

GUIDELINES ON THE EXPORT OF FRESH CAPSICUM

FROM THE CARIBBEAN



NEW PLANT HEALTH RULES FROM THE EUROPEAN UNION

COLEACP GUIDELINES ON THE EXPORT OF
CAPSICUM FROM THE CARIBBEANS

DISCLAIMER

Note that this document is not a regulatory reference. The elements included within it are not exhaustive or exclusive, and they may or may not be relevant, depending on the situation of each country. The content of each national action plan, and any dossiers submitted to the EU, remain the sole responsibility of the NPPO and industry stakeholders in the countries concerned.

This publication has been developed by the Fit For Market + programme, implemented by COLEAD within the framework of the Development Cooperation between the Organisation of African, Caribbean and Pacific States (OACPS) and the European Union (EU). It should be noted that the information presented does not necessarily reflect the views of the donors.

This publication is part of a collection of COLEAD resources, which consists of online and offline educational and technical tools and materials. All of these tools and methods are the result of more than 20 years of experience and have been developed progressively through COLEAD's technical assistance programmes, notably in the framework of development cooperation between the OACPS and the EU.

The use of particular designations of countries or territories does not imply any judgement on the part of COLEAD concerning the legal status of these countries or territories, their authorities and institutions or the delimitation of their frontiers.

The content of this publication is provided in a "currently available" form. COLEAD makes no warranty, direct or implied, as to the accuracy, completeness, reliability or suitability of the information at a later date. COLEAD reserves the right to change the content of this publication at any time without notice. The content may contain errors, omissions or inaccuracies, and COLEAD cannot guarantee the accuracy or completeness of the content.

COLEAD cannot guarantee that the content of this publication will always be current or suitable for any particular purpose. Any use of the content is at the user's own risk and the user is solely responsible for the interpretation and use of the information provided.

COLEAD accepts no liability for any loss or damage of any kind arising from the use of, or inability to use, the content of this publication, including but not limited to direct, indirect, special, incidental or consequential damages, loss of profits, loss of data, loss of opportunity, loss of reputation, or any other economic or commercial loss.

This publication may contain hyperlinks. Links to non-COLEAD sites/platforms are provided solely for the information of COLEAD staff, its partner-beneficiaries, its funders and the general public. COLEAD cannot and does not guarantee the authenticity of information on the Internet. Links to non-COLEAD sites/platforms do not imply any official endorsement of, or responsibility for, the opinions, ideas, data or products presented on those sites, or any guarantee as to the validity of the information provided.

Unless otherwise stated, all material contained in this publication is the intellectual property of COLEAD and is protected by copyright or similar rights. As this content is compiled solely

for educational and/or technical purposes, the publication may contain copyrighted material, the further use of which is not always specifically authorised by the copyright owner.

Mention of specific company or product names (whether or not indicated as registered) does not imply any intention to infringe proprietary rights and should not be construed as an endorsement or recommendation by COLEAD.

This publication is publicly available and may be freely used provided that the source is credited and/or the publication remains hosted on one of COLEAD's platforms. However, it is strictly forbidden for any third party to state or imply publicly that COLEAD is participating in, or has sponsored, approved or endorsed the manner or purpose of the use or reproduction of the information presented in this publication, without prior written consent from COLEAD. The use of the contents of this publication by any third party does not imply any affiliation and/or partnership with COLEAD.

Similarly, the use of any COLEAD trademark, official mark, official emblem or logo, or any other means of promotion or advertising, is strictly prohibited without the prior written consent of COLEAD. For more information, please contact COLEAD at network@colead.link

PART 1

Background and guidelines on meeting EU requirements for regulated pests : pepper weevil (*Anthonomus eugeni*), tomato fruit borer (*Neoleucinodes elegantalis*), fall armyworm (*Spodoptera frugiperda*) and the tomato psyllid (*Bactericera cockerelli*) on *Capsicum*

1.1. BACKGROUND

The European Union (EU) is overhauling its plant health (phytosanitary) regulations. On 14 December 2019, the new Plant Health Regulation (EU 2016/2031) came into operation bringing rigorous new rules to prevent the introduction and spread of pests and diseases in the EU. The rules continue to evolve, and further amendments to the regulations came into force in 2023.

Under the new regime, special measures have been introduced for crops that are a known pathway into the EU of serious pests that could damage EU agriculture or the environment. These measures have now been incorporated into the new regulation. They include stringent new requirements covering the export of capsicum to prevent the introduction into Europe of the pepper weevil (*Anthonomus eugenii*), tomato fruit borer (*Neoleucinodes elegantalis*), fall armyworm (*Spodoptera frugiperda*) and tomato psyllid (*Bactericera cockerelli*).

In addition, from 11 April 2022, all fruit flies of the *Tephritidae* group are listed as EU quarantine pests, and special measures are stipulated to manage some individual species such as *Bactrocera latifrons* on certain crops. This includes measures covering fresh fruits of *Capsicum* L. and *Solanum* L. originating in certain third countries (but not including the Caribbean).

In addition, from 11 April 2022, all fruit flies of the *Tephritidae* group are listed as EU quarantine pests, and special measures are stipulated to manage some individual species such as *Bactrocera latifrons* on certain crops. This includes measures covering fresh fruits of *Capsicum* L. and *Solanum* L. originating in certain third countries.

The new rules stipulate conditions that exporting countries must meet before exports of *Capsicum* are allowed. Some of these conditions refer to International Standards for Phytosanitary Measures (ISPMs). Exporting countries must consult the relevant ISPMs in order to fully understand and comply with the EU regulatory requirements.

This document has been updated to include the most recent amendments to EU legislation. The latest changes are highlighted in orange and include new requirements relating to Fall Armyworm (FAW; *Spodoptera frugiperda*).

National action plans and stakeholder engagement

Meeting these new rules requires immediate and concerted action from producers, exporters and National Plant Protection Organisations (NPPOs). There is no room for complacency by any capsicum-exporting country. If there are any interceptions of these pests in exported capsicum, the EU is expected to react and impose more stringent measures.

Experience has shown that meeting the new EU rules requires effective dialogue and

engagement between public and private sectors. All stakeholders must agree on the actions needed to prepare any dossiers required by the EU prior to export, and to ensure that exported capsicum is free of the designated pests. This means identifying and agreeing on actions to be taken by private sector operators at all stages, from production to export. It also means agreeing to the responsibilities of the public sector authorities, in particular the NPPO.

COLEAD recommends the establishment of committees or task forces that bring all major stakeholders around the table to develop (and oversee the implementation of) a national capsicum action plan. To be effective, this national action plan must be appropriate to the local context, and usable by the range of different producers and exporters concerned (large and small). It is essential that all stakeholders agree to and implement the national action plan; if only one exporter sends infested consignments to the EU, this could bring down the entire export sector.

COLEAD support

This document has been prepared by COLEAD for national authorities and capsicum export sectors to help orient the development of national action plans and dossiers to meet the new rules. It provides a framework to guide the process, and outlines the various elements that can be incorporated into a national approach to manage the pests concerned. It identifies the information to be provided, and actions to be taken, at all stages from production to export, by both public and private sectors. References and links to the relevant ISPMs are provided.

Note that the elements included here are not exhaustive. The national *Capsicum* action plan and dossier could include all or a selection of the measures outlined, as well as any others that may be available and appropriate locally.



1.2. REGULATORY CHANGES AFFECTING CAPSICUM EXPORTS TO THE EUROPEAN UNION

In June 2023, the European Union, through IMPLEMENTING REGULATION (EU) 2023/1134, strengthened measures to prevent the introduction, establishment, and spread of fall armyworm (FAW; *Spodoptera frugiperda*) within its territories.

Another recent amendment was Implementing Regulation (EU) No 2021/2285 (effective from 11 April 2022), which introduced changes affecting several ACP exports to the EU including eggplants, tomatoes, mangoes, papayas, guavas, peppers, and citrus fruits. This resulted from the re-classification of all fruit flies from the *Tephritidae* family as EU quarantine pests, as well as specific new management requirements for certain species, including *Bactrocera latifrons*, which are stipulated in the regulation, in particular for fresh fruits of *Capsicum* L. and *Solanum* L.

The implications of these updated regulations for the export of fresh fruit of *Capsicum* and *Solanum* species to the EU are detailed below.

Rules on pepper weevil (*Anthonomus eugenii*)

Regulation (EU) 2019/2072, issued on 28 November 2019, contains specific requirements for *Capsicum* exports from countries where the pepper weevil (*Anthonomus eugenii* Cano) is known to occur. This covers Belize, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Puerto Rico, USA and French Polynesia. These requirements are detailed in Point 72, Annex VII of the Regulation, and they state that *Capsicum* exported to the EU from these countries must conform with one of the following options. It must originate from either:

- a. an area free from *Anthonomus eugenii* Cano, established by the national plant protection organisation in accordance with the relevant International Standards for Phytosanitary Measures, and which is mentioned on the phytosanitary certificate referred to in Article 71 of Regulation (EU) No 2016/2031, under the rubric 'Additional declaration',

or

- b. a place of production, established in the country of origin by the national plant protection organisation in that country, as being free from *Anthonomus eugenii* Cano, in accordance with the relevant International Standards for Phytosanitary Measures, and which is mentioned on the phytosanitary certificate referred to in Article 71 of Regulation (EU) No 2016/2031, under the rubric 'Additional declaration', and declared free from *Anthonomus eugenii* Cano on official inspections carried out at least monthly during the two months prior to export, at the place of production and its immediate vicinity.

Recommended action by NPPOs

National monitoring data will reveal the distribution of the pest in each of the countries covered by the regulation. The likely widespread distribution of this pest in these countries means that in most circumstances Option a above will not be feasible. Instead it will be necessary to use Option b, which requires official inspections to be carried out by the NPPO at each production site during the two months prior to export. Information on traceability must also be available.

Rules on fall armyworm (*Spodoptera frugiperda*)

The European Commission, in its recent IMPLEMENTING REGULATION (EU) 2023/1134 dated 8 June 2023, has introduced further measures to prevent the introduction, establishment, and spread of FAW within the European Union territory. This pest, previously not known to exist within the Union, has continued its rapid global spread, with confirmed presence in Cyprus as of January 2023. The high rate of non-compliance concerning the presence of this pest on imported goods, coupled with its growing threat, has necessitated a more protective stance.

The previous measures, detailed under Implementing Decision (EU) 2018/638, were initiated as emergency measures to curtail the spread of FAW. However, with this new regulation, these emergency measures have been replaced. This shift highlights the EU's evolving strategy from a reactive attitude to a more comprehensive and long-term preventative approach.

The regulation has identified specific plant species that have been subject to interceptions due to the presence of FAW. These species are now subject to specific new requirements to ensure that they do not act as carriers for the pest into the EU. The Commission has decided that this new regulation (EU 2023/1134) will be in effect until 31 December 2025. In the interim, further evaluations will be conducted of the threat posed by the pest, a review of the range of plants affected, and the effectiveness of the measures implemented. Art. 10 of the Regulation ("Introduction into the Union of the specified plants") applied from 1 July 2023.

Included in the **specified plants** are: *Capsicum* species; *Momordica*; Ethiopian eggplant (*Solanum aethiopicum*); African eggplant (*Solanum macrocarpon*), eggplant/aubergine (*Solanum melongena*) and *Asparagus officinalis* exported into the EU from any country. It also covers plants (other than live pollen, plant tissue cultures, seeds and grains) of maize (*Zea mays*).

Capsicum exports must be accompanied by a phytosanitary certificate (see chapter 3) and must meet requirements set out in one of the following options. They must either:

- (a) originate from a country where the pest is not known to occur;
- (b) originate from an area free from the specified pest, as established by the National Plant Protection Organisation (NPPO) concerned, in accordance with the International Standard for Phytosanitary Measures No 4; the name of that area shall be stated in the phytosanitary certificate under the rubric 'place of

- origin’;
- (c) prior to export they have been subject to an official inspection and found free from the specified pest, and originate from a site of production complying with the following conditions:
 - (i) it is registered and supervised by the NPPO in the country of origin;
 - (ii) official inspections have been carried out during the last three months prior to export, and no presence of the specified pest has been detected on the specified plants;
 - (iii) it has physical isolation against the introduction of the specified pest;
 - (iv) information ensuring traceability of the specified plants to that site of production has been ensured during their movement prior to export;
 - (d) prior to their export they have been subject to an official inspection and found free from the specified pest, and they originate from a site of production complying with the following conditions:
 - (i) it is registered and supervised by the NPPO in the country of origin;
 - (ii) official inspections have been carried out during the three months prior to export, and no presence of the specified pest has been detected on the specified plants;
 - (iii) the specified plants have been subjected to an effective treatment to ensure freedom from the specified pest;
 - (iv) information ensuring the traceability of the specified plants to that site of production has been ensured during their movement prior to export;
 - (e) they have been subjected to an effective post-harvest treatment to ensure freedom from the specified pest, and that treatment is indicated on the phytosanitary certificate.

As mentioned in earlier sections, options (c) and (d) are the most feasible for producers in most circumstances; the first two require pest-free countries or areas. Option (e) is also problematic as there are few effective single treatments available for post-harvest control of fall armyworm on *Capsicum* that will guarantee it is pest free.

Option (c) requires a place of production designated as pest free. This can be achieved using insect-proof screen houses coupled with the required inspections by the NPPO. As noted earlier, this is an effective option, but requires significant investment in infrastructure.

Option (d) requires *Capsicum* to be subjected to an effective treatment, in addition to specified supervision and inspections by the NPPO. As in the case of FCM, this allows for the use of a systems approach for management of the pest.

Applying Option (d): National fall armyworm action plan and the role of the NPPO

As in the case of *B. latifrons*, Option (d) of this Directive is the most accessible for the majority of *Capsicum* operators. However, there are some important differences:

1. In the case of fall armyworm, there is no requirement for a dossier to be submitted to the European Commission outlining the systems approach that will be used for the “effective treatment”. Nevertheless, COLEAD strongly recommends that exporting countries should take a similar approach to that recommended for FCM; they must prepare and implement a national action plan that specifies the measures to be taken by all stakeholders along the supply chain to manage Fall Armyworm in *Capsicum*; it is critical to ensure that there is no risk of it being present in exported consignments.
2. There are specific actions that must be taken by the NPPO for all production sites that supply *Capsicum* for export to the EU. To recap:
 - a) The NPPO must register and supervise all production sites.
 - b) The NPPO must carry out official inspections at all production sites during the three months prior to export. Exports can only be permitted if no fall armyworm has been detected at the production site.
 - c) The NPPO must conduct an official inspection prior to export. Exports can only be permitted if the produce is found to be free from fall armyworm.
3. If there is a problem or interception, or if a country is subject to an audit by the EU authorities (DG Santé) at any stage, the **national authorities in the exporting country must be able to provide all the necessary documentation to demonstrate that the correct registration, supervision and inspections have been conducted.**
4. The NPPO must inspect all export consignments to ensure that there is full traceability covering all movements of *Capsicum* from the place of production to the point of export.

Rules on tomato fruit borer (*Neoleucinodes elegantalis*)

Implementing Regulation (EC) 2019/2072, which was introduced in November 2019, brought in specific requirements for Tomato Fruit Borer under Point 68.

The regulation applies to a number of fresh products exported into the EU from any third country including fruits of *Capsicum annum* L., Ethiopian eggplant (*Solanum aethiopicum*), tomato (*Solanum lycopersicum*) and eggplant/aubergine (*Solanum melongena*).

Capsicum exports must be accompanied by a phytosanitary certificate (see section 1.3) and must meet requirements set out in one of the following options. There

must be an official statement that the fruit originates in either:

- a. a country recognised as being free from *Neoleucinodes elegantalis* (Guenée) in accordance with the relevant International Standards for Phytosanitary Measures, provided that this freedom status has been communicated in advance in writing to the Commission by the national plant protection organisation of the third country concerned;

or

- b. an area established by the national plant protection organisation in the country of origin as being free from *Neoleucinodes elegantalis* (Guenée) in accordance with the relevant International Standards for Phytosanitary Measures, which is mentioned on the phytosanitary certificate referred to in Article 71 of Regulation (EU) No 2016/2031, under the rubric 'Additional declaration', provided that this freedom status has been communicated in advance in writing to the Commission by the national plant protection organisation of the third country concerned,

or

- c. a place of production established by the national plant protection organisation of the country of origin as being free from *Neoleucinodes elegantalis* (Guenée) in accordance with the relevant International Standards for Phytosanitary Measures and official inspections have been carried out in the place of production at appropriate times during the growing season to detect the presence of the pest, including an examination on representative samples of fruit, shown to be free from *Neoleucinodes elegantalis* (Guenée), and information on traceability is included in the phytosanitary certificate referred to in Article 71 of Regulation (EU) No 2016/2031;

or

- d. an insect proof site of production, established by the national plant protection organisation in the country of origin as being free from *Neoleucinodes elegantalis* (Guenée), on the basis of official inspections and surveys carried out during the three months prior to export, and information on traceability is included in the phytosanitary certificate referred to in Article 71 of Regulation (EU) No 2016/2031.

Recommended action by NPPOs

National monitoring data will reveal the distribution of the pest in each country of the Caribbean zone. The likely widespread distribution of this pest means that in most circumstances Options a and b above will not be feasible. Instead, it will be necessary to use Option c or d. Both of these options require official inspections to be carried out by the NPPO at each production site during the three months prior to export. Information on traceability must also be available.

Rules on the tomato psyllid (*Bactericera cockerelli*)

On 14 December 2021, Commission Implementing Regulation (EU) 2021/2285 was published, and applies from 11 April 2022. This new regulation amends Implementing Regulation (EU) 2019/2072 Point 67 and introduces minor changes concerning tomato psyllid. These cover all fresh fruits of *Solanaceae* exported into the EU from Australia, the Americas and New Zealand, including *Capsicum annum*, bitter tomato (*Solanum aethiopicum*), tomato (*Solanum lycopersicum*), eggplant/aubergine (*Solanum melongena*) and African eggplant (*Solanum macrocarpon*).

Exports of these crops must be accompanied by a phytosanitary certificate (see Section 1.3) and must meet requirements set out in one of the following options. There must be an official statement that the fruits originate in either:

- (a) a country recognised as being free from *Bactericera cockerelli* (Sulc.) in accordance with the relevant International Standards for Phytosanitary Measures, provided that this freedom status has been communicated in advance in writing to the Commission by the national plant protection organisation of the third country concerned,
or
- (b) an area established by the national plant protection organisation in the country of origin as being free from *Bactericera cockerelli* (Sulc.) in accordance with the relevant International Standards for Phytosanitary Measures, which is mentioned on the phytosanitary certificate, provided that this freedom status has been communicated in advance in writing to the Commission by the national plant protection organisation of the third country concerned,
or
- (c) a place of production, where official inspections and surveys for the presence of *Bactericera cockerelli* (Sulc.) including its immediate vicinity have been carried out during the last three months prior to export and subjected to effective treatments to ensure freedom from the pest, and representative samples of the fruit have been inspected prior to export, and information on traceability is included in the phytosanitary certificate,
or
- (d) an insect proof site of production, established by the national plant protection organisation in the country of origin, as being free from *Bactericera cockerelli* (Sulc.), on the basis of official inspections and surveys carried out during the three months prior to export, and information on traceability is included in the phytosanitary certificate.’;

Note that Implementing Regulation (EU) 2021/2285 introduces minor changes compared to the earlier version. The previous text referred to Article 71 of Regulation (EU) No 2016/2031, requiring more details in the phytosanitary certificate under the rubric ‘Additional declaration’. References to this Article are no longer made in this later version.

Recommended action by NPPOs

National monitoring data will reveal the distribution of the pest in each country. The likely widespread distribution of this pest means that in most circumstances Options a and b above will not be feasible. Instead, it will be necessary to use Option c or d. Both of these options require official inspections to be carried out by NPPOs at each production site during the three months prior to export. Information on traceability must also be available.

Option (c) requires fresh products to be subjected to an effective treatment, in addition to specified supervision and inspections by the NPPO. The effective treatment allows the use of a systems approach for management of the pest.

Option (d) requires a place of production designated as pest free. This can be achieved for example by using insect-proof screen houses coupled with the required inspections by the NPPO.

Other quarantine pests

Under national plant health legislation, a number of plant pests and diseases are classified as quarantine organisms. These are pests that are mainly or entirely absent from a country, but which could have a potentially serious economic, environmental or social impact if they were to be introduced. Most countries have a quarantine list that identifies the most dangerous harmful organisms whose introduction must be prohibited.

The new EU Plant Health Law, [Regulation \(EU\) 2016/2031](#), classifies all plant pests according to the following four categories:

- **Union quarantine pests:** Not present at all in the EU territory or, if present, just locally and under official control. Strict measures must be taken to prevent their entry or further spread within the EU. Union Quarantine Pests are listed in Commission Implementing Regulation (EU) No 2019/2072 of 28 November 2019.
- **Protected zone quarantine pests:** Present in most parts of the Union, but still known to be absent in certain 'protected zones'. These pests are not allowed to enter and spread within these protected zones.
- **Regulated non-quarantine pests:** Widely present in the EU territory, but because they have an important impact, plants for planting should be guaranteed free or almost free from the pest.
- **Priority pests:** Those with the most severe impact on the economy, environment and/or society. The EU Commission released a list of 20 priority pests in October 2019 ([Regulation EU 2019/1702](#)).

Fall armyworm (*Spodoptera frugiperda*) is listed as a priority pest and consequently is subject to the very strict measures outlined in this document. The other pests included here are classed as Union quarantine pests, which are also subject to statutory controls.

It is important to note that this document is not exhaustive. There are other Union quarantine pests that concern capsicum, and whose introduction into the EU is banned but for which no additional special measures or declarations are specified.

For example, *Bemisia tabaci* Genn. (non-European populations), a known virus vector, is a Union Quarantine Pests. Each year there are several interceptions of imported capsicum where this pest is detected, and the consignment is detained at EU border controls.

It is essential to monitor and avoid the presence of any quarantine pest in capsicum for export.

Note that in Regulation (EU) 2021/2285, published in December 2021, the non-European isolates of potato viruses A, M, V and Y were removed from the list of Union Quarantine Pests.

1.3. COMPLETING THE PHYTOSANITARY CERTIFICATE

Plants and plant products imported into the EU from non-EU countries are subject to compulsory plant health checks . These include:

- a review of the phytosanitary certificate and associated documents to ensure that the consignment meets EU requirements;
- an identity check to make sure that the consignment corresponds with the certificate;
- an inspection of the produce to ensure that it is free from harmful organisms.

All *Capsicum* exported to the EU must be accompanied by a phytosanitary certificate. There are strict requirements on how this should be filled, and it is important to note that:

1. the phytosanitary certificate must include information on all regulated pests of concern for the exported product; at the present time, pepper weevil (*Anthonomus eugeni*), tomato fruit borer (*Neoleucinodes elegantalis*), fall armyworm (*Spodoptera frugiperda*) and tomato psyllid (*Bactericera cockerelli*) are regulated pests for *Capsicum* originating in the Caribbean, and information on all of them must be included
2. According to [ISPM 12](#), if the space provided in the phytosanitary certificate is not sufficient to insert all the necessary information (e.g., in the additional declaration), it is permitted to add an attachment. If you do so, it is very important to adhere to the following:
 - Each page of any attachment must bear the number of the phytosanitary certificate and be dated, signed and stamped in the same manner as required for the phytosanitary certificate itself.
 - You must state in the relevant section of the phytosanitary certificate if there is an attachment.
 - If an attachment has more than one page, the pages must be numbered, and the number of pages indicated on the phytosanitary certificate.

It is critically important to complete the certificate correctly as there is a low tolerance of mistakes by European importing countries. COLEAD has received information about consignments of *Capsicum* entering Europe that have been rejected and destroyed because the phytosanitary certificate has been filled incorrectly.

As a general rule, it is advisable to write the number of the regulation concerned, and to copy/paste the exact text for the option selected, as it is written in the regulation. This will avoid any possible mistakes or omissions, even if it appears cumbersome.

To streamline the process of completing the phytosanitary certificate, we strongly recommend utilizing the EU system TRACES NT. This tool automatically indicates all the boxes/points in the certificate that are relevant to the country of origin, and it simplifies the selection of options for each relevant pest. For more detailed information and access

to this system, please visit the [EU website](#). Alternatively, you can contact SANTE-TRACES@ec.europa.eu for further assistance.

The information to be provided on the phytosanitary certificate varies between pests, and depending on which management option is selected. The following section gives guidance for the main pests addressed in the EU regulations.

For pepper weevil (*Anthonomus eugeni*) according to Implementing Regulation (EU) 2019/2072

Option (b)

If exporting countries are using Option (b) for a pest free place of production, it is essential to include the following words in the phytosanitary certificate:

- In the Additional declaration write: “The consignment complies with Option (b) of Annex VII, Point 72 of Implementing Regulation (EU) 2019/2072: production from an officially designated place of production free of *Anthonomus eugeni* based on official inspections carried out at least monthly during the two months prior to export”.
- Information on traceability must be provided: in the phytosanitary certificate, alongside the description of the product, you must write the unique identification number or name of the approved production site from which the produce was sourced.

For fall armyworm (**IMPLEMENTING REGULATION (EU) 2023/1134**)

Exporting under Option (c): Pest free production site

If exporting countries are using Option (c) for a pest free production site (*Capsica* grown in insect-proof screenhouses), it is essential to include the following wording in the phytosanitary certificate:

in the **Additional Declaration** write: “The consignment complies with the following conditions in accordance with Option (c) of Article 10 of the Regulation (EU) 2023/1134 related to *Spodoptera frugiperda*: prior to export they have been subject to an official inspection and found free from the specified pest, and originate from a site of production complying with the following conditions:

- (i) it is registered and supervised by the NPPO in the country of origin;
- (ii) official inspections have been carried out during the last three months prior to export, and no presence of the specified pest has been detected on specified plants;
- (iii) it has physical isolation against the introduction of the specified pest;
- (iv) information ensuring traceability of the specified plants to that site of production has been ensured during their movement prior to export;

Information on traceability must be provided: In the phytosanitary certificate, alongside the description of the product, you must write the unique identification number or name of the approved production site from which the produce was sourced.

Exporting under Option (d): Systems Approach

If exporting countries are using Option (d) for an effective treatment, it is essential to include the following wording in the phytosanitary certificate:

1. In the **Treatment Box/section** write: “Systems approach”.
2. In the **Additional Declaration** write: “The consignment complies with Option (d) of Article 10 of the Regulation (EU) 2023/1134 related to *Spodoptera frugiperda*: prior to their export they have been subject to an official inspection and found free from the specified pest, and they originate from a site of production complying with the following conditions:
 - (i) it is registered and supervised by the NPPO in the country of origin;
 - (ii) official inspections have been carried out during the three months prior to export, and no presence of the specified pest has been detected on the specified plants;
 - (iii) the specified plants have been subjected to an effective treatment to ensure freedom from the specified pest;
 - (iv) information ensuring the traceability of the specified plants to that site of production has been ensured during their movement prior to export;

For tomato fruit borer (*Neoleucinodes elegantalis*) according to Implementing Regulation (EU) 2019/2072

Exporting under Options (c & d):

If exporting countries are using Option (c) linked to a place of production free of *N. elegantalis*, it is essential to include the following words in the phytosanitary certificate:

- In the Additional declaration write: The consignment complies with the following conditions in accordance with Option (c) of Annex VII, point 68 of Implementing Regulation (EU) 2019/2072: It comes from a place of production established as being free from *Neoleucinodes elegantalis* in accordance with the relevant International Standards. Official inspections have been carried out in the place of production at appropriate times to detect the presence of the pest, including an examination on representative samples of fruit, shown to be free from *Neoleucinodes elegantalis* (Guenée).
- Information on traceability must be provided: in the phytosanitary

certificate, alongside the description of the product, you must write the unique identification number or name of the approved place/site of production from which the produce was sourced.

If exporting countries are using Option (d) insect-proof site of production, it is essential to include the following words in the phytosanitary certificate:

- In the Additional declaration write: The consignment complies with the following conditions in accordance with Option (d) of Annex VII, point 68 of Implementing Regulation (EU) 2019/2072: It comes from an insect proof site of production, established as being free from *Neoleucinodes elegantalis* (Guenée), on the basis of official inspections and surveys carried out during the three months prior to export.
- Information on traceability must be provided: in the phytosanitary certificate, alongside the description of the product, you must write the unique identification number or name of the approved production site from which the produce was sourced.

For the tomato psyllid (*Bactericera cockerelli*) according to Implementing Regulation (EU) 2019/2072

Exporting under Option (c):

If exporting countries are using Option (c) for an effective treatment, it is essential to include the following words in the phytosanitary certificate:

- In the Treatment Box/ section write: “Systems approach”.
- In the Additional declaration write: “The consignment complies with Option (c) of Article 67, Annex VII of commission implementing regulation (EU) 2019/2072: a place of production, where official inspections and surveys for the presence of *Bactericera cockerelli* (Sulc.) including its immediate vicinity have been carried out during the last three months prior to export and subjected to effective treatments to ensure freedom from the pest, and representative samples of the fruit have been inspected prior to export, and information on traceability is included in the phytosanitary certificate.
- Information on traceability must be provided: in the phytosanitary certificate, alongside the description of the product, you must write the unique identification number or name of the approved production site from which the produce was sourced.

Exporting under Option (d):

If exporting countries are using Option (d) for a pest free production site, it is essential to include the following words in the phytosanitary certificate:

- In the Additional declaration write: The consignment complies with the following conditions in accordance with Option (d) of Article 67 of commission implementing regulation (EU) 2019/2072: **an insect proof site of production, established by the national plant protection organisation in the country of origin, as being free from *Bactericera cockerelli* (Sulc.), on the basis of official inspections and surveys carried out during the three months prior to export, and information on traceability is included in the phytosanitary certificate.**
- Information on traceability must be provided: in the phytosanitary certificate, alongside the description of the product, you must write the unique identification number or name of the approved production site from which the produce was sourced.

1.4. PEST FREE STATUS

International standards for phytosanitary measures (ISPMs) describe what needs to be done in order for an area, country, place of production or production site to be officially recognised as pest free. In each case, the process must be led by the officially designated NPPO in each country, and it must follow closely the methodology outlined.

Establishing pest free area (PFA) status requires data to be collected so that the presence or absence of the pest can be verified. Establishing pest free status needs to follow strictly the guidelines described in the relevant ISPM, and requires the NPPO (and its designated agents) to have the necessary training, resources and capabilities in data collection and pest risk analysis.

Pest free areas and countries

Pest free area or pest free country status would be difficult to obtain in the case of pepper weevil or fall armyworm on capsicum, as these pests are highly mobile and widely dispersed. This option would only be worth pursuing in areas that are geographically distinct or isolated from the main areas of pest distribution. Establishing and maintaining an area of low pest prevalence may be a possibility (where the capacity and resources are available nationally) and can be part of the systems approach.

Pest- or disease-free area:

An area in which a specific pest or disease does not occur. This can be an entire country; an uninfested part of a country in which a limited area is infested; or an uninfested part of a country within a generally infested area.

An area of low pest or disease prevalence:

An area, whether all of a country, part of a country, or all or parts of several countries (as identified by the competent authorities) in which a specific pest or disease occurs at low levels and is subject to effective surveillance, control or eradication measures.

There are three main stages to establish and maintain a PFA:

- systems to establish freedom;
- phytosanitary measures to maintain freedom;
- checks to verify freedom has been maintained.

The work needed in each case varies according to factors such as the biology of the pest, the characteristics of the PFA, and the level of phytosanitary security required.

The work involved in establishing and maintaining pest free area/country status is detailed and time consuming, and involves:

- data collection (pest surveys for delimiting, detection, monitoring);
- regulatory controls (protective measures against the introduction into the country, including listing as a quarantine pests);
- audits (reviews and evaluation);
- documentation (reports, work plans).

The following documents and guides from IPPC/FAO provide further information:

- [ISPM 4](#) on requirements for establishing a PFA;
- [Guide for Establishing and Maintaining Pest Free Areas](#): Understanding the principal requirements for pest free areas, pest free places of production, pest free production sites and areas of low pest prevalence;
- [ISPM 6](#) (Guidelines for surveillance) and [ISPM 2](#) (Framework for pest risk analysis) provide further details on general surveillance and specific survey requirements.

Pest free place of production:

Place of production in which a pest is absent (demonstrated by scientific evidence) and generally maintained officially pest free for a defined period.

A place of production is “any premises or collection of fields operated as a single production or farming unit”.

Pest free production site: Place of production in which a pest is absent (demonstrated by scientific evidence) and generally maintained officially pest free for a defined period.

A production site is “a defined part of a place of production, that is managed as a separate unit for phytosanitary purposes”.

Directives covering three of the regulated pests in capsicum allow countries to export if the capsicum has been produced in a “pest free place of production”. As noted above, some countries have adopted this option by using insect-proof screen houses.

Screen houses require significant investment in infrastructure, and are therefore out of reach of many smallholder farmers. However, where resources are available, this can be an effective option.

A place of production can only be designated as pest free by the NPPO. The NPPO and producers/exporters are required to conduct surveillance and inspections according to the international guidelines.

In addition, producers growing capsicum in screen houses must use an appropriate design of screen house so that it is insect proof, and ideally with an entry lobby. Strict biosecurity measures need to be in place when people or goods move in or out of the screen house to prevent pest entry.

The following documents and guides from IPPC/FAO provide further information:

- [ISPM 10](#) for the establishment of pest free places of production and pest free production sites;
- [Guide for Establishing and Maintaining Pest Free Areas](#): Understanding the principal requirements for pest free areas, pest free places of production, pest free production sites and areas of low pest prevalence.

PART 2

Guidelines for preparing a dossier for submission to the EU on
management of fall armyworm

2.1. THE FALL ARMYWORM (ACTION PLAN)

The EC has published [IMPLEMENTING REGULATION \(EU\) 2023/1134](#) of 8 June 2023 on measures to prevent the introduction into, establishment and spread within the Union territory of *Spodoptera frugiperda* (Smith), amending Implementing Regulation (EU) 2019/2072 and repealing Implementing Decision (EU) 2018/638.

As indicated in Part 1, COLEAD strongly recommends that horticultural export sectors affected by this regulation prepare and implement a national action plan that specifies the measures to be taken by all stakeholders along the supply chain to manage Fall armyworm in the products concerned; it is essential to ensure that there is no risk of it being present in export consignments.

Part 2 of this document deals with the development of a national action plan in order to comply with Option (d) of Article 10 of [Implementing Regulation \(EU\) 2023/1134](#): prior to their export they have been subject to an official inspection and found free from the specified pest, and they originate from a site of production complying with the following conditions:

- (i) it is registered and supervised by the NPPO in the country of origin;
- (ii) official inspections have been carried out during the three months prior to export, and no presence of the specified pest has been detected on the specified plants;
- (iii) the specified plants have been subjected to an effective treatment to ensure freedom from the specified pest;
- (iv) information ensuring the traceability of the specified plants to that site of production has been ensured during their movement prior to export;

The use of an effective treatment is the most accessible option for the majority of exporters. The Regulation allows the use of a systems approach. While the term "systems approach" is not explicitly mentioned, our communications with the EU have clarified their stance. The EU has confirmed that "effective treatment" covers any official procedure aimed at eradicating, inactivating, or removing pests, rendering them infertile, or achieving devitalization, as defined in ISPM 5. This definition also includes the systems approach.

A systems approach means developing an action plan that combines several different pest management measures that, in combination, will significantly reduce the pest risk. These measures may include surveillance, cultural practices, crop treatment, post-harvest disinfestation, inspection and others. The use of integrated measures in a systems approach for pest risk management is described in [ISPM 14](#).

These guidelines are intended to assist national authorities and exporters of fresh capsicum in developing a national FAW action plan in the context of [Implementing Decision \(EU\) 2018/638](#). It provides a framework to guide the process, and outlines the various elements that can be incorporated into a systems approach to manage

FAW. It identifies the information to be provided, and actions to be taken, at all stages from production to export, by both public and private sectors.

Note that the elements included here are not exhaustive. The national action plan could include all or a selection of these measures, as well as any others that may be available and appropriate locally.

2.2. WHAT TO INCLUDE IN THE NATIONAL ACTION PLAN

This section covers the following information that should be included in the national action plan:

- An overview of the national export sector for capsicum;
- Phytosanitary measures taken before, during and after harvest to prevent and control FAW;
- Phytosanitary inspection and certification system;
- Quality management system put in place by the NPPO to ensure that the national FAW management dossier is effectively implemented and monitored.

According to ISPM 14, the characteristics of a systems approach are as follows:

- A systems approach requires two or more measures that are independent of each other, and may include any number of measures. An advantage of the systems approach is the ability to address [local] variability and uncertainty by modifying the number and strength of measures [needed] to meet phytosanitary import requirements.
- Measures used in a systems approach may be applied pre- and/or post-harvest wherever national plant protection organizations (NPPOs) have the ability to oversee and ensure compliance with phytosanitary procedures.
- A systems approach may include measures applied in the place of production, during the post-harvest period, at the packing house, or during shipment and distribution of the commodity.
- Risk management measures designed to prevent contamination or re-infestation are generally included (e.g. maintaining the integrity of lots, pest-proof packaging, screening of packing areas, etc.).
- Procedures such as pest surveillance, trapping and sampling can also be components of a systems approach.

- Measures that do not kill pests or reduce their prevalence but reduce their potential for entry or establishment (safeguards) can be included in a systems approach. Examples include designated harvest or shipping periods, restrictions on the maturity, colour, hardness, or other condition of the commodity, the use of resistant hosts, and limited distribution or restricted use at the destination.

Effective engagement between stakeholders

Experience has shown that engagement between public and private sector stakeholders is essential during development of the dossier to ensure that it is adapted to the local context, and to secure the buy-in of all involved. The national action plan must be rigorously followed by all stakeholders involved in exports of capsicum to the EU. It is very important therefore that the dossier is appropriate for the context, and is appropriate for the range of different producers and exporters concerned (large and small).

Useful tool to help implement a systems approach

The [Decision Support for Systems Approach \(DSSA\)](#) tool has been developed to allow users in importing or exporting countries to identify potential options for pest risk management that could help with the formulation of pest risk management plans. The DSSA facilitates the evaluation and development of a systems approach to pest risk management, as defined in ISPM 14.

2.2.1. Overview of the national export sector

According to ISPM 14, the following information is important for the evaluation of pest risk:

- The crop, place of production, expected volume and frequency of shipments.
- Production, harvesting, packaging/handling and transportation.
- The crop/pest dynamics.
- Plant health risk management measures that will be included in the systems approach, and relevant data on their efficacy.
- Relevant references.

Information on the national sector

Crop details:

- species and varieties of capsicum grown for export (scientific names and common names);

- characteristics of each species and variety;
- production zones: describe and map the main production zones for export;
- describe the production seasons (timeframe), by zone;
- describe the climate in each production zone, assessed according to risk of pest infestation.

Production and export statistics for the past 2 to 3 years, specifying if possible:

- destination country;
- method of shipment (sea, air, land);
- presence and distribution of FAW in the country: geographical distribution and prevalence;
- period of infestation;
- other host plants in production areas.

2.2.2. Phytosanitary measures to prevent and control fall armyworm

According to ISPM 14, the following pre- and post-harvest measures may be integrated into a systems approach:

- surveillance and monitoring (traps)
- treatment, including the use of plant protection products
- post-harvest disinfestation
- inspection
- others.

Combined into an integrated management system, these measures will reduce the risk of any capsicum exported to the EU being infested with FCM.

Measures at plantation level to monitor and control fall armyworm

Pre-harvest

Growers producing for export to the EU should:

- Apply good crop hygiene.

Good field management and crop hygiene are critical to eliminate FAW adults and larvae in fallen fruit, and to remove injured fruit. In all production sites, growers must:

- remove all damaged and injured fruit, including fruit on the plants or on the ground;
- remove all dead or dying plants;

- destroy all crops and crop waste as soon as possible after harvest.
- **Conduct surveillance and monitoring.**
Surveillance is a major component of the integrated management of FAW:
 - all production sites growing capsicum for export should undertake monitoring on a daily basis;
 - the authorities should agree with industry the thresholds of intervention.
- **Agree the procedure to be followed by companies when there is an FAW alert.**

Strict procedures should be maintained until the pest is under control and crops are certified FAW free by the NPPO. For example:

- quarantine all harvest from the infested site and initiate a product recall of fruit recently harvested in the vicinity;
- implement an eradication programme;
- apply cultural and chemical control;
- adhere to biosafety measures on the farm to eliminate pest transfer.
- **Implement cultural control of FAW to reduce pest incidence.**
For example:
 - rotate susceptible crops with non-susceptible or low-risk crops;
 - produce capsicum away from other host crops.
- **Control FAW using plant protection products.**

The national authorities should provide guidance on which products to use, and how to use them (including application method, dose rate, pre-harvest interval). These must be in accordance with the registration status in the country of origin, and the maximum residue level (MRL) of the active ingredient in the EU.

- **Receive up-to-date training.**

Growers and workers must be trained (and updated) in good practices relating to the identification, prevention, surveillance and control of FAW.

During harvest

Growers producing capsicum for export to the EU should:

- During harvest, ensure that procedures are in place for sorting, isolating and disposing of all damaged fruit.
- Ensure that handling and transport conditions are managed carefully to reduce the risk of FAW gaining access to harvested fruit.
- Operate a traceability system that allows for the identification of plantations, and strict separation of harvest lots.

- Ensure that all people involved in harvesting are trained so that they are aware of and apply good practices to reduce the risk of FAW attack; this includes good practices for prevention, control, crop hygiene, and traceability.

Measures at the packhouse to prevent introduction, infestation and spread of fall armyworm

On receiving the fruit, packhouse managers must:

- Have procedures in place to record the condition and phytosanitary status (pest presence) of the harvested produce when it arrives at the packhouse.
- Have a system in place to record all FAW control treatments applied pre- and post- harvest to each lot.
- Have a traceability system in place to ensure that each lot is identified and maintained separately through all post-harvest operations.

Measures post-harvest to monitor and control fall armyworm

- Ensure that all operators involved in harvest and post-harvest activities can recognise FAW damage, and know what to do when they find it.
- Have procedures in place in the field and packhouse to inspect for FAW presence and damage at all handling, packing and storage sites.
- Operate an FAW alert system, and put intervention and isolation procedures in place when infested fruit is identified.
- Maintain a system to keep records of packhouse inspections.
- Ensure practices and facilities are in place for the management of all crop waste, including pest-damaged fruit.
- Use refrigerated storage facilities where possible.
- Apply post-harvest treatments, when necessary, using plant protection products.
- As in the case of field applications, the national authorities should be able to provide guidance on which products to use, and how to use them (e.g. application method, dose rate, pre-harvest interval).
- These must be in accordance with the registration status in the country of origin, and the maximum residue level (MRL) of the active ingredient in the EU.
- Ensure that harvested fruit is never exposed to pest attack during packing, storage (including temporary storage), or transport (road, port or airport). This includes physical screens protecting transported consignments, and packing areas to prevent pest entry. Use of pest-proof packaging is also an option.
- Train all people involved in post-harvest handling so they are aware of and apply good practices at all times to reduce the risk of pest damage.



2.2.3. Phytosanitary inspection and certification system

As noted in Part 1, there are specific actions that must be taken by the NPPO for all production sites that supply capsicum for export to the EU.

To recap:

- The NPPO must register and supervise all production sites.
- The NPPO must carry out official inspections at all production sites during the three months prior to export. Exports can only be permitted if no FAW has been detected at the production site.
- The NPPO must conduct an official inspection prior to export. Exports can only be permitted if the produce is found to be free from FAW.

If there is a problem or interception, or if a country is subject to an audit by the EU authorities (DG Santé) at any stage, the national authorities in the exporting country must be able to provide all the necessary documentation to demonstrate that the correct registration, supervision and inspections have been conducted.

The NPPO must inspect all export consignments to ensure that there is full traceability covering all movements of the products concerned from the place of production to the point of export.

The following sections outline the administrative and regulatory frameworks that need to be in place for the effective functioning of the official control system, and its enforcement by the NPPO.

Administrative and regulatory framework governing exports of capsicum to the EU

- There should be a system in place to register and identify all individual operators in the production and export chain (e.g. with a unique number).
- There should be a system for the identification and traceability of all production sites that supply for export to the EU.
- Authorities should conduct risk categorisation of exporters (high, medium and low risk).
- Authorities should conduct risk categorisation of exports (e.g. locations and seasons with higher pest pressure).

National system for monitoring FAW populations

This includes:

- Surveillance: monitoring of FAW populations (using traps) in and near areas where these crops are grown for export. This needs to be accompanied by a system to compile and analyse the data.
- Risk mitigation measures: according to the results of the monitoring, measures may be needed to reduce the risk of infested fruit entering the export supply chain.
- Alert system: needs to be in place to inform stakeholders of any increased risk of FAW infestation, and any mitigation measures they must take.

Control and certification system

The NPPO (or its designated agents) must be active at all stages of the export value chain. This includes providing advice and training, as well as monitoring the implementation of plant health measures (which may include specific controls and certification). In brief:

- At the plantation level, the NPPO provides advice and training to private sector operators on crop production, and on the monitoring and control of FAW. They should oversee and ensure the application of good practice.
- At the packhouse level, the NPPO controls infrastructure and packing conditions. Training of private sector operators will be provided in identification of FAW presence and damage, crop waste management, among others.
- At the point of export (ports, airports, road borders), procedures are in place, and implemented effectively, for the inspection of produce, issuing of plant health certificates, and preparation of all necessary documentation

Action to be taken by the NPPO at producer level for export of capsicum to the EU

- Confirming exporter registration.
- Checking traceability of all plantations that supply these crops for export.
- Assessing and documenting the application of good practices by producers, covering:
 - cropping practices;
 - crop hygiene and crop waste management;
 - FAW monitoring system using approved traps;
 - implementation of FAW control;
 - others.

- System to verify the training of operators in good practices for the prevention and control of FAW.

Action to be taken by the NPPO at all packhouses supplying capsicum for export to the EU

The NPPO will conduct an assessment of:

- Premises and equipment, to ensure the prevention of FAW entry and spread.
- Implementation of good hygiene practices and measures to prevent the risk of FAW infestation.
- Implementation of inspection/monitoring by packhouse personnel at all handling and storage sites to check for FAW.
- Effectiveness of sorting and isolation systems, and suitability of infrastructure, to deal with produce that shows FAW presence and damage.
- Facilities and procedures for disposal of damaged fruit and waste.
- Effectiveness and implementation of the traceability system.
- Effectiveness of the system in place for the isolation of lots.
- Frequency and effectiveness of staff training.

Issuing of phytosanitary certificates

The NPPO must operate a system of controls and certification according to the method of shipment. This must address:

- implementation of document checks;
- physical inspection;
- identity checks;
- sampling method;
- a system in place for tracking and archiving inspection data;
- a system for tracking and archiving phytosanitary certificates.

2.2.4. NPPO quality management system

According to ISPM 14, the exporting country authorities are responsible for:

- monitoring, auditing and reporting on the effectiveness of the system;
- taking appropriate corrective measures;
- keeping the relevant documentation up-to-date;
- use of phytosanitary certificates in accordance with requirements.

Internal audit

This should describe the monitoring and internal audit system in place to ensure the effective implementation of the plant health inspection and certification system, including:

- training of NPPO managers and technical personnel (inspectors, enforcement officers);
- designing and implementing effective procedures for the inspection of production sites and packhouses.

Management of interceptions/notifications

This should describe the system in place for tracking notifications and communicating with stakeholders, including:

- statistics on FAW notifications;
- information on processing, tracking and communicating official notifications.

The following steps are recommended for the preparation and submission of the national action plan.

Step 1: Setting up a Technical Working Group

The Technical Working Group (TWG) will bring together stakeholders (private and public sector) to consider and agree the elements that should be included in the national FAW action plan.

The TWG can be convened by the NPPO. The composition of the group may vary according to the local industry and public authorities. As a general rule, a small group will be more effective than a large one. As a minimum, it is important for the group to ensure that the membership:

- contains representatives of the NPPO with sound knowledge and experience in the relevant phytosanitary controls and enforcement;
- is acceptable to organisations representing the private sector;
- is representative of the capsicum export sector, including both large- and small-scale operators who have a sound knowledge of production and export;

- contains representatives with strong scientific and technical expertise – this is essential to document the phytosanitary measures that will be included in a clear and precise manner.

These COLEAD guidelines can be used to provide a framework for the national action plan. The content of each section can be adapted and customised according to local circumstances.

Step 2: Validating the national action plan with stakeholders

Consultation with the key public and private stakeholders is essential to ensure that the action plan is fit for purpose, locally appropriate, and accepted by all the major stakeholders who will be involved in implementing it.

If resources are available, consultation is best achieved through the organisation of a national workshop where the action plan can be presented to a large group, and discussed. If this is not possible, the draft may be presented to smaller meetings/groups, or circulated via industry associations or other representative bodies.

This consultation process will give the wider industry a chance to obtain clarification and to recommend changes. The aim is to use feedback from the consultation to develop a final version of the action plan that is approved and recognised by all.

BIBLIOGRAPHY

Andermatt Biological (2020). PheroNorm.

www.andermttbioccontrol.com/sites/products/monitoring-systems/pheronorm.html

Corteva (2020). Delegate 250 WG label (a.i. spinetoram).

www.corteva.co.za/label-finder.html

EU (2019). MRL database. <https://ec.europa.eu/food/plant/pesticides/eu-pesticides-database/public/?event=pesticide.residue.selection&language=EN>

Fening, K.O., Billah, M.K., Kukiriza, C.N.M. (2017). Roadmap for pest reduction in Ghana's export vegetable sector. GhanaVeg Sector Reports.

<http://docplayer.net/80364213-Ghanaveg-sector-reports-roadmap-for-pest-reduction-in-ghana-s-export-vegetable-sector.html>

Fritsch, E. (1988). Biologische bekämpfung des falschen apfelwicklers, *Cryptophlebia leucotreta* (Meyrick) (Lep., Tortricidae), mit granuloseviren. *Mitt. Dtsch. Ges. Allg. Angew. Ent.* 6, 280–283.

IPPC (2008). ISPM 31: Methodologies for sampling of consignments.

www.ippc.int/static/media/files/publication/en/2016/11/ISPM_31_2008_Sampling_of_consignments_EN.pdf

IPPC (2017a). ISPM 14: The use of integrated measures in a systems approach for pest risk management. International Standards for Phytosanitary Measures.

www.fao.org/3/a-y4221e.pdf

IPPC (2017b). ISPM 20: Guidelines for a phytosanitary import regulatory system.

International Standards for Phytosanitary Measures. www.fao.org/3/a-y5721e.pdf

IPPC SYSTEMS APPROACH ONLINE TOOLS <https://www.ippc.int/en/core-activities/capacity-development/phytosanitary-system/systems-approach/>

Martin, T., Assogba-Komlan, F., Houndete, T., Hougard, J.M., Chandre, F. (2006). Efficacy of mosquito netting for sustainable small holders' cabbage production in Africa. *J. Econ. Entomol.* 99, 450–454.

Whyte, C.F. (2009). Explanatory document on International Standard for Phytosanitary Measures No. 31 (Methodologies for sampling of consignments).

www.ippc.int/static/media/files/publications/en/2013/06/04/1252507962732_ippm31_ed_in_format_201304232112en.pdf



COLEAD

colead.link