlap. Inside the box, a central compartment, 46 cm long, is lined with additional layers of corrugated cardboard. Nine bags of pupae are placed lengthwise within this central compartment in three layers of three bags each. Layers, as well as bags within a layer, are separated by spacers of double- and single-wall corrugated cardboard, respectively. The space remaining at either end of the box (aproximately 10 cm of the length of the box) is used to hold cooling units. These can be cooling units (hydrogel) prepared at the packing facilities, or using two packs of 'blue ice', wrapped in newspaper (**Figure 3a**).

According to the capacity of the cardboard box, temperature must be kept at 16–20 °C. In Australia 2-litre bags of pupae are placed in a cardboard carton, with ten of these cartons in a Styrofoam box (**Figure 3b**). In Argentina, a cardboard box of 42.5 × 33 × 27 cm^3 and a Styrofoam box inside with seven plastic bags of 2.8 L pupae per bag is used (FAO/IAEA/USDA. 2019).

Once full, a box is sealed with carton staples (placing staples in locations where they will not hit the bags of pupae) and two bands of fibre-reinforced plastic adhesive tape (**Figure 4**).

Moths

As an example, sterile adults of the False codling moth (*Thaumatotibia leucotreta)* are packed in a cardboard box, 14 × 13.2 × 5.2 cm^3, containing ca. 15000 individuals. To keep moth nonactive, low temperature of 4–8 ºC should be kept in long transboundary shipment. Moth boxes are placed in two Styrofoam containers, with cooling units within the internal and exterior containers. This form allows

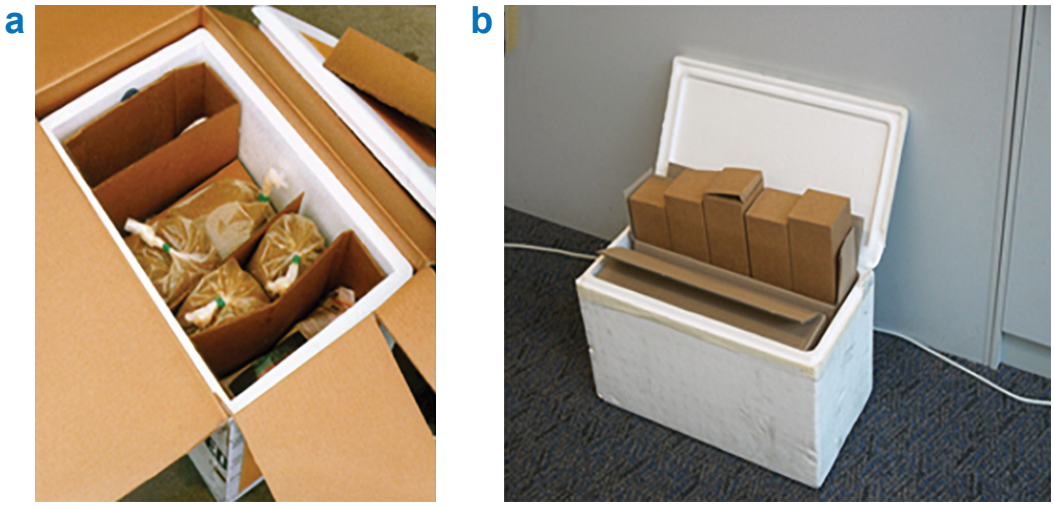


Figure 3. (a) Inside view of a box used to ship sterile Medfly pupae from Guatemala Moscamed rearing facility; (b) Inside view of a box used to ship Queensland fruit fly in Australia

Figure 4. Sealed boxes used for shipping sterile medfly pupae from Guatemala Moscamed rearing facility

Figure 5. Sealed box used for shipping sterile Codling moth adults from British Columbia, Canada, to New Zealand

cool chain of 72 hours. Since flight ability of moth is affected directly by scales lost, keeping the insects in cool environment to prevent movement is crucial before release.

In the case of the Codling moth (*Cydia pomonella*), 50 petri dishes containing each approximately 23 g of sterile moth adults are packed in a polyurethane cooler box with icepacks wrapped in newspaper surrounding the box. The cooler box is then placed in a cartoon box with proper labels (**Figure 5**). Data shows that airfreighting (67 to 89 hours in duration) at temperatures near 0 °C appears to have little detrimental effect on quality including moth emergence, longevity, and ability to mate (Blomefield *et al.* 2011).

Tsetse Flies

Tsetse flies are usually transported as pupae, either chilled at 8–10 °C just before emergence between 28–31 days post larviposition, or between day 25–30 post larviposition at ambient temperatures of 20–22 °C if pupae were sorted with the Near Infrared Pupae Sex Sorter (NIRPSS). The irradiated pupae are placed in petri dishes or carton boxes (**Figure 6**) and transported in insulated shipping boxes containing phase change material packs (PCM) (**Figure 7**), see detailed description of the packaging protocol in www.iaea.org/sites/default/files/21/06/nafa-ipc-manual-long-distance-shipment-tsetse-pupae.pdf. For example, in the packing system that was used in 2012 for the shipment of irradiated tsetse pupae from Bobo-Dioulasso to Dakar, eight PCM packs maintained the temperature inside the shipment box at around 10 °C for up to four days (Pagabeleguem *et al.* 2015) (**Figure 8**).

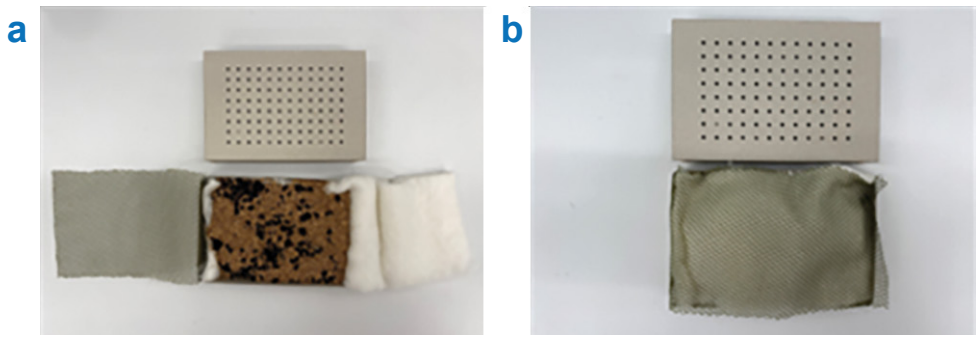


Figure 6. (a) Open transport boxes showing tsetse pupae with sawdust partly wrapped with cotton wool and netting; (b) Partly closed transport box showing final wrapping of cotton wool and netting

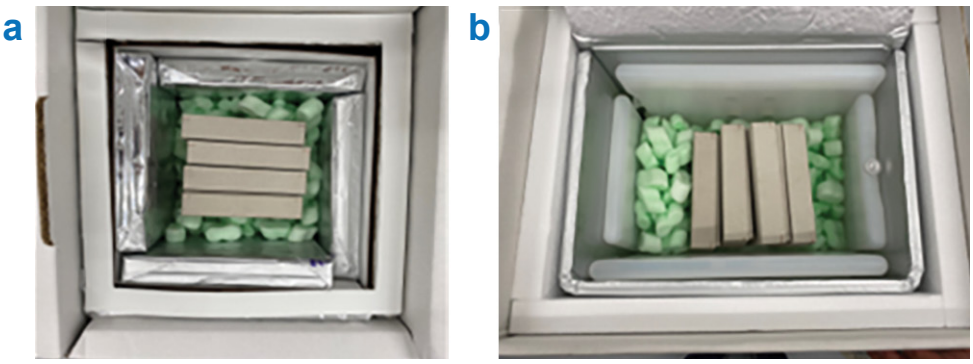


Figure 7. (a) Inside view of a box used for chilled pupae shipment conditions; (b) Inside view of a box used to ship pupae at ambient temperatures

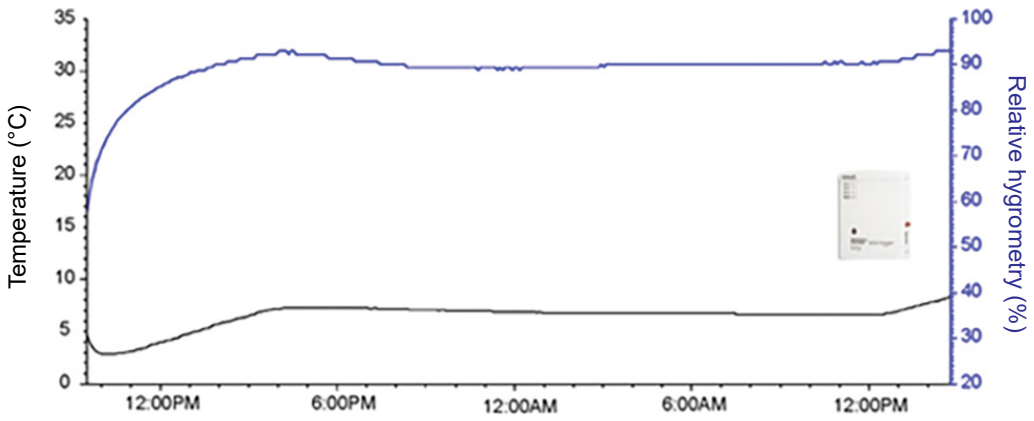


Figure 8. Temperature and relative humidity recorded inside the insulated transport box with a data logger during a pupal shipment of mature irradiated tsetse pupae from Bobo-Dioulasso to Dakar (Pagabeleguem *et al.* 2015)

Figure 9. Transport boxes used for the trans-boundary shipment of sterile male mosquitoes

Figure 10. Sample of label placed on boxes containing sterile medfly pupae shipped from Argentina (Mendoza rearing facility) to Spain (region of Valencia

Mosquitoes

In mosquitoes, chilled adult irradiated males are transported within insulated boxes containing phase change material packs (PCM) keeping the temperature in a range of 8–15 °C, together with humidity control packs to maintain the relative humidity at 70–75 %. Sterile males are packed at about 100 males/cm^3 in containers such as diamond painting storage boxes (DiamondPaintingsx.ch, Switzerland) attached in four rows (**Figure 9**). Each individual box (2.5 × 2.3 × 2.3 cm) has a press down lid that ensures that the lids do not come off. Each single box contains about 1300 sterile males. These individual boxes are placed in a larger closed box itself placed within an insulated box. Three levels of containment are actually required for their transport to avoid any possible escape, while allowing possible inspection activities by the sanitary authority or customs thanks to the transparency of the boxes (**Figure 9**).

4.2 Labelling

All boxes are properly labelled with the words: ‘Fragile’ and/or ‘Biological Material’. The words ‘Live Sterile Insects’ and indication of the storage conditions (‘This Side Up’, ‘Handle with Care’, ‘Keep Cool’ or ‘Do not leave in the sun’) should also be present on the boxes (**Figure 10**).

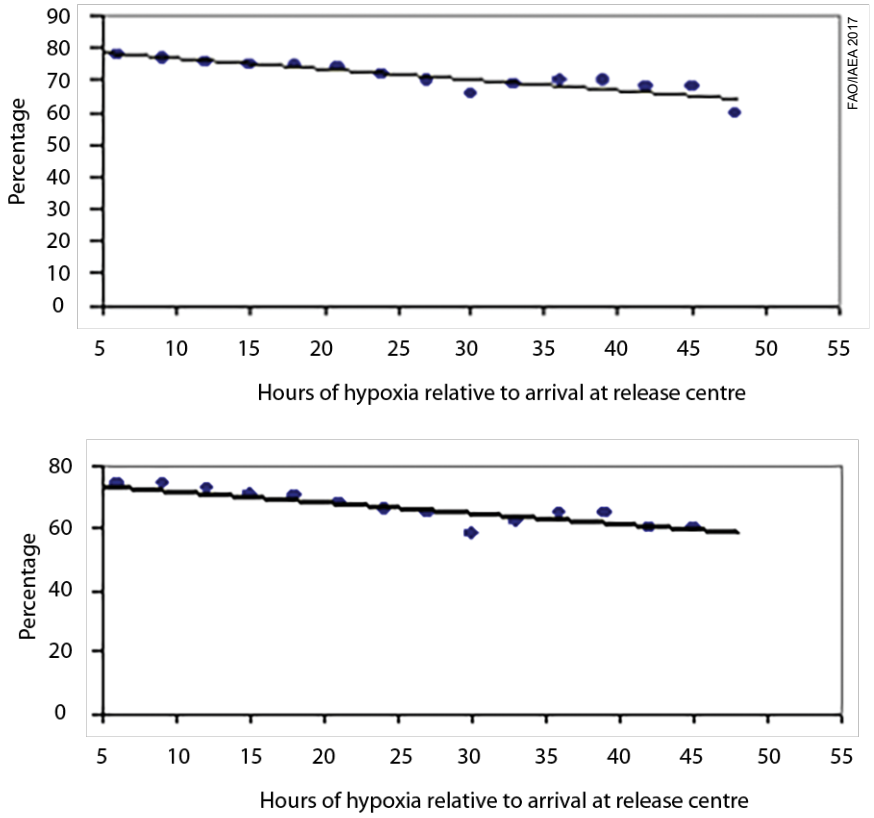


Figure 11. Effects on emergence (top) and fliers (bottom) of sterile fruit flies from prolonged hours in hypoxia during shipment

These words should be adopted as a standard for those programmes using SIT. In all cases, the boxes should be kept under the shade in a cool place. As described in **Section 4.1,** the minimum temperature at which the boxes containing sterile insects should be kept is different for each species. The boxes should never be kept at freezing temperatures.

To facilitate tracking of consignments, these should have complete information on the location of the addressee and a shipment number. Additionally, boxes for each shipment have to be numbered consecutively in large, clear writing on the outside of the box, e.g. 'Shipment 18, Box 3 of 24'.

4.3 Shipping time

For transboundary shipment, insects shipped as pupae or adults, are typically carried by commercial airlines in a portion of the cargo hold where temperature and air pressure are held at 'cabin' levels.

For long distance shipments airline routing should be carefully selected to minimize transhipment points and overall shipment time. Although in certain cases fruit fly pupae have been held under hypoxia for 40 hours, for some insects such as the Mediterranean fruit fly it has been observed that quality begins to drop rapidly when hypoxia extends beyond approximately 24 hours. Use of plastic bottles rather than bags and boxes increases the negative effects of extended hypoxia on insect quality **(Figure 11**).

For some adult moths such as the false codling moth using low temperature of 4–8 ºC for transboundary shipment, allows expansion of transport time up to 60 hours, with minor effect on survival. However other parameters such as mating behaviour might be affected.

5. Normative procedures

National governments should designate the authority responsible for facilitating safe shipment of sterile insects (either through or to their territory). It is up to the competent authority (for example National Plant Protection Organization (NPPOs), Veterinary and Sanitary Services) to coordinate with the producer/shipper and importer regarding their responsibilities for achieving secure and timely shipment.

5.1 Responsibilities of the producer/shipper of the sterile insects

The producer/shipper should:

- Ensure that sterile insects conform to internationally accepted quality control standards (where available) (for fruit flies FAO/IAEA/USDA 2019, FAO 2005) and, otherwise, to established procedures developed by operational programmes.
- Ensure that exported sterile insects conform to the requirements established by the competent authority of the importing country and to the extent the transit route is anticipated and advised by the carrier, of any transit country (**Figure 12**).
- Ensure that documentation includes instructions to handlers and officials at the point of entry on how the package should be treated. This is to avoid damage to the contents and on action to be taken if the packaging is breached. Documentation should also indicate whether it may be opened for Customs inspection (**Figure 13**).
- The producer/shipper should give advance notice with full details of routing to the importer/receiver to minimize delays and to alert officials at the point(s) of entry.

©FAO/Programa Moscamed Mexico, Guatemala, USA

Figure 12. Transit documents for shipment of sterile medfly pupae from Guatemala to Israel through the Netherlands

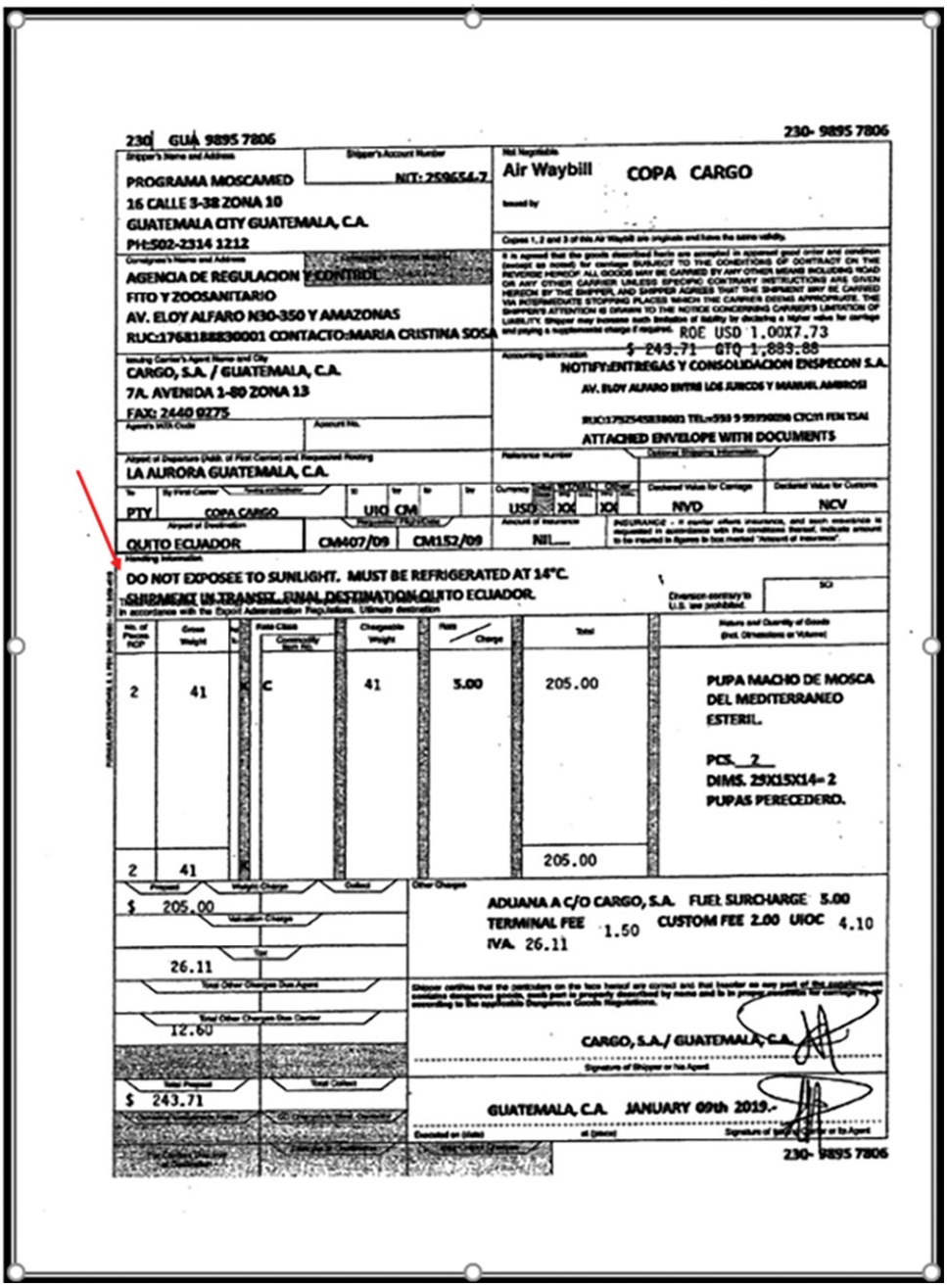


Figure 13. Sample of Air Waybill indicating handling procedures for sterile insect packages

5.2 Responsibilities of the competent authority of the exporting country

The competent authority in the exporting country should support the producer/shipper as needed by:

- clarifying the requirements of the importing country, and if necessary, negotiating how they can be met;
- providing a phytosanitary, zoosanitary or sanitary certificate for the shipment as required by the importing country's competent authority, or by the competent authority of any transit country (**Figure 14**).

The need for official documentation

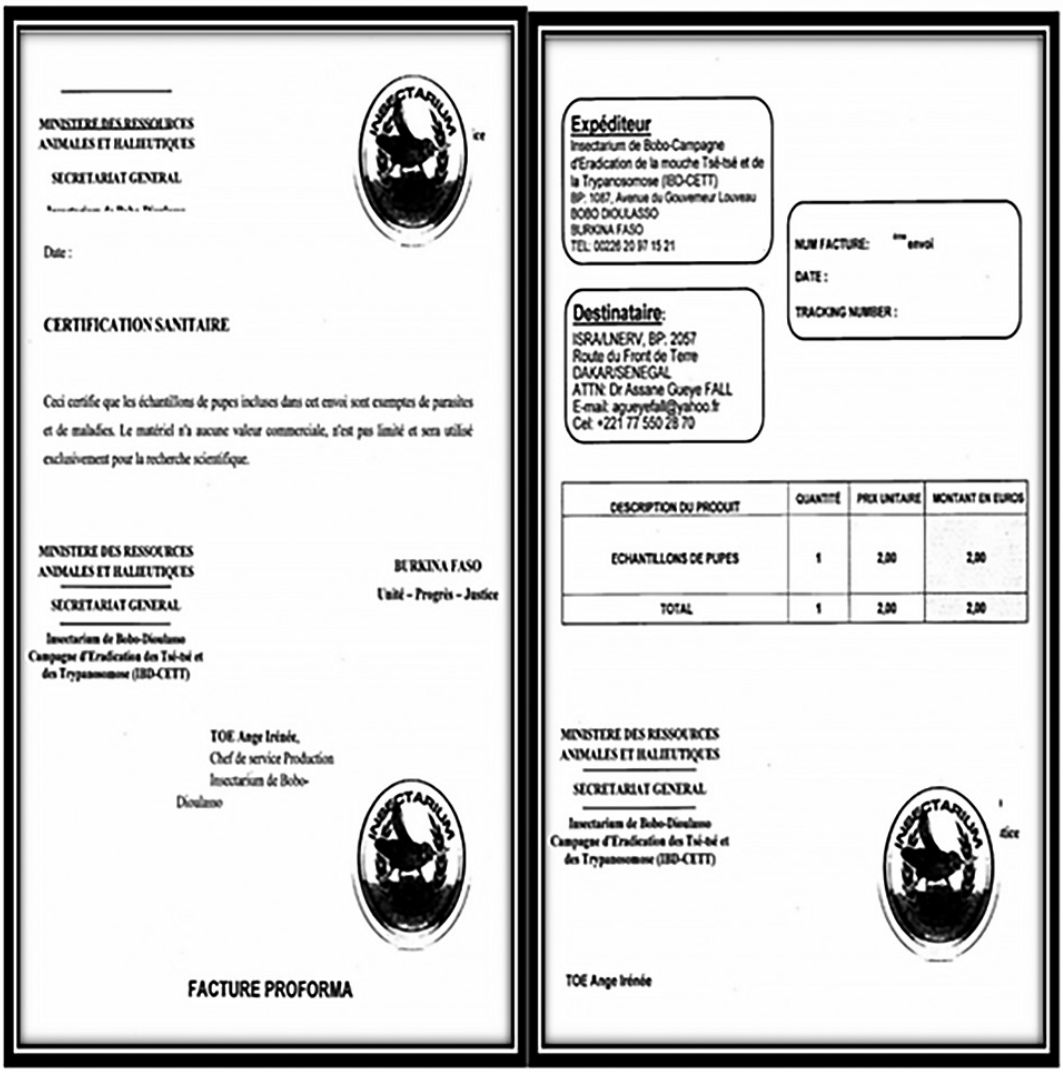
Historically, international supplies of sterile insects for SIT programmes have been based on government-to-government arrangements, motivated by the importing country's official control programmes. Over more recent years, as commercial shipments and end-user involvement have increased, national authorities are seeking some form of assurance that consignments of sterile insects coming into their country are safe. In terms plant and animal health mandates, this focuses on the imported insects not becoming a pest itself – which is mitigated by sterility and in many programmes release of males only – or introducing vectored disease. For insects that may vector human or zoonotic diseases this includes freedom from that pathogen as well. Freedom from contaminating organisms (e.g. parasites) is also required – in both cases the risk is mitigated by specific procedures applied in the insect mass rearing facilities and during packaging and transport. Countries are requesting different types of documentation to fulfil this purpose, as there is no single, fit-for-purpose certificate that would cover all these scenarios (Quinlan *et al.*, 2022).

The roles and process for managing these requirements for plan pests are laid out in the International Standard for Phytosanitary Measures 3 (FAO 2005), under the International Plan Protection Convention. An NPPO is the competent authority for issuing plant health certifications for export, which may be the paper form or an electronic certificate. Inspections or other steps to demonstrate compliance must be carried out by the NPPO or a different public sector entity, which is technically qualified and duly authorized by the NPPO (PM 12). The public sector in this context may be at any level of government. Many of those involved in shipping live insects are not familiar with PM 3, however, or the regional frameworks, e.g. in the European Union (Oliva *et al*., 2022).

In order to align with the model certificate (International Plant Protection Convention Article V.2 (b); ISPM 12, Annex 2), national phytosanitary certificates for export may only be used for trade in regulated products (i.e. regulated species, strains or biotypes of insects) and may only make statemen related to the mandate of the IPPC, for instance statements about animal health cannot be added. Sterile in sects are often used against regulated pest species, but may also be imported for control programmes against insect species that are not officially regulated, e.g. species established in a country where SIT is being used for limited areas or without the framework of official control.

Sanitary Certificates issued by National Veterinary Services have been required by several importing country authorities to attest to the health of the insects. This may be requested for each consignment or for a particular trade (several consignments from the same company, using the same route, over a specified time). This approach has been used for sterile insect that are animal pests or vectors of animal disease (i.e. screwworm and tsetse). The Terrestrial Animal Code (WOAH 2021), however, has a definition of animal that does not include any insects other than bees (which are covered by WOAH for particular reportable diseases, as explained by Torres *et al.* (2022). There is no national authority consistently recognized for declaring a vector of human or zoonotic disease as free from pathogens, although the individual production facility should be able to confirm procedures to achieve this status.

The WOAH has encouraged discussion of how to rationalize the use of official certificates for live insect trade (Éloti 2022). Shippers and competent authorities should follow developments under the WOAH and IPPC, or other relevant international bodies, regarding future use of health certificates for sterile insect shipments.



MINISTERE DES RESSOURCES ANIMALES ET HALIEUTIQUES

SECRETARIAT GENERAL

Date :

CERTIFICATION SANITAIRE

Ceci certifie que les échantillons de pupes incluses dans cet envoi sont exemptes de parasites et de maladies. Le matériel n'a aucune valeur commerciale, n'est pas limité et sera utilisé exclusivement pour la recherche scientifique.

MINISTERE DES RESSOURCES ANIMALES ET HALIEUTIQUES

SECRETARIAT GENERAL

Insectarium de Bobo-Dioulasso
Campagne d'Eradication des Tsé-tsé et des Trypanosomose (IBD-CETT)

BURKINA FASO
Unité - Progrès - Justice

TOE Ange Irénée,
Chef de service Production
Insectarium de Bobo-Dioulasso

FACTURE PROFORMA

Expéditeur
Insectarium de Bobo-Campagne d'Eradication de la mouche Tsé-tsé et de la Trypanosomose (IBD-CETT)
BP: 1087, Avenue du Gouverneur Louveau
BOBO DIOULASSO
BURKINA FASO
TEL: 00226 20 97 15 21

NUM FACTURE: ème envoi
DATE :
TRACKING NUMBER :

Destinataire:
ISRA/LNERV, BP: 2057
Route du Front de Terre
DAKAR/SENEGAL
ATTN: Dr Assane Gueye FALL
E-mail: agueyefall@yahoo.fr
Cel: +221 77 550 28 70

DESCRIPTION DU PRODUIT	QUANTITÉ	PRIX UNITAIRE	MONTANT EN EUROS
ECHANTILLONS DE PUPES	1	2,00	2,00
TOTAL	1	2,00	2,00

MINISTERE DES RESSOURCES ANIMALES ET HALIEUTIQUES

SECRETARIAT GENERAL

Insectarium de Bobo-Dioulasso
Campagne d'Eradication des Tsé-tsé et des Trypanosomose (IBD-CETT)

TOE Ange Irénée

Figure 14. Sample document: Sanitary Certificate for exports of tsetse (*Glossina sp*) from Burkina Faso to Senegal

5.3 Responsibilities of the competent authority of the importing country

The competent authority of the importing country should:

- provide information on all requirements to import sterile insects including instructions and need for advance notice to the first point of contact (e.g., Customs Border Control);
- in case of inspection, avoid escape, harm or contamination of the sterile insects.

5.4 Responsibilities of the importer

The importer should:

- obtain necessary permits for importing sterile insects from the competent authority of the importing country and as needed, from the competent authority of any transit country;

- notify the producer/shipper and appropriate authorities in the case of a missing or delayed consignment of sterile insects to facilitate tracking the shipment and proper handling when located or if a package arrives damaged.

5.5 Responsibility of the carrier

The role of the carrier is a critical part of the transboundary shipment process of sterile insects. The quality and usefulness of these shipments rely on timeliness and reasonable care of each shipment.

The carrier should:

- seek the most direct and timely routing for shipment;
- provide an online tracking process for all shipments;
- be aware of and follow the procedures outlined under handling, particularly the ambient temperature requirements for storage of the parcel.

5.6 Shipping documents

Packages should be accompanied by the necessary documentation to guarantee timely and safe delivery. Producers/shippers should be vigilant of the following (see **Appendix 3** for examples of documentation):

- Documentation should conform to relevant regulations of exporting and importing countries and as needed of any transit countries. These will include a customs declaration (see sample 3.4, **Appendix 3**), commercial invoice, and may include additional documents as required such as export permit and import permit (see samples 3.3 and 3.5, **Appendix 3**), certificate of origin (**Figure 15**), national transit permit, phytosanitary, zoosanitary or sanitary certificate, irradiation certificate (**Figure 16**), labelling and notification.
- Documentation should include clear instructions to handlers and officials at the point of embarkment, transhipment and import on how the package should be handled to avoid damage to the contents and on action to be taken if the package is damaged.
- Documentation should indicate that package content is perishable and therefore rapid transit of sterile insects is necessary.
- Contact details should be provided to facilitate immediate notification upon arrival, or if the package is delayed or arrives damaged. Documents should include clear instructions to officials at transhipment or entry points to contact producer/shipper and importer.
- Any other additional documentation to meet contractual requirements for secure and timely shipments.

5.7 Traceability

A system to allow tracing the sterile insect batch throughout the whole process is of primary importance.

The importer may request that for each consignment every box is numbered and include specific forms with detailed shipment information including: litres of pupae (or number of insects), collection number, basic quality control parameters (e.g. pupae weight, pupae/litre). The forms should include the corresponding supervisor signature for the different control points (i.e. irradiation, transportation, reception, quality control). Pupae or adult containers (bags/bottles/box/petri dishes) must include radiation indicators inside or outside the container. Containers should be sealed before irradiation, in

CERTIFICADO DE ORIGEN

F No. 437172

Cámara de Comercio de Guatemala

LA CAMARA DE COMERCIO DE GUATEMALA, hace constar:

a) Que el día de hoy se ha presentado a sus oficinas a requerir la emisión del presente certificado, el señor DR. EDWIN RAMIREZ quien manifestó actuar en nombre PROGRAMA MOSCAMED

PLANTA EL PINO comerciante domiciliado en KM. 47.5 RUTA A EL SALVADOR

BARBERENA SANTA ROSA GUATEMALA, CENTRAL AMERICA y bajo juramento declaró que las mercaderías abajo especificadas enviadas por vía AEREA en el COPA CARGO que zarpó (zarpará) de el 25 DE AGOSTO DE 2021 con destino a MINISTERIO DE AGRICULTURA Y GANADERÍA, QUITO, ECUADOR a la orden de AGENCIA DE REGULACION Y CONTROL FITO Y ZOOSANITARIO (AGROCALIDAD) / SR. CRISTIAN ORTIZ / SRA. MARIA CRISTINA son de origen o producción GUATEMALA C.A.

MARCAS			PESO BRUTO	NETO	VALOR
SIN MARCAS	2	PIEZAS CONTENIENDO 3,550 MILLONES PUPA MACHO ESTERIL DE MOSCA DEL MEDITERRANEO.-	42.00 KGS	80.00 KGS	525.00
		FACTURA EC-52 VEINTE Y CINCO DOLARES CON 00/100			$25.00

b) Que las mercaderías arriba descritas son productos de GUATEMALA, C.A.- PROGRAMA MOSCAMED PLANTA EL PINO, según se desprende de la documentación presentada al efecto y analizada por esta Cámara

En fe de lo cual se firma el presente certificado por el requirente y por el Gerente de la Cámara de Comercio de Guatemala, en la ciudad de Guatemala el 18 DE AGOSTO DE 2021.-

Cámara de Comercio de Guatemala

CHAMBER OF COMMERCE OF GUATEMALA

19 AGO 2021

COMMERCIAL DEPARTMENT

PROGRAMA MOSCAMED

REQUIRENTE

CAMARA DE COMERCIO DE GUATEMALA

Gabriela de León

COMERCIO EXTERIOR

CAMARA DE COMERCIO DE GUATEMALA

GUATEMALA, C.A.

POR GERENTE

-ORIGINAL-

Figure 15. Sample of certificate of origin for sterile Mediterranean fruit flies being shipped from Guatemala to Ecuador

order to ensure integrity. For example, in the case of tsetse, the transport box should be accompanied by a document indicating the number and age of the shipped pupae, time of chilling or date of sorting with the NIRPSS, irradiation dates and duration, and dose.

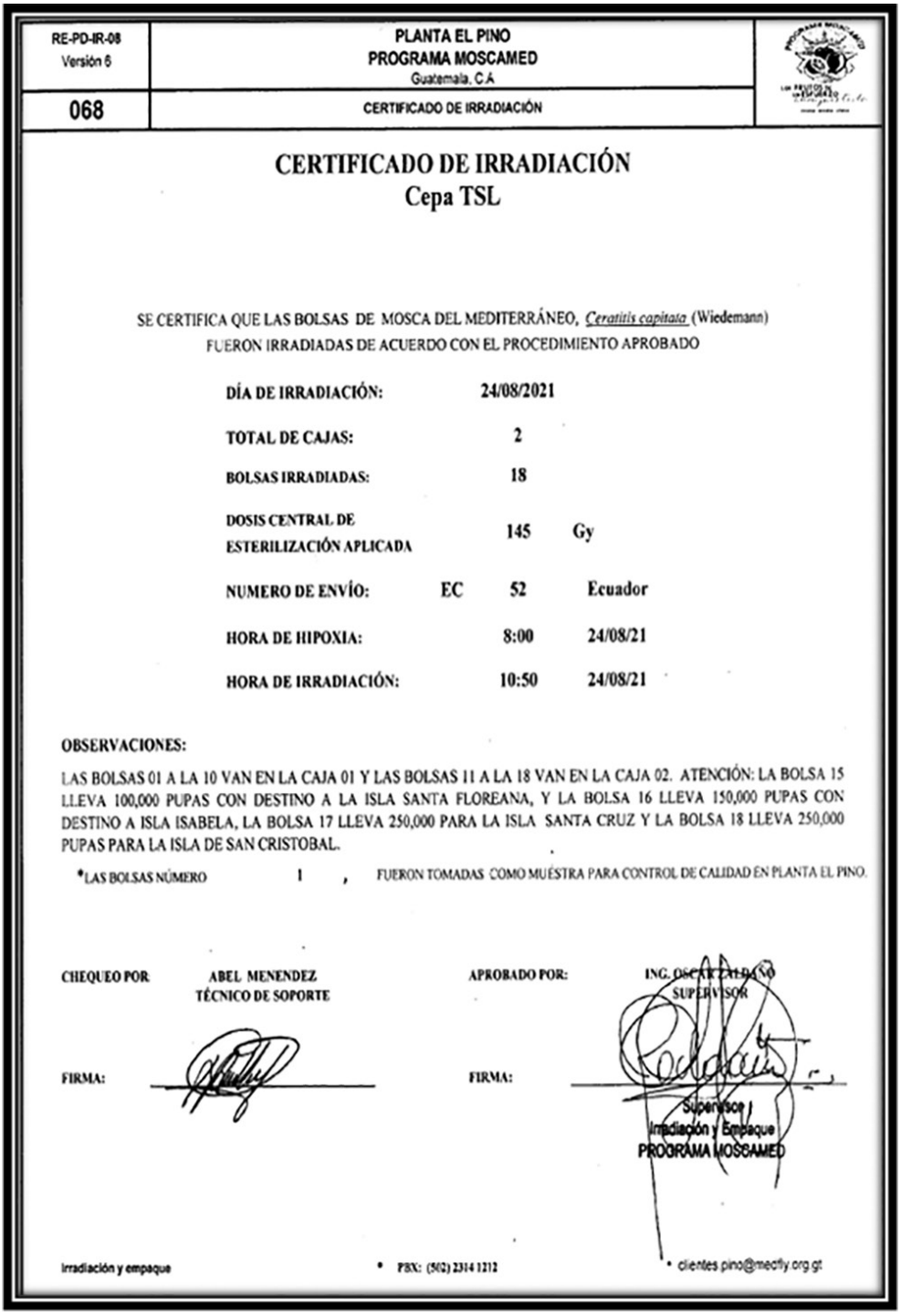
This procedure as a whole will assure traceability of the sterile pupae or adult consignment. A datasheet with a minimum of information is shown as an example in **Appendix 4**.

5.8 Action in case of non-compliance

In accordance with the competent authority of the countries involved, the type of action in case of non-compliance will vary with circumstances and should be the minimum necessary to counter identified risk. Opportunities should be found to resolve administrative errors.

Other options for non-compliance may require action such as:

- *Detention/Rejection and return* – This may be used if further information is required and not provided, taking into account need to avoid consignment damage as far as possible.
- *Destruction* – Consignment may be destroyed in cases where the competent authority considers consignment cannot be otherwise handled. Before destruction is carried out, the importer and/or producer/shipper should be consulted according to the contact information as described in **Section 4.2**. Sterile insects are safe for biodegradable destruction.



RE-PD-IR-08
Versión 6

PLANTA EL PINO
PROGRAMA MOSCAMED
Guatemala, C.A

068

CERTIFICADO DE IRRADIACIÓN

CERTIFICADO DE IRRADIACIÓN
Cepa TSL

SE CERTIFICA QUE LAS BOLSAS DE MOSCA DEL MEDITERRÁNEO, *Ceratitis capitata* (Wiedemann)
FUERON IRRADIADAS DE ACUERDO CON EL PROCEDIMIENTO APROBADO

DÍA DE IRRADIACIÓN:		**24/08/2021**	
TOTAL DE CAJAS:		**2**	
BOLSAS IRRADIADAS:		**18**	
DOSIS CENTRAL DE ESTERILIZACIÓN APLICADA		**145**	**Gy**
NUMERO DE ENVÍO:	**EC**	**52**	**Ecuador**
HORA DE HIPOXIA:		**8:00**	**24/08/21**
HORA DE IRRADIACIÓN:		**10:50**	**24/08/21**

OBSERVACIONES:

LAS BOLSAS 01 A LA 10 VAN EN LA CAJA 01 Y LAS BOLSAS 11 A LA 18 VAN EN LA CAJA 02. ATENCIÓN: LA BOLSA 15 LLEVA 100,000 PUPAS CON DESTINO A LA ISLA SANTA FLOREANA, Y LA BOLSA 16 LLEVA 150,000 PUPAS CON DESTINO A ISLA ISABELA, LA BOLSA 17 LLEVA 250,000 PARA LA ISLA SANTA CRUZ Y LA BOLSA 18 LLEVA 250,000 PUPAS PARA LA ISLA DE SAN CRISTOBAL.

*LAS BOLSAS NÚMERO 1 , FUERON TOMADAS COMO MUÉSTRA PARA CONTROL DE CALIDAD EN PLANTA EL PINO.

CHEQUEO POR ABEL MENENDEZ
TÉCNICO DE SOPORTE

FIRMA:

APROBADO POR: ING. OSCAR CALDERÓN
SUPERVISOR

FIRMA:

Supervisor
Irradiación y Empaque
PROGRAMA MOSCAMED

Irradiación y empaque • PBX: (502) 2314 1212 • clientes.pino@mosca.org.gt

Figure 16. Sample of irradiation certificate for sterile Mediterranean fruit being shipped from Guatemala to Ecuador

Any non-compliance should trigger review of procedures and identify corrective actions.

Official action should be notified between competent authorities of each country for example, following ISPM No. 13: Guidelines for the notification of non-compliance and emergency action (FAO 2021).

5.9 Communications

Producer/shipper, carrier, importer and competent authorities for exporting and importing countries (and transit countries as needed) should ensure that there are functioning communication channels including after normal business hours.

6. Relevant resources

6.1 Scientific articles

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6.3 International Standards of Phytosanitary Measures (ISPM) and technical assessments

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6.4 Glossary of terms

Term	Description	Source
Additional declaration	A statement that is required by an importing country to be entered on a **phytosanitary certificate** and which provides specific additional information on a **consignment** in relation to **regulated pests** or **regulated articles** [ISPM 5]	FAO
Animal	*For the purpose of the Terrestrial Code:* means a mammal, reptile, bird or bee.	World Organisation for Animal Health (OIE), Terrestrial Animal Health Code. 29th edn. OIE, Paris (2021). (Under review by WOAH – September 2022?)
Carrier	Carrier is a person or business that transports consignment goods.	
Competent authorities	The governmental authority (of a Member Country including sub-national authorities) having the responsibility and competence for overseeing and regulating the transboundary shipments of irradiated sterile insects	
Consignment	One or more items accepted by the carrier from one shipper at one time and at one address, receipted in one consignment and moving on one waybill or shipment record to one consignee at one destination address.	Adapted from ICAO-WCO
Consignments in transit	Consignments in transit are not imported. However, the phytosanitary import regulatory system may be extended to cover consignments in transit and to establish technically justified phytosanitary measures to prevent the introduction and/or spread of pests (Article VII.4 of the IPPC, ISPM 25 (Consignments in transit)). Measures may be required to track consignments, to verify their integrity or to confirm that they leave the country of transit. Countries may establish points of entry, routes within the country, conditions for transportation and time spans permitted within their territories. [ISPM 20, 2019].	FAO
Customs	The Government Service which is responsible for administration of Customs law and the collection of duties and taxes, and which also has the responsibility for the application of other laws and regulations relating to importation, exportation, movement or storage of goods.*	World Customs Organization. (2018) Glossary. www.wcoomd.org/en/topics/facilitation/instrument-and-tools/tools/glossary-of-international-customs-terms.aspx
Detention	Keeping a **consignment** in **official** custody or confinement.	
Established Procedures	Procedures that are used by facilities as standards for the mass rearing and sterilization of insects.	Self-defined for the purpose of this guideline
Import permit	**Official** document authorizing importation of a **commodity** in accordance with specified **phytosanitary import requirements** [ISPM 5, 2022]	FAO Or for other insects remove the term 'phytosanitary'
Irradiation	**Treatment** with any type of ionizing radiation [ISPM 18, 2003]	FAO
Notification or to notify	Notification is a term that links to a legal requirement to inform a government counterpart when issues arise. The term 'to notify' is used to communicate information which is not a legal requirement.	
Packaging	Material used in supporting, protecting or carrying a **commodity** [ISPM 20, 2004]	FAO
Phytosanitary Certificate	An **official** paper document or its **official** electronic equivalent, consistent with the model certificates of the **IPPC**, attesting that a **consignment** meets **phytosanitary import requirements** [ISPM 5]	FAO

	A phytosanitary certificate for export or for re-export can be issued only by a public officer who is technically qualified and duly authorized by an NPPO [ISPM 12, 2022]	FAO
Producer/Shipper	The term 'producer' indicates either the mass-rearing facility and/or the irradiation facility of sterile insects. The term '**shipper'** is often used to describe the entity or individual who initiates the trade in goods. Consignor and shipper are separate roles but can be the same entity or individual.	
Regulated pest	A **quarantine pest** or a **regulated non-quarantine pest** [ISPM 5, 2022]	FAO
Sanitary Certificate	The certificate usually released by the Veterinary authority of the exporting country [Article 5.1.3.]. The international veterinary certificate should not include measures against pathogenic agents or diseases which are not OIE listed, unless the importing country has demonstrated through import risk analysis. [Article 5.1.2]	WOAH Terrestrial Code
Sterile insect	An insect that, as a result of a specific treatment, is unable to reproduce (FAO 2006). An insect incapable of reproduction (Gordh and Headrick 2001).	https://nucleus.iaea.org/sites/naipc/dirsit/Documents/sit-glossary-updated-9-6-10.pdf
Sterile insect technique	Method of pest control using area-wide inundative release of sterile insects to reduce reproduction in a field population of the same species (FAO 2006, Klassen 2021, Robinson 2021). The SIT depends upon inducing a high proportion of sterile matings in a natural population that reduces reproduction to a level below population maintenance (Parker 2021). A genetic control technique used to control or eradicate pest insects. Large numbers of mass-produced males are given non-lethal but sterilizing doses of radiation and then released. Females in natural populations mate with the sterilized males, and produce inviable progeny. After multiple releases a new generation is not produced (Hoy 2003, King *et al.* 2006, Coppel and Mertins 1977, Daly *et al.* 1998, Bijlmakers 2008, NAL 2008). A process in which insects are reared in massive numbers, sterilized, and released to prevent normal mating in target populations (Resh and Cardé 2003). A method of insect control in which laboratory-propagated insects are irradiated to the point of sterility and then released into the environment to compete for males with conspecifics in feral populations (Gordh and Headrick 2001). Sterile male technique. A method of insect control, in which sterile males are introduced to a community of insect pests to control population growth (Coombs and Hall 1998).	https://nucleus.iaea.org/sites/naipc/dirsit/Documents/sit-glossary-updated-9-6-10.pdf
Traceability	It is based on documentation and other evidence by which a product can be traced from an importer all the way back through the chain of custody to the producer/shipper from which it originated.	
Tracked	System to inform the shipper or others in real time as to the location of a specific package during shipment, usually accessible online	
Transit Country	Means a country through which *commodities* destined for an *importing country* are transported or in which a stopover is made at a *border post*.	OIE
Waybill	A document prepared by or on behalf of a shipper that evidences the contract between the shipper and carriers of goods over routes of the operator(s). Waybills have several purposes, but their two main functions are as a contract of carriage (behind every original waybill are the conditions of contract for carriage), and as evidence of the receipt of goods.	Adapted from ICAO-WCO

* General Annex Chapter 2 of the International Convention on the simplification and harmonization of Customs procedures (as amended), known as the Revised Kyoto Convention.

Appendix 1
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Appendix 2
Table of transboundary shipments

Year	Species	Site of production	Approximate amount shipped (million pupae/ adults)	Recipient	Purpose
1963–2000	Mexican fruit fly, *Anastrepha ludens*	Mexico (Monterrey and Metapa)	2511	USA (Texas and San Diego)	To assist the California and Texas Department of Agriculture in the eradication of Mexican fruit fly outbreaks
1970–2021	Mediterranean fruit fly, *Ceratitis capitata*	Argentina (Mendoza), Austria (Seibersdorf), Chile (Arica), Costa Rica, Guatemala (El Pino), Israel (Biofly), Mexico (Metapa), Portugal (Madeira), Spain (Valencia), USA (Hawaii)	913 851.5	Argentina (Patagonia), Belice, Bolivia (Cochabamba), Chile, Croatia, Ecuador, Italy (Procida), Greece, Guatemala, Honduras, Israel, Jordan, Mexico, Morocco (Agadir and Berkane), Nicaragua, Peru (Tacna), Spain (Canary Islands), Tunisia, USA	For prevention, containment, suppression and eradication of the Mediterranean fruit fly
1990–1991	New World Screwworm (NWS) *Cochliomyia hominivorax*	Mexico (Tuxtla Gutierrez, Chiapas), Panama (COPEG)	108 994	Central American countries (7 countries), Lybia (Tripoli), USA (Florida)	To eradicate NWS from Central America To assist the eradication of NWS outbreaks in Lybia and Florida, USA
1972–1973	Tsetse *(Glossina tachinoides)*	France (Maison Alfort, IEMVT)	0.016	Tchad (Njamena)	Adult irradiated males for research on SIT trials
1990–2021	Tsetse *(Glossina spp.)*	Austria (Seibersdorf), Slovakia	25.5	Tanzania (Tanga) Senegal (Dakar)	To assist Tsetse eradication from Tanzania and Senegal
2018–2022	Tsetse *(Glossina palpalis gambiensis)*	Burkina Faso (IBD)	Unknown	Senegal (Dakar)	To assist Tsetse eradication from Senegal
2008	Cactus moth (*Cactoblastis cactorum*)	USA (Florida)	0.0213 *	Mexico (Yucatan Penninsula)	Eradication of incipient cactus moth outbreaks
2001–2014	Pink bollworm *(Pectinophora gossypiella)*	USA (Arizona)	Unknown	Mexico (Northern States)	Regional (USA and Mexico) eradication of the pink bollworm

2010–2022	Codling moth (*Cydia pomonella*)	Canada (Osoyoos)	Unknown	New Zealand, South Africa, USA	For SIT pilot validation
2017–2021	Mosquitoes (*Aedes albopictus*)	Italy	2.0	Albania, Montenegro, Germany, Greece	Field studies and suppression pilot trials
2021–2022	Mosquitoes (*Aedes aegypti*)	Austria (Seibersdorf)	0.476	La Reunion, France (St Denis), Dakar, Senegal	Irradiated adults for research and a suppression trial
2021-2022	False codling moth (*Thaumatotibia leucotreta)*	South Africa	0.9	Israel	For SIT pilot validation
	Total		**1 025 385.1**		

Note: Numbers are estimates from information available from mass rearing facilities in operational SIT programmes and rearing facilities in other institutions.

* 21 398 sterile moths were released to eradicate incipient outbreaks in Isla Mujeres and Isla Contoy of the coast of the Yucatan Peninsula in Mexico.

Appendix 3

Samples of shipping documents

A-3.1 Model of a Phytosanitary export (ISPM 12 Phytosanitary Certificate).

This annex is a prescriptive part of the standard.

ANNEX 1: Model phytosanitary certificate for export

[Original annexed to the IPPC]

No. _____

Plant Protection Organization of _____

TO: Plant Protection Organization(s) of _____

I. Description of Consignment

Name and address of exporter: _____

Declared name and address of consignee: _____

Number and description of packages: _____

Distinguishing marks: _____

Place of origin: _____

Declared means of conveyance: _____

Declared point of entry: _____

Name of produce and quantity declared: _____

Botanical name of plants: _____

This is to certify that the plants, plant products or other regulated articles described herein have been inspected and/or tested according to appropriate official procedures and are considered to be free from the quarantine pests specified by the importing contracting party and to conform with the current phytosanitary requirements of the importing contracting party, including those for regulated non-quarantine pests.

They are deemed to be practically free from other pests.*

II. Additional Declaration

[Enter text here]

III. Disinfestation and/or Disinfection Treatment

Date _____ Treatment _____ Chemical (active ingredient) _____

Duration and temperature _____

Concentration _____

Additional information _____

_____

Place of issue _____

(Stamp of Organization) Name of authorized officer _____

Date _____ _____

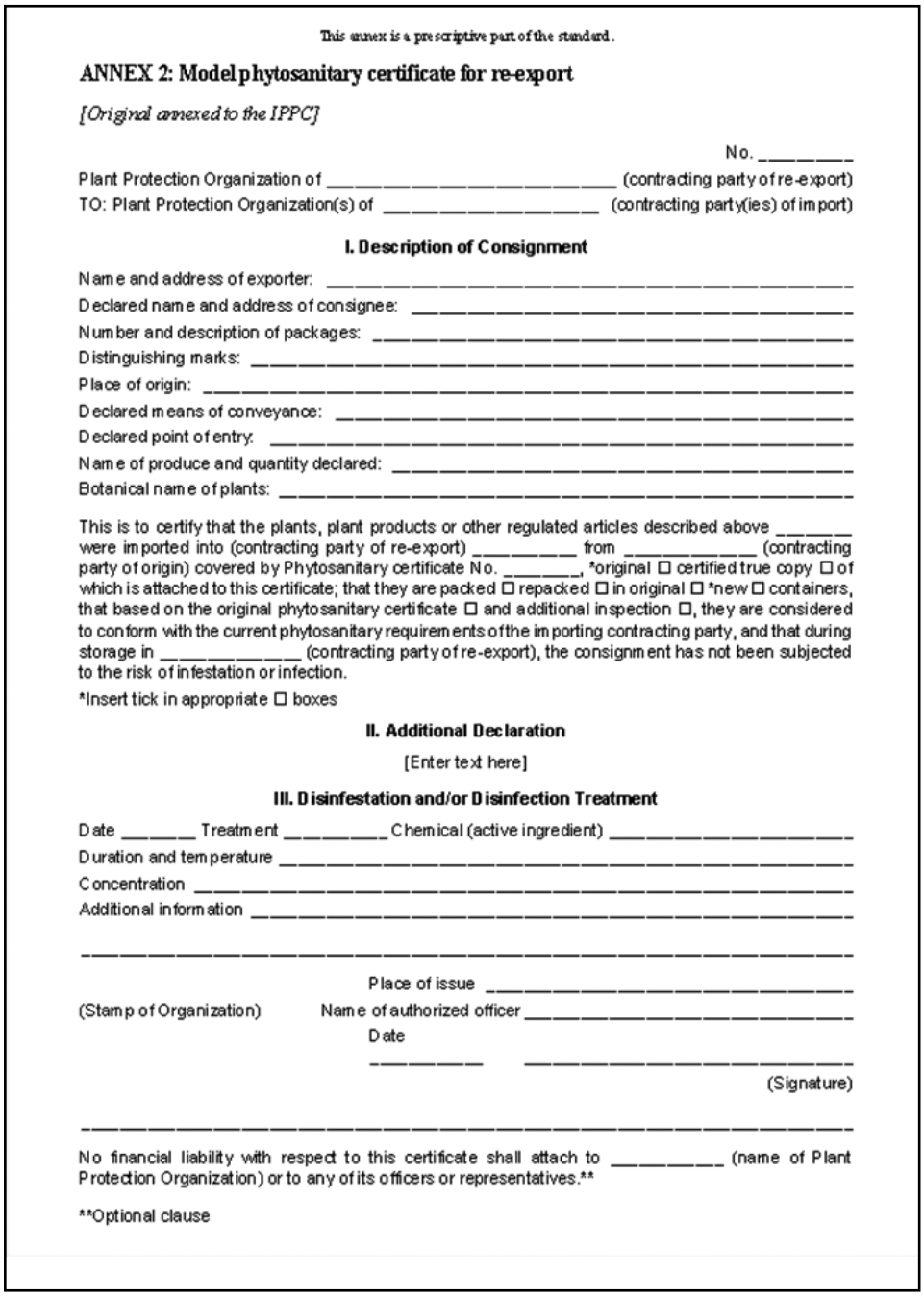
(Signature)

_____

No financial liability with respect to this certificate shall attach to _____ (name of Plant Protection Organization) or to any of its officers or representatives.*

*Optional clause

A-3.2 Model of a phytosanitary re-export ((ISPM 12 Phytosanitary Certificate).



This annex is a prescriptive part of the standard.

ANNEX 2: Model phytosanitary certificate for re-export

[Original annexed to the IPPC]

No. _____

Plant Protection Organization of _____ (contracting party of re-export)
TO: Plant Protection Organization(s) of _____ (contracting party(ies) of import)

I. Description of Consignment

Name and address of exporter: _____
Declared name and address of consignee: _____
Number and description of packages: _____
Distinguishing marks: _____
Place of origin: _____
Declared means of conveyance: _____
Declared point of entry: _____
Name of produce and quantity declared: _____
Botanical name of plants: _____

This is to certify that the plants, plant products or other regulated articles described above _____ were imported into (contracting party of re-export) _____ from _____ (contracting party of origin) covered by Phytosanitary certificate No. _____, *original ☐ certified true copy ☐ of which is attached to this certificate; that they are packed ☐ repacked ☐ in original ☐ *new ☐ containers, that based on the original phytosanitary certificate ☐ and additional inspection ☐, they are considered to conform with the current phytosanitary requirements of the importing contracting party, and that during storage in _____ (contracting party of re-export), the consignment has not been subjected to the risk of infestation or infection.

*Insert tick in appropriate ☐ boxes

II. Additional Declaration

[Enter text here]

III. Disinfestation and/or Disinfection Treatment

Date _____ Treatment _____ Chemical (active ingredient) _____
Duration and temperature _____
Concentration _____
Additional information _____

_____

Place of issue _____
(Stamp of Organization) Name of authorized officer _____
Date
_____ _____
(Signature)

_____

No financial liability with respect to this certificate shall attach to _____ (name of Plant Protection Organization) or to any of its officers or representatives.**

**Optional clause

A-3.3 Sample document: Sanitary Certificate for exports of tsetse (Glossina sp) from Burkina Faso to Senegal.

MINISTERE DES RESSOURCES
ANIMALES ET HALIEUTIQUES

SECRETARIAT GENERAL

Insectarium de Bobo-Dioulasso

Date :

CERTIFICATION SANITAIRE

Ceci certifie que les échantillons de pupes incluses dans cet envoi sont exemptes de parasites et de maladies. Le matériel n'a aucune valeur commerciale, n'est pas limité et sera utilisé exclusivement pour la recherche scientifique.

MINISTERE DES RESSOURCES
ANIMALES ET HALIEUTIQUES

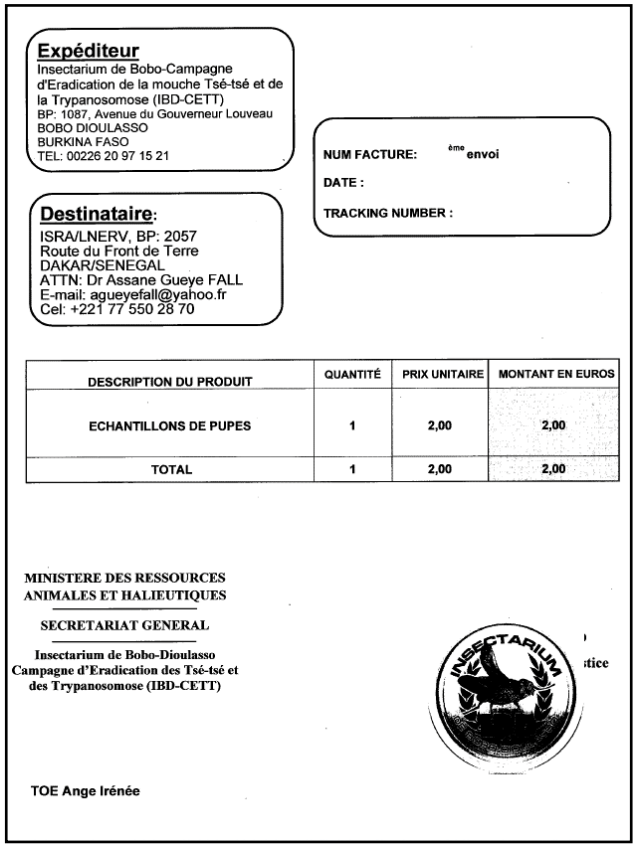
SECRETARIAT GENERAL

Insectarium de Bobo-Dioulasso
Campagne d'Eradication des Tsé-tsé et des Trypanosomose (IBD-CETT)

BURKINA FASO
Unité – Progrès – Justice

TOE Ange Irénée,
Chef de service Production
Insectarium de Bobo-Dioulasso

FACTURE PROFORMA



Expéditeur
Insectarium de Bobo-Campagne d'Eradication de la mouche Tsé-tsé et de la Trypanosomose (IBD-CETT)
BP: 1087, Avenue du Gouverneur Louveau
BOBO DIOULASSO
BURKINA FASO
TEL: 00226 20 97 15 21

Destinataire:
ISRA/LNERV, BP: 2057
Route du Front de Terre
DAKAR/SENEGAL
ATTN: Dr Assane Gueye FALL
E-mail: agueyefall@yahoo.fr
Cel: +221 77 550 28 70

NUM FACTURE: ème envoi
DATE :
TRACKING NUMBER :

DESCRIPTION DU PRODUIT	QUANTITÉ	PRIX UNITAIRE	MONTANT EN EUROS
ECHANTILLONS DE PUPES	1	2,00	2,00
TOTAL	1	2,00	2,00

MINISTERE DES RESSOURCES
ANIMALES ET HALIEUTIQUES

SECRETARIAT GENERAL

Insectarium de Bobo-Dioulasso
Campagne d'Eradication des Tsé-tsé et des Trypanosomose (IBD-CETT)

TOE Ange Irénée

A-3.4 Sample document: Customs declaration for exports of tsetse (Glossina sp) from Burkina Faso to Senegal.

Chef de Service de la Production,
Insectarium de Bobo-Dioulasso

Date :

DECLARATION DE L'EXPEDITEUR

Nous déclarons que la valeur, à des fins personnalisées, de la marchandise est de 2 EUROS. L'expédition comprend des échantillons de pupes à des fins de recherche scientifique.

MINISTERE DES RESSOURCES ANIMALES ET HALIEUTIQUES

SECRETARIAT GENERAL

Insectarium de Bobo-Dioulasso
Campagne d'Eradication des Tsé-tsé et des Trypanosomose (IBD-CETT)

TOE Ange Irénée,
Chef de service Production
Insectarium de Bobo-Dioulasso

BURKINA FASO
Unité – Progrès – Justice

Date :

LISTE DE COLISAGE

EXPEDITEUR :		Insectarium de Bobo-Campagne d'Eradication de la mouche Tsé-tsé et de la Trypanosomose (IBD-CETT) BP: 1087, Avenue du Gouverneur Louveau BOBO DIOULASSO/ BURKINA FASO TEL: +226 20 97 15 21 E-mail :ibdcett@fasonet.bf
DESTINATAIRE :		ISRA/LNERV, BP: 2057, Route du Front de Terre DAKAR/SENEGAL Dr Assane Gueye FALL E-mail: agueyefall@yahoo.fr Cel: +221 77 550 28 70
TRANSPORT	DE :	Bobo-Dioulasso, **BURKINA FASO**
	A :	Dakar, **SENEGAL**
MODE DE TRANSPORT :		Courrier - Fedex
CONTENU :		Echantillons de pupes
DESCRIPTIOON DU COLIS :		1 carton (43 x 36 x 28 cm)
POIDS :		10 kg
DECLARATION DE L'EXPEDITEUR SUR LES MARCHANDISES A TRANSPORTER L'expéditeur confirme et assure que les informations ci-dessus mentionnées sur les marchandises pour ce transport sont correctes, complètes et exactes, et que le contenu des marchandises emballées correspond au contenu réel des colis		

TOE Ange Irénée,
Chef de service Production
Insectarium de Bobo-Dioulasso

BURKINA FASO
Unité – Progrès – Justice

Date :

CERTIFICATION DE VALEUR - ORIGINE DES MARCHANDISES

ORIGINE :	Insectarium de Bobo-Campagne d'Eradication de la mouche Tsé-tsé et de la Trypanosomose (IBD-CETT) BP: 1087, Avenue du Gouverneur Louveau BOBO DIOULASSO/ BURKINA FASO TEL: +226 20 97 15 21 E-mail :ibdcett@fasonet.bf
DESTINATAIRE :	ISRA/LNERV, BP: 2057, Route du Front de Terre **DAKAR/SENEGAL** Dr Assane Gueye FALL E-mail: agueyefall@yahoo.fr Cel: +221 77 550 28 70
MODE DE TRANSPORT :	**Courrier - Fedex**
VALEUR TOTAL :	2 EUROS

MINISTERE DES RESSOURCES ANIMALES ET HALIEUTIQUES

SECRETARIAT GENERAL

Insectarium de Bobo-Dioulasso
Campagne d'Eradication des Tsé-tsé et des Trypanosomose (IBD-CETT)

ngereux, sans valeur commerciale et utilisés exclusivement pour la recherche scientifique.

TOE Ange Irénée,
Chef de service Production
Insectarium de Bobo-Dioulasso

A-3.5 Sample of import permit for tsetse (*Glossina sp*) issued by the Veterinary Services of Senegal.

REPUBLIQUE DU SENEGAL
Un Peuple – Un But – Une Foi

MINISTERE DE L'ELEVAGE ET
DES PRODUCTIONS ANIMALES

DIRECTION DES SERVICES VETERINAIRES

N°01451 /MEPA/DSV

Dakar, le 21 AOUT 2017

AUTORISATION D'IMPORTATION DE PUPES IRRADIEES DE GLOSSINES

Je soussigné, Dr. Mbargou LO, Directeur des Services vétérinaires, autorise le Laboratoire national de l'Elevage et de Recherches vétérinaires de Dakar, à importer de la Slovaquie, des pupes irradiées de *Glossina papalis gambiensis*.

Lesdites pupes, fournies par l'Agence internationale de l'Energie atomique (AIEA) dans le cadre du Projet de lutte contre la mouche tsé-sté dans la zone des Niayes, seront acheminées hebdomadairement par lots de 5000 à 20 000 pour la période du 21 août 2017 au 20 août 2018.

En foi de quoi, la présente autorisation est établie pour servir et valoir ce que de droit.

Ampliations:
- MEPA/CAB (ATCR)
- SVPA/SREL Dakar

Appendix 4

Sample data sheets for shipment of sterile insects

A copy of this datasheet should be present within each box of the consignment.

Name and address of the facility (origin):	Name and address of the recipient:
…… …… …… …… ……	…… …… …… …… ……

Consignment General Information			
Irradiation date:		**Irradiation dose (Gy):**	
Packing date:		**Shipping date:**	
Total No of boxes:		**Total weight (kg):**	

	Box Number within the Consignment											
Elements	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Total**	**Observations**
Number of sterile insect containers inside the box[1]											*a*	
Weight (kg)											*b*	
Number of sterile insect containers with radiation sensitive indicator											*c*	
Number of indicators that were exposed to the recommended dose[2]											*d*	
Number of indicators countersigned at the origin, after irradiation											*e*	

Observations: _____

_____

Authorization: _____

(a) Ideally a=c=d=e

(b) This value should be equal to the total weight reported under "General Information"

(d) Should it differ from value in (a), the consignment should be disposed safely and not used

[1] Plastic bags, 'sausages' or other

[2] 'Visual determination'