2018 SECOND CONSULTATION

1 July – 30 September 2018

Compiled comments for Draft ISPM Requirements for the use of Fumigation (2014-004)

Summary of comments

Name	Summary
Benin Σ	Accepté
Congo	commentaires acceptés
Croatia	After the consultation with relevant subject matter experts I agree with a comments shared during the workshops.
Cuba	No tenemos comentarios a la propuesta
European Union	Completed on 27 September 2018 by the European Commission on behalf of the European Union and its 28 member States.
Korea, Republic of	Republic of Korea agrees with the comments made during APPPC Regional workshop. [Revided version of paragraph 299-302 (By volume)] in Appendix 2: Examples of formulae to calculate the amount of fumigant required is sent to IPPC email.
Lao People's Democratic Republic	Lao PDR has agreed with APPPC as Regional Comments.
Nicaragua	Revisada
OIRSA	Proyecto de norma revisado e incorporado los comentarios respectivos.
Peru	completado
Singapore	Singapore also support the APPPC's submitted comments.
Trinidad and Tobago	Trinidad and Tobago is in agreement with the comments made during the 2018 IPPC Regional Workshop in the Caribbean.

T (Type) - B = Bullet, C = Comment, P = Proposed Change, R = Rating

FAO sequential number	Para	Text	T	Comment
1	G	(General Comment)	C	**OIRSA** Se recomienda revisar y corregir la numeración de los puntos y sub-puntos de este borrador luego del punto 2. Fumigation Application Ways of Applying Fumigation aparece como punto 4., cuando realmente debería ser el punto 3. y así sucesivamente sus sub-puntos y los demás puntos.

				Category : EDITORIAL
2	G	(General Comment)	C	**Benin** Pas de commentaire *Category : TECHNICAL*
3	G	(General Comment)	C	**Guyana** Guyana has reviewed this draft standard and found no reason that is sufficient to inhibit its adoption. Hence, we accept the requirements for the use of fumigation as a phytosanitary measure outlined in this standard. *Category : SUBSTANTIVE*
4	G	(General Comment)	C	**Sri Lanka** In addition to the comments made, Sri Lanka agrees with the comments made by APPPC on this standard *Category : EDITORIAL*
5	G	(General Comment)	C	**Canada** Canada supports the draft ISPM on fumigation as a phytosanitary measure. Several substantive, technical and editorial comments are provided for consideration. *Category : SUBSTANTIVE*
6	G	(General Comment)	C	**Antigua and Barbuda** Antigua and Barbuda supports the comments submitted by CAHFSA on this draft standard. *Category : SUBSTANTIVE*
7	G	(General Comment)	C	**Peru** Peru shares with the final comments of COSAVE *Category : SUBSTANTIVE*
8	G	(General Comment)	C	**Viet Nam** Vietnam fully agree with some opinion from* New Zealand; Japan and Republic of Korea as mention below: New Zealand's comment Potential implementation issues. 1. New Zealand runs a full approval (web listed) and audited system for treatment providers undertaking all types of official fumigation treatments. The proposed standard would require some small adjustments to our procedures. 2. It would assist regulators and fumigators to maintain a high standard of fumigation performance and compliance with trading partner's requirements by providing: - capacity-building assistance to regulatory officers in respect to registering, monitoring and auditing fumigation providers. - providing best practice fumigation training. - improve the technical expertise of fumigators and regulatory officers. Republic of Korea's comment

				There is no mention about safety or environmental aspect overall the ISPM. We may consider to add the general statement regarding safety and environmental issue at the scope. Japan's comment Although safety and health issues are important, this was removed from the ISPM as countries commented because it should not be part of an ISPM. And a general remark was added in section 10 (Responsibilities). However, this information is important for NPPOs and entities who conduct fumigation activities, so it is better to include in BACKGROUND. For example, the relevant information like the 1st sentence of Section 7.3 "Environment, health and safety" in the 1st round draft ISPM should be added in BACKGROUND as a new paragraph after paragraph No 49. *Category : SUBSTANTIVE*
9	G	(General Comment)	C	**Trinidad and Tobago** Trinidad and Tobago is in agreement with the comments made during the 2018 IPPC Regional Workshop in the Caribbean. *Category : SUBSTANTIVE*
10	G	(General Comment)	C	**Panama** Se recomienda revisar la pertinencia de la sección 7.1 "autorización de entidades" en este borrador y en la norma adoptada de tratamientos térmicos tomando en cuenta la elaboración de una norma especifica sobre autorización de entidades *Category : SUBSTANTIVE*
11	G	(General Comment)	C	**Botswana** No comment at this stage *Category : TECHNICAL*
12	G	(General Comment)	C	**Philippines** We agree with the comments made during the APPPC Regional Workshop. *Category : SUBSTANTIVE*
13	G	(General Comment)	C	**Korea, Republic of** Republic of Korea agrees with the comments made during APPPC Regional workshop. *Category : SUBSTANTIVE*
14	G	(General Comment)	C	**Saint Kitts And Nevis** St.Kitts does not object but to the adoption of the requirements for the use of fumigation as a phyytosanitaionary measure. Implementation however becomes an issue due to the lack of

				adequate systems for treatment facilities, authorized entities to perform fumigation and provide accurate records. *Category : SUBSTANTIVE*
15	G	(General Comment)	C	**Japan** Although safety and health issue is important, the relevant part was removed from the draft ISPM as countries commented that it should not be part of an ISPM. Instead, a general description was added in section 10 (Responsibilities). However, safety and health issue is important for NPPOs and entities who conduct fumigation activities, so it is better to include in this ISPM. For a specific comment, the relevant information like the 1st sentence of Section 7.3 "Environment, health and safety" in the 1st round draft ISPM may be added in BACKGROUND as a new paragraph after paragraph No 49. *Category : SUBSTANTIVE*
16	G	(General Comment)	C	**Sierra Leone** Sierra Leone agrees to the comment made during the Africa regional workshop *Category : SUBSTANTIVE*
17	G	(General Comment)	C	**Costa Rica** no comment *Category : TECHNICAL*
18	G	(General Comment)	C	**Congo** j'accepte les commentaires de l'atelier *Category : EDITORIAL*
19	G	(General Comment)	C	**Congo** j'accepte les commentaires de l'atelier *Category : TECHNICAL*
20	G	(General Comment)	C	**Congo** j'accepte les commentaires de l'atelier *Category : SUBSTANTIVE*
21	G	(General Comment)	C	**Namibia** In agreement with the inputs. *Category : SUBSTANTIVE*
22	G	(General Comment)	C	**NEPPO** I agree with the comments made during NEPPO regional workshop *Category : SUBSTANTIVE*
23	G	(General Comment)	C	**Iraq** Iraq reviewed the drafts and has no comments *Category : TECHNICAL*
24	G	(General Comment)	C	**South Africa** The National Plant Protection Organisation of South Africa (NPPOZA) endorse the comments from the regional workshop *Category : SUBSTANTIVE*
25	G	(General Comment)	C	**Caribbean Agricultural Health and Food Safety Agency** T&T endorses the standard on this subject inclusive of the authorization of entities to conduct fumigation. *Category : SUBSTANTIVE*

26	G	(General Comment)	C	**New Zealand** New Zealand agrees with the APPPC comments, and submits the comments made by New Zealand as noted in the APPPC submission. *Category : SUBSTANTIVE*
27	G	(General Comment)	C	**Lao People's Democratic Republic** Lao PDR has agreed with APPPC as Regional Comments. *Category : TECHNICAL*
28	G	(General Comment)	C	**Argentina** We suggest the SC to evaluate the relevance of including the section on authorization of entities taking into account the draft under development on Authorization of entities. *Category : TECHNICAL*
29	G	(General Comment)	C	**APPPC** (96) New Zealand (5 Sep 2018 3:53 AM) Potential implementation issues. 1. New Zealand runs a full approval (web listed) and audited system for treatment providers undertaking all types of official fumigation treatments. The proposed standard would require some small adjustments to our procedures. 2. It would assist regulators and fumigators to maintain a high standard of fumigation performance and compliance with trading partner's requirements by providing: - capacity-building assistance to regulatory officers in respect to registering, monitoring and auditing fumigation providers. - providing best practice fumigation training. - improve the technical expertise of fumigators and regulatory officers. (126) Korea, Republic of (10 Sep 2018 9:44 AM) There is no mention about safety or environmental aspect overall the ISPM. We may consider to add the general statement regarding safety and environmental issue at the scope. (110) Japan (7 Sep 2018 3:46 PM) Although safety and health issues are important, this was removed from the ISPM as countries commented because it should not be part of an ISPM. And a general remark was added in section 10 (Responsibilities). However, this information is important for NPPOs and entities who conduct fumigation activities, so it is better to include in BACKGROUND. For example, the relevant information like the 1st sentence of Section 7.3 "Environment, health and safety" in the 1st round draft ISPM should be added in BACKGROUND as a new paragraph after paragraph No 49. (11) Malaysia (21 Aug 2018 5:05 AM)

				Malaysia has reviewed and accepted the draft. *Category : SUBSTANTIVE*
30	G	(General Comment)	C	**United States of America** It needs to be clear from the draft if fumigation as a phytosanitary measure is intended for harvested commodities, or storage facilities, or plants in the field (some are fumigated). Glossary definitions of fumigation, or of phytosanitary measures/ actions, or proposed for revision definition of the phytosanitary treatment do not explain this. *Category : TECHNICAL*
31	G	(General Comment)	C	**Bangladesh** In case of application of fumigation measure product should be selected and environment friendly fumigant should be use. *Category : SUBSTANTIVE*
32	G	(General Comment)	C	**COSAVE** We suggest the SC to evaluate the relevance of including the section on authorization of entities taking into account the draft under development on Authorization of entities. *Category : TECHNICAL*
33	G	(General Comment)	C	**Uruguay** We suggest the SC to evaluate the relevance of including section 7.1 "Authorization of entities" taking into account the draft under development on Authorization of entities. *Category : TECHNICAL*
34	G	(General Comment)	C	**Kenya** Kenya ok with document. No comments *Category : SUBSTANTIVE*
35	G	(General Comment)	C	**Korea, Republic of** There is no mention about safety or environmental aspect overall the ISPM. We may consider to add the general statement regarding safety and environmental issue at the scope. *Category : SUBSTANTIVE*
36	G	(General Comment)	C	**Algeria** NO COMMENT *Category : SUBSTANTIVE*
37	G	(General Comment)	C	**Nicaragua** Sin ningún comentario. *Category : EDITORIAL*
38	G	(General Comment)	C	**Brazil** Brazil supports COSAVE's comments. *Category : SUBSTANTIVE*
39	G	(General Comment)	C	**Eritrea** It looks that the draft is well prepared and Eritrea does not have any comments to make *Category : SUBSTANTIVE*

40	G	(General Comment)	C	**Venezuela** Venezuela esta de acuerdo con esta propuesta de norma y no tiene comentario *Category : EDITORIAL*
41	G	(General Comment)	C	**Lao People's Democratic Republic** No comments *Category : TECHNICAL*
42	G	(General Comment)	C	**Malawi** No comment *Category : SUBSTANTIVE*
43	G	(General Comment)	C	**Malaysia** Malaysia has reviewed and accepted the draft. *Category : SUBSTANTIVE*
44	G	(General Comment)	C	**Peru** Peru shares the comments made by COSAVE *Category : SUBSTANTIVE*
45	G	(General Comment)	C	**Guinea-Bissau** This standard provides technical guidance for national plant protection organizations (NPPOs) on the application of fumigation as a phytosanitary measure, encompassing treatments with chemicals that reach the commodity in a gaseous state. This standard also provides guidance for NPPOs on the authorization of entities to conduct fumigation. This standard must provide details on treatments with specific fumigants. Application of modified atmosphere as a phytosanitary treatment is not part of this standard. *Category : SUBSTANTIVE*
46	G	(General Comment)	C	**Indonesia** Indonesia propose to change the second last sentence under impact on biodeversity and the environment become "Where possible, IPPC also encourages contracting parties to use other fumigants that have no potential to harm the environment." To the last sentence Indonesia propose to delete the word "destruction", and the sentence become "Environmental impact of fumigants can be mitigated through the use of chemical breakdown or recapture technology to reduce gas emissions." *Category : EDITORIAL*
Draft ISPM: Requirements for the use of fumigation as a phytosanitary measure (2014-004)				
47	8	**Current document stage**	C	**Malawi** We agree with draft ISPm *Category : SUBSTANTIVE*
48	11	2014-04 CPM-9 added the topic *Requirements for the use of fumigation as a ~~phytosanitary~~ Phytosanitary measure* (2014-004) to the work programme with priority 1.	P	**Ghana** *Category : EDITORIAL*
49	24	~~2004-05~~ 2014-05 SC Mr Yuejin WANG (CN, Steward)	P	**European Union** Typo: Date to be corrected. *Category : EDITORIAL*

50	24	~~2004-05~~ 2014-05 SC Mr Yuejin WANG (CN, Steward)	P	**EPPO** Date to be corrected *Category : EDITORIAL*
Scope				
51	35	This standard provides technical guidance for national plant protection organizations (NPPOs) on the application of fumigation as a phytosanitary measure, encompassing treatments with chemicals that reach the commodity in a gaseous state. This standard also provides guidance for NPPOs on the authorization of ~~entities~~ treatment providers to conduct fumigation.	P	**European Union** The TPG reviewed first consultation comments for consistency in the use of terms and noted that a treatment provider is a person or organization applying the treatment operating in a physical construction (i.e. the treatment facility). Because "entity" could refer to the facility, the provider, or both, the TPG supported using "treatment provider" and "treatment facility" instead of "entity" when it was clear that the references in the draft ISPM were made to either the provider or the facility. They felt such an approach would be clearer, although they acknowledged it was not consistent with the draft ISPM on "Requirements for the use of temperature treatments as phytosanitary measures". According to Appendix 4 (General recommendations on use of terms in ISPMs) of the IPPC style guide for standards and meeting documents, in ISPMs and other IPPC documents it is recommended the term "authorize" to be used "to give authority to a person or a body to do something". In this sentence, it is therefore suggested to replace "entities" with "treatment providers" which is a term already used in this draft standard (e.g. see paragraph 56) and used many times in ISPM 15 (Regulation of wood packaging material in international trade). *Category : TECHNICAL*
52	35	This standard provides technical guidance for national plant protection organizations ~~(NPPOs)~~ (NPPO's) on the application of fumigation as a ~~phytosanitary~~ Phytosanitary measure, encompassing treatments with chemicals that reach the commodity in a gaseous state. This standard also provides guidance for ~~NPPOs~~ NPPO's on the authorization of entities to conduct fumigation.	P	**Ghana** *Category : EDITORIAL*
53	35	This standard provides technical guidance for national plant protection organizations (NPPOs) on the application of fumigation as a phytosanitary measure, encompassing treatments with chemicals that reach the commodity in a gaseous state. This standard also provides guidance for NPPOs on the authorization of ~~entities~~ treatment providers to conduct fumigation.	P	**EPPO** The TPG reviewed first consultation comments for consistency in the use of terms and noted that a treatment provider is a person or organization applying the treatment operating in a physical construction (i.e. the treatment facility). Because "entity" could refer to the facility, the provider, or both, the TPG supported using "treatment provider" and "treatment facility" instead of "entity" when it was clear that the references in the draft ISPM were made to either the provider or the facility. They felt such an approach would be clearer, although they acknowledged it was not consistent with the draft ISPM on "Requirements for the use of temperature treatments as phytosanitary measures".

				According to Appendix 4 (General recommendations on use of terms in ISPMs) of the IPPC style guide for standards and meeting documents, in ISPMs and other IPPC documents it is recommended the term "authorize" to be used "to give authority to a person or a body to do something". In this sentence, it is therefore suggested to replace "entities" with "treatment providers" which is a term already used in this draft standard (e.g. see paragraph 56) and used many times in ISPM 15 (Regulation of wood packaging material in international trade). *Category : TECHNICAL*
54	36	This standard does not provide details on specific treatments with specific fumigants. Application of modified atmosphere as a phytosanitary treatment is not part of this standard.	P	**APPPC** (4) Nepal (25 Jul 2018 3:59 AM) *Category : TECHNICAL*
55	36	This standard does not provide details on treatments with specific fumigants. Application of modified atmosphere as a phytosanitary treatment is not part of this standard.	C	**APPPC** 148) Philippines (12 Sep 2018 3:41 AM) Would this not be contradicting since the standard includes fumigation under special conditions. *Category : SUBSTANTIVE*
56	36	This standard does not provide details on treatments with specific fumigants. Application of modified atmosphere as a phytosanitary treatment is not part of this standard.	C	**Jamaica** How will this work? If no specific fumigants are emphasised Will there be specification as to the commodities that would be treated with fumigation? • What is there to guide CP/entities in the selection of a fumigant specific to certain commodities, knowing that not all fumigant can be used for some commodities? • What will guide CP/entities in defining dose and concentration per/volume/time for effectiveness in treatment? I.e. the need for product specific or group schedules. Can there be references to treatment manuals that Member States could use to obtain the information? eg USDA Treatment Manual *Category : SUBSTANTIVE*
57	36	~~This standard does not provide details on treatments with specific fumigants. Application of modified atmosphere as a phytosanitary treatment is not part of this standard.~~La aplicación de atmosfera modificada como tratamiento fitosanitario no es parte de este estándar, sin embargo es posible mejorar la eficacia de un fumigante en combinación con atmosferas modificadas.	P	**Colombia** Tal como está redactado entendemos que la aplicación de tratamientos de atmósfera modificada se trata aparte sin contemplar la posibilidad de combinación de tratamientos. Es posible la combinación de tratamientos para mejorar eficacia de un fumigante con una plaga objetivo, reducir dosis y tiempos de exposición. *Category : SUBSTANTIVE*

58	36	This standard does not provide details on treatments with specific fumigants. Application of modified atmosphere as a phytosanitary treatment is not part of this standard.	C	**Philippines** Would this not be a contradictory statement that "application of modified atmosphere as a phytosanitary treatment is not part of this standard" where in fact, there is a paragraph on "Fumigation under special conditions". *Category : SUBSTANTIVE*
59	36	This standard does not provide details on treatments with specific fumigants. Application of modified atmosphere as a phytosanitary ~~treatment~~ measure is not part of this standard.	P	**Argentina** For consistency. *Category : TECHNICAL*
60	36	This standard does not provide details on treatments with specific fumigants. Application of modified atmosphere as a phytosanitary ~~treatment~~ measure is not part of this standard.	P	**Uruguay** For consistency *Category : TECHNICAL*
61	36	This standard does not provide details on treatments with specific fumigants. Application of modified atmosphere as a phytosanitary ~~treatment~~ measure is not part of this standard.	P	**COSAVE** For consistency. *Category : TECHNICAL*
References				
62	39	**CPM R-03.** 2017. Replacement or reduction of the use of ~~methyl bromide~~ Methyl Bromide as a ~~phytosanitary~~ Phytosanitary measure. CPM Recommendation. Rome, IPPC, FAO. Available at https://www.ippc.int/en/publications/84230/ (last accessed 3 June 2018).	P	**Ghana** *Category : EDITORIAL*
Definitions				
63	41	Definitions of phytosanitary terms used in this standard can be found in ISPM 5 (*Glossary of ~~phytosanitary~~ Phytosanitary terms*).	P	**Ghana** *Category : EDITORIAL*
Outline of Requirements				
64	43	NPPOs should ensure that the fumigation application is carried out effectively so that critical parameters are (e.g concentration or dose, temperature, duration) at the required level throughout the commodity to achieve the stated efficacy.	P	**Viet Nam** To include the critical parameters for emphasis and for consistency with paragraph 64 whereby examples have been provided as such as well. *Category : SUBSTANTIVE*
65	43	NPPOs should ensure that the fumigation application is carried out effectively so that critical parameters are at the required level throughout the commodity to achieve the stated ~~efficacy~~efficacy without compromising the quality of the commodity.	P	**Australia** ISPM 28 states the need to not compromise the quality of a commodity through a treatment. *Category : TECHNICAL*
66	43	~~NPPOs~~ NPPO's should ensure that the fumigation application is carried out effectively so that critical parameters are at the required level throughout the commodity to achieve the stated efficacy.	P	**Ghana** *Category : EDITORIAL*
67	43	NPPOs should ensure that the fumigation application is carried out effectively so that critical parameters (e.g concentration or dose, temperature, duration) are at the required level throughout the commodity to achieve the stated efficacy.	P	**APPPC** (18) Singapore (4 Sep 2018 1:01 AM) To include the critical parameters for emphasis and for consistency with paragraph 64 whereby examples have been

				provided as such as well. *Category : SUBSTANTIVE*
68	43	NPPOs should ensure that the fumigation application of fumigation, the use of equipment, and the fumigation procedures are followed so that it is carried out effectively ~~so that critical parameters are at the required level throughout the commodity~~ to achieve the stated efficacy. Systems should be implemented to prevent the infestation or contamination of the fumigated commodity. Record keeping and documentation requirements should be followed to enable auditing, verification or trace-back.	P	**APPPC** (146) Philippines (12 Sep 2018 3:38 AM) *Category : SUBSTANTIVE*
69	43	NPPOs should ensure that the fumigation application is carried out effectively so that critical parameters are at the required level throughout the commodity to achieve the stated efficacy.	C	**Jamaica** replace effectively with in accordance with the fumigation guidelines. *Category : SUBSTANTIVE*
70	43	NPPOs should ensure that the fumigation ~~application is~~ application, use of equipment and fumigation procedures are carried out effectively so that critical parameters are at the required level throughout the commodity to achieve the stated efficacy.	P	**Philippines** *Category : EDITORIAL*
71	43	NPPOs should ensure that the fumigation application is carried out effectively so that critical ~~parameters~~ parameters (e.g concentration or dose, temperature, duration) are at the required level throughout the commodity to achieve the stated efficacy.	P	**Singapore** To include the critical parameters for emphasis and for consistency with paragraph 64. *Category : SUBSTANTIVE*
72	44	The ~~main~~ requirements for the application of fumigation, the use of equipment, and the fumigation procedures should be followed. Systems should be implemented to prevent the infestation or contamination of the fumigated commodity. Record keeping and documentation requirements should be followed to enable auditing, verification or trace-back.	P	**European Union** All the requirements should be followed and not only the main ones. *Category : SUBSTANTIVE*
73	44	The main requirements for the application of fumigation, the use of ~~equipment,~~ equipment and the fumigation procedures should be ~~followed~~met. Systems should be implemented to prevent the infestation or contamination of the fumigated commodity. Record keeping and documentation requirements should be followed to enable auditing, verification or trace-back.	P	**European Union** Useless comma. Suggest this sentence be rewritten with better wording ('to meet requirements') or simplified as follows: 'The main requirements for the application of fumigation should be met'. *Category : EDITORIAL*
74	44	The ~~main~~ requirements for the application of fumigation, the use of ~~equipment,~~ equipment and the fumigation procedures should be ~~followed~~met. Systems should be implemented to prevent the infestation or contamination of the fumigated commodity. Record keeping and documentation requirements should be followed to enable auditing, verification or trace-back.	P	**EPPO** Better wording (to meet requirements) All the requirements should be followed and not only the main ones *Category : SUBSTANTIVE*

75	44	The main requirements for the application of fumigation, the use of equipment, and the fumigation procedures should be followed. Systems should be implemented to prevent the infestation or contamination of the fumigated commodity. Record keeping and documentation requirements should be followed to enable auditing, verification or trace-back.	C	**APPPC** (100) New Zealand (7 Sep 2018 8:14 AM) Re. "Systems should be implemented to prevent the infestation or contamination of the fumigated commodity." Sometime it is difficult to implement phytosanitaty security for commodities some as logs, in such case, MPI implements a post fumigation exposure rule between fumigating and loadig to minimise reinfestation. New Zealand propose to refrain of using "prevent" and replace with "minimise". *Category : TECHNICAL*
76	44	~~The main requirements for the application of fumigation, the use of equipment, and the fumigation procedures should be followed.~~ Systems should be implemented to prevent the infestation or contamination of the fumigated commodity. Record keeping and documentation requirements should be followed to enable auditing, verification or trace-back.	P	**APPPC** (147) Philippines (12 Sep 2018 3:40 AM) *Category : SUBSTANTIVE*
77	44	The main requirements for the application of fumigation, the use of equipment, and the fumigation procedures should be followed. Systems should be implemented to prevent the ~~infestation~~ infestation, re-infestation, or contamination of the fumigated commodity. Record keeping and documentation requirements should be followed to enable auditing, verification or trace-back, and pesticide label.	P	**United States of America** Safeguarding includes prevention form infestation by new pests and re-infestation by the pests that were already fumigated. Pesticide label is important legal component of fumigation. *Category : TECHNICAL*
78	44	The main requirements for the application of fumigation, the use of fumigant equipment, and the fumigation procedures should be followed. Systems should be implemented to prevent the infestation or contamination of the fumigated commodity. Record keeping and documentation requirements should be followed to enable auditing, verification or trace-back.	P	**Australia** Additional term 'fumigant' is a key requirement. *Category : TECHNICAL*
79	44	~~The main requirements for the application of fumigation, the use of equipment, and the fumigation procedures should be followed.~~ Systems should be implemented to prevent the infestation or contamination of the fumigated commodity. Record keeping and documentation requirements should be followed to enable auditing, verification or trace-back.	P	**Philippines** *Category : EDITORIAL*
80	45	The roles and responsibilities of ~~parties~~ entities (person or organization) involved in fumigation are described. Guidance is provided to NPPOs on authorizing, monitoring and auditing treatment entities.	P	**Viet Nam** To ensure consistency with the requirement of "ISPM 42 Requirements for the use of temperature treatments as phytosanitary measures". *Category : SUBSTANTIVE*
81	45	The roles and responsibilities of parties involved in fumigation are described. Guidance is provided to NPPOs on authorizing, monitoring and auditing treatment ~~entities~~providers.	P	**European Union** Please see the comment on paragraph 35 about the use of the word "entity". *Category : TECHNICAL*
82	45	The roles and responsibilities of parties involved in fumigation are described. Guidance is provided to ~~NPPOs~~ NPPO's on authorizing, monitoring and auditing treatment entities.	P	**Ghana** *Category : EDITORIAL*

83	45	The roles and responsibilities of parties involved in fumigation are described. Guidance is provided to NPPOs on authorizing, monitoring and auditing treatment ~~entities~~providers.	P	**EPPO** Please see the comment on paragraph 35 about the use of the word "entity". *Category : TECHNICAL*
84	45	The roles and responsibilities of ~~parties~~ entities (person or organization) involved in fumigation are described. Guidance is provided to NPPOs on authorizing, monitoring and auditing treatment entities.	P	**Japan** To ensure consistency with the requirement of "ISPM 42 Requirements for the use of temperature treatments as phytosanitary measures". *Category : SUBSTANTIVE*
85	45	The roles and responsibilities of ~~parties~~ entities (person or organization) involved in fumigation are described. Guidance is provided to NPPOs on authorizing, monitoring and auditing treatment entities.	P	**APPPC** (122) Japan (8 Sep 2018 4:48 AM) To ensure consistency with the requirement of "ISPM 42 Requirements for the use of temperature treatments as phytosanitary measures". *Category : SUBSTANTIVE*
BACKGROUND				
86	47	The purpose of this standard is to provide generic requirements for the application of fumigation as a ~~phytosanitary~~ Phytosanitary treatment, specifically for those treatments adopted under ISPM 28 (*Phytosanitary treatments for regulated pests*).	P	**Ghana** *Category : EDITORIAL*
87	47	The purpose of this standard is to provide generic requirements (not specific) for the application of fumigation as a phytosanitary treatment, specifically for those treatments adopted under ISPM 28 (*Phytosanitary treatments for regulated pests*).	P	**APPPC** (5) Nepal (25 Jul 2018 4:01 AM) *Category : SUBSTANTIVE*
88	47	The purpose of this standard is to provide generic requirements for the application of fumigation as a phytosanitary treatment, specifically for those treatments adopted under ISPM 28 (*Phytosanitary treatments for regulated pests*~~)~~) and other regulated articles.	P	**Australia** Clarification *Category : TECHNICAL*
89	47	The purpose of this standard is to provide generic requirements for the application of fumigation as a phytosanitary treatment, specifically for those treatments adopted under ISPM 28 and ISPM 15 (*Phytosanitary treatments for regulated pests*).	P	**Iran** *Category : TECHNICAL*
90	47	The purpose of this standard is to provide ~~generic~~ general requirements for the application of fumigation as a phytosanitary treatment, specifically for those treatments adopted under ISPM 28 (*Phytosanitary treatments for regulated pests*).	P	**Iran** The purpose of this standard is to provide general requirements for the application of fumigation as a phytosanitary treatment, specifically for those treatments adopted under ISPM◦28 (Phytosanitary treatments for regulated pests). *Category : EDITORIAL*
91	47	The purpose of this standard is to provide generic requirements for the application of fumigation as a phytosanitary ~~treatment~~measure, specifically for those treatments adopted under ISPM 28 (*Phytosanitary treatments for regulated pests*).	P	**Argentina** For consistency. *Category : TECHNICAL*

92	47	The purpose of this standard is to provide generic requirements for the application of fumigation as a phytosanitary ~~treatment~~measure, specifically for those treatments adopted under ISPM 28 (*Phytosanitary treatments for regulated pests*).	P	**Uruguay** For consistency *Category : TECHNICAL*
93	47	The purpose of this standard is to provide generic requirements for the application of fumigation as a phytosanitary ~~treatment~~measure, specifically for those treatments adopted under ISPM 28 (*Phytosanitary treatments for regulated pests*).	P	**COSAVE** For consistency. *Category : TECHNICAL*
94	48	ISPM 28 was adopted to harmonize effective ~~phytosanitary~~ Phytosanitary treatments over a wide range of circumstances and to enhance the mutual recognition of treatment efficacy by ~~NPPOs~~NPPO's, which may facilitate trade. ISPM 28 provides requirements for submission and evaluation of efficacy data and other relevant information on ~~phytosanitary~~ Phytosanitary treatments, and annexes with specific fumigations that have been evaluated and adopted by the Commission on Phytosanitary Measures.	P	**Ghana** *Category : EDITORIAL*
95	48	ISPM 28 was adopted to harmonize effective phytosanitary treatments over a wide range of circumstances and to enhance the mutual recognition of treatment efficacy by NPPOs, which may facilitate ~~trade.~~ trade of plant products that present a potential risk of dispersion of quarantine pests for importing countries ISPM 28 provides requirements for submission and evaluation of efficacy data and other relevant information on phytosanitary treatments, and annexes with specific fumigations that have been evaluated and adopted by the Commission on Phytosanitary Measures.	P	**Colombia** Se sugiere la inclusión de la frase " … de productos vegetales que presentan un riesgo potencial de introducción y dispersión de plagas cuarentenarias para los países importadores." Es importante hacer claridad en el tipo de productos que se comercializan y el tipo de riesgo al que se está expuesto. *Category : SUBSTANTIVE*
96	49	Fumigation is considered to be effective when the specific concentration of fumigant at the minimum temperature and duration required for the stated efficacy is ~~achieved~~achieved inside the fumigation enclosure, measured in areas likely to have the lowest concentration of fumigant..	P	**Canada** For clarity. *Category : TECHNICAL*
97	49	Fumigation is considered to be effective when the specific concentration of fumigant at the minimum temperature and duration required for the stated efficacy is achieved. Prior to any application of a fumigant, a review of the health and safety risks should be completed to ensure that all the requirements of domestic regulations are met and the safety of applicators and those living or working in proximity to the fumigation site are ensured.	P	**Viet Nam** Although safety and health issues are important, this was removed from the ISPM as countries commented because it should not be part of an ISPM. And a general remark was added in section 10 (Responsibilities). However, this information is important for NPPOs and entities who conduct fumigation activities, so it is better to include in BACKGROUND. So the 1st sentence of Section 7.3 "Environment, health and safety" in the 1st round draft ISPM shoud be added in BACKGROUND as a new paragraph after paragraph No 49. *Category : SUBSTANTIVE*
98	49	Fumigation is considered to be effective when the specific concentration of fumigant at the minimum temperature and duration required for the stated efficacy is achieved. Prior to any application of a fumigant, a review of the health and safety risks should be completed to ensure that all the requirements of domestic	P	**Korea, Republic of** This information is important for NPPOs and entities who conduct fumigation activities, so it is better to include in BACKGROUND. *Category : SUBSTANTIVE*

		regulations are met and the safety of applicators and those living or working in proximity to the fumigation site are ensured.		
99	49	Fumigation is considered to be effective when the specific concentration of fumigant at the minimum temperature and duration required for the stated efficacy is achieved. Prior to any application of a fumigant, a review of the health and safety risks should be completed to ensure that all the requirements of domestic regulations are met and the safety of applicators and those living or working in proximity to the fumigation site are ensured.	P	**Japan** Please see the general commnent on safety and health issue . For a specific comment, the relevant information like the 1st sentence of Section 7.3 "Environment, health and safety" in the 1st round draft ISPM may be added in BACKGROUND as a new paragraph after paragraph No 49. *Category : SUBSTANTIVE*
100	49	Fumigation is considered to be effective when the specific concentration of fumigant at the minimum temperature and duration required for the stated efficacy is achieved. Prior to any application of a fumigant, a review of the health and safety risks should be completed to ensure that all the requirements of domestic regulations are met and the safety of applicators and those living or working in proximity to the fumigation site are ensured.	P	**APPPC** 111) Japan (7 Sep 2018 3:47 PM) Although safety and health issues are important, this was removed from the ISPM as countries commented because it should not be part of an ISPM. And a general remark was added in section 10 (Responsibilities). However, this information is important for NPPOs and entities who conduct fumigation activities, so it is better to include in BACKGROUND. So the 1st sentence of Section 7.3 "Environment, health and safety" in the 1st round draft ISPM shoud be added in BACKGROUND as a new paragraph after paragraph No 49. *Category : SUBSTANTIVE*
101	49	Fumigation is considered to be effective when the specific concentration of fumigant at the minimum temperature and duration required for the stated efficacy is achieved~~.~~. This includes safeguarding measures applied after the successful fumigation	P	**United States of America** Protecting treated commodity from re-infestation is important part of the treatment effectiveness *Category : TECHNICAL*
102	49	Fumigation is considered to be effective when the specific concentration of fumigant at the minimum ~~temperature~~ temperature, concentration readings, and duration required for the stated efficacy is achieved.	P	**United States of America** Important operational parameter for implementing fumigation treatments. *Category : TECHNICAL*
IMPACTS ON BIODIVERSITY AND THE ENVIRONMENT				
103	51	Historically, fumigation has been widely applied to prevent the introduction and spread of regulated pests and has, therefore, been beneficial to biodiversity. However, fumigant gases, such as methyl bromide, sulphuryl fluoride, phosphine and ethyl formate, may have negative impacts on the environment. For example, the emission of methyl bromide into the atmosphere is known to deplete the ozone layer and sulphuryl fluoride is a recognized greenhouse gas. The IPPC Recommendation on the replacement or reduction of the use of methyl bromide as a phytosanitary measure (CPM R-03, 2017) has been adopted in relation to this issue. It encourages contracting parties to choose other fumigants, where ~~possible~~possible with minimum environmental impact. Environmental impacts of	P	**Canada** Emphasizing environmental impact. *Category : SUBSTANTIVE*

		fumigants can be mitigated through the use of destruction (chemical breakdown) or recapture technology to reduce gas emissions.		
104	51	Historically, fumigation has been widely applied to prevent the introduction and spread of regulated pests and has, therefore, been beneficial to biodiversity. However, fumigant gases, such as methyl ~~bromide,~~ bromide and sulphuryl fluoride~~, phosphine and ethyl format~~,~~e~~ may have negative impacts on the environment. For example, the emission of methyl bromide into the atmosphere is known to deplete the ozone layer and sulphuryl fluoride is a recognized greenhouse gas. The IPPC Recommendation on the replacement or reduction of the use of methyl bromide as a phytosanitary measure (CPM R-03, 2017) has been adopted in relation to this issue. ~~, may have negative impacts on the environment. For example, the emission of methyl bromide into the atmosphere is known to deplete the ozone layer and sulphuryl fluoride is a recognized greenhouse gas. The IPPC Recommendation on the replacement or reduction of the use of methyl bromide as a phytosanitary measure (CPM R-03, 2017) has been adopted in relation to this issue.~~ It encourages contracting parties to choose other fumigants, where possible. Environmental impacts of fumigants can be mitigated through the use of destruction (chemical breakdown) or recapture technology to reduce gas emissions.	P	**Viet Nam** There are no clear negative effects on phosphine and ethyl formate on environment. *Category : TECHNICAL*
105	51	Historically, fumigation has been widely applied to prevent the introduction and spread of regulated pests and has, therefore, been beneficial to biodiversity. However, fumigant gases, such as methyl bromide, sulphuryl fluoride, phosphine and ethyl formate, may have negative impacts on the environment. For example, the emission of methyl bromide into the atmosphere is known to deplete the ozone layer and sulphuryl fluoride is a recognized greenhouse gas. The IPPC Recommendation on the replacement or reduction of the use of methyl bromide as a phytosanitary measure (CPM R-03, 2017) has been adopted in relation to this issue. It encourages contracting parties to choose other fumigants, where possible. Environmental impacts of fumigants can be mitigated through the use of destruction (chemical breakdown) or recapture technology or environmentally friendly fumigants to reduce gas emissions.	P	**Australia** Environmentally friendly fumigants also reduce greenhouse gas emissions. *Category : TECHNICAL*
106	51	Historically, fumigation has been widely applied to prevent the introduction and spread of regulated pests and has, therefore, been beneficial to biodiversity. However, fumigant gases, such as methyl bromide, sulphuryl fluoride, phosphine and ethyl formate, ~~may~~ will have negative impacts on the environment. For example, the emission of methyl bromide into the atmosphere is known to deplete the ozone layer and sulphuryl fluoride is a recognized greenhouse gas. The IPPC Recommendation on the replacement or reduction of the use of methyl bromide as a phytosanitary measure (CPM R-03, 2017) has been adopted in relation to this	P	**Sri Lanka** Usually any chemical that is released to the environment may change the composition of atmospheric gases, and will harm the biodiversity (even in small scale). *Category : TECHNICAL*

		issue. It encourages contracting parties to choose other fumigants, where possible. Environmental impacts of fumigants can be mitigated through the use of destruction (chemical breakdown) or recapture technology to reduce gas emissions.		
107	51	Historically, fumigation has been widely applied to prevent the introduction and spread of regulated pests and has, therefore, been beneficial to biodiversity. However, fumigant gases, such as methyl bromide, sulphuryl fluoride, phosphine and ethyl formate, may have negative impacts on the environment. For example, the emission of methyl bromide into the atmosphere is known to deplete the ozone layer and sulphuryl fluoride is a recognized greenhouse gas. The IPPC Recommendation on the replacement or reduction of the use of methyl bromide as a phytosanitary measure (CPM R-03, ~~2017) has been adopted in relation to this issue.~~ 2017)~~It~~ encourages contracting parties to choose other fumigants, where possible. Environmental impacts of fumigants can be mitigated through the use of destruction (chemical breakdown) or recapture technology to reduce gas emissions.	P	**European Union** Simplification. *Category : EDITORIAL*
108	51	Historically, fumigation has been widely applied to prevent the introduction and spread of regulated pests and has, therefore, been beneficial to biodiversity. However, fumigant gases, such as methyl bromide, sulphuryl fluoride, phosphine and ethyl formate, may have negative impacts on the environment. For example, the emission of methyl bromide into the atmosphere is known to deplete the ozone layer and sulphuryl fluoride is a recognized greenhouse gas. The IPPC Recommendation on the replacement or reduction of the use of methyl bromide as a phytosanitary measure (CPM R-03, 2017) has been adopted in relation to this issue. It encourages contracting parties to ~~choose other fumigants~~use alternatives to methyl bromide, where possible. Environmental impacts of fumigants can be mitigated through the use of destruction (chemical breakdown) or recapture technology to reduce gas emissions.	P	**European Union** Alternative methods are not necessarily fumigation with another gas than methyl bromide (e.g. for ISPM 15 heat treatment or dielectric heating may be used). *Category : SUBSTANTIVE*
109	51	Historically, fumigation has been widely applied to prevent the introduction and spread of regulated pests and has, therefore, been beneficial to biodiversity. However, fumigant gases, such as methyl bromide, sulphuryl fluoride, phosphine and ethyl formate, may have negative impacts on the environment. For example, the emission of methyl bromide into the atmosphere is known to deplete the ozone layer and sulphuryl fluoride is a recognized greenhouse gas. The IPPC Recommendation on the replacement or reduction of the use of methyl bromide as a phytosanitary measure (CPM R-03, 2017) ~~has been adopted~~ in ~~relation to this issue.~~ particular~~It~~ encourages contracting parties to ~~choose other fumigants~~use alternative to methyl bromide, where possible. Environmental impacts of fumigants can be mitigated through the use of destruction (chemical breakdown) or recapture technology to reduce gas emissions.	P	**EPPO** Alternative methods are not necessarily fumigation with another gas than methyl bromide (e.g. for ISPM 15 heat treatment or dielectric heating may be used). Simplification. *Category : EDITORIAL*

110	51	Historically, fumigation has been widely applied to prevent the introduction and spread of regulated pests and has, therefore, been beneficial to biodiversity. However, ~~fumigant gases~~chemical agents, such as methyl bromide, sulphuryl fluoride, phosphine and ethyl formate, may have negative impacts on the environment. For example, the emission of methyl bromide into the atmosphere is known to deplete the ozone layer and sulphuryl fluoride is a recognized greenhouse gas. The IPPC Recommendation on the replacement or reduction of the use of methyl bromide as a phytosanitary measure (CPM R-03, 2017) has been adopted in relation to this issue. It encourages contracting parties to choose other ~~fumigants~~chemical agents , where possible. Environmental impacts of ~~fumigants~~ chemical agents can be mitigated through the use of destruction (chemical breakdown) or recapture technology to reduce gas emissions.	P	**Libya** glossary: Definition of fumigation *Category : SUBSTANTIVE*
111	51	Historically, fumigation has been widely applied to prevent the introduction and spread of regulated pests and has, therefore, been beneficial to biodiversity. However, fumigant gases, such as methyl bromide, sulphuryl fluoride, phosphine and ethyl formate, may have negative impacts on the environment. For example, the emission of methyl bromide into the atmosphere is known to deplete the ozone layer and sulphuryl fluoride is a recognized greenhouse gas. The IPPC Recommendation on the replacement or reduction of the use of methyl bromide as a phytosanitary measure (CPM R-03, 2017) has been adopted in relation to this issue. It encourages contracting parties to choose other fumigants, where possible. Environmental impacts of fumigants can be mitigated through the use of destruction (chemical breakdown) or recapture technology to reduce gas emissions.	C	**Nigeria** Sulphuryl fluoridea is not accessible in the market in the developing countries as a replacement for methylbromide. Consideraction should be given to the contracting parties ability to use this fuimigants as alternative . *Category : SUBSTANTIVE*
112	51	Historically, fumigation has been widely applied to prevent the introduction and spread of regulated pests and has, therefore, been beneficial to biodiversity. However, fumigant gases, such as methyl bromide, sulphuryl fluoride, phosphine and ethyl formate, may have negative impacts on the environment. For example, the emission of methyl bromide into the atmosphere is known to deplete the ozone layer and sulphuryl fluoride is ~~a~~ recognized as a greenhouse gas. The IPPC Recommendation on the replacement or reduction of the use of methyl bromide as a phytosanitary measure (CPM R-03, 2017) has been adopted in relation to this issue. It encourages contracting parties to choose other fumigants, where possible. Environmental impacts of fumigants can be mitigated through the use of destruction (chemical breakdown) or recapture technology to reduce gas emissions.	P	**Japan** *Category : EDITORIAL*
113	51	Historically, fumigation has been widely applied to prevent the introduction and spread of regulated pests and has, therefore, been beneficial to biodiversity. However, fumigant gases, such as methyl bromide, sulphuryl fluoride, phosphine and ethyl formate, may have negative impacts on the environment. For example,	P	**APPPC** (3) Nepal (25 Jul 2018 3:57 AM) *Category : SUBSTANTIVE*

		the emission of methyl bromide into the atmosphere is known to deplete the ozone layer and sulphuryl fluoride is a recognized greenhouse gas. The IPPC Recommendation on the replacement or reduction of the use of methyl bromide as a phytosanitary measure (CPM R-03, 2017) has been adopted in relation to this issue. It encourages contracting parties to choose other fumigants, where possible. Environmental impacts of fumigants can be mitigated through the use of destruction (chemical breakdown) or recapture technology to reduce gas ~~emissions~~emissions or can help mitigate environmental concerns.		
114	51	Historically, fumigation has been widely applied to prevent the introduction and spread of regulated pests and has, therefore, been beneficial to biodiversity. However, fumigant gases, such as methyl ~~bromide,~~ bromide and sulphuryl fluoride, ~~phosphine and ethyl formate~~may have negative impacts on the environment. For example, the emission of methyl bromide into the atmosphere is known to deplete the ozone layer and sulphuryl fluoride is a recognized greenhouse gas. The IPPC Recommendation on the replacement or reduction of the use of methyl bromide as a phytosanitary measure (CPM R-03, 2017) has been adopted in relation to this issue. ~~, may have negative impacts on the environment. For example, the emission of methyl bromide into the atmosphere is known to deplete the ozone layer and sulphuryl fluoride is a recognized greenhouse gas. The IPPC Recommendation on the replacement or reduction of the use of methyl bromide as a phytosanitary measure (CPM R-03, 2017) has been adopted in relation to this issue.~~ It encourages contracting parties to choose other fumigants, where possible. Environmental impacts of fumigants can be mitigated through the use of destruction (chemical breakdown) or recapture technology to reduce gas emissions.	P	**APPPC** (134) Korea, Republic of (10 Sep 2018 10:15 AM) There are no clear negative effects on phosphine and ethyl formate on environment. *Category : TECHNICAL*
115	51	Historically, fumigation has been widely applied to prevent the introduction and spread of regulated pests and has, therefore, been beneficial to biodiversity. However, fumigant gases, such as methyl bromide, sulphuryl fluoride, phosphine and ethyl formate, may have negative impacts on the environment. For example, the emission of methyl bromide into the atmosphere is known to deplete the ozone layer and sulphuryl fluoride is a recognized greenhouse gas. The IPPC Recommendation on the replacement or reduction of the use of methyl bromide as a phytosanitary measure (CPM R-03, 2017) has been adopted in relation to this issue. It encourages contracting parties to choose other fumigants, where possible. Environmental impacts of fumigants can be mitigated through the use of destruction (chemical breakdown) or recapture technology to reduce gas emissions.	C	**Jamaica** replace destruction (chemical breakdown) with chemical decomposition. *Category : SUBSTANTIVE*
116	51	Historically, fumigation has been widely applied to prevent the introduction and spread of regulated pests and has, therefore, been beneficial to biodiversity. However, fumigant gases, such as methyl bromide, sulphuryl fluoride, phosphine	C	**Korea, Republic of** There are no clear negative effects on phosphine and ethyl formate on environment. *Category : TECHNICAL*

		and ethyl formate, may have negative impacts on the environment. For example, the emission of methyl bromide into the atmosphere is known to deplete the ozone layer and sulphuryl fluoride is a recognized greenhouse gas. The IPPC Recommendation on the replacement or reduction of the use of methyl bromide as a phytosanitary measure (CPM R-03, 2017) has been adopted in relation to this issue. It encourages contracting parties to choose other fumigants, where possible. Environmental impacts of fumigants can be mitigated through the use of destruction (chemical breakdown) or recapture technology to reduce gas emissions.		
117	51	Historically, fumigation has been widely applied to prevent the introduction and spread of regulated pests and has, therefore, been beneficial to biodiversity. However, fumigant gases, such as methyl ~~bromide,~~ bromide and sulphuryl fluoride~~, phosphine and ethyl formate~~, may have negative impacts on the environment. For example, the emission of methyl bromide into the atmosphere is known to deplete the ozone layer and sulphuryl fluoride is a recognized greenhouse gas. The IPPC Recommendation on the replacement or reduction of the use of methyl bromide as a phytosanitary measure (CPM R-03, 2017) has been adopted in relation to this issue. It encourages contracting parties to choose other fumigants, where possible. Environmental impacts of fumigants can be mitigated through the use of destruction (chemical breakdown) or recapture technology to reduce gas emissions.	P	**Korea, Republic of** *Category : TECHNICAL*
118	51	Historically, fumigation has been widely applied to prevent the introduction and spread of regulated pests and has, therefore, been beneficial to biodiversity. However, fumigant gases, such as methyl bromide, sulphuryl fluoride, phosphine and ethyl formate, may have negative impacts on the environment. For example, the emission of methyl bromide into the atmosphere is known to deplete the ozone layer and sulphuryl fluoride is a recognized greenhouse gas. The IPPC Recommendation on the replacement or reduction of the use of methyl bromide as a phytosanitary measure (CPM R-03, 2017) has been adopted in relation to this issue. It encourages contracting parties to choose other ~~fumigants~~chemical agents, where possible. Environmental impacts of ~~fumigants~~ chemical agents can be mitigated through the use of destruction (chemical breakdown) or recapture technology to reduce gas emissions.	P	**NEPPO** *Category : SUBSTANTIVE*
119	51	Historically, fumigation has been widely applied to prevent the introduction and spread of regulated pests and has, therefore, been beneficial to biodiversity. However, ~~fumigant gases~~chemical agents, such as methyl bromide, sulphuryl fluoride, phosphine and ethyl formate, may have negative impacts on the environment. For example, the emission of methyl bromide into the atmosphere is known to deplete the ozone layer and sulphuryl fluoride is a recognized greenhouse gas. The IPPC Recommendation on the replacement or reduction of the use of	P	**NEPPO** glossary: Definition of fumigation *Category : SUBSTANTIVE*

		methyl bromide as a phytosanitary measure (CPM R-03, 2017) has been adopted in relation to this issue. It encourages contracting parties to choose other fumigants, where possible. Environmental impacts of fumigants can be mitigated through the use of destruction (chemical breakdown) or recapture technology to reduce gas emissions.		
120	51	Historically, fumigation has been widely applied to prevent the introduction and spread of regulated pests and has, therefore, been beneficial to biodiversity. However, fumigant gases, such as methyl bromide, sulphuryl fluoride, phosphine and ethyl formate, may have negative impacts on the environment. For example, the emission of methyl bromide into the atmosphere is known to deplete the ozone layer and sulphuryl fluoride is a recognized greenhouse gas. The IPPC Recommendation on the replacement or reduction of the use of methyl bromide as a phytosanitary measure (CPM R-03, 2017) has been adopted in relation to this issue. It encourages contracting parties to choose other ~~fumigants~~chemicals, where possible. Environmental impacts of fumigants can be mitigated through the use of destruction (chemical breakdown) or recapture technology to reduce gas emissions.	P	**NEPPO** to be on line with the recommandation *Category : SUBSTANTIVE*
REQUIREMENTS				
121	52	**REQUIREMENTS**	P	**United States of America** Needs a section on the pesticide label, procedure for fumigations (commodity, dosage, temperature, time),legality of the fumigant. Should inserted before Section 2. *Category : SUBSTANTIVE*
1. Fumigation Objective				
122	54	The objective of using fumigation as a ~~phytosanitary~~ Phytosanitary measure is to achieve pest mortality at a specified efficacy.	P	**Ghana** *Category : EDITORIAL*
123	54	The objective of using fumigation as a phytosanitary measure is to achieve pest mortality at a specified efficacy.	C	**Jamaica** Add while facilitating trade to the end of the sentence. *Category : SUBSTANTIVE*
124	54	The objective of using fumigation as a phytosanitary measure is to achieve pest mortality at a specified efficacy. agreed upon between ONPFs and in quarantine treatments must getting a complete control of all stages of the target pest (s).”	P	**Colombia** A que hace referencia “mortalidad de plagas con una eficacia especificada”. La “mortalidad de plagas con una eficacia especificada” queda a criterio de las ONPFs o es convenida por estas, en tratamientos cuarentenarios hay que tener claridad sobre el alcance que debería tener en condiciones ideales un protocolo de fumigación. *Category : SUBSTANTIVE*
125	54	The objective of using fumigation as a phytosanitary measure is to achieve pest mortality on specified or regulated pests and articles at a specified efficacy.	P	**Australia** It seems practical to add regulated pests and articles as fumigation is used to devitalise seed. *Category : TECHNICAL*
2. Fumigation Application				

126	56	Fumigation is undertaken by treatment providers (e.g. fumigation companies or individuals) either in a treatment facility or at other suitable locations (e.g. cargo ship holds and warehouses).	P	**Grenada** *Category : TECHNICAL*
127	56	Fumigation is undertaken by treatment providers (e.g. NPPO, fumigation companies or ~~individuals)~~ individuals or authorized entities) either in a treatment facility or at other locations (e.g. cargo ship holds and warehouses).	P	**Sri Lanka** NPPO could also provide fumigation services) As per the new standard for authorization of entities, we suggest to include, Authorized entities as well *Category : TECHNICAL*
128	56	Fumigation is undertaken by treatment providers (e.g. fumigation companies or certified individuals) either in a treatment facility or at other locations (e.g. ~~cargo ship holds~~ shipping containers, chambers, under tarpaulin, and warehouses).	P	**United States of America** To correct the treatment facilities/ and locations. *Category : TECHNICAL*
129	56	It is the responsibility of the NPPO to verify and comply with the fumigant label requirement before initiating the fumigation treatment Fumigation is undertaken by treatment providers (e.g. fumigation companies or individuals) either in a treatment facility or at other locations (e.g. cargo ship holds and warehouses).	P	**United States of America** See above comment. *Category : SUBSTANTIVE*
130	56	Fumigation is undertaken by treatment providers (e.g. fumigation companies or individuals) either in a treatment facility or at other locations (e.g. cargo ship holds and warehouses).	C	**Jamaica** Fumigation is a treatment process undertaken by treatment providers (eg government entities, fumigation companies, individuals) to apply of target specific fumigants in treatment facilities (eg chambers, containers, tarpaulins facility) or at other locations (egg Cargo ships holds and warehouse *Category : SUBSTANTIVE*
131	58	as an integral part of production or packaging ~~operations~~operations (e.g. during storage before packaging, during packaging)	P	**Viet Nam** Add an example to clarify the differnece between this indent and the other (i.e. "during storage" after packaging in paragraph No60) because packaging operations in paragraph No59 include different types of operations, "during storage before packaging" and "during packaging". *Category : SUBSTANTIVE*
132	58	as an integral part of production or packaging ~~operations~~operations (e.g. during storage before packaging, during packaging)	P	**Japan** Add an example to clarify the differnece between this indent and the other (i.e. "during storage" after packaging in paragraph No60) because packaging operations in paragraph No59 include different types of operations, "during storage before packaging" and "during packaging". *Category : SUBSTANTIVE*
133	58	as an integral part of production or packaging ~~operations~~operations (e.g. during storage before packaging, during packaging)	P	**APPPC** 121) Japan (8 Sep 2018 4:47 AM) Add an example to clarify the differnece between this indent and the other (i.e. "during storage" after packaging in paragraph No60) because packaging operations in paragraph No59 include different types of operations, "during storage before packaging"

				and "during packaging". *Category : SUBSTANTIVE*
134	59	after packaging (e.g. once the commodity is packaged for ~~dispatch)~~dispatch) - in situations where packaging material allow expected level of penetration of the fumigant	P	**Sri Lanka** The term packaging was considered not equivalent to packing Some packaging material may not allow penetration of fumigants (if tightly packed) *Category : TECHNICAL*
135	59	after packaging (e.g. once the commodity is packaged for dispatch)	C	**APPPC** (80) New Zealand (5 Sep 2018 2:51 AM) A note is helpful re. gas penetration. for exmple, packaging needs to allow the fumigant to reach the target. *Category : TECHNICAL*
136	62	during transport (Only when using suitable fumigants) - Special considerations should be taken to avoid mixing the material with residues, when the food and feed are fumigated	P	**Sri Lanka** This specifically applied for pelleted slow releasing fumigants (therefore as a health measure, proper measures should be take to avoid contaminating the material with residues of the fumigant) *Category : TECHNICAL*
137	62	during transport	C	**Ecuador** Cómo se puede garantizar que los parámetros críticos estén en el nivel requerido en una fumigación durante el transporte?? Eso no debería estar descrito? *Category : EDITORIAL*
138	64	The requirement of fumigation is to ensure that the critical parameters (e.g. concentration or dose, temperature, duration) are at the required ~~level throughout the commodity~~level, allowing the stated efficacy to be achieved.	P	**APPPC** *Category : SUBSTANTIVE*
139	64	The requirement of fumigation is to ensure that the critical parameters (e.g. concentration or dose, temperature, duration) are at the required level throughout the commodity, allowing the stated efficacy to be achieved.	C	**APPPC** (29) New Zealand (5 Sep 2018 1:34 AM) There are occasions that parameters do not necessarily need to be attained throughout the commodity. E.g. sometimes the target pest is a hitch-hiking insect that is only present on the surface of the commodity (e.g. some adult longhorn beetles are attracted to bark free timber but do not lay eggs in it). *Category : SUBSTANTIVE*
140	64	The requirement of fumigation is to ensure that the critical parameters (e.g. concentration or dose, temperature, duration) are at the required level throughout the commodity, allowing the stated efficacy to be achieved.	C	**APPPC** (19) Singapore (4 Sep 2018 1:04 AM) Paragraphs 64, 65 & 67 should be grouped together with paragraphs 108 - 116 under a section called "Critical Parameters for Fumigation" for clarity in explanation of the critical parameters of fumigation. *Category : SUBSTANTIVE*
141	64	The requirement of fumigation is to ensure that the critical parameters (e.g. concentration readings if required, or dose, temperature, duration) are at the	P	**United States of America** For operational clarity

		required level throughout the commodity, allowing the stated efficacy to be achieved.		*Category : TECHNICAL*
142	64	The requirement of fumigation is to ensure that the critical parameters (e.g. concentration or dose, temperature, duration) are at the required level throughout the commodity, allowing the stated efficacy to be achieved.	C	**Singapore** Paragraph 64, 65 and 67 together with paragraphs 108 - 116 should be grouped under a section called Critical Parameters for Fumigation. *Category : SUBSTANTIVE*
143	65	Fumigation efficacy may be affected by factors such as the moisture content of the commodity and, within the enclosure used for the fumigation, the humidity, pressure, and changes in the atmospheric gas composition created by the packaging or by the commodity. Other factors to consider during fumigation are the penetration of the fumigant, sorption of the fumigant by the packaging or the commodity, fumigant specific gravity, and circulation of the fumigant. For circulation of fumigants, NPPOs should take into account differences in the loading configuration between the commodity loaded in boxes with spacing and the commodity loaded in bulk.	P	**Canada** Another factor to consider. *Category : TECHNICAL*
144	65	Fumigation efficacy may be affected by factors such as the moisture content of the commodity and, within the enclosure used for the fumigation, the humidity, pressure, and changes in the atmospheric gas composition created by the packaging or by the commodity. Other factors to consider during fumigation are the penetration of the fumigant, sorption of the fumigant by the packaging or the commodity, and circulation of the fumigant. For circulation of fumigants, ~~NPPOs should take into account~~ the differences in the loading configuration between the commodity loaded in boxes with spacing and the commodity loaded in ~~bulk~~bulk should be taken account.	P	**Viet Nam** It is not only NPPO's responsibility. *Category : SUBSTANTIVE*
145	65	Fumigation efficacy may be affected by factors such as the moisture content of the commodity and, within the enclosure used for the fumigation, the humidity, pressure, and changes in the atmospheric gas composition created by the packaging or by the commodity. Other factors to consider during fumigation are the penetration of the fumigant, sorption of the fumigant by the packaging or the commodity, and circulation of the fumigant. For circulation of fumigants, NPPOs should take into account differences in the loading configuration between the commodity loaded in boxes with spacing and the commodity loaded in bulk. Some fumigants react with certain commodities or materials and this needs to be taken into consideration before fumigation (e.g. phosphine reacts strongly with copper and may affect electronics).	P	**European Union** Better location for the last paragraph (67). *Category : EDITORIAL*

146	65	Fumigation efficacy may be affected by factors such as the moisture content of the commodity and, within the enclosure used for the fumigation, the humidity, pressure, and changes in the atmospheric gas composition created by the packaging or by the commodity. Other factors to consider during fumigation are the penetration of the fumigant, sorption of the fumigant by the packaging or the commodity, and circulation of the fumigant. For circulation of fumigants, NPPOs should take into account differences in the loading configuration between ~~the commodity~~ commodities loaded in boxes with spacing and ~~the commodity~~ commodities loaded in bulk.	P	**European Union** Better English. *Category : EDITORIAL*
147	65	Fumigation efficacy may be affected by factors such as the moisture content of the commodity and, within the enclosure used for the fumigation, the humidity, pressure, and changes in the atmospheric gas composition created by the packaging or by the commodity. Other factors to consider during fumigation are the penetration of the fumigant, sorption of the fumigant by the packaging or the commodity, ~~and~~ circulation of the ~~fumigant~~fumigant and leakage from the fumigation enclosure. For circulation of fumigants, NPPOs should take into account differences in the loading configuration between the commodity loaded in boxes with spacing and the commodity loaded in bulk.	P	**European Union** This is one important factor that needs to be mentioned. *Category : SUBSTANTIVE*
148	65	Fumigation efficacy may be affected by factors such as the moisture content of the commodity and, within the enclosure used for the fumigation, the humidity, pressure, and changes in the atmospheric gas composition created by the packaging or by the commodity. Other factors to consider during fumigation are the penetration of the fumigant, sorption of the fumigant by the packaging or the commodity, and circulation of the fumigant. For circulation of fumigants, ~~NPPOs~~ NPPO's should take into account differences in the loading configuration between the commodity loaded in boxes with spacing and the commodity loaded in bulk.	P	**Ghana** *Category : EDITORIAL*
149	65	Fumigation efficacy may be affected by factors such as the moisture content of the commodity and, within the enclosure used for the fumigation, the humidity, pressure, and changes in the atmospheric gas composition created by the packaging or by the commodity. Other factors to consider during fumigation are the penetration of the fumigant, sorption of the fumigant by the packaging or the commodity, ~~and~~ circulation of the fumigant, and leakage from the fumigation enclosure. For circulation of fumigants, NPPOs should take into account differences in the loading configuration between ~~the commodity~~ commodities loaded in boxes with spacing and ~~the commodity~~ commodities loaded in bulk.	P	**EPPO** This is an important factor that needs to be mentioned. Better English Better location for the last paragraph *Category : EDITORIAL*

		Some fumigants react with certain commodities or materials and this needs to be taken into consideration before fumigation (e.g. phosphine reacts strongly with copper and may affect electronics).		
150	65	Fumigation efficacy may be affected by factors such as the moisture content of the commodity and, within the enclosure used for the fumigation, the humidity, pressure, and changes in the atmospheric gas composition created by the packaging or by the commodity. Other factors to consider during fumigation are the penetration of the ~~fumigant~~chemical agent , sorption of the ~~fumigant~~ chemical agent by the packaging or the commodity, and circulation of the ~~fumigant~~chemical agent. For circulation of ~~fumigants~~chemical agent, NPPOs should take into account differences in the loading configuration between the commodity loaded in boxes with spacing and the commodity loaded in bulk.	P	**Libya** *Category : SUBSTANTIVE*
151	65	Fumigation efficacy may be affected by factors such as the moisture content of the commodity and, within the enclosure used for the fumigation, the humidity, pressure, and changes in the atmospheric gas composition created by the packaging or by the commodity. Other factors to consider during fumigation are the penetration of the fumigant, sorption of the fumigant by the packaging or the commodity, and circulation of the fumigant. For circulation of fumigants, ~~NPPOs should take into account~~ the differences in the loading configuration between the commodity loaded in boxes with spacing and the commodity loaded in ~~bulk~~bulk should be taken into account.	P	**Japan** It is not only NPPO's responsibility. *Category : SUBSTANTIVE*
152	65	Fumigation efficacy may be affected by factors such as the moisture content of the commodity and, within the enclosure used for the fumigation, the humidity, pressure, and changes in the atmospheric gas composition created by the packaging or by the commodity. Other factors to consider during fumigation are the penetration of the fumigant, sorption of the fumigant by the packaging or the commodity, and circulation of the fumigant. For circulation of fumigants, ~~NPPOs should take into account~~ the differences in the loading configuration between the commodity loaded in boxes with spacing and the commodity loaded in ~~bulk~~bulk should be taken into account.	P	**APPPC** (120) Japan (8 Sep 2018 4:46 AM) It is not only NPPO's responsibility. *Category : SUBSTANTIVE*
153	65	Fumigation efficacy may be affected by factors such as the moisture content of the commodity and, within the enclosure used for the fumigation, the humidity, pressure, and changes in the atmospheric gas composition created by the packaging or by the commodity. Other factors to consider during fumigation are the penetration of the fumigant, sorption of the fumigant by the packaging or the commodity, and circulation of the fumigant. For circulation of fumigants, NPPOs	C	**Jamaica** Insert. Size of the structure must also be taken into consideration when factoring provisions for circulation. *Category : SUBSTANTIVE*

		should take into account differences in the loading configuration between the commodity loaded in boxes with spacing and the commodity loaded in bulk.		
154	65	Fumigation efficacy may be affected by factors such as the moisture content of the commodity and, within the enclosure used for the fumigation, the humidity, pressure, and changes in the atmospheric gas composition created by the packaging or by the commodity. Other factors to consider during fumigation are the penetration of the fumigant, sorption of the fumigant by the packaging or the commodity, and circulation of the fumigant. For circulation of fumigants, NPPOs should take into account differences in the loading configuration between the commodity loaded in boxes with spacing and the commodity loaded in bulk.	C	**Jamaica** Recommending New sub topic:Factors to consider before fumigation *Category : SUBSTANTIVE*
155	65	Fumigation efficacy may be affected by factors such as the moisture content of the commodity and, within the enclosure used for the fumigation, the humidity, pressure, and changes in the atmospheric gas composition created by the packaging or by the commodity. Other factors to consider during fumigation are the penetration of the fumigant, sorption of the fumigant by the packaging or the commodity, and circulation of the fumigant. For circulation of fumigants, NPPOs should take into account differences in the loading configuration between the commodity loaded in boxes with spacing and the commodity loaded in bulk.	C	**Singapore** Paragraph 64, 65 and 67 together with paragraphs 108 - 116 should be grouped under a section called Critical Parameters for Fumigation *Category : SUBSTANTIVE*
156	65	Fumigation efficacy may be affected by factors such as the moisture content of the commodity and, within the enclosure used for the fumigation, the humidity, pressure, and changes in the atmospheric gas composition created by the packaging or by the commodity. Other factors to consider during fumigation are the penetration of the ~~fumigant~~chemical agent, sorption of the ~~fumigant~~ chemical agent by the packaging or the commodity, and circulation of the ~~fumigant~~chemical agent. For circulation of ~~fumigants~~chemical agents, NPPOs should take into account differences in the loading configuration between the commodity loaded in boxes with spacing and the commodity loaded in bulk.	P	**NEPPO** *Category : SUBSTANTIVE*
157	66	The procedures approved by the NPPO for the application of a treatment should be clearly ~~described in a "treatment protocol"~~documented. These procedures should be designed to ensure that the critical parameters stated in the treatment schedule are achieved. The procedures should include the process of pre- and post-conditioning to reach the required dose, where these processes are critical to the treatment achieving the required efficacy while preserving commodity quality. They should also include contingency procedures and guidance on corrective actions for treatment failures or problems with critical treatment parameters.	P	**European Union** "Treatment protocol" is a confusing term because it may be confused with the Glossary term "treatment schedule". In addition, the TPG noted that "schedule" and "protocol" would be translated the same way in some of the other FAO languages. *Category : TECHNICAL*
158	66	The procedures approved by the NPPO for the application of a treatment should be clearly ~~described in a "treatment protocol"~~documented. These procedures should be designed to ensure that the critical parameters stated in the treatment schedule	P	**EPPO** "Treatment protocol" is a confusing term because it may be confused with the Glossary term "treatment schedule". In

		are achieved. The procedures should include the process of pre- and post-conditioning to reach the required dose, where these processes are critical to the treatment achieving the required efficacy while preserving commodity quality. They should also include contingency procedures and guidance on corrective actions for treatment failures or problems with critical treatment parameters.		addition, the TPG noted that "schedule" and "protocol" would be translated the same way in some of the other FAO languages. *Category : TECHNICAL*
159	66	The procedures approved by the NPPO for the application of a treatment should be clearly described in a "treatment protocol". These procedures should be designed to ensure that the critical parameters stated in the treatment schedule are achieved. The procedures should include the process of pre- and post-conditioning to reach the required dose, where these processes are critical to the treatment achieving the required efficacy while preserving commodity quality. They should also include contingency procedures (an alternative to the normal procedure in SoP) and guidance on corrective actions for treatment failures or problems with critical treatment parameters.	P	**APPPC** (6) Nepal (25 Jul 2018 4:08 AM) *Category : EDITORIAL*
160	66	The procedures approved by the NPPO for the application of a treatment should be clearly described in a "treatment protocol". These procedures should be designed to ensure that the critical parameters stated in the treatment schedule are achieved. The procedures should include the process of pre- and post-conditioning such as temperature and loading conditions to reach the ~~required~~ effective dose, of the fumigant for target pests where these processes are critical to the treatment achieving the required efficacy while preserving commodity quality. They should also include contingency procedures and guidance on corrective actions for treatment failures or problems with critical treatment parameters.	P	**United States of America** *Category : TECHNICAL*
161	66	The procedures approved by the NPPO for the application of a treatment should be clearly described in a "treatment protocol". These procedures should be designed to ensure that the critical parameters stated in the treatment schedule are achieved. The procedures should include the process of pre- and post-conditioning to reach the required dose, where these processes are critical to the treatment achieving the required efficacy while preserving commodity quality. They should also include contingency procedures and guidance on corrective actions for treatment failures or problems with critical treatment parameters.	C	**United States of America** Needs clarification what pre- and post-conditioning means for dumigation. Do these relate to temperature? *Category : TECHNICAL*
162	66	The procedures approved by the NPPO for the application of a treatment should be clearly described in a "treatment protocol". These procedures should be designed to ensure that the critical parameters stated in the treatment schedule are achieved. The procedures should include the process of pre- and post-conditioning to reach the required dose, where these processes are critical to the treatment achieving the required efficacy while preserving commodity quality. They should also include	C	**Jamaica** There is mention of a treatment schedule but the standard did not cover any. Please indicate what guidance is being provided to NPPO for development of schedule or use of. *Category : SUBSTANTIVE*

		contingency procedures and guidance on corrective actions for treatment failures or problems with critical treatment parameters.		
163	66	The procedures approved by the NPPO for the application of a treatment should be clearly described in a "treatment protocol". These procedures should be designed to ensure that the critical parameters stated in the treatment schedule are achieved. The procedures should include the process of pre- and post-conditioning to reach the required dose, where these processes are critical to the treatment achieving the required efficacy in terms of mortality from the target pest, while preserving commodity quality. They should also include contingency procedures and guidance on corrective actions for treatment failures or problems with critical treatment parameters.	P	**Colombia** Se sugiere la inclusión de frase en términos de mortalidad de la plaga objetivo. Es importante aclarar que la eficacia está estrechamente ligada a la mortalidad de la plaga el objetivo. *Category : SUBSTANTIVE*
164	66	The procedures approved by the NPPO for the application of a treatment should be clearly described in a "treatment protocol". These procedures should be designed to ensure that the critical parameters stated in the treatment schedule are achieved. The procedures should include the process of pre- during and post-conditioning to reach the required dose, where these processes are critical to the treatment achieving the required efficacy while preserving commodity quality. They should also include contingency procedures and guidance on corrective actions for treatment failures or problems with critical treatment parameters.	P	**Iran** *Category : TECHNICAL*
165	66	The procedures approved by the NPPO for the application of a treatment should be clearly described in a ~~"treatment protocol"~~treatment protocol. These procedures should be designed to ensure that the critical parameters stated in the treatment schedule are achieved. The procedures should include the process of pre- and post-conditioning to reach the required dose, where these processes are critical to the treatment achieving the required efficacy while preserving commodity quality. They should also include contingency procedures and guidance on corrective actions for treatment failures or problems with critical treatment parameters.	P	**Argentina** It is no necessary to highlight treatment protocol in quotation marks. *Category : EDITORIAL*
166	66	The procedures approved by the NPPO for the application of a treatment should be clearly described in a ~~"treatment protocol"~~treatment protocol. These procedures should be designed to ensure that the critical parameters stated in the treatment schedule are achieved. The procedures should include the process of pre- and post-conditioning to reach the required dose, where these processes are critical to the treatment achieving the required efficacy while preserving commodity quality. They should also include contingency procedures and guidance on corrective actions for treatment failures or problems with critical treatment parameters.	P	**Uruguay** There is no need to highlight treatment protocol in quotation marks *Category : EDITORIAL*
167	66	The procedures approved by the NPPO for the application of a treatment should be clearly described in a ~~"treatment protocol"~~treatment protocol. These procedures should be designed to ensure that the critical parameters stated in the treatment	P	**COSAVE** It is no necessary to highlight treatment protocol in quotation marks.

		schedule are achieved. The procedures should include the process of pre- and post-conditioning to reach the required dose, where these processes are critical to the treatment achieving the required efficacy while preserving commodity quality. They should also include contingency procedures and guidance on corrective actions for treatment failures or problems with critical treatment parameters.		*Category : EDITORIAL*
168	67	Some fumigants react with certain commodities or materials and this needs to be taken into consideration before fumigation (e.g. phosphine reacts strongly with copper and other metals, and may affect ~~electronics)~~electronics used in verification equipment or in ventilators).	P	**Canada** Additional clarity *Category : TECHNICAL*
169	67	Some fumigants react with certain commodities or materials and this needs to be taken into consideration before fumigation (e.g. phosphine reacts strongly with copper and may affect ~~electronics)~~electronics, Methyl Bromide could be dissolved in material with high oil content and may damage goods made from natural rubber).	P	**Sri Lanka** Additional examples may provide more clarity *Category : TECHNICAL*
170	67	~~Some fumigants react with certain commodities or materials and this needs to be taken into consideration before fumigation (e.g. phosphine reacts strongly with copper and may affect electronics).~~	P	**European Union** Suggestion to move the last paragraph before the previous paragraph (more logical order), see comment on para 65. *Category : EDITORIAL*
171	67	~~Some fumigants react with certain commodities or materials and this needs to be taken into consideration before fumigation (e.g. phosphine reacts strongly with copper and may affect electronics).~~	P	**EPPO** Suggestion to move the last paragraph before the previous paragraph (more logical order) *Category : EDITORIAL*
172	67	Some ~~fumigants~~ chemical agent react with certain commodities or materials and this needs to be taken into consideration before fumigation (e.g. phosphine reacts strongly with copper and may affect electronics).	P	**Libya** *Category : SUBSTANTIVE*
173	67	Some fumigants react with certain commodities or materials and this needs to be taken into consideration before fumigation (e.g. phosphine reacts strongly with copper and may affect electronics).	C	**APPPC** (21) Singapore (4 Sep 2018 1:06 AM) Paragraphs 65, 66 & 67 should be grouped together with paragraphs 108-116 under a new Section - " Critical Parameters of Fumigation" for better clarity in explanation of these critical parameters. *Category : SUBSTANTIVE*
174	67	Some fumigants react with certain commodities or materials and this needs to be taken into consideration before fumigation (e.g. phosphine reacts strongly with copper and may affect ~~electronics)~~electronics or can generate autoignition or flammability).	P	**Colombia** Adicionar información importante de otros fumigantes. La fosfina, a altas concentraciones hay autoignicion o en presencia de humedad es flamable. *Category : SUBSTANTIVE*

175	67	Some fumigants ~~react with~~ may have adverse effects on certain commodities or materials and this needs to be taken into consideration before fumigation (e.g. phosphine reacts strongly with copper and may affect electronics).	P	**Iran** *Category : EDITORIAL*
176	67	Some fumigants react with certain commodities or materials and this needs to be taken into consideration before fumigation (e.g. phosphine reacts strongly with copper and may affect electronics).	C	**Singapore** Paragraph 64, 65 and 67 together with paragraphs 108 - 116 should be grouped under a section called Critical Parameters for Fumigation *Category : SUBSTANTIVE*
177	67	Some ~~fumigants~~ chemical agents react with certain commodities or materials and this needs to be taken into consideration before fumigation (e.g. phosphine reacts strongly with copper and may affect electronics).	P	**NEPPO** *Category : SUBSTANTIVE*
4. Ways of Applying Fumigation				
178	68	~~**4.**~~ ~~**Ways of Applying Fumigation**~~	P	**European Union** We propose deleting the title of this section and consider the text within section 2. Indeed section 2 is about "Fumigation Application" and the difference with a section titled "Ways of Applying Fumigation" is not straightforward. Single fumigant treatments, combination treatments, fumigation under modified atmosphere and fumigation under vacuum are different application methods. Section 4.1 becomes section 2.1, Section 4.2 becomes section 2.2 etc. *Category : TECHNICAL*
179	68	~~**4. Ways of Applying Fumigation**~~	P	**EPPO** We propose deleting the title of this section and consider the text within section 2. Indeed section 2 is about "Fumigation Application" and the difference with a section titled "Ways of Applying Fumigation" is not straightforward. Single fumigant treatments, combination treatments, fumigation under modified atmosphere and fumigation under vacuum are different application methods. Section 4.1 becomes section 2.1, Section 4.2 becomes section 2.2 etc. *Category : TECHNICAL*
180	68	~~4~~3. **Ways of Applying Fumigation**	P	**Japan** *Category : EDITORIAL*
181	68	~~4~~3. **Ways of Applying Fumigation**	P	**APPPC** (30) New Zealand (5 Sep 2018 1:36 AM) Numbering of the heading. should change to 3. Ways of Applying Fumigation *Category : EDITORIAL*

182	68	**4. Ways of Applying Fumigation**	C	**APPPC** (149) Philippines (12 Sep 2018 3:42 AM) We suggest to put a section which details site selection as this is an important consideration for the fumigation process. *Category : SUBSTANTIVE*
183	68	**4. Ways of Applying Fumigation**	C	**Philippines** We suggest to add "site selection" as a section in fumigation application since this one of the most important considerations of the fumigation process. *Category : SUBSTANTIVE*
4.1 Single fumigant treatments				
184	70	**4.1 Single ~~fumigant~~ chemical agent treatments**	P	**Libya** *Category : SUBSTANTIVE*
185	70	**~~43~~.1 Single fumigant treatments**	P	**Japan** *Category : EDITORIAL*
186	70	**43.1 Single fumigant treatments**	P	**APPPC** (31) New Zealand (5 Sep 2018 1:37 AM) *Category : EDITORIAL*
187	70	**4.1 Single ~~fumigant~~ chemical agent treatments**	P	**NEPPO** *Category : SUBSTANTIVE*
188	71	The most common ~~fumigations~~ chemical agent used are those that apply a single fumigant. General-use ~~fumigants~~ chemical agent such as phosphine or sulphuryl fluoride rely on a mode of action that is generally effective against all pest groups or against one particular group (e.g. arthropods, fungi, nematodes) and all or most life stages. Treatment schedules for single fumigants are generally simple, requiring a single application to achieve a required minimum concentration over a required duration to achieve the specified efficacy. A list of commonly used fumigants and their chemical properties is provided in Appendix 1.	P	**Libya** *Category : SUBSTANTIVE*
189	71	The most common fumigations used are those that apply a single fumigant. General-use fumigants such as methyl bromide, phosphine or sulphuryl fluoride rely on a mode of action that is generally effective against all pest groups or against one particular group (e.g. arthropods, fungi, nematodes) and all or most life stages. Treatment schedules for single fumigants are generally simple, requiring a single application to achieve a required minimum concentration over a required duration to achieve the specified efficacy. A list of commonly used fumigants and their chemical properties is provided in Appendix 1.	P	**APPPC** (129) Korea, Republic of (10 Sep 2018 9:54 AM) Methyl bromide is one of general-use fumigants. *Category : TECHNICAL*
190	71	The most common fumigations used are those that apply a single fumigant. General-use fumigants such as methyl bromide, phosphine or sulphuryl fluoride rely on a mode of action that is generally effective against all ~~pest groups or against~~	P	**United States of America** The efficacy of treatments are usually directed to the most resistant life stage. *Category : TECHNICAL*

		~~one particular group (e.g. arthropods, fungi, nematodes)~~ target pests and ~~all or~~ their most resistant life ~~stages~~stage. Treatment schedules for single fumigants are generally simple, requiring a single application to achieve a required minimum concentration over a required duration to achieve the specified efficacy. A list of commonly used fumigants and their chemical properties is provided in Appendix 1.		
191	71	The most common fumigations used are those that apply a single fumigant. General-use fumigants such as methyl bromide, phosphine or sulphuryl fluoride rely on a mode of action that is generally effective against all pest groups or against one particular group (e.g. arthropods, fungi, nematodes) and all or most life stages. Treatment schedules for single fumigants are generally simple, requiring a single application to achieve a required minimum concentration over a required duration to achieve the specified efficacy. A list of commonly used fumigants and their chemical properties is provided in Appendix 1.	P	**Korea, Republic of** Methy bromide is one of general-use fumigants. *Category : TECHNICAL*
192	71	The most common fumigations used are those that apply a single fumigant. General-use fumigants such as methil bromide, phosphine or sulphuryl fluoride rely on a mode of action that is generally effective against all pest groups or against one particular group (e.g. arthropods, fungi, nematodes) and all or most life stages. Treatment schedules for single fumigants are generally simple, requiring a single application to achieve a required minimum concentration over a required duration to achieve the specified efficacy. A list of commonly used fumigants and their chemical properties is provided in Appendix 1.	P	**Argentina** MB is also used as phytosanitary measure and it is included in appendix 1. *Category : TECHNICAL*
193	71	The most common fumigations used are those that apply a single fumigant. General-use fumigants such as methyl bromide, phosphine or sulphuryl fluoride rely on a mode of action that is generally effective against all pest groups or against one particular group (e.g. arthropods, fungi, nematodes) and all or most life stages. Treatment schedules for single fumigants are generally simple, requiring a single application to achieve a required minimum concentration over a required duration to achieve the specified efficacy. A list of commonly used fumigants and their chemical properties is provided in Appendix 1.	P	**Uruguay** MB is also used as phytosanitary measure and it is included in appendix 1. *Category : TECHNICAL*
194	71	The most common fumigations used are those that apply a single ~~fumigant~~chemical agent. General-use ~~fumigants~~ chemical agents such as phosphine or sulphuryl fluoride rely on a mode of action that is generally effective against all pest groups or against one particular group (e.g. arthropods, fungi, nematodes) and all or most life stages. Treatment schedules for single fumigants are generally simple, requiring a single application to achieve a required minimum concentration over a required duration to achieve the specified efficacy. A list of commonly used fumigants and their chemical properties is provided in Appendix 1.	P	**NEPPO** *Category : SUBSTANTIVE*

195	71	The most common fumigations used are those that apply a single fumigant. General-use fumigants such as methyl bromide, phosphine or sulphuryl fluoride rely on a mode of action that is generally effective against all pest groups or against one particular group (e.g. arthropods, fungi, nematodes) and all or most life stages. Treatment schedules for single fumigants are generally simple, requiring a single application to achieve a required minimum concentration over a required duration to achieve the specified efficacy. A list of commonly used fumigants and their chemical properties is provided in Appendix 1.	P	**COSAVE** MB is also used as phytosanitary measure and it is included in appendix 1. *Category : TECHNICAL*
4.2 Combination treatments				
196	72	**~~43~~.2 Combination treatments**	P	**Japan** *Category : EDITORIAL*
197	72	**~~43~~.2 Combination treatments**	P	**APPPC** (31) New Zealand (5 Sep 2018 1:37 AM) *Category : EDITORIAL*
198	73	~~Where a single fumigant may not achieve the required efficacy without rendering the commodity unmarketable, or for reasons of economy or logistics, another fumigant or treatment may be included in the treatment schedule.~~Where a single fumigant may not achieve the required efficacy without rendering the commodity unmarketable, or for reasons of economy or logistics, treatments, refer to the inclusion of another fumigant or the sequential application of another treatment may be in necessary for the treatment.	P	**Viet Nam** Add some words into the explanation about "combination treatments" for clear understanding. *Category : SUBSTANTIVE*
199	73	Where a ~~single fumigant~~ single chemical agent may not achieve the required efficacy without rendering the commodity unmarketable, or for reasons of economy or logistics, another ~~fumigant~~ chemical agent or treatment may be included in the treatment schedule.	P	**Libya** *Category : SUBSTANTIVE*
200	73	Where a single fumigant may not achieve the required efficacy without rendering the commodity unmarketable, or for reasons of economy or logistics, combination treatments, refer to the inclusion of another fumigant or the sequential application of another treatment may be ~~included in~~ necessary for the ~~treatment schedule~~treatment.	P	**Japan** Add some words into the explanation about "combination treatments" for clear understanding. *Category : SUBSTANTIVE*
201	73	Where a single fumigant may not achieve the required efficacy without rendering the commodity unmarketable, or for reasons of economy or logistics, combination treatments, refer to the inclusion of another fumigant or treatment may be ~~included~~ necessary for in the ~~treatment schedule~~treatment.	P	**APPPC** (119) Japan (8 Sep 2018 4:43 AM) Add some words into the explanation about "combination treatments" for clear understanding. *Category : SUBSTANTIVE*
202	73	Where a single ~~fumigant~~ chemical agent may not achieve the required efficacy without rendering the commodity unmarketable, or for reasons of economy or logistics, another ~~fumigant~~ chemical agent or treatment may be included in the treatment schedule.	P	**NEPPO** *Category : SUBSTANTIVE*

203	74	Another treatment may be applied sequentially immediately before or after fumigation to increase the effectiveness of the combination treatment. For example, ~~fumigant~~ chemical agent and temperature treatments applied sequentially may be necessary where the commodity is vulnerable to damage from the increased severity required of either treatment alone, or where the most tolerant life stage of the target pest is different for the different treatments.	P	**Libya** *Category : SUBSTANTIVE*
204	74	Another treatment may be applied sequentially immediately before or after fumigation to increase the effectiveness of the combination treatment. For example, ~~fumigant~~ chemical agent and temperature treatments applied sequentially may be necessary where the commodity is vulnerable to damage from the increased severity required of either treatment alone, or where the most tolerant life stage of the target pest is different for the different treatments.	P	**NEPPO** *Category : SUBSTANTIVE*
205	75	Concurrent combinations of a fumigant with other fumigants or other type of treatments may also be beneficial in terms of effectiveness, commodity tolerance, ~~economics~~ economics, environmental impact or logistics, compared to treatment with a single fumigant alone.	P	**Canada** Additional factor to consider. *Category : SUBSTANTIVE*
206	75	Concurrent combinations of a ~~fumigant~~ chemical agent with ~~other fumigants~~ other chemical agent or other type of treatments may also be beneficial in terms of effectiveness, commodity tolerance, economics or logistics, compared to treatment with a single fumigant alone.	P	**Libya** *Category : SUBSTANTIVE*
207	75	Concurrent combinations of a ~~fumigant~~ chemical agent with other ~~fumigants~~ chemical agents or other type of treatments may also be beneficial in terms of effectiveness, commodity tolerance, economics or logistics, compared to treatment with a single fumigant alone.	P	**NEPPO** *Category : SUBSTANTIVE*
4.3 Fumigation under special conditions				
208	76	**43.3 Fumigation under special conditions**	P	**Japan** *Category : EDITORIAL*
209	76	**43.3 Fumigation under special conditions**	P	**APPPC** (33) New Zealand (5 Sep 2018 1:39 AM) *Category : EDITORIAL*
210	77	Fumigation may be conducted under special conditions to increase efficacy.	C	**Viet Nam** If possible, give some examples for this case *Category : SUBSTANTIVE*
211	77	Fumigation may be conducted under special conditions to increase ~~efficacy~~efficacy or decrease the damage to commodities.	P	**China** For example, absorbing agent is required in fresh plant products fumigated with phosphine to minimize the damage caused by high level CO2. *Category : SUBSTANTIVE*
212	77	Fumigation may be conducted under special conditions to increase efficacy.	C	**APPPC** (7) Nepal (25 Jul 2018 4:12 AM)

				It may better to suggest to mention the e.g. of special condition *Category : SUBSTANTIVE*
213	77	Fumigation may be conducted under special conditions to increase ~~efficacy~~efficacy or decrease the damage to commodities.	P	**APPPC** (12) China (3 Sep 2018 10:27 AM) For example, absorbing agent is required in fresh plant products fumigated with phosphine to minimize the damage caused by high level CO2. *Category : SUBSTANTIVE*
4.3.1 Fumigation under modified atmosphere				
214	78	**~~4~~3.3.1 Fumigation under modified atmosphere**	P	**Japan** *Category : EDITORIAL*
215	78	**~~4~~3.3.1 Fumigation under modified atmosphere**	P	**APPPC** (34) New Zealand (5 Sep 2018 1:39 AM) *Category : EDITORIAL*
216	79	Increasing the atmospheric carbon dioxide concentration in the enclosure used for fumigation, either alone or in combination with increasing the nitrogen and decreasing or increasing the ~~atmospheric~~ oxygen concentrations, may be used to increase the efficacy of the fumigation. Changing the atmospheric gas concentrations in this way may directly enhance target pest mortality or may increase target pest respiration thereby increasing the efficacy of fumigants such as phosphine. Reducing the concentration of oxygen in the enclosure (e.g. by replacement with non-flammable gases such as carbon dioxide or nitrogen) may also be necessary where the fumigant is flammable, such as is the case with ethyl formate.	P	**European Union** The precision "atmospheric" is given for carbon dioxide and oxygen concentrations but not for nitrogen concentration. It is suggested to remove the word "atmospheric" before oxygen in the first sentence rather than repeating the word three times. It is made clear that it relates to all three in the next sentence. *Category : EDITORIAL*
217	79	Increasing the atmospheric carbon dioxide concentration in the enclosure used for fumigation, either alone or in combination with increasing the nitrogen and decreasing or increasing the ~~atmospheric~~ oxygen concentrations, may be used to increase the efficacy of the fumigation. Changing the atmospheric gas concentrations in this way may directly enhance target pest mortality or may increase target pest respiration thereby increasing the efficacy of fumigants such as phosphine. Reducing the concentration of oxygen in the enclosure (e.g. by replacement with non-flammable gases such as carbon dioxide or nitrogen) may also be necessary where the fumigant is flammable, such as is the case with ethyl formate.	P	**EPPO** The precision "atmospheric" is given for carbon dioxide and oxygen concentrations but not for nitrogen concentration. It is suggested to remove the word "atmospheric" before oxygen in the first sentence rather than repeating the word three times. It is made clear that it relates to all three in the next sentence. *Category : EDITORIAL*
218	79	Increasing the atmospheric carbon dioxide concentration in the enclosure used for fumigation, either alone or in combination with increasing the nitrogen and decreasing or increasing the atmospheric oxygen concentrations, may be used to increase the efficacy of the fumigation. Changing the atmospheric gas	P	**APPPC** (8) Nepal (25 Jul 2018 4:14 AM) *Category : TECHNICAL*

		concentrations in this way may directly enhance target pest mortality or may increase target pest respiration thereby increasing the efficacy of fumigants such as phosphine. Reducing the concentration of oxygen in the enclosure (e.g. by replacement with non-flammable gases such as carbon dioxide or nitrogen) may also be necessary where the fumigant is flammable, such as is the case with ethyl ~~formate~~formate or PH3 Gas Fumigation Generator.		
4.3.2 Fumigation under vacuum				
219	80	**~~43~~.3.2 Fumigation under vacuum**	P	**Japan** *Category : EDITORIAL*
220	80	**~~43~~.3.2 Fumigation under vacuum**	P	**APPPC** (35) New Zealand (5 Sep 2018 1:40 AM) *Category : EDITORIAL*
221	80	**4.3.2 Fumigation under ~~vacuum~~ reduced atmospheric pressure**	P	**Iran** *Category : TECHNICAL*
222	81	Applying a fumigant under a partial atmospheric vacuum can significantly increase the rate of fumigant penetration into a commodity, resulting in increased efficacy or the ability to reduce fumigant quantity or duration of treatment. Such treatments should be carried out in purpose-built vacuum chambers that can withstand the ~~change~~ changes in ~~pressures~~ pressure and ensure minimal vacuum loss during the fumigation, and using a vacuum pump capable of attaining the atmospheric pressure required within the time frame required.	P	**European Union** Better English. *Category : EDITORIAL*
223	81	Applying a fumigant under a partial atmospheric vacuum can significantly increase the rate of fumigant penetration into a commodity, resulting in increased efficacy or the ability to reduce fumigant quantity or duration of treatment. Such treatments should be carried out in purpose-built vacuum chambers that can withstand the ~~change~~ changes in ~~pressures~~ pressure and ensure minimal vacuum loss during the fumigation, and using a vacuum pump capable of attaining the atmospheric pressure required within the time frame required.	P	**EPPO** Better English *Category : EDITORIAL*
224	81	Applying a fumigant under a ~~partial atmospheric vacuum~~ reduced pressure can significantly increase the rate of fumigant penetration into a commodity, resulting in increased efficacy or the ability to reduce fumigant quantity or duration of treatment. Such treatments should be carried out in purpose-built vacuum chambers that can withstand the change in pressures and ensure minimal vacuum loss during the fumigation, and using a vacuum pump capable of attaining the atmospheric pressure required within the time frame required.	P	**United States of America** Most treatments use reduced pressure rather than partial atmospheric vacuum *Category : TECHNICAL*
225	81	Applying a fumigant under a partial atmospheric vacuum can significantly increase the rate of fumigant penetration into a commodity, resulting in increased efficacy	P	**Philippines** *Category : EDITORIAL*

		or the ability to reduce fumigant quantity or duration of treatment. Such treatments should be carried out in purpose-built vacuum chambers that can withstand the change in pressures and ensure minimal vacuum loss during the fumigation, and using a vacuum pump capable of attaining the atmospheric pressure required within the time ~~frame required~~frame.		
5. Enclosures and Equipment used for Fumigation				
226	82	5~~.~~. Sites, **Enclosures and Equipment used for Fumigation**	P	**Viet Nam** include consideration of site conditions where fumigation is to be conducted as site conditions do have an impact on efficacy of fumigation. And to add new section to touch upon site conditions for fumigation i.e safety considerations as illustrated in proposed addition in preceding paragraph 83 *Category : SUBSTANTIVE*
227	82	~~5~~4. **Enclosures and Equipment used for Fumigation**	P	**Japan** *Category : EDITORIAL*
228	82	5. Sites, **Enclosures and Equipment used for Fumigation**	P	**APPPC** (22) Singapore (4 Sep 2018 1:09 AM) To include consideration of site conditions where fumigation is to be conducted as site conditions do have an impact on efficacy of fumigation. And to add new section to touch upon site conditions for fumigation i.e safety considerations as illustrated in proposed addition in preceding paragraph 83. *Category : SUBSTANTIVE*
229	82	~~5~~4. **Enclosures and Equipment used for Fumigation**	P	**APPPC** (36) New Zealand (5 Sep 2018 1:40 AM) *Category : EDITORIAL*
230	82	5. Sites, **Enclosures and Equipment used for Fumigation**	P	**Singapore** To inlcude consideration of site conditions where fumigation is to be conducted as site conditions do have an impact on efficacy of fumigation. And to add in a section to touch upon site conditions for fumigation i.e safety considerations. *Category : SUBSTANTIVE*
231	83	There are many potential types and designs for equipment and enclosures used in fumigation. These vary depending on the type of fumigant used, the nature of the commodity, and the conditions of the surrounding environment. The following enclosures and equipment may be necessary to ensure that a fumigation achieves the required efficacy. (New) 5.1 Site Conditions The fumigation sites should be a suitable location to perform the fumigation. It should be isolated from unprotected personnel, shelters from high winds, well ventilated and provide electrical power supply or generator to run the required fumigation equipment.	P	**Viet Nam** Proposed site requirements to be included as these are practical considerations to be made by fumigator before conducting any fumigation. *Category : SUBSTANTIVE*

		The fumigation floor should be impermeable to the fumigant or gas proof sheets should be laid on the floor (loose sheet fumigation) to act as a barrier. The fumigation floor must be flat and free of stones, debris or other sharp objects.		
232	83	There are many potential types and designs of sites for equipment and enclosures used in fumigation. These vary depending on the type of fumigant used, the nature of the commodity, and the conditions of the surrounding environment. The ~~following~~ following requirements for sites, enclosures and equipment may be necessary to ensure that a fumigation achieves the required efficacy. (New) 5.1 Site Conditions The fumigation sites should be a suitable location to perform the fumigation. It should be isolated from unprotected personnel, shelters from high winds, well ventilated and provide electrical power supply or generator to run the required fumigation equipment. The fumigation floor should be impermeable to the fumigant or gas proof sheets should be laid on the floor (loose sheet fumigation) to act as a barrier. The fumigation floor must be flat and free of stones, debris or other sharp objects.	P	**APPPC** (23) Singapore (4 Sep 2018 1:13 AM) Proposed site requirements to be included as these are practical considerations to be made by fumigator before conducting any fumigation. *Category : SUBSTANTIVE*
233	83	There are many potential types and designs ~~for~~ of sites, equipment and enclosures used in fumigation. These vary depending on the type of fumigant used, the nature of the commodity, and the conditions of the surrounding environment. The following requirements for sites, enclosures and equipment may be necessary to ensure that a fumigation achieves the required efficacy. (New) 5.1 Sites The fumigation site hsould be a suitable location to perform the fumigation. It should be isolated from unprotected personnel, sheltered from high winds, well ventilated and provide electrical power supply or generator to run the required fumigation equipment. The fumigation floor should be impermeable to the fumigant or gas proof sheets should be laid on teh floor (loose lot fumigation) to act as a barrier. The fumigation floor must be flat and free of stones, debris or other sharp objects.	P	**Singapore** Proposed site requirements to be included as these are practical considerations to be made by fumigator before conducting any fumigation. *Category : SUBSTANTIVE*
5.1 Enclosures				
234	84	**~~5~~4.1 Enclosures**	P	**Japan** *Category : EDITORIAL*
235	84	**~~5~~4.1 Enclosures**	P	**APPPC** (37) New Zealand (5 Sep 2018 1:40 AM) *Category : EDITORIAL*

236	84	**5.1 Enclosures**	C	**Jamaica** Rename : Characteristic of the Enclosure *Category : SUBSTANTIVE*
237	85	The enclosure should be a space that can be enclosed in a manner that ensures that appropriate fumigation conditions are maintained throughout the duration of the fumigation. Examples of enclosures include purpose-built fumigation chambers, silos, freight containers, warehouses, ship's holds or tarpaulin "tents". The enclosure should be constructed from materials that maintain adequate fumigant concentrations over the fumigation period and prevent fumigant escape (e.g. materials that are not porous or absorbent to the fumigant). Openings should be sealed effectively. ~~Surfaces~~ Previous or porour surfaces consisted of such as ~~soil,~~ sand, base rock, wood and paving (stones or blocks) are not a suitable floor for a tent enclosure.	P	**Viet Nam** Not all materials of the surface for fumigation are improper to floor for a tent enclosure. The controversial point is pervious or porous surfaces which may not keed a certain level of concentration. Even if the surface is consisted of soil, the leveled and solidified surface can maintain the effective level of concentration for a tent enclosure. *Category : SUBSTANTIVE*
238	85	The enclosure should be a space that can be enclosed ~~in a manner that ensures that~~ to ensure appropriate fumigation conditions are maintained throughout the duration of the fumigation. Examples of enclosures include purpose-built fumigation chambers, silos, freight containers, warehouses, ship's holds or tarpaulin "tents". The enclosure should be constructed from materials that maintain adequate fumigant concentrations over the fumigation period and prevent fumigant escape (e.g. materials that are not porous or absorbent to the fumigant). Openings should be sealed effectively. Surfaces such as soil, sand, base rock, wood and paving (stones or blocks) are not a suitable floor for a tent enclosure.	P	**Sri Lanka** *Category : EDITORIAL*
239	85	The enclosure should be a space that can be enclosed in a manner that ensures that appropriate fumigation conditions are maintained throughout the duration of the fumigation. Examples of enclosures include purpose-built fumigation chambers, silos, freight containers, warehouses, ship's holds or tarpaulin "tents". The enclosure should be constructed from materials that maintain adequate fumigant concentrations over the fumigation period and prevent fumigant escape (e.g. materials that are not porous or absorbent to the fumigant). Openings should be sealed effectively. ~~Surfaces~~ Pervious or porous surfaces consisted of such as ~~soil,~~ sand, base rock, wood and paving (stones or blocks) are not a suitable floor for a tent enclosure.	P	**Korea, Republic of** Not all materials of the surface for fumigation are improper to floor for a tent enclosure. The controversial point is pervious or porous surfaces which may not keed a certain level of concentration. Even if the surface is consisted of soil, the leveled and solidified surface can maintain the effective level of concentration for a tent enclosure. *Category : TECHNICAL*
240	85	The enclosure should be a space that can be enclosed in a manner that ensures that appropriate fumigation conditions are maintained throughout the duration of the fumigation. Examples of enclosures include purpose-built fumigation chambers, silos, freight containers, warehouses, ship's holds or tarpaulin "tents". The enclosure should be constructed from materials that maintain adequate fumigant concentrations over the fumigation period and prevent fumigant escape (e.g.	P	**Japan** Not all materials of the surface for fumigation are improper to floor for a tent enclosure. The controversial point is pervious or porous surfaces which may not keep a certain level of concentration. Even if the surface is consisted of soil, the leveled and solidified surface can maintain the effective level of concentration for a tent enclosure. This proposed change is supported by APPPC as well as by Japan.

		materials that are not porous or absorbent to the fumigant). Openings should be sealed effectively. ~~Surfaces~~ Pervious or porous surfaces consisted of such as ~~soil,~~ sand, base rock, wood and paving (stones or blocks) are not a suitable floor for a tent enclosure.		*Category : SUBSTANTIVE*
241	85	The enclosure should be a space that can be enclosed in a manner that ensures that appropriate fumigation conditions are maintained throughout the duration of the fumigation. Examples of enclosures include purpose-built fumigation chambers, silos, freight containers, warehouses, ship's holds or tarpaulin "tents". The enclosure should be constructed from materials that maintain adequate fumigant concentrations over the fumigation period and prevent fumigant escape (e.g. materials that are not porous or absorbent to the fumigant). Openings should be sealed effectively. ~~Surfaces~~ Pervious or porous surfaces consisted of such as ~~soil,~~ sand, base rock, wood and paving (stones or blocks) are not a suitable floor for a tent enclosure.	P	**Australia** Not all materials of the surface for fumigation are improper to floor for a tent enclosure. The controversial point is pervious or porous surfaces which may not need a certain level of concentration. Even if the surface is consisted of soil, the leveled and solidified surface can maintain the effective level of concentration for a tent enclosure. *Category : TECHNICAL*
242	85	The enclosure should be a space that can be enclosed in a manner that ensures that appropriate fumigation conditions are maintained throughout the duration of the fumigation. Examples of enclosures include purpose-built fumigation chambers, silos, freight containers, warehouses, ship's holds or tarpaulin "tents". The enclosure should be constructed from materials that maintain adequate fumigant concentrations over the fumigation period and prevent fumigant escape (e.g. materials that are not porous or absorbent to the fumigant). Openings should be sealed effectively. ~~Surfaces~~ Pervious or porous surfaces consisted of such as ~~soil,~~ sand, base rock, wood and paving (stones or blocks) are not a suitable floor for a tent enclosure.	P	**APPPC** (138) APPPC (12 Sep 2018 2:33 AM) Not all materials of the surface for fumigation are improper to floor for a tent enclosure. The controversial point is pervious or porous surfaces which may not keed a certain level of concentration. Even if the surface is consisted of soil, the leveled and solidified surface can maintain the effective level of concentration for a tent enclosure. (118) Japan (8 Sep 2018 4:39 AM) Not all materials of the surface for fumigation are improper to floor for a tent enclosure. The controversial point is pervious or porous surfaces which may not keed a certain level of concentration. Even if the surface is consisted of soil, the leveled and solidified surface can maintain the effective level of concentration for a tent enclosure. *Category : TECHNICAL*
243	85	The enclosure should be a space that can be enclosed in a manner that ensures that appropriate fumigation conditions are maintained throughout the duration of the fumigation. Examples of enclosures include purpose-built fumigation chambers, silos, freight containers, warehouses, ship's holds or tarpaulin "tents". The enclosure should be constructed from materials that maintain adequate fumigant concentrations over the fumigation period and prevent fumigant escape (e.g. materials that are not porous or absorbent to the fumigant). Each enclosure must be sealed properly at each opening (e.g., solders, welds, mastic tape, folding) to prevent leaks and any holes must be covered to maintain the integrity of the	P	**United States of America** The sentence is vague and needs to be clarified *Category : TECHNICAL*

		fumigation. All chamber doors and vents should be fitted with high quality, heavy duty gaskets approved for the fumigant that will be used.~~Openings should be sealed effectively~~ Surfaces such as soil, sand, base rock, wood and paving (stones or blocks) are not a suitable floor for a tent enclosure.~~. Surfaces such as soil, sand, base rock, wood and paving (stones or blocks) are not a suitable floor for a tent enclosure.~~		
244	85	The enclosure should be a space that can be enclosed in a manner that ensures that appropriate fumigation conditions are maintained throughout the duration of the fumigation. Examples of enclosures include purpose-built fumigation chambers, silos, freight containers, warehouses, ship's holds or tarpaulin "tents". The enclosure should be constructed from materials that maintain adequate fumigant concentrations over the fumigation period and prevent fumigant escape (e.g. materials that are not porous or absorbent to the fumigant). Openings should be sealed effectively. Surfaces such as soil, sand, base rock, wood and paving (stones or blocks) are not a suitable floor for a ~~tent~~ tarpaulin enclosure due to their nature to absorb fumigant, which could affect the dose of the fumigant in the enclosure.	P	**United States of America** this term is used more often. Clarification why these types of floors are not suitable. *Category : TECHNICAL*
245	85	The enclosure should be a space that can be enclosed in a manner that ensures that appropriate fumigation conditions are maintained throughout the duration of the fumigation. Examples of enclosures include purpose-built fumigation chambers, silos, freight containers, warehouses, ship's holds or tarpaulin "tents". The enclosure should be constructed from materials that maintain adequate fumigant concentrations over the fumigation period and prevent fumigant escape (e.g. materials that are not porous or absorbent to the fumigant). Openings should be sealed effectively. Surfaces such as soil, sand, base rock, wood and paving (stones or blocks) are not a suitable floor for a tent enclosure.	C	**Jamaica** Revise sentence: The enclosure should be a properly spaced, with impervious floor, that can and be enclosed in a manner that ensures that appropriate fumigation conditions are maintained throughout the duration of the fumigation. Examples of enclosures include purpose-built fumigation chambers, silos, freight containers, warehouses, ship's holds or tarpaulin "tents". sentence *Category : SUBSTANTIVE*
246	85	The enclosure should be a space that can be enclosed in a manner to ensure that ~~ensures that~~ appropriate fumigation conditions are maintained throughout the duration of the fumigation. Examples of enclosures include purpose-built fumigation chambers, silos, freight containers, warehouses, ship's holds or tarpaulin "tents". The enclosure should be constructed from materials that maintain adequate fumigant concentrations over the fumigation period and prevent fumigant escape (e.g. materials that are not porous or absorbent to the fumigant). Openings should be sealed effectively. Surfaces such as soil, sand, base rock, wood and paving (stones or blocks) are not a suitable floor for a tent enclosure.	P	**Iran** *Category : EDITORIAL*
247	86	All enclosures should allow adequate access for the equipment that is required to verify that the fumigation ~~has been~~ is conducted appropriately.	P	**European Union** More appropriate tense. *Category : EDITORIAL*

248	86	All enclosures should allow adequate access for the equipment that is required to verify that the fumigation ~~has been~~ is conducted appropriately.	P	**EPPO** More appropriate tense *Category : EDITORIAL*
5.2 Fumigation equipment				
249	87	~~5~~4.2 **Fumigation equipment**	P	**Japan** *Category : EDITORIAL*
250	87	~~5~~4.2 **Fumigation equipment**	P	**APPPC** (38) New Zealand (5 Sep 2018 1:41 AM) *Category : EDITORIAL*
251	88	All equipment used for measuring fumigation parameters should be calibrated according to the manufacturer's ~~instructions and~~instructions, in the same way they must be certified by a competent entity, where applicable, NPPO specifications.	P	**Colombia** Se sugiere incluir en el párrafo la frase " … de igual manera estos deben ser certificados por un entidad competente…" Este proceso garantiza la fiabilidad del instrumento de medición empleado para el proceso. *Category : TECHNICAL*
5.2.1 Dosing equipment				
252	89	~~5~~4.2.1 **Dosing equipment**	P	**Japan** *Category : EDITORIAL*
253	89	~~5~~4.2.1 **Dosing equipment**	P	**APPPC** (39) New Zealand (5 Sep 2018 1:41 AM) *Category : EDITORIAL*
254	90	Dosing equipment should enable the quantitative introduction of fumigant gas into an enclosure. ~~Dosing equipment includes an appropriately safe and secure storage vessel~~ Dosing equipment includes an appropriately safe and secure storage vessel for the fumigant, and lines that allow the fumigant to be delivered to the enclosure, ~~and should include a device that can either measure the rate or volume of gas flow into the enclosure~~ and should include a device that can either measure the rate or volume of gas flow into the enclosure (e.g. a gas mass flow-meter) or measure the volume or weight loss from the gas containers supplying the enclosure (e.g. a scale or balance). In some cases, fumigant gas can be introduced into an enclosure as a solid (e.g. magnesium phosphide tablets) that releases a known volume of fumigant to achieve the required dose.	P	**Sri Lanka** These could not be applied to commercially available canister type fumigation containers. They contain defined volume of fumigant and could not be used again after used once *Category : TECHNICAL*
5.2.2 Gas vaporizer				
255	91	~~5~~4.2.2 **Gas vaporizer**	P	**Japan** *Category : EDITORIAL*
256	91	~~5~~4.2.2 **Gas vaporizer**	P	**APPPC** New Zeland *Category : EDITORIAL*
257	92	Some fumigants are stored as a compressed liquid in a metal cylinder. Release and vaporization of a significant quantity of the liquid as required for fumigation	P	**APPPC** (84) New Zealand (5 Sep 2018 3:01 AM) a gas vaporizer is not used for all types of fumigant.

		absorbs a significant amount of energy. A vaporizer may be used to provide energy (as heat) during the vaporization of the liquid to a gas to ensure that the required amount of gas is provided to the enclosure. Depending on the ~~fumigant~~fumigant and energy source, an appropriate pressure-resistant vaporizer should be used.		*Category : TECHNICAL*
5.2.3 Heating equipment				
258	93	**~~5~~4.2.3 Heating equipment**	P	**Japan** *Category : EDITORIAL*
259	93	**~~5~~4.2.3 Heating equipment**	P	**APPPC** New Zeland *Category : EDITORIAL*
260	94	Heating should be used to ensure adequate fumigant activities. When it is necessary to raise the temperature of the commodity and the air within the enclosure, exposed heating sources should not be used with flammable fumigants or fumigants that decompose at high temperatures (see Appendix 1 for fumigant chemical properties).	P	**Viet Nam** Move sentences from paragraph 116 to this section because it discribes heating equipment. *Category : SUBSTANTIVE*
261	94	When it is necessary to raise the temperature of the commodity and the air within the enclosure, exposed heating sources should not be used with flammable fumigants or fumigants that decompose at high temperatures (see Appendix 1 for fumigant chemical properties).	C	**Sri Lanka** Is there any practical situations where the commodity or enclosure is heated prior to fumigation? *Category : TECHNICAL*
262	94	Heating equipment should be used to ensure adequate fumigant activity. When it is necessary to raise the temperature of the commodity and the air within the enclosure, exposed heating sources should not be used with flammable fumigants or fumigants that decompose at high temperatures (see Appendix 1 for fumigant chemical properties).	P	**Japan** Move sentences from paragraph 116 to this section because it discribes heating equipment. *Category : SUBSTANTIVE*
5.2.4 Gas circulation equipment				
263	95	**~~5~~4.2.4 Gas circulation equipment**	P	**Japan** *Category : EDITORIAL*
264	95	**~~5~~4.2.4 Gas circulation equipment**	P	**APPPC** new zeland *Category : EDITORIAL*
265	96	Even and quick distribution of fumigant gas introduced into the enclosure ~~may be~~ is important for successful fumigation of a large quantity of commodity, especially with gases that diffuse relatively slowly. Rapid circulation of gas is required for the fumigation of perishable commodities or commodities that sustain damage on extended exposure to the fumigant. One or more ~~electrical~~ fans of the correct type suitable for fumigant and capable of providing adequate gas circulation should be used.	P	**Viet Nam** Phosphine attacks electrical fans -> correct type of fans suitable for fumigant. *Category : SUBSTANTIVE*

266	96	Even and quick distribution of fumigant gas introduced into the enclosure ~~may be~~ is important for successful fumigation of a large quantity of commodity, especially with gases that diffuse relatively slowly. Rapid circulation of gas is required for the fumigation of perishable commodities or commodities that sustain damage on extended exposure to the fumigant. One or more ~~electrical~~ fans of the correct type suitable for the fumigant and capable of providing adequate gas circulation should be used.	P	**Korea, Republic of** e.g Phosphine attacks electrical fans -> correct type of fans suitable for fumigant. *Category : SUBSTANTIVE*
267	96	Even and quick distribution of fumigant gas introduced into the enclosure may be important for successful fumigation of a large quantity of commodity, especially with gases that diffuse relatively slowly. Rapid circulation of gas is required for the fumigation of perishable commodities or commodities that sustain damage on extended exposure to the fumigant. One or more ~~electrical~~ fans of the correct type suitable for the fumigant and capable of providing adequate gas circulation should be used.	P	**China** "One or more electrical fans capable of providing adequate gas circulation should be used." This requirement could stifle innovation. It may be preferable for gas to be circulated by means other than electric fans. e.g Phosphine attacks electrical fans -> correct type of fans suitable for fumigant. *Category : SUBSTANTIVE*
268	96	Even and quick distribution of fumigant gas introduced into the enclosure may be important for successful fumigation of a large quantity of commodity, especially with gases that diffuse relatively slowly. Rapid circulation of gas is required for the fumigation of perishable commodities or commodities that sustain damage on extended exposure to the fumigant~~. One or more electrical fans capable of .providing adequate gas circulation should be used.~~	P	**APPPC** Suggest deleting this sentence. this is not a requirement, but an implementation guidlie wold be helpful. *Category : SUBSTANTIVE*
269	96	Even and quick distribution of fumigant gas introduced into the enclosure may be important for successful fumigation of a large quantity of commodity, especially with gases that diffuse relatively slowly. Rapid circulation of gas is required for the fumigation of perishable commodities or commodities that sustain damage on extended exposure to the fumigant. One or more electrical fans capable of providing adequate gas circulation should be used.	C	**APPPC** (42) New Zealand (5 Sep 2018 1:44 AM) Re. "One or more electrical fans capable of providing adequate gas circulation should be used." This requirement could stifle innovation. It may be preferable for gas to be circulated by means other than electric fans. Phosphine (for example) attacks electric circuitry, and some gases are flammable, so there may be better/ safer ways to circulate gases within a fumigation enclosure. *Category : SUBSTANTIVE*
270	96	Even and quick distribution of fumigant gas introduced into the enclosure ~~may be~~ is important for successful fumigation of a large quantity of commodity, especially with gases that diffuse relatively slowly. Rapid circulation of gas is required for the fumigation of perishable commodities or commodities that sustain damage on extended exposure to the fumigant. One or more ~~electrical~~ fans of the correct type suitable for the fumigant and capable of providing adequate gas circulation should be used.	P	**APPPC** (136) APPPC (12 Sep 2018 2:24 AM) e.g Phosphine attacks electrical fans -> correct type of fans suitable for fumigant. (86) New Zealand (5 Sep 2018 3:07 AM) (85) New Zealand (5 Sep 2018 3:02 AM) *Category : SUBSTANTIVE*
271	96	Even and quick distribution of fumigant gas introduced into the enclosure may be important for successful fumigation of a large quantity of commodity, especially	P	**United States of America** Better circulation is achieved when the number of fans correlates with the size of enclosures.

		with gases that diffuse relatively slowly. Rapid circulation of gas is required for the fumigation of perishable commodities or commodities that sustain damage on extended exposure to the fumigant. One or more electrical fans capable of providing adequate gas circulation should be used, depending on the volume of the enclosure.		*Category : TECHNICAL*
272	96	Even and quick distribution of fumigant gas introduced into the enclosure may be important for successful fumigation of a large quantity of commodity, especially with gases that diffuse relatively slowly. Rapid circulation of gas is required for the fumigation of perishable commodities or commodities that sustain damage on extended exposure to the fumigant. One or more electrical fans capable of providing adequate gas circulation should be used.	C	**Jamaica** Sentence revision: For even and quick distribution of fumigant gas introduced throughout the into the enclosure fans may be be used. This is important for the successful fumigation of a large quantity of commodity, where the fumigant is heavier than air, and especially with gases that diffuse relatively slowly. Rapid circulation of gas is required for the fumigation of perishable commodities or commodities that sustain damage on extended exposure to the fumigant. One or more electrical fans capable of providing capacity to move one volume of air per volume of structure within a given minute in respect to total enclosure (the correct Cubic Feet Per minute (CFM) must be accounted for) adequate gas circulation should be used . *Category : SUBSTANTIVE*
273	96	Even and quick distribution of fumigant gas introduced into the enclosure may be important for successful fumigation of a large quantity of commodity, especially with with high density gases gases that diffuse relatively ~~slowly~~slowly (Example: Bromide of Methyl). Rapid circulation of gas is required for the fumigation of perishable commodities or commodities that sustain damage on extended exposure to the fumigant. One or more electrical fans capable of providing adequate gas circulation should be used.	P	**Colombia** Se sugiere la inclusión de frase de alta densidad, y ……(Ejemplo: Bromuro de Metilo), con el fin de complementar la idea. Es importante resaltar el tema de la densidad de los gases e ilustrar al usuario con un ejemplo. *Category : TECHNICAL*
274	96	Even and quick distribution of fumigant gas introduced into the enclosure may be important for successful fumigation of a large quantity of commodity, especially with gases that diffuse relatively slowly. Rapid circulation of gas is required for the fumigation of perishable commodities or commodities that sustain damage on extended exposure to the fumigant. ~~One~~ For these commodities one or more electrical fans capable of providing adequate gas circulation should be used. Electrical fans may not be used for bulk commodities (e.g. grains).	P	**Argentina** To provide more guidelines for bulk commodities. *Category : TECHNICAL*
275	96	Even and quick distribution of fumigant gas introduced into the enclosure may be important for successful fumigation of a large quantity of commodity, especially with gases that diffuse relatively slowly. Rapid circulation of gas is required for the fumigation of perishable commodities or commodities that sustain damage on extended exposure to the fumigant. ~~One~~ For these commodities one or more electrical fans capable of providing adequate gas circulation should be used. Electrical fans may not be used for bulk commodities (e.g. grains)	P	**Uruguay** To provide more guidance for bulk commodities *Category : TECHNICAL*

276	96	Even and quick distribution of fumigant gas introduced into the enclosure may be important for successful fumigation of a large quantity of commodity, especially with gases that diffuse relatively slowly. Rapid circulation of gas is required for the fumigation of perishable commodities or commodities that sustain damage on extended exposure to the fumigant. ~~One~~ For these commodities one or more electrical fans capable of providing adequate gas circulation should be used~~.~~. Electrical fans may not be used for bulk commodities (eg. grains).	P	**COSAVE** To provide more guidelines for bulk commodities. *Category : TECHNICAL*
5.2.5 Instruments to measure moisture content				
277	97	~~5~~4.2.5 **Instruments to measure moisture content**	P	**Japan** *Category : EDITORIAL*
278	97	**5.2.5 Instruments to measure moisture content**	C	**APPPC** (24) Singapore (4 Sep 2018 1:16 AM) To include an appendix to explain the relation of moisture content with other fumigation parameters eg concentration or dose for clarity. Since this is meant to be a technical guideline, this should explain or provide guidance on how an NPPO or the treatment provider should respond to moisture content variation for commodity like wood where moisture content affects the efficacy of the treatment. Wood products inSingapore tend to have high MC specially for those stored in open spaces. *Category : TECHNICAL*
279	97	~~5~~4.2.5 **Instruments to measure moisture content**	P	**APPPC** (43) New Zealand (5 Sep 2018 1:45 AM) *Category : EDITORIAL*
280	97	**5.2.5 Instruments to measure moisture content**	C	**Singapore** To include an Appendix to explain the relation of moisture content with other fumigation parameters eg concentration or dose. Since this is meant to be a technical guideline, this should explain or provide guidance on how an NPPO or the treatment provider should respond to moisture content variation for commodity like wood where the mositure content affects the efficacy of the treatment. Wood products in Singapore tend to have high MC specially for those stored in open spaces. *Category : TECHNICAL*
281	97	**5.2.5 Instruments to measure moisture content**	C	**Ecuador** Se debería especificar que las mediciones de concentraciones son obligatorias en los tratamientos fitosanitarios *Category : EDITORIAL*
282	98	For commodities where the moisture content affects the efficacy of the treatment (e.g. wood), the moisture content should be measured. A moisture meter gives a reading of the approximate moisture content of the commodity. As moisture content usually varies within and between the commodities within the same lot, moisture meters need only measure within 5% of the actual moisture content.	P	**Canada** Additional technical information. *Category : TECHNICAL*

		Available moisture meters include those that measure electrical resistance (pin meters) or use electrometric wave technology (pinless meters). Appropriate use of moisture meters for different types of commodities is needed following existing guidelines for moisture content determination. Where moisture content of commodity is larger than 35%, pin meters are inaccurate and gravimetrical or other moisture determination methods may need to be used.		
283	98	For commodities where the moisture content affects the efficacy of the ~~treatment (e.g. wood)~~treatment, the moisture content ~~should~~ may be measured. A moisture meter gives a reading of the approximate moisture content of the ~~commodity~~commodity and should be appropriately calibrated before us. As moisture content usually varies within and between the commodities within the same lot, moisture meters need only measure within 5% of the actual moisture content. Available moisture meters include those that measure electrical resistance (pin meters) or use electrometric wave technology (pinless meters).	P	**Viet Nam** In general, moisture in the commodity does not affect the treatment efficacy directly. And moisture is not mandatory in many countries. *Category : SUBSTANTIVE*
284	98	For commodities where the moisture content affects the efficacy of the treatment (e.g. wood), the moisture content should be measured. A moisture meter gives a reading of the approximate moisture content of the commodity. As moisture content usually varies within and between the commodities within the same lot, moisture meters need only measure within 5% of the actual moisture content. ~~Available~~ (Eg: moisture meters may include ~~those~~ technologies that measure electrical resistance (pin meters) or use electrometric wave technology (pinless ~~meters)~~meters)).	P	**Sri Lanka** There may be new technologies available in the future. Therefore, better to leave these as examples) *Category : EDITORIAL*
285	98	For commodities where the moisture content affects the efficacy of the treatment (e.g. wood), the moisture content should be measured. A moisture meter gives a reading of the approximate moisture content of the ~~commodity~~commodity and should be appropriately calibrated before use. As moisture content usually varies within and between the commodities within the same lot, moisture meters need only measure within 5% of the actual moisture content. Available moisture meters include those that measure electrical resistance (pin meters) or use electrometric wave technology (pinless meters).	P	**China** Measurement equipment should be properly calibrated before use and to refer to an acceptable range for correction factor/ accuracy of a calibrated equipment . *Category : SUBSTANTIVE*
286	98	For commodities where the moisture content affects the efficacy of the treatment (e.g. wood), the moisture content should be measured. A moisture meter gives a reading of the approximate moisture content of the ~~commodity~~commodity and should be appropriately calibrated before use. As moisture content usually varies within and between the commodities within the same lot, moisture meters need only measure within 5% of the actual moisture ~~content~~content I.e 5% correction factor/accuracy. Available moisture meters include those that measure electrical resistance (pin meters) or use electrometric wave technology (pinless meters).	P	**APPPC** (25) Singapore (4 Sep 2018 1:19 AM) Measurement equipment should be properly calibrated before use and to refer to an acceptable range for correction factor/ accuracy of a calibrated equipment instead of citing within 5% to be consistent with paragraph 105. *Category : SUBSTANTIVE*

287	98	For commodities where the moisture content affects the efficacy of the ~~treatment (e.g. wood)~~treatment, the moisture content ~~should~~ may be measured. A moisture meter gives a reading of the approximate moisture content of the commodity. As moisture content usually varies within and between the commodities within the same lot, moisture meters need only measure within 5% of the actual moisture content. Available moisture meters include those that measure electrical resistance (pin meters) or use electrometric wave technology (pinless meters).	P	**APPPC** (130) Korea, Republic of (10 Sep 2018 9:57 AM) In general, moisture in the commodity does not affect the treatment efficacy directly. And moisture is not mandatory in many countries. *Category : TECHNICAL*
288	98	For commodities where the moisture content affects the efficacy of the treatment (e.g. wood), the moisture content should be measured. A moisture meter gives a reading of the approximate moisture content of the commodity. As moisture content usually varies within and between the commodities within the same lot, moisture meters need only measure within 5% of the actual moisture content. ~~Available~~ There are various instruments available for measuring moisture ~~meters include those that measure electrical resistance (pin meters) or~~ content. Their use ~~electrometric wave technology (pinless meters)~~should be consistent with the manufacturer's instructions.	P	**United States of America** Deleted text is too detailed for a standard and is more appropriate for a manual or other implementation guidance. *Category : TECHNICAL*
289	98	For commodities where the moisture content affects the efficacy of the ~~treatment (e.g. wood)~~treatment, the moisture content ~~should~~ may be measured. A moisture meter gives a reading of the approximate moisture content of the commodity. As moisture content usually varies within and between the commodities within the same lot, moisture meters need only measure within 5% of the actual moisture content. Available moisture meters include those that measure electrical resistance (pin meters) or use electrometric wave technology (pinless meters).	P	**Korea, Republic of** In general, moisture in the commodity does not affect the treatment efficacy directly. And measurement of moisture is not mandatory in many countries. *Category : TECHNICAL*
290	98	For commodities where the moisture content affects the efficacy of the treatment (e.g. wood), the moisture content should be measured. A moisture meter gives a reading of the approximate moisture content of the ~~commodity~~commodity and should be appropriately calibrated before use. As moisture content usually varies within and between the commodities within the same lot, moisture meters need only measure within 5% of the actual moisture ~~content~~content i.e 5% correction factor/accuracy. Available moisture meters include those that measure electrical resistance (pin meters) or use electrometric wave technology (pinless meters).	P	**Singapore** Measurement equipment should be properly calibrated before use and to refer to an acceptable range for correction factor/accuracy of a calibrated equipment instead of citing " within 5%" to be consistent with paragraph 105. *Category : SUBSTANTIVE*
291	99	To ensure that the fumigation achieves the required efficacy, it may also be necessary to use instruments that measure the environmental humidity at the moment of fumigation or during fumigation.	P	**APPPC** (26) Singapore (4 Sep 2018 1:22 AM) To use a better term ie during fumigation instead of at the moment of fumigation which is unclear of which moment is this referring to. Assumed the reference is to monitor humidity throughout fumigation ie during fumigation and not at the start of fumigation ie moment of fumigation. *Category : SUBSTANTIVE*

292	99	~~To ensure that the fumigation achieves the required efficacy, it may also be necessary to use instruments that measure the environmental humidity at the moment of fumigation.~~	P	**United States of America** Same comment as above - too much detail. *Category : TECHNICAL*
293	99	To ensure that the fumigation achieves the required efficacy, it may also be necessary to use of type instruments dataloggers that measure the environmental humidity during at the moment of fumigation, , which should be calibrated.	P	**Colombia** Se sugiere incluir en el párrafo la frase: "De un instrumento tipo dataloggers" , así como cambiar la frase :"…en el momento por la palabra " durante " y al final añadir la frase: "…,los cuales deberían ser calibrados." Es importante tener un instrumento ó equipo que permita rastrear y registra la variable humedad, no solo en un momento sino durante todo el proceso de fumigación. *Category : TECHNICAL*
294	99	To ensure that the fumigation achieves the required efficacy, it may also be necessary to use instruments that measure the environmental humidity at the ~~moment~~ time of fumigation.	P	**Philippines** *Category : EDITORIAL*
295	99	To ensure that the fumigation achieves the required efficacy, it may also be necessary to use instruments that measure the environmental humidity at the moment of fumigation or during fumigation.	P	**Singapore** Humidity is a critical parameter for fumigation and this should be monitored throughout the fumigation process and not only at the moment of fumigation (ie start of fumigation?) *Category : SUBSTANTIVE*
5.2.6 Instruments to measure vacuum				
296	100	~~5~~4.2.6 **Instruments to measure vacuum**	P	**Japan** *Category : EDITORIAL*
297	100	~~5~~4.2.6 **Instruments to measure vacuum**	P	**APPPC** Category : EDITORIAL (44) New Zealand (5 Sep 2018 1:46 AM) *Category : EDITORIAL*
298	100	**5.2.6 Instruments to measure ~~vacuum~~atmospheric pressure**	P	**Iran** *Category : EDITORIAL*
299	101	When ~~using vacuum during fumigation~~fumigation is performed under vacuum, a suitable vacuum gauge, of appropriate accuracy and sensitivity, should be used to measure and record the air pressure or vacuum drawn and maintained during the exposure or testing period. Further, vacuum could be used to detect any mechanical defects of the fumigation enclosure infrastructure. Suitable vacuum gauges may include a simple U-tube manometer or a Bourdon gauge, although specialized electronic measuring instruments are also available, and should measure within 10 Pa of the actual pressure.	P	**Sri Lanka** When fumigation is performed under vacuum - For consistency with section 4.3.2 The enclosure could be vacuumed prior to fumigation and the drop of internal air pressure could be measured to detect any mecanical damages of the enclosure *Category : TECHNICAL*
300	101	When using vacuum during fumigation, a suitable vacuum gauge, of appropriate accuracy and sensitivity, should be used to measure and record the air pressure or vacuum drawn and maintained during the exposure or testing period. Suitable	C	**United States of America** Pressure with this accuracy is hard to achieve for a vacuum chamber and is also not necessary. Suggest to use 1 kPa instead of 10 Pa.

		vacuum gauges may include a simple U-tube manometer or a Bourdon gauge, although specialized electronic measuring instruments are also available, and should measure within 10 Pa of the actual pressure.		*Category : TECHNICAL*
5.2.7 Instruments to measure temperatures				
301	102	**5.2.7 Instruments to measure ~~temperatures~~temperature**	P	**Sri Lanka** *Category : EDITORIAL*
302	102	**~~5~~4.2.7 Instruments to measure temperatures**	P	**Japan** *Category : EDITORIAL*
303	102	**~~5~~4.2.7 Instruments to measure temperatures**	P	**APPPC** 45) New Zealand (5 Sep 2018 1:48 AM) *Category : EDITORIAL*
304	103	Calibrated thermometers should be used to measure at suitable intervals the temperature in the enclosure space and, ~~as appropriate,~~ the external surfaces ~~and~~ or inside the ~~commodity~~ commodity, as appropriate, before and during fumigation. The number of temperature sensors required depends on the size of the ~~enclosure (see section 6~~enclosure.~~4).~~	P	**Viet Nam** The number of temperature sensors in section 6.4 has been deleted & hence the last sentence reference to section 6.4 is not valid here ie proposed deletion of section 6.4 *Category : SUBSTANTIVE*
305	103	Calibrated thermometers should be used to measure ~~at suitable intervals the temperature in the enclosure~~ **at suitable intervals the temperature in the enclosure** space and, as appropriate, the external surfaces and inside the commodity before and during fumigation. The number of temperature sensors required depends on the size of the enclosure (see section 6.4).	P	**Sri Lanka** For refrigerated containers, there is no requirement of measuring the temperature inside the enclosure. For non refrigerated containers, measuring the temperature of the external surface will be adequate as the internal temperature is almost equivalent to external temperature. Therefore, it is suggested to edit this part appropriately. *Category : TECHNICAL*
306	103	Calibrated thermometers should be used to measure ~~at~~ (at suitable ~~intervals~~ intervals) the temperature in the enclosure space and, as appropriate, the external surfaces and inside the commodity before and during fumigation. The number of temperature sensors required depends on the size of the enclosure (see section 6.4).	P	**Sri Lanka** *Category : EDITORIAL*
307	103	Calibrated thermometers should be used to measure at suitable intervals the temperature in the enclosure ~~space and~~space, ~~as appropriate,~~ the external surfaces ~~and~~ or inside the ~~commodity~~ commodity, as appropriate, before and during fumigation. The number of temperature sensors required depends on the size of the ~~enclosure (see section 6~~enclosure.~~4).~~	P	**Korea, Republic of** The number of temperature sensors in section 6.4 has been deleted & hence the last sentence reference to section 6.4 is not valid here ie proposed deletion of section 6.4 *Category : SUBSTANTIVE*
308	103	Calibrated thermometers should be used to measure at suitable intervals the temperature in the enclosure space and, as appropriate, the external surfaces and inside the commodity before and during fumigation. The number of temperature sensors required depends on the size of the enclosure (see section 6.4).	C	**China** The temperature needs to be measured accurately.Please add the requirements for the accuracy of the thermometer at the end of this paragraph. *Category : SUBSTANTIVE*
309	103	Calibrated thermometers should be used to measure at suitable intervals the temperature in the enclosure space and, as appropriate, the external surfaces and	C	**China** There should be a table for the volume of enclosure and the

		inside the commodity before and during fumigation. The number of temperature sensors required depends on the size of the enclosure (see section 6.4).		number of temperature probes. However, this table is not available in Section 6.4 and needs to be added or modified. *Category : SUBSTANTIVE*
310	103	Calibrated thermometers should be used to measure at suitable intervals the temperature in the enclosure space ~~and~~and/or, ~~as appropriate,~~ the external surfaces and inside the commodity before and during fumigation. The number of temperature sensors required depends on the size of the enclosure (see section 6.4).	P	**APPPC** *Category : TECHNICAL*
311	103	Calibrated thermometers should be used to measure at suitable intervals the temperature in the enclosure space and, as appropriate, the external surfaces and inside the commodity before and during fumigation. The number of temperature sensors required depends on the size of the enclosure (see section 6.4).	C	**APPPC** 47) New Zealand (5 Sep 2018 1:53 AM) Re. "to measure at suitable intervals the temperature in the enclosure space and, as appropriate, the external surfaces and inside the commodity before and during fumigation. " The wording of this requirement would mean that wherever product temperature is specified the fumigators would also have to measure the temperature in the enclosure. Most fumigation specifications state either minimum product temperature or minimum ambient temperature. They don't usually specify both. To require measurement of both would add time and cost to most fumigation. *Category : TECHNICAL*
312	103	Calibrated thermometers should be used to measure at suitable intervals the temperature in the enclosure space and, as appropriate, the external surfaces and inside the commodity before and during fumigation. The number of temperature sensors required depends on the size of the enclosure (see section 6.4).	C	**APPPC** (13) China (3 Sep 2018 10:31 AM) See 6.4 There should be a table for the volume of enclosure and the number of temperature probes. However, this table is not available in Section 6.4 *Category : SUBSTANTIVE*
313	103	Calibrated thermometers should be used to measure at suitable intervals the temperature in the enclosure space and, as appropriate, the external surfaces and inside the commodity before and during fumigation. The number of temperature sensors required depends on the size of the enclosure (see section 6.4). The requirements for the accuracy of the thermometer.	P	**APPPC** (14) China (3 Sep 2018 10:33 AM) The temperature needs to be measured accurately. *Category : SUBSTANTIVE*
314	103	Calibrated thermometers should be used to measure at suitable intervals the temperature in the enclosure space and, as appropriate, the external surfaces and inside the commodity before and during fumigation. The number of temperature sensors required depends on the size of the enclosure (see section ~~6~~5.4).	P	**APPPC** (46) New Zealand (5 Sep 2018 1:50 AM) *Category : EDITORIAL*
315	103	Calibrated thermometers should be used to measure at suitable intervals the temperature in the enclosure space and, as appropriate, the external surfaces and inside the commodity before and during fumigation. ~~The number of temperature sensors required depends on the size of the enclosure (see section 6.4).~~	P	**APPPC** (131) Korea, Republic of (10 Sep 2018 9:58 AM) The number of temperature sensors in section 6.4 was deleted. *Category : EDITORIAL*
316	103	Calibrated thermometers should be used to measure at suitable intervals the temperature in the enclosure ~~space and~~space, ~~as appropriate,~~ the external surfaces	P	**APPPC** (139) APPPC (12 Sep 2018 2:41 AM) The number of temperature sensors in section 6.4 has been

		~~and~~ or inside the ~~commodity~~ commodity, as appropriate, before and during fumigation. The number of temperature sensors required depends on the size of the ~~enclosure (see section 6~~enclosure.~~4).~~		deleted & hence the last sentence reference to section 6.4 is not valid here ie proposed deletion of section 6.4 (137) New Zealand (12 Sep 2018 2:32 AM) *Category : SUBSTANTIVE*
317	103	T~~Calibrated thermometers~~ hermometers should be used to measure at suitable intervals the temperature in the enclosure space and, as appropriate, the external surfaces and inside the commodity before and during fumigation. The number of temperature sensors required depends on the size of the enclosure (see section 6.4).	P	**United States of America** *Category : TECHNICAL*
318	103	Calibrated and certified thermometers should be used to measure at suitable intervals the temperature in the enclosure space and, as appropriate, the external surfaces and inside the commodity before and during fumigation. The number of temperature sensors with precision required depends on the size of the enclosure (see section 6.4).	P	**Colombia** Se sugiere incluir en el párrafo la frase: "… y certificado…" además debe informar el grado de precisión del equipo y tener niveles de variación propios del tratamiento. Las variables deben tener un rango permitido de medición. *Category : TECHNICAL*
319	103	Calibrated thermometers should be used to measure at suitable intervals the temperature in the enclosure space and, as appropriate, the external surfaces and inside the commodity before and during fumigation. The number of temperature sensors required depends on the size of the treatment enclosure (see section 6.4).	P	**Nepal** *Category : SUBSTANTIVE*
5.2.8 Instruments to measure gas concentration				
320	104	**~~5~~4.2.8 Instruments to measure gas concentration**	P	**Japan** *Category : EDITORIAL*
321	104	**~~5~~4.2.8 Instruments to measure gas concentration**	P	**APPPC** Category : EDITORIAL (48) New Zealand (5 Sep 2018 1:53 AM) *Category : EDITORIAL*
322	105	The equipment required to measure the fumigant concentration within the enclosure depends on the type of gas used. The equipment used should have an adequate accuracy (e.g. ±5% of the fumigant concentration to be achieved throughout the fumigation). The measuring equipment (e.g. sampling lines) exposed to the fumigant should be constructed from materials that do not absorb the fumigant. Fumigant sampling lines should be placed as far as possible from fumigant supply lines or dispensers, and in the area or areas of the enclosure likely to have the lowest concentration of fumigant. 5.2.9 - Fumigant leak detectors The equipment used to detect any gas leaks from the fumigation enclosures.	P	**Sri Lanka** It is suggested to add this equipment as well. A proper technical description may be added after consulting the EWG. *Category : TECHNICAL*

323	105	The equipment required to measure the fumigant concentration within the enclosure depends on the type of gas used. The equipment used should have an adequate accuracy (e.g. ±5% of the fumigant concentration to be achieved throughout the fumigation). The measuring equipment (e.g. sampling lines) exposed to the fumigant should be constructed from materials that do not absorb the fumigant. Fumigant sampling lines should be placed as far as possible from fumigant supply lines or dispensers, and in the area or areas of the enclosure likely to have the lowest concentration of fumigant.	C	**Jamaica** Sentence revision: The equipment required to measure the fumigant concentration within the enclosure depends on the type of gas used. The equipment used should have an adequate accuracy (e.g. ±5% of the fumigant concentration to be achieved throughout the fumigation). The measuring equipment (e.g. sampling lines) exposed to the fumigant should be constructed from materials that do not absorb the fumigant. Fumigant sampling lines must be strategically placed front-top, middle centre and rear bottom to get an accurate reading of the gas concentration inside the enclosure throughout the fumigation. *Category : SUBSTANTIVE*
324	105	The equipment required to measure the fumigant concentration within the enclosure depends on the type of gas used. The equipment used should have an adequate accuracy (e.g. ±5% of the fumigant concentration to be achieved throughout the fumigation), and correction factor may need to be applied if the inaccuracy results in under-dosing. The measuring equipment (e.g. sampling lines) exposed to the fumigant should be constructed from materials that do not absorb the fumigant. Fumigant sampling lines should be placed as far as possible from fumigant supply lines or dispensers, and in the area or areas of the enclosure likely to have the lowest concentration of fumigant.	P	**APPPC** *Category : TECHNICAL*
325	105	The equipment required to measure the fumigant concentration within the enclosure depends on the type of gas used. The equipment used should have an adequate accuracy (e.g. ±5% of the fumigant concentration to be achieved throughout the fumigation). The measuring equipment (e.g. sampling lines) exposed to the fumigant should be constructed from materials that do not absorb the fumigant. Fumigant sampling lines should be placed as far as possible from fumigant supply lines or dispensers, and in the area or areas of the enclosure likely to have the lowest concentration of fumigant. 5.2.9 Risk and Management in Fumigation Risk refers to things that could happen that can harm the fumigation procedures. Fumigators need to anticipate these risks ahead of time, and be prepared with fumigation strategies.	P	**APPPC** (9) Nepal (25 Jul 2018 4:20 AM) *Category : TECHNICAL*
326	105	The equipment required to measure the fumigant concentration within the enclosure depends on the type of gas used. The equipment used should have an adequate accuracy (e.g. ±5% of the fumigant concentration to be achieved throughout the fumigation). The measuring equipment (e.g. sampling lines) exposed to the fumigant should be constructed from materials that do not absorb the fumigant. Fumigant sampling lines should be placed as far as possible from	C	**APPPC** (49) New Zealand (5 Sep 2018 1:55 AM) If equipment inaccuracy results in underdosing, shouldn't the treatment provider compensate for this by applying a correction factor? Not applying a correction could result in non-efficacious treatments and survival of target pests.

		fumigant supply lines or dispensers, and in the area or areas of the enclosure likely to have the lowest concentration of fumigant.		*Category : TECHNICAL*
327	105	The equipment required to measure the fumigant concentration within the enclosure depends on the type of gas used. The equipment ~~used~~ should be calibrated and should have an adequate accuracy (e.g. ±5% of the fumigant concentration to be achieved throughout the ~~fumigation)~~fumigation and exposure levels and limits). The measuring equipment (e.g. sampling lines) exposed to the fumigant should be constructed from materials that do not absorb the fumigant. Fumigant sampling lines should be placed as far as possible from fumigant supply lines or dispensers, and in the area or areas of the enclosure likely to have the lowest concentration of fumigant.	P	**Colombia** Debe de medirse la concentración dentro y fuera del recinto o lugar de fumigación además, se sugiere incluir en el párrafo la frase: "… debería ser calibrado y…". Este proceso garantiza la fiabilidad de los datos y la seguridad en el proceso, dado que la concentración del fumigante es una variable crítica en la mayoría de los procesos de fumigación. En algunos casos en exteriores se establecen niveles más estrictos dependiendo de la normas NIOSH, OSHA o relacionadas. *Category : TECHNICAL*
6. Fumigation Procedures				
328	106	~~6~~5. **Fumigation Procedures**	P	**Japan** *Category : EDITORIAL*
329	106	~~6~~5. **Fumigation Procedures**	P	**APPPC** (50) New Zealand (5 Sep 2018 2:04 AM) *Category : EDITORIAL*
330	107	Many factors may affect fumigation efficacy. These include fumigant concentration, exposure time, commodity characteristics that relate to penetration or sorption of the fumigant, commodity temperature and atmospheric temperature. Gas tightness of the enclosure, load configuration and load ratio (ratio of occupied space to the entire space) directly influence gas distribution and gas concentration during fumigation. The fumigant supply and circulation equipment (where required) should be arranged within the enclosure in a way that ensures that the fumigant concentrations required by the treatment schedule are achieved and maintained within the enclosure during fumigation.	P	**Canada** *Category : TECHNICAL*
331	107	Many factors may affect fumigation efficacy. These include fumigant concentration, exposure time, commodity characteristics that relate to penetration of the fumigant, commodity temperature and atmospheric temperature. Gas tightness of the enclosure, load configuration and load ratio (ratio of occupied space to the entire space) directly influence gas distribution and gas concentration during fumigation. The fumigant supply and circulation equipment (where required) should be arranged within the enclosure in a way that ensures that the fumigant concentrations required by the treatment schedule are achieved and maintained within the enclosure during fumigation~~.~~. Treatment providers should have written procedures to ensure the correct process is followed for every treatment	P	**APPPC** (87) New Zealand (5 Sep 2018 3:12 AM) *Category : TECHNICAL*

332	107	Many factors may affect fumigation efficacy. These include fumigant concentration, exposure time, the airtightness of the fumigation enclosure commodity characteristics that relate to penetration of the fumigant, commodity temperature and atmospheric temperature. Gas tightness of the enclosure, load configuration and load ratio (ratio of occupied space to the entire space) directly influence gas distribution and gas concentration during fumigation. The fumigant supply and circulation equipment (where required) should be arranged within the enclosure in a way that ensures that the fumigant concentrations required by the treatment schedule are achieved and maintained within the enclosure during fumigation.	P	**Colombia** Se sugiere incluir en el párrafo la frase: "…la hermeticidad del recinto de fumigación …" Es importante incluir este aspecto, ya que en la mayoría de los procesos de fumigación requieren alta hermeticidad. *Category : TECHNICAL*
6.1 Commodity loading				
333	108	**~~65~~.1 Commodity loading**	P	**Japan** *Category : EDITORIAL*
334	108	**~~65~~.1 Commodity loading**	P	**APPPC** (52) New Zealand (5 Sep 2018 2:04 AM) *Category : EDITORIAL*
335	109	Before fumigation, the commodity should be loaded into the enclosure in a manner that ensures sufficient ~~space~~ space, including airspace under the commodity (e.g. pallets), for adequate circulation of the fumigant. In some cases, to ensure fumigant penetration into the commodity, separators should be used. For bulk loading, adequate circulation should be ensured, for instance by means of a recirculation system.	P	**United States of America** For clarification. *Category : TECHNICAL*
6.2 Packaging				
336	110	**~~65~~.2 Packaging**	P	**Japan** *Category : EDITORIAL*
337	110	**~~65~~.2 Packaging**	P	**APPPC** (53) New Zealand (5 Sep 2018 2:05 AM) *Category : EDITORIAL*
338	111	When used, packaging should be of a composition and construction that does not preclude fumigant gas penetration to the commodity and prevent fumigant concentrations achieving required levels. If this is not the case, fumigant-impenetrable packing material or coatings should be removed or punctured to ensure adequate access for the ~~fumigant.~~ fumigant and its aeration. Perforated packaging should not be overlapped, as holes may become blocked.	P	**United States of America** Adding clarification. *Category : TECHNICAL*
339	111	When ~~used~~commodities are in packages , packaging should be of a composition and construction that does not preclude fumigant gas penetration to the commodity and prevent fumigant concentrations achieving required levels. If this is not the case, fumigant-impenetrable packing material or coatings should be removed or	P	**Iran** *Category : EDITORIAL*

		punctured to ensure adequate access for the fumigant. Perforated packaging should not be overlapped, as holes may become blocked.		
6.3 Sorption				
340	112	~~6~~5.3 **Sorption**	P	**Japan** *Category : EDITORIAL*
341	112	~~6~~5.3 **Sorption**	P	**APPPC** (54) New Zealand (5 Sep 2018 2:06 AM) *Category : EDITORIAL*
342	113	Sorption is the process of chemically or physically binding free fumigant on or within the fumigated commodity, packaging or enclosure. Oil, fats or porous or finely ground materials may be highly sorptive materials. Sorption may make the fumigant unavailable to kill the plant pest. The sorption rate is high at the start of the fumigation, then gradually reduces as fumigation progresses. Sorption increases the time required for aeration after fumigation. Highly sorptive commodities or packaging should not be fumigated unless concentration readings can be taken to ensure that the required minimum concentration is achieved.	C	**Jamaica** Add types of sorption- Chemi-sorption, adsorption, absorption. Give examples of sorptive commodities example cotton, wool,rubber,flour, starch,bone meal. *Category : SUBSTANTIVE*
343	113	Sorption is the process of chemically or physically binding free fumigant on or within the fumigated commodity, packaging or enclosure. Oil, fats or porous or finely ground materials may be highly sorptive materials. Sorption may make the fumigant unavailable to kill the ~~plant~~ pest. The sorption rate is high at the start of the fumigation, then gradually reduces as fumigation progresses. Sorption increases the time required for aeration after fumigation. Highly sorptive commodities or packaging should not be fumigated unless concentration readings can be taken to ensure that the required minimum concentration is achieved.	P	**European Union** "Plant pest" is a redundant term because according to ISPM 5, pests are injurious to plants or plant products. *Category : EDITORIAL*
344	113	Sorption is the process of chemically or physically binding free fumigant on or within the fumigated commodity, packaging or enclosure. ~~Oil, fats or porous or finely ground materials may be highly sorptive materials.~~ Sorption may make the fumigant unavailable to kill the plant pest. The sorption rate is high at the start of the fumigation, then gradually reduces as fumigation progresses. Sorption increases the time required for aeration after fumigation~~. Highly sorptive commodities or packaging should not be fumigated unless concentration readings can be taken to ensure that the required minimum concentration is achieved~~. Oil, fats or porous or finely ground materials may be highly sorptive materials. Highly sorptive commodities or packaging should not be fumigated unless concentration readings can be taken to ensure that the required minimum concentration is achieved.	P	**European Union** More logical order (and new paragraph created). *Category : EDITORIAL*
345	113	Sorption is the process of chemically or physically binding free fumigant on or within the fumigated commodity, packaging or enclosure. ~~Oil, fats or porous or~~	P	**EPPO** More logical order (and new paragraph created).

		~~finely ground materials may be highly sorptive materials.~~ Sorption may make the fumigant unavailable to kill the ~~plant~~ pest. The sorption rate is high at the start of the fumigation, then gradually reduces as fumigation progresses. Sorption increases the time required for aeration after fumigation. Oil, fats or porous or finely ground materials may be highly sorptive materials. Highly sorptive commodities or packaging should not be fumigated unless concentration readings can be taken to ensure that the required minimum concentration is achieved.		"Plant pest" is a redundant term because according to ISPM 5, pests are injurious to plants or plant products. *Category : EDITORIAL*
346	113	Sorption is the process of chemically or physically binding free fumigant on or within the fumigated commodity, packaging or enclosure. Oil, fats or porous or finely ground materials may be highly sorptive materials. Sorption by packaging may make the fumigant unavailable to kill the plant ~~pest~~pests, but sorption by the commodity is necessary to kill internal feeders such as fruit flies. The sorption rate is high at the start of the fumigation, then gradually reduces as fumigation progresses. Sorption increases the time required for aeration after fumigation. Highly sorptive commodities or packaging should not be fumigated unless concentration readings can be taken to ensure that the required minimum concentration is achieved.	P	**Australia** MB is sorbed by the commodity and the packaging. Mortality of external pests requires exposure to headspace concentration. However internal feeders such as fruit fly need sorption by the commodity for mortality. See Reference below for more information on sorption. *Category : TECHNICAL*
347	113	Sorption is the process of chemically or physically binding free fumigant on or within the fumigated commodity, packaging or enclosure. Oil, fats or porous or finely ground materials may be highly sorptive ~~materials~~materials and should not be fumigated. Sorption may make the fumigant unavailable to kill the plant pest. The sorption rate is high at the start of the fumigation, then gradually reduces as fumigation progresses. Sorption increases the time required for aeration after fumigation. Highly sorptive commodities or packaging should not be fumigated unless concentration readings can be taken to ensure that the required minimum concentration is achieved.	P	**United States of America** Recommendation. *Category : TECHNICAL*
348	113	Sorption is the process of chemically or physically binding free fumigant on or within the fumigated commodity, packaging or enclosure. Oil, fats or porous or finely ground materials may be highly sorptive materials. Sorption may make the fumigant unavailable to kill the ~~plant~~ pest. The sorption rate is high at the start of the fumigation, then gradually reduces as fumigation progresses. Sorption increases the time required for aeration after fumigation. Highly sorptive commodities or packaging should not be fumigated unless concentration readings can be taken to ensure that the required minimum concentration is achieved.	P	**Argentina** For consistency. *Category : TECHNICAL*
349	113	Sorption is the process of chemically or physically binding free fumigant on or within the fumigated commodity, packaging or enclosure. Oil, fats or porous or	P	**Uruguay** For consistency

		finely ground materials may be highly sorptive materials. Sorption may make the fumigant unavailable to kill the ~~plant~~ pest. The sorption rate is high at the start of the fumigation, then gradually reduces as fumigation progresses. Sorption increases the time required for aeration after fumigation. Highly sorptive commodities or packaging should not be fumigated unless concentration readings can be taken to ensure that the required minimum concentration is achieved.		*Category : TECHNICAL*
350	113	Sorption is the process of chemically or physically binding free fumigant on or within the fumigated commodity, packaging or enclosure. Oil, fats or porous or finely ground materials may be highly sorptive materials. Sorption may make the fumigant unavailable to kill the ~~plant~~ pest. The sorption rate is high at the start of the fumigation, then gradually reduces as fumigation progresses. Sorption increases the time required for aeration after fumigation. Highly sorptive commodities or packaging should not be fumigated unless concentration readings can be taken to ensure that the required minimum concentration is achieved.	P	**COSAVE** For consistency. *Category : TECHNICAL*
6.4 Determination of fumigation temperature				
351	114	**~~6~~5.4 Determination of fumigation temperature**	P	**Japan** *Category : EDITORIAL*
352	114	**~~6~~5.4 Determination of fumigation temperature**	P	**APPPC** (55) New Zealand (5 Sep 2018 2:06 AM) *Category : EDITORIAL*
353	116	The temperatures of the commodity and the atmosphere within the enclosure should be measured and recorded. The lowest temperature recorded in the enclosure or the commodity should be taken as the temperature at which the fumigation is undertaken. ~~Fumigation should not proceed if, before or during fumigation, the temperature within the enclosure or the commodity falls to within 3–5 °C of the fumigant boiling point at the atmospheric pressure used. Under such conditions, heating equipment should be used to ensure adequate fumigant activity. Appendix 1 provides boiling point temperatures for some common fumigants.~~	P	**Viet Nam** The efficiency of fumigation is enough as long as fumigants are used after vaporization even blow 3-5°C fumigant boiling point. And it has been using in many countries. The sicentific evidence relared to "within 3–5 °C of the fumigant boiling point at the atmospheric pressure" is unkonwn and the figures vary with fumigants. *Category : SUBSTANTIVE*
354	116	The temperatures of the commodity and the atmosphere within the enclosure should be measured and recorded. The lowest temperature recorded in the enclosure or the commodity should be taken as the temperature at which the fumigation is undertaken~~. Fumigation should not proceed if, before or during fumigation, the temperature within the enclosure or the commodity falls to within 3–5 °C of the fumigant boiling point at the atmospheric pressure used. Under such conditions, heating equipment should be used to ensure adequate fumigant activity. Appendix 1 provides boiling point temperatures for some common fumigants.~~	P	**China** For high boiling fumigant, such as Methyl isothiocyanate which boiling point is 119 degree centigrate, the temperature in the enclosure or the commodity exceeds the boiling point of the fumigant 3 to 5 degrees C, it would affect the goods or basically cannot be realized. *Category : SUBSTANTIVE*

355	116	The temperatures of the commodity and the atmosphere within the enclosure should be measured and recorded. The lowest temperature recorded in the enclosure or the commodity should be taken as the temperature at which the fumigation is undertaken. Temperature affects the behaviour of the fumigant. Fumigation should not proceed if, before or during fumigation, the temperature within the enclosure or the commodity falls to within 3–5 °C of the fumigant boiling point at the atmospheric pressure used. Under such conditions, heating equipment should be used to ensure adequate fumigant activity. Appendix 1 provides boiling point temperatures for some common fumigants.	P	**APPPC** (89) New Zealand (5 Sep 2018 3:16 AM) (56) New Zealand (5 Sep 2018 2:08 AM) Re. "within 3–5◦°C". It would be more helpful if this were not a range. e.g. either 3 or 5 degree. *Category : TECHNICAL*
356	116	The temperatures of the commodity and the atmosphere within the enclosure should be measured and recorded. The lowest temperature recorded in the enclosure or the commodity should be taken as the temperature at which the fumigation is undertaken~~. Fumigation should not proceed if, before or during fumigation, the temperature within the enclosure or the commodity falls to within 3–5 °C of the fumigant boiling point at the atmospheric pressure used. Under such conditions, heating equipment should be used to ensure adequate fumigant activity.~~. ~~Appendix 1 provides boiling point temperatures for some common fumigants.~~	P	**Japan** The sicentific evidence relared to "within 3–5 °C of the fumigant boiling point at the atmospheric pressure" is unkonwn and the figures vary with fumigants. The information on fumigant boilling point should be considered when treatment schedule is developed, which is not necessary to operate fumigation. The 4th sentence should be modified as " Heating equipment should be used to ensure adequate fumigant activity." and be moved to before the 1st sentence in Section "5.2.3 Heating equipment" *Category : TECHNICAL*
357	116	The temperatures of the commodity and the atmosphere within the enclosure should be measured and recorded. The lowest temperature recorded in the enclosure or the commodity should be taken as the temperature at which the fumigation is undertaken. ~~Fumigation should not proceed if, before or during fumigation, the temperature within the enclosure or the commodity falls to within 3–5 °C of the fumigant boiling point at the atmospheric pressure used. Under such conditions, heating equipment should be used to ensure adequate fumigant activity. Appendix 1 provides boiling point temperatures for some common fumigants.~~	P	**APPPC** (15) China (3 Sep 2018 10:37 AM) For high boiling fumigant, such as Ethyl formate, Methyl iodide and Methyl isothiocyanate, the temperature in the enclosure or the commodity exceeds the boiling point of the fumigant 3 to 5 degrees C, it will affect the goods or basically cannot be realized. *Category : SUBSTANTIVE*
358	116	The temperatures of the commodity and the atmosphere within the enclosure should be measured and recorded. The lowest ambient temperature recorded in the enclosure or the commodity should be taken as the temperature at which the fumigation is undertaken. Fumigation should not proceed if, before or during fumigation, the temperature within the enclosure or the commodity falls to within 3–5 °C of the fumigant boiling point at the atmospheric pressure used. Under such conditions, heating equipment should be used to ensure adequate fumigant activity. Appendix 1 provides boiling point temperatures for some common fumigants.	P	**APPPC** (27) Singapore (4 Sep 2018 1:24 AM) To add in " ambient" temperature to be consistent with paragraph 121 where the minimum ambient temp that the enclosure or commodity is expected to experience... *Category : SUBSTANTIVE*
359	116	The temperatures of the commodity and the atmosphere within the enclosure should be measured and recorded. The lowest temperature recorded in the enclosure or the commodity should be taken as the temperature at which the	P	**APPPC** (114) Japan (8 Sep 2018 3:48 AM) The sicentific evidence relared to "within 3–5 °C of the fumigant boiling point at the atmospheric pressure" is unkonwn and the

		fumigation is undertaken. ~~Fumigation should not proceed if, before or during fumigation, the temperature within the enclosure or the commodity falls to within 3–5 °C of the fumigant boiling point at the atmospheric pressure used. Under such conditions, heating equipment should be used to ensure adequate fumigant activity. Appendix 1 provides boiling point temperatures for some common fumigants.~~		figures vary with fumigants. The information on fumigant boilling point should be considered when treatment schedule is developped, which is not necessary to operate fumigation. The 4th sentence should be modified as " Heating equipment should be used to ensure adequate fumigant activity." and be moved to before the 1st sentence in Section "5.2.3 Heating equipment" *Category : TECHNICAL*
360	116	The temperatures of the commodity and the atmosphere within the enclosure should be measured and recorded. The lowest temperature recorded in the enclosure or the commodity should be taken as the temperature at which the fumigation is undertaken. ~~Fumigation should not proceed if, before or during fumigation, the temperature within the enclosure or the commodity falls to within 3–5 °C of the fumigant boiling point at the atmospheric pressure used. Under such conditions, heating equipment should be used to ensure adequate fumigant activity. Appendix 1 provides boiling point temperatures for some common fumigants.~~	P	**APPPC** (132) Korea, Republic of (10 Sep 2018 10:03 AM) The efficiency of fumigation is enough as long as fumigants are used after vaporization even blow 3-5°C fumigant boiling point. And it has been using in many countries. *Category : TECHNICAL*
361	116	The temperatures of the commodity and the atmosphere within the enclosure should be measured and recorded. The lowest temperature recorded in the enclosure or the commodity should be taken as the temperature at which the fumigation is undertaken. ~~Fumigation should not proceed if, before or during fumigation, the temperature within the enclosure or the commodity falls to within 3–5 °C of the fumigant boiling point at the atmospheric pressure used.~~ Fumigation should not proceed if, before or during fumigation, the temperature within the enclosure or the commodity falls to within 3–5 °C of the fumigant boiling point at the atmospheric pressure used. Under such conditions, heating equipment should be used to ensure adequate fumigant activity. Appendix 1 provides boiling point temperatures for some common fumigants.	P	**United States of America** This sentence needs to be reworded to improve its clarity. *Category : EDITORIAL*
362	116	The temperatures of the commodity and the atmosphere within the enclosure should be measured and recorded. The lowest temperature recorded in the enclosure or the commodity should be taken as the temperature at which the fumigation is undertaken. Fumigation should not proceed if, before or during fumigation, the temperature within the enclosure or the commodity falls to within 3–5 °C of the fumigant boiling point at the atmospheric pressure used. Under such conditions, heating equipment should be used to ensure adequate fumigant activity. Appendix 1 provides boiling point temperatures for some common fumigants.	C	**Philippines** Check if indeed fumigation should proceed or not if the temperature falls within certain degrees of the fumigant boiling point. *Category : TECHNICAL*
363	116	The temperatures of the commodity and the atmosphere within the enclosure should be measured and recorded. The lowest temperature recorded in the enclosure or the commodity should be taken as the temperature at which the	P	**Korea, Republic of** The efficiency of fumigation is enough as long as fumigants are used after vaporization even below 3-5°C fumigant boiling point. And it has been using in many countries.

		fumigation is undertaken~~. Fumigation should not proceed if, before or during fumigation, the temperature within the enclosure or the commodity falls to within 3–5 °C of the fumigant boiling point at the atmospheric pressure used. Under such conditions, heating equipment should be used to ensure adequate fumigant activity.~~. ~~Appendix 1 provides boiling point temperatures for some common fumigants.~~		*Category : TECHNICAL*
364	116	The temperatures of the commodity and the atmosphere within the enclosure should be measured and recorded. The lowest ambient temperature recorded in the enclosure or the commodity should be taken as the temperature at which the fumigation is undertaken. Fumigation should not proceed if, before or during fumigation, the temperature within the enclosure or the commodity falls to within 3–5 °C of the fumigant boiling point at the atmospheric pressure used. Under such conditions, heating equipment should be used to ensure adequate fumigant activity. Appendix 1 provides boiling point temperatures for some common fumigants.	P	**Singapore** To add in ambient temperature to be consistent with paragraph 121. *Category : SUBSTANTIVE*
6.5 Gas tightness test				
365	117	~~6~~5.5 **Gas tightness test**	P	**Japan** *Category : EDITORIAL*
366	117	~~6~~5.5 **Gas tightness test**	P	**APPPC** 57) New Zealand (5 Sep 2018 2:10 AM) *Category : EDITORIAL*
367	118	The required gas tightness of an enclosure should be based on the fumigant being used. Before fumigation (preferably immediately before), a gas tightness test should be performed. However, if the enclosure is of sufficiently resistant construction and in regular use, the testing may only be necessary at intervals of, for example, 6 or 12 months, or after a number of ~~treatments~~ treatments, as specified by the NPPO.	P	**European Union** A comma added for a better understanding. *Category : EDITORIAL*
368	118	The required gas tightness of an enclosure should be based on the fumigant being used. Before fumigation (preferably immediately before), a gas tightness test should be performed. However, if the enclosure is of sufficiently resistant construction and in regular use, the testing may only be necessary at intervals of, for example, 6 or 12 months, or after a number of ~~treatments~~ treatments, as specified by the NPPO.	P	**EPPO** A comma added for a better understanding. *Category : EDITORIAL*
369	118	~~The required gas tightness of an enclosure~~ Fumigation encloser should be ~~based on the fumigant being used. Before fumigation (preferably immediately before), a~~ checked prior to use to ensure gas ~~tightness test~~ tightness.~~should be performed. However, if the enclosure is of sufficiently resistant construction and in regular use, the testing may only be necessary at intervals of, for example, 6 or 12 months, or after a number of treatments as specified by the NPPO.~~	P	**APPPC** this section should be generic for all fumigation enclosers, includig chambers and covers. the wording is too specific to some encloser types but not all. providing alternative wordings. *Category : SUBSTANTIVE*

370	118	The required gas tightness of ~~an enclosure~~ a chamber should be based on the fumigant being used. Before fumigation (preferably immediately before), a gas tightness test should be ~~performed~~performed on a chamber. However, if the ~~enclosure~~ chamber is of sufficiently resistant construction and in regular use, the testing may only be necessary at intervals of, for example, 6 or 12 months, or after a number of treatments as specified by the NPPO.	P	**United States of America** There is no gas tightness of the tarp fumigation. *Category : TECHNICAL*
371	119	~~Where the gas tightness of an enclosure may not be sufficient to ensure that adequate gas concentrations are maintained throughout the fumigation period, the gas tightness should be determined by measuring the half pressure decreasing time.~~	P	**APPPC** deleting as suggested above. *Category : SUBSTANTIVE*
372	119	Where the gas tightness of ~~an enclosure~~ a chamber may not be sufficient to ensure that adequate gas concentrations are maintained throughout the fumigation period, ~~the gas tightness should be determined by measuring the half pressure decreasing time.~~ the gas tightness should be determined by measuring the half pressure decreasing time.	P	**United States of America** this sentence needs clarification. *Category : TECHNICAL*
6.6 Introduction of the fumigant				
373	120	**6.6 Introduction of the fumigant**	C	**Jamaica** A fumigation schedule or reference should added in this paragraph. *Category : SUBSTANTIVE*
374	120	**~~6~~5.6 Introduction of the fumigant**	P	**Japan** *Category : EDITORIAL*
375	120	**~~6~~5.6 Introduction of the fumigant**Apply	P	**APPPC** (58) New Zealand (5 Sep 2018 2:10 AM) *Category : EDITORIAL*
376	121	The minimum ambient temperature that the enclosure or commodity (whichever is less) is expected to experience over the duration of the treatment should be used when determining the dosage.	C	**APPPC** (60) New Zealand (5 Sep 2018 2:14 AM) Same comment as per 5.2.7. The wording of this requirement would mean that wherever product temperature is specified the fumigators would also have to measure the temperature in the enclosure. Most fumigation specifications state either minimum product temperature or minimum ambient temperature. They don't usually specify both. To require measurement of both would add time and cost to most fumigation *Category : TECHNICAL*
377	121	The minimum ~~ambient~~ temperature that the ~~enclosure or~~ commodity ~~(whichever~~ is ~~less) is~~ expected to experience over the duration of the treatment should be used when determining the dosage.	P	**United States of America** Typically only commodity temperature is used *Category : TECHNICAL*

378	123	~~Sufficient~~ A sufficient amount of fumigant should be ~~applied~~ introduced into the enclosure to ensure that the required minimum concentration, as stated in the treatment schedule, is achieved. The amount of fumigant may be calculated with an appropriate formula: for examples, see Appendix 2.	P	**European Union** More precise wording. *Category : EDITORIAL*
379	123	Sufficient fumigant should be applied to ensure that the required minimum concentration, as stated in the treatment schedule, is achieved. The required amount of fumigant ~~may~~ should be calculated with an appropriate formula: for examples, see Appendix 2.	P	**European Union** This is a critical requirement. *Category : SUBSTANTIVE*
380	123	~~Sufficient~~ A sufficient amount of fumigant should be ~~applied~~ introduced in the enclosure to ensure that the required minimum concentration, as stated in the treatment schedule, is achieved. The required amount of fumigant ~~may~~ should be calculated with an appropriate formula: for examples, see Appendix 2.	P	**EPPO** This a critical requirement More precise wording. *Category : EDITORIAL*
381	124	The volume of the enclosure is the internal volume and should be calculated separately for each differently shaped enclosure (see Appendix 3 for examples of shapes and formulae for calculations). ~~The volume of containers (e~~The volume of containers (e.g. drums or boxes) within the enclosure that are airtight and non-absorbent to the fumigant can be subtracted from the enclosure volume.~~g. drums or boxes) within the enclosure that are airtight and non-absorbent to the fumigant can be subtracted from the enclosure volume.~~	P	**United States of America** Only when the containers are closed tight and no gas could penetrate into the containers can the volume of the containers be subtracted from the enclosure volume. However, this practice is not universally accepted and this sentence should be removed. *Category : TECHNICAL*
382	125	Under cool conditions, if it is required that the fumigant is introduced into the enclosure in a gaseous state, the liquid fumigant may be applied through a ~~vaporizer~~vaporizer (see Section 5.2.2). However, some fumigants such as phosphine are introduced as solids that then react with moisture and oxygen to turn into a gaseous ~~state~~state (see Section 5.2.1).	P	**European Union** Otherwise delete this rather redundant paragraph ensuring that all the relevant information is included in Sections 5.2.1 and 5.2.2. *Category : EDITORIAL*
383	125	Under cool conditions, if it is required that the fumigant is introduced into the enclosure in a gaseous state, the liquid fumigant may be applied through a ~~vaporizer~~vaporizer (see Section 5.2.2). However, some fumigants such as phosphine are introduced as solids that then react with moisture and oxygen to turn into a gaseous ~~state~~state (see Section 5.2.1).	P	**EPPO** Otherwise delete this rather redundant paragraph ensuring that all the relevant information is included in Sections 5.2.1 and 5.2.2. *Category : EDITORIAL*
384	125	Under cool conditions, if it is required that the fumigant is introduced into the enclosure in a gaseous state, the liquid fumigant may be applied through a vaporizer. However, some fumigants such as phosphine ~~are~~ can be introduced as solids that then react with moisture and oxygen to turn into a gaseous state.	P	**United States of America** More and more phosphine treatments use gaseous phosphine now, such as ECO2FUME (a ready to use, non-flammable mixture of phosphine & CO2) and VAPORPH3OS (pure phosphine gas to be blended with air or CO2). *Category : TECHNICAL*
385	125	Under cool conditions, if it is required that the fumigant is introduced into the enclosure in a gaseous state, the liquid fumigant may be applied through a vaporizer. However, some fumigants such as phosphine are introduced as solids that then react with moisture and oxygen to turn into a gaseous state~~.~~. In this case,	P	**Colombia** Se sugiere incluir en el párrafo la frase "En este caso, se puede usar un dispositivo especial para la desgasificación del fumigante (por ejemplo: la caja para desgasificación rápida)"

		it can use a special divace in order to desgacification of the fumigant (For example: The speed Box)		Es importante mencionar que existen dispositivos especiales que se pueden usar para optimizar la sublimación ó desgasificación del fumigante en presentación solida *Category : TECHNICAL*
6.7 Measuring and recording				
386	126	~~6~~5.7 **Measuring and recording**	P	**Japan** *Category : EDITORIAL*
387	126	~~6~~5.7 **Measuring and recording**	P	**APPPC** (59) New Zealand (5 Sep 2018 2:12 AM) *Category : EDITORIAL*
388	126	**6.7 Measuring and recording**	C	**Ecuador** La medición y el registro de concentraciones no debe ser condicionado sino exigido. *Category : TECHNICAL*
389	127	When fumigant concentration is measured and recorded, the measurements should be used to verify whether the concentration of fumigant in the enclosure is correct and that there has been no excessive leakage or sorption of the fumigant~~. The fumigation time begins once all the gas has been introduced and has distributed throughout the enclosure. Concentration readings should be taken according to the treatment schedule to ensure that the fumigant is evenly distributed in the enclosure over the duration of the treatment~~. Fumigant concentration should be continuously measured and recorded in sufficient frequency to provide confidence that the required dose has been achieved and maintained and to allow adequate calculations of the concentration–time product (CT) to be made (if required).	P	**Viet Nam** The second sentence does not cover all types of fumigation. For example, regarding phosphine fumigation, tablets as well as liquefied gas are often used. Tablets are directly introduced into grains stored in facilities and transport media. Because it takes days to vaporize tablets into gas, this case is not applied to "The fumigation time begins once all the gas has been introduced" The third sentence should be deleted because concentration reading aims to check acieving the required dose. the purpose of the sentence is already covered in the 4th sentence of paragraph 127 which describes measuring the concentration of fumigant in the enclosure. *Category : TECHNICAL*
390	127	When fumigant concentration is measured and recorded, the measurements should be used to verify whether the concentration of fumigant in the enclosure is correct and that there has been no excessive leakage or sorption of the fumigant. The fumigation time begins once all the gas has been introduced and has distributed throughout the enclosure. Concentration readings should be taken according to the treatment schedule to ensure that the fumigant is evenly distributed in the enclosure over the duration of the treatment. Fumigant concentration should be continuously measured and recorded in sufficient frequency to provide confidence that the required dose has been achieved and maintained and to allow adequate calculations of the concentration–time product (CT) to be made (if required). The minimum measurements are at the start and finish.	P	**Viet Nam** Re. "Fumigant concentration should be continuously measured and recorded in sufficient frequency to provide confidence that the required dose has been achieved and maintained and to allow adequate calculations of the concentration–time product (CT) to be made (if required)." Under the International Cargo Cooperative Biosecurity Arrangement (ICCBA) methodology section 7.2 that NZ works to, concentration reading are required for the start and end of the fumigation. Any additional readings required to be taken would increase the cost of the fumigation (additional time to do multiple readings). Recommend start and end readings as a minimum and additional readings as best practice. *Category : TECHNICAL*
391	127	When fumigant concentration is measured and recorded, the measurements should be used to verify whether the concentration of fumigant in the enclosure is correct	P	**Japan** The second sentence does not cover all types of fumigation. For example, regarding phosphine fumigation, tablets as well as

		and that there has been no excessive leakage or sorption of the fumigant~~. The fumigation time begins once all the gas has been introduced and has distributed throughout the enclosure. Concentration readings should be taken according to the treatment schedule to ensure that the fumigant is evenly distributed in the enclosure over the duration of the treatment~~. Fumigant concentration should be continuously measured and recorded in sufficient frequency to provide confidence that the required dose has been achieved and maintained and to allow adequate calculations of the concentration–time product (CT) to be made (if required). Concentration readings should also be taken according to the treatment schedule to ensure that the fumigant is evenly distributed in the enclosure over the duration of the treatment.		liquefied gas are often used. Tablets are directly introduced into grains stored in facilities and transport media. Because it takes days to vaporize tablets into gas, this case is not applied to "The fumigation time begins once all the gas has been introduced" The third sentence should be moved to the last sentence and add "also" in the sentence. The most important object of concentration reading is to check if the required dose is achieved. To ensure that the fumigant is evenly distributed is the subsequent object. *Category : TECHNICAL*
392	127	When fumigant concentration is measured and recorded, the measurements should be used to verify whether the concentration of fumigant in the enclosure is correct and that there has been no excessive leakage or sorption of the fumigant~~. The fumigation time begins once all the gas has been introduced and has distributed throughout the enclosure. Concentration readings should be taken according to the treatment schedule to ensure that the fumigant is evenly distributed in the enclosure over the duration of the treatment~~. Fumigant concentration should be continuously measured and recorded in sufficient frequency to provide confidence that the required dose has been achieved and maintained and to allow adequate calculations of the concentration–time product (CT) to be made (if required).	P	**Korea, Republic of** The second sentence does not cover all types of fumigation. For example, regarding phosphine fumigation, tablets as well as liquefied gas are often used. Tablets are directly introduced into grains stored in facilities and transport media. Because it takes days to vaporize tablets into gas, this case is not applied to "The fumigation time begins once all the gas has been introduced" The third sentence should be deleted because concentration reading aims to check acieving the required dose. the purpose of the sentence is already covered in the 4th sentence of paragraph 127 which describes measuring the concentration of fumigant in the enclosure. *Category : TECHNICAL*
393	127	When fumigant concentration is measured and recorded, the measurements should be used to verify whether the concentration of fumigant in the enclosure is correct and that there has been no excessive leakage or sorption of the fumigant. The fumigation time begins once all the gas has been introduced and has distributed throughout the enclosure. Concentration readings should be taken according to the treatment schedule to ensure that the fumigant is evenly distributed in the enclosure over the duration of the treatment. Fumigant concentration should be ~~continuously~~ measured and recorded in sufficient frequency to provide confidence that the required dose has been achieved and maintained and to allow adequate calculations of the concentration–time product (CT) to be made (if required).	P	**European Union** Continuous measuring is not always required, as for example when using phosphine in fumigation the concentration of fumigant is not measured over time. *Category : SUBSTANTIVE*
394	127	When fumigant concentration is measured and recorded, the measurements should be used to verify whether the concentration of fumigant in the enclosure is correct and that there has been no excessive leakage or sorption of the fumigant. The fumigation time begins once all the gas has been introduced and has distributed throughout the enclosure. Concentration readings should be taken according to the treatment schedule to ensure that the fumigant is evenly distributed in the enclosure over the duration of the treatment. Fumigant concentration should be ~~continuously~~	P	**EPPO** Continuous measuring is not always required, as for example when using phosphine in fumigation the concentration of fumigant is not measured over time. *Category : SUBSTANTIVE*

		measured and recorded in sufficient frequency to provide confidence that the required dose has been achieved and maintained and to allow adequate calculations of the concentration–time product (CT) to be made (if required).		
395	127	When fumigant concentration is measured and recorded, the measurements should be used to verify whether the concentration of fumigant in the enclosure is correct and that there has been no excessive leakage or sorption of the fumigant. The fumigation time begins once all the gas has been introduced and has distributed throughout the enclosure. Concentration readings should be taken according to the treatment schedule to ensure that the fumigant is evenly distributed in the enclosure over the duration of the treatment. Fumigant concentration should be continuously measured and recorded in sufficient frequency to provide confidence that the required dose has been achieved and maintained and to allow adequate calculations of the concentration–time product (CT) to be made (if required). The minimum measurements are at the start and finish of the fumigation.	P	**APPPC** 92) New Zealand (5 Sep 2018 3:24 AM) *Category : TECHNICAL*
396	127	When fumigant concentration is measured and recorded, the measurements should be used to verify whether the concentration of fumigant in the enclosure is correct and that there has been no excessive leakage or sorption of the fumigant. The fumigation time begins once all the gas has been introduced and has distributed throughout the enclosure. Concentration readings should be taken according to the treatment schedule to ensure that the fumigant is evenly distributed in the enclosure over the duration of the treatment. Fumigant concentration should be ~~continuously~~ measured and recorded in sufficient frequency to provide confidence that the required dose has been achieved and maintained and to allow adequate calculations of the concentration–time product (CT) to be made (if required).	P	**APPPC** *Category : TECHNICAL*
397	127	When fumigant concentration is measured and recorded, the measurements should be used to verify whether the concentration of fumigant in the enclosure is correct and that there has been no excessive leakage or sorption of the fumigant. The fumigation time begins once all the gas has been introduced and has distributed throughout the enclosure. Concentration readings should be taken according to the treatment schedule to ensure that the fumigant is evenly distributed in the enclosure over the duration of the treatment. Fumigant concentration should be continuously measured and recorded in sufficient frequency to provide confidence that the required dose has been achieved and maintained and to allow adequate calculations of the concentration–time product (CT) to be made (if required).	C	**APPPC** (101) New Zealand (7 Sep 2018 8:18 AM) Re. "Fumigant concentration should be continuously measured and recorded in sufficient frequency to provide confidence that the required dose has been achieved and maintained and to allow adequate calculations of the concentration–time product (CT) to be made (if required)." Under the International Cargo Cooperative Biosecurity Arrangement (ICCBA) methodology section 7.2 that NZ works to, concentration reading are required for the start and end of the fumigation. Any additional readings required to be taken would increase the cost of the fumigation (additional time to do multiple readings). Recommend start and end readings as a minimum and additional readings as best practice. *Category : SUBSTANTIVE*

398	127	When fumigant concentration is measured and recorded, the measurements should be used to verify whether the concentration of fumigant in the enclosure is correct and that there has been no excessive leakage or sorption of the fumigant. ~~The fumigation time begins once all the gas has been introduced and has distributed throughout the enclosure. Concentration readings should be taken according to the treatment schedule to ensure that the fumigant is evenly distributed in the enclosure over the duration of the treatment.~~ Fumigant concentration should be continuously measured and recorded in sufficient frequency to provide confidence that the required dose has been achieved and maintained and to allow adequate calculations of the concentration–time product (CT) to be made (if required).	P	**APPPC** (115) Japan (8 Sep 2018 4:18 AM) The second sentence does not cover all types of fumigation. For example, regarding phosphine fumigation, tablets as well as liquefied gas are often used. Tablets are directly introduced into grains stored in facilities and transport media. Because it takes days to vaporize tablets into gas, this case is not applied to "The fumigation time begins once all the gas has been introduced" The third sentence should be deleted because concentration reading aims to check acieving the required dose. the purpose of the sentence is already covered in the 4th sentence of paragraph 127 which describes measuring the concentration of fumigant in the enclosure. *Category : TECHNICAL*
399	127	When fumigant concentration is measured and recorded, the measurements should be used to verify whether the concentration of fumigant in the enclosure is correct and that there has been no excessive leakage or sorption of the fumigant. The fumigation time begins once all the gas has been introduced and has distributed throughout the enclosure. Concentration readings should be taken according to the treatment schedule to ensure that the fumigant is evenly distributed in the enclosure over the duration of the treatment. Fumigant concentration should be continuously measured and recorded in sufficient frequency to provide confidence that the required dose has been achieved and maintained and to allow adequate calculations of the concentration–time product (CT) to be made (if required). The minimum measurements are at the start and finish.	P	**APPPC** (142) APPPC (12 Sep 2018 3:06 AM) Re. "Fumigant concentration should be continuously measured and recorded in sufficient frequency to provide confidence that the required dose has been achieved and maintained and to allow adequate calculations of the concentration–time product (CT) to be made (if required)." Under the International Cargo Cooperative Biosecurity Arrangement (ICCBA) methodology section 7.2 that NZ works to, concentration reading are required for the start and end of the fumigation. Any additional readings required to be taken would increase the cost of the fumigation (additional time to do multiple readings). Recommend start and end readings as a minimum and additional readings as best practice. *Category : TECHNICAL*
6.7.1 Measuring and recording the fumigant concentration				
400	128	**6.7.1 Measuring and recording the fumigant concentration**	C	**Jamaica** Recommending that this section is merged with 5.2.8 *Category : SUBSTANTIVE*
401	128	**~~6~~5.7.1 Measuring and recording the fumigant concentration**	P	**Japan** *Category : EDITORIAL*
402	128	**~~6~~5.7.1 Measuring and recording the fumigant concentration**	P	**APPPC** (61) New Zealand (5 Sep 2018 2:15 AM) *Category : EDITORIAL*
403	129	Sampling lines should be positioned in the places that are expected to be the most difficult for the fumigant to reach. The number of sampling lines required to adequately measure the fumigant concentration throughout the enclosure depends on the volume and nature of the enclosure. Purpose-built fumigation chambers may require fewer sampling lines than tent enclosures.	C	**Sri Lanka** It will be better to add a technical drawing as an annexure guiding the points of placement of fumigant monitoring. *Category : TECHNICAL*

404	129	~~Sampling~~ Where possible, sampling lines should be positioned in the places that are expected to be the most difficult for the fumigant to reach. The number of sampling lines required to adequately measure the fumigant concentration throughout the enclosure depends on the volume and nature of the enclosure. Purpose-built fumigation chambers may require fewer sampling lines than tent enclosures.	P	**APPPC** *Category : SUBSTANTIVE*
405	129	Sampling lines should be positioned in the places that are expected to be the most difficult for the fumigant to reach. The number of sampling lines required to adequately measure the fumigant concentration throughout the enclosure depends on the volume and nature of the enclosure. Purpose-built fumigation chambers may require fewer sampling lines than tent enclosures.	C	**APPPC** (102) New Zealand (7 Sep 2018 8:23 AM) Re. "Sampling lines should be positioned in the places that are expected to be the most difficult for the fumigant to reach." There is a practical component in that sample tubes may be difficult to insert into some commodities i.e types must be able to measure gas. Log fumigation with PH3 in the ship hold is an example. *Category : TECHNICAL*
406	129	Sampling lines should be positioned in the places that are expected to be the most difficult for the fumigant to reach. The number of sampling lines required to adequately measure the fumigant concentration throughout the enclosure depends on the volume and nature of the enclosure. Purpose-built fumigation chambers may require fewer sampling lines than ~~tent~~ tarpaulin enclosures.	P	**United States of America** For consistency with the previous suggestions. *Category : TECHNICAL*
6.7.2 CT calculation				
407	131	**6.7.2 CT calculation**	C	**Jamaica** Add a section to address Gas and Time adjustments Add gas to the enclosure, if interval concentration reading indicate that they are below the minimum concentration indicated by the fumigation schedule. Extend or reduce time in the event the reading is low or high respectively. *Category : SUBSTANTIVE*
408	131	**6.7.2 CT calculation**	C	**APPPC** Explain what CT stands for please *Category : TECHNICAL*
409	131	**~~6~~5.7.2 CT calculation**	P	**Japan** *Category : EDITORIAL*
410	131	**6.7.2 CT calculation**	C	**United States of America** Spell out CT in the title of this section to avoid confusions (e.g., with Cold Treatments) *Category : EDITORIAL*
411	132	The CT can be calculated in different ways (Appendix 4). The CT values obtained from a contiguous series of readings can be ~~added together~~ used to calculate the cumulative CT for the whole exposure period for that location, taking into account	P	**European Union** Readings cannot just be added to calculate the cumulative CT, it depends on the time interval between the readings. This has to be clear otherwise it can lead to confusion, e.g. treatment for an hour

		the interval in between the readings. The number of contiguous measurements required to obtain a suitable estimate of the CT depends on the shape of the dose curve over the duration of the treatment.		with readings every second or every 5 minutes (all readings being 10 g/cubic meter), would by adding up lead to a cumulative CT of 3600 x 10 g second/cubic meter and 12 x 10 g /cubic meter, respectively (the last calculation should be multiplied by 300, the interval between the readings). *Category : TECHNICAL*
412	132	The CT can be calculated in different ways (Appendix 4). The CT values obtained from a contiguous series of readings can be ~~added together~~ used to calculate the cumulative CT for the whole exposure period for that location, taking into account the interval in between the readings. The number of contiguous measurements required to obtain a suitable estimate of the CT depends on the shape of the dose curve over the duration of the treatment.	P	**EPPO** Readings cannot just be added to calculate the cumulative CT, it depends on the time interval between the readings. This has to be clear otherwise it can lead to confusion, e.g. treatement for an hour with readings every second or every 5 minutes (all readings being 10 g/cubic meter), would by adding up lead to a cumulative CT of 3600 x 10 g second/cubic meter and 12 x 10 g /cubic meter, respectively (the last calculation should be multiplied by 300, the interval between the readings) *Category : TECHNICAL*
413	132	The CT can be calculated in different ways (Appendix 4). The CT values obtained from a contiguous series of readings can be added together to calculate the cumulative CT for the whole exposure period for that location. The number of contiguous measurements required to obtain a suitable estimate of the CT depends on the shape of the dose curve over the duration of the treatment.	C	**APPPC** (2) Nepal (19 Jul 2018 5:02 AM) concentration-time or concentration-time product? *Category : SUBSTANTIVE*
414	133	If the sampling lines provide different readings of the fumigant concentration, the cumulative CT should be calculated using the lowest readings.	C	**China** It is necessary to consider the disposal measures when the fumigation can not meet the technical requirements.It is suggested to add the following sentence at the end of this paragraph: "If the CT products is below the requirement, expended the exposure time, or introduce fumigant (supplementary dosage) or re-fumigation. *Category : SUBSTANTIVE*
415	133	If the sampling lines provide different readings of the fumigant concentration, the cumulative CT should be calculated using the lowest readings. If the CT products is below the requirement, expended the exposure time, or introduce fumigant (supplementary dosage) or re-fumigation.	P	**APPPC** 16) China (3 Sep 2018 10:39 AM) It is necessary to consider the disposal measures when the fumigation can not meet the technical requirements. *Category : SUBSTANTIVE*
6.8 Completion of the fumigation				
416	134	~~6~~5.8 **Completion of the fumigation**	P	**Japan** *Category : EDITORIAL*
417	134	~~6~~5.8 **Completion of the fumigation**	P	**APPPC** (64) New Zealand (5 Sep 2018 2:17 AM) *Category : EDITORIAL*
418	135	Once the treatment time has been completed and the required CT, temperature and minimum concentration have been achieved, the fumigation should be considered as completed. In circumstances where a minimum CT product is not initially achieved, a small extension to the fumigation period or re-insertion of adequate	P	**Sri Lanka** CT could ve adjusted by addition of Fumigant in to the enclosure. However, keeping longer time seems not effective as there is no required concentration of the chemical at that point of time *Category : TECHNICAL*

		amount of fumigant to achieve minimum CT may be permitted for some fumigant types and fumigation conditions.		
419	135	Once the treatment time has been completed and the required CT, temperature and minimum concentration have been achieved, the fumigation should be considered as completed. In circumstances where a minimum CT product is not initially achieved, a small extension to the fumigation period may be permitted for some fumigant types and fumigation conditions.	C	**Jamaica** a small extension to the fumigation period may be permitted for some fumigant types and fumigation conditions. Should the standard give guidance as it relates to this extension. Eg Extend by 15 mins if reading is X or reduce time if reading is Y. *Category : SUBSTANTIVE*
420	135	Once the treatment time has been completed and the required CT, temperature and minimum concentration have been achieved, the fumigation should be considered as completed. In circumstances where a minimum CT product is not initially achieved, a small extension to the fumigation period may be permitted for some fumigant types and fumigation conditions. Addition fumigant may be added during this period.	P	**APPPC** *Category : TECHNICAL*
421	135	Once the treatment time has been completed and ~~the required CT,~~ temperature and the required CT or minimum concentration have been achieved, the fumigation should be considered as completed. In circumstances where a minimum CT ~~product~~ or concentration is not initially achieved, a small extension to the fumigation period may be permitted for some fumigant types and fumigation conditions.	P	**Japan** Not all parameters are needed to confirm the completion of fumigation. But the temperature and the required CT or the temperature and minimum concentration is needed to be checked. Concentration at completion time of fumigation, decided by considering sorption, can be used for confirming the completion of fumigation as well as minimum CT. *Category : TECHNICAL*
422	135	Once the treatment time has been completed and the required CT, temperature and minimum concentration have been achieved, the fumigation should be considered as completed. In circumstances where a minimum CT product is not initially achieved, a small extension to the fumigation period may be permitted for some fumigant types and fumigation conditions, including adding extra fumigant.~~.~~	P	**APPPC** (94) New Zealand (5 Sep 2018 3:27 AM) *Category : TECHNICAL*
423	135	Once the treatment time has been completed and temperature and the required ~~CT, temperature and~~ CT or minimum concentration have been achieved, the fumigation should be considered as completed. In circumstances where a minimum CT ~~product~~ or concentration is not initially achieved, a small extension to the fumigation period may be permitted for some fumigant types and fumigation conditions.	P	**APPPC** (123) Japan (9 Sep 2018 9:47 AM) Not all parameters are needed to confirm the completion of fumigation. But the temperature and the required CT or the temperature and minimum concentration is needed to be checked. Concentration at completion time of fumigation, decided by considering sorption, can be used for confirming the completion of fumigation as well as minimum CT. *Category : TECHNICAL*
424	135	Once the treatment time has been completed and the required CT, temperature and minimum concentration have been achieved, the fumigation should be considered as completed. After aeration has been conducted and meets the requirements of the NPPO for release, the commodity can be released. In circumstances where a	P	**United States of America** part of the fumigation requirements *Category : TECHNICAL*

		minimum CT product is not initially achieved, a small extension to the fumigation period may be permitted for some fumigant types and fumigation conditions.		
425	136	Indications of fumigation success can be obtained by inspection or testing to verify target pest mortality. For many fumigations, an extended post-fumigation period may be required before full pest mortality is achieved.	C	**Sri Lanka** Sometimes the pest may be semi-live at the end of the fumigation, and after a small period of time from the end of fumigation, the pest may be killed. In such situations, keeping the consignment for additional duration without applying the fumigant will be important. Because additional applications of fumigant may damage the quality of the product *Category : TECHNICAL*
426	136	Indications of fumigation success can be obtained by inspection or testing to verify target pest mortality. For many fumigations, an extended post-fumigation period may be required before full pest mortality is achieved. 6.9 Aeration after Fumigation or Post Fumigation Operations When fumigation is completed, the fumigant must be completely dissipated by aeration before allowing access to anyone. Appropriate respiratory equipment must be worn to aerate bulk items that have been covered with a tarpaulin during fumigation. If fumigation has been made inside an enclosure, doors and windows should be opened or to use fans to exhaust the fumigant. The air being exhausted from the enclosure must be directed away from work areas, sensitive plants and neighbouring property. Fans should be installed during tarring and before fumigant is applied. The fumigant level should be checked to be within acceptable threshold limits before it is safe to allow re-entry without protective equipment.	P	**China** There should be a specific mention of the need for post fumigation operations I.e.aeration or ventilation of the treated space or commodities on completion of the fumigation treatment as required to Ensure safe thresholds have been reached before personnel can enter without PPE or to protect workers from unintentional exposure during opening of received imported containers. The current section 6.8 may give a false impression that fumigation is completed once all required parameters have been achieved without consideration of acceptable threshold limits for the fumigant. *Category : SUBSTANTIVE*
427	136	Indications of fumigation success can be obtained by inspection or testing to verify target pest mortality. For many fumigations, an extended post-fumigation period may be required before full pest mortality is achieved. **6.9 Aeration After Fumigation or Post Fumigation operations** When fumigation is completed, the fumigant must be completely dissipated by aeration before allowing access to anyone. Appropriate respiratory equipment must be worn to aerate bulk items that have bee covered with a tarpaulin. If the fumigation was made inside an enclosure, open doors and windows and use fans to exhaust the fumigant. The air being exhausted from the enclosure must be directed away from work areas, sensitive plants and neighbouring property. Fans should be installed during tarping and before the fmigant is applied. Check teh fumigant level to determine the elve at which it is safe to allow re-entry without protective equipment i.e. acceptable threshold limits.	P	**Singapore** There should be a specific mention of the need for post fumigation operations i.e. aeration or ventilation of the treated space & commodities on completion of the fumigation treatment as required to ensure safe thresholds before personnel can enter without PPE. For MB, the acceptable threshold limit is 5ppm and for any level above this, PPE is expected for worker's safety. The current section 6.8 may give a false impression that fumigation is completed once all required parameters have been achieved without consideration of acceptabel threshold limit for the fumigant. *Category : SUBSTANTIVE*

428	136	Indications of fumigation success can be obtained by inspection or testing to verify target pest mortality. For many fumigations, an extended post-fumigation period may be required before ~~full~~ pest mortality at the stated efficacy is achieved.	P	**Argentina** For consistency with the fumigation objetive *Category : TECHNICAL*
429	136	Indications of fumigation success can be obtained by inspection or testing to verify target pest mortality. For many fumigations, an extended post-fumigation period may be required before ~~full~~ pest mortality at the stated efficacy is achieved.	P	**Uruguay** For consistency with fumigation objective *Category : TECHNICAL*
430	136	Indications of fumigation success can be obtained by inspection or testing to verify target pest mortality. For many fumigations, an extended post-fumigation period may be required before full pest mortality is achieved. **6.9 Application of Fumigation** Application of fumigation requires appropriately trained operators, a pre-prepared fumigation place, required equipments and fumigants.	P	**Nepal** *Category : SUBSTANTIVE*
431	136	Indications of fumigation success can be obtained by inspection or testing to verify target pest mortality. For many fumigations, an extended post-fumigation period may be required before ~~full~~ pest mortality at the stated efficacy is achieved.	P	**COSAVE** For consistency with the fumigation objetive. *Category : TECHNICAL*
7. Adequate Systems for Treatment Facilities				
432	137	**~~7~~6. Adequate Systems for Treatment Facilities**	P	**Japan** *Category : EDITORIAL*
433	137	**~~7~~6. Adequate Systems for Treatment Facilities**	P	**APPPC** (65) New Zealand (5 Sep 2018 2:18 AM) *Category : EDITORIAL*
434	137	**7. Adequate Systems for Treatment ~~Facilities~~Facilities and Locations**	P	**United States of America** Carefully chosen locations for fumigation are important part of safety and environmental protection. *Category : TECHNICAL*
435	139	~~The NPPO of the country in which the treatments are conducted or initiated is responsible for ensuring that the system requirements are met.~~ The NPPO of the country in which the treatments are conducted or initiated (the latter when fumigation takes place during transport) through its phytosanitary certification ensures that the system requirements are met.	P	**Canada** In Canada, the NPPO does not always authorize treatment entities or supervise the treatment entity though an authorized entity. Treatment entities, like carbon dioxide applicators or fumigation applicators are licensed by other government departments, which have specific legislation and requirements. However, when the outcome of a treatment entity's activity is used by the NPPO for phytosanitary certification, it ensures that the system requirements are met. The sentence as worded currently brings on direct responsibility to the NPPO with regards to system requirements. *Category : SUBSTANTIVE*
7.1 Authorization of entities				
436	140	**7.1 Authorization of ~~entities~~treatment providers**	P	**European Union** The TPG reviewed first consultation comments for consistency in the use of terms and noted that a treatment provider is a person

				or organization applying the treatment operating in a physical construction (i.e. the treatment facility). Because "entity" could refer to the facility, the provider, or both, the TPG supported using "treatment provider" and "treatment facility" instead of "entity" when it was clear that the references in the draft ISPM were made to either the provider or the facility. They felt such an approach would be clearer, although they acknowledged it was not consistent with the draft ISPM on "Requirements for the use of temperature treatments as phytosanitary measures". According to Appendix 4 (General recommendations on use of terms in ISPMs) of the IPPC style guide for standards and meeting documents, in ISPMs and other IPPC documents it is recommended the term "authorize" to be used "to give authority to a person or a body to do something". It is therefore suggested to replace "entities" with "treatment providers" which is a term already used in this draft standard (e.g. see paragraph 56) and used many times in ISPM 15 (Regulation of wood packaging material in international trade). *Category : TECHNICAL*
437	140	**7.1 Authorization of ~~entities~~treatment providers**	P	**EPPO** The TPG reviewed first consultation comments for consistency in the use of terms and noted that a treatment provider is a person or organization applying the treatment operating in a physical construction (i.e. the treatment facility). Because "entity" could refer to the facility, the provider, or both, the TPG supported using "treatment provider" and "treatment facility" instead of "entity" when it was clear that the references in the draft ISPM were made to either the provider or the facility. They felt such an approach would be clearer, although they acknowledged it was not consistent with the draft ISPM on "Requirements for the use of temperature treatments as phytosanitary measures". According to Appendix 4 (General recommendations on use of terms in ISPMs) of the IPPC style guide for standards and meeting documents, in ISPMs and other IPPC documents it is recommended the term "authorize" to be used "to give authority to a person or a body to do something". It is therefore suggested to replace "entities" with "treatment providers" which is a term already used in this draft standard (e.g. see paragraph 56) and used many times in ISPM 15 (Regulation of wood packaging material in international trade). *Category : TECHNICAL*
438	140	**~~7~~6.1 Authorization of entities**	P	**Japan** *Category : EDITORIAL*

439	140	~~7~~6.1 **Authorization of entities**	P	**APPPC** (66) New Zealand (5 Sep 2018 2:20 AM) *Category : EDITORIAL*
440	141	In this standard, “entities” include both treatment providers and treatment facilities. Fumigation is applied by treatment providers in treatment facilities.	C	**Grenada** This standard is relevant in the implementation of phytosanitary measures. It will be supported and adopted by Grenada's NPPO *Category : SUBSTANTIVE*
441	141	In this standard, “entities” include both treatment providers and treatment facilities. ~~Fumigation is applied by treatment providers in treatment facilities.~~	P	**Grenada** *Category : SUBSTANTIVE*
442	141	In this standard, “entities” include both treatment providers and treatment facilities. Fumigation is applied by treatment providers in treatment facilities.	C	**Jamaica** Fumigation is applied by treatment providers in treatment facilities. Remove this sentence as it doesn't provide any guidance. *Category : SUBSTANTIVE*
443	141	~~In this standard, “entities” include both treatment providers and treatment facilities. Fumigation is applied by treatment providers in treatment facilities.~~	P	**European Union** This definition of "entity" is no more necessary (please see the comment on "entities" in the previous paragraph) and the second sentence is redundant with paragraph 56. *Category : TECHNICAL*
444	141	~~In this standard, “entities” include both treatment providers and treatment facilities. Fumigation is applied by treatment providers in treatment facilities.~~	P	**EPPO** This definition of "entity" is no more necessary (please see the comment on "entities" in the previous paragraph) and the second sentence is redundant with paragraph 56. *Category : TECHNICAL*
445	141	In this standard, “entities” include both treatment providers and treatment facilities. ~~Fumigation is applied by treatment providers in treatment facilities.~~	P	**Caribbean Agricultural Health and Food Safety Agency** We suggest to delete the second sentence, as it is not related to authorization of entities and this reference is confusing. *Category : SUBSTANTIVE*
446	142	Treatment entities should be authorized by the NPPO in the country in which the phytosanitary treatments are conducted or ~~initiated (the latter when fumigation takes place during transport)~~initiated. However, in some countries, treatment entities are not authorized by NPPOs, but licensed by other government departments or agencies. This authorization or licensing normally includes approval of both treatment facilities and treatment providers. The NPPO or, where appropriate, other government department or agency should set requirements for entity ~~authorization~~authorization or licensing, respective, including training of personnel, fumigation procedures and adequate equipment. Specific procedures appropriate for each entity and commodity treatment should also be approved by the NPPO.	P	**Canada** In Canada, the NPPO does not always authorize treatment entities or supervise the treatment entity though an authorized entity. Treatment entities, like carbon dioxide applicators or fumigation applicators are licensed by other government departments, which have specific legislation and requirements. *Category : SUBSTANTIVE*
447	142	Treatment entities should be authorized by the NPPO in the country in which the phytosanitary treatments are conducted or initiated (the latter when fumigation takes place during transport). This authorization normally includes approval of both treatment facilities and treatment providers. The NPPO should set	P	**European Union** An important aspect to be included. *Category : TECHNICAL*

		requirements for entity authorization, including training of personnel, fumigation ~~procedures and~~ procedures, adequate ~~equipment~~equipment and storage conditions. Specific procedures appropriate for each entity and commodity treatment should also be approved by the NPPO.		
448	142	Treatment ~~entities~~ providers should be authorized by the NPPO in the country in which the phytosanitary treatments are conducted or initiated (the latter when fumigation takes place during transport). This authorization normally includes approval of both treatment facilities and treatment providers. The NPPO should set requirements for ~~entity~~ treatment providors authorization, including training of personnel, fumigation procedures and adequate equipment. Specific procedures appropriate for each ~~entity~~ facility provider and commodity treatment should also be approved by the NPPO.	P	**European Union** Please see the comment on "entities" in paragraph 140. *Category : TECHNICAL*
449	142	Treatment entities should be authorized by the NPPO in the country in which the ~~phytosanitary~~ Phytosanitary treatments are conducted or initiated (the latter when fumigation takes place during transport). This authorization normally includes approval of both treatment facilities and treatment providers. The NPPO should set requirements for entity authorization, including training of personnel, fumigation procedures and adequate equipment. Specific procedures appropriate for each entity and commodity treatment should also be approved by the NPPO.	P	**Ghana** *Category : EDITORIAL*
450	142	Treatment ~~entities~~ providers should be authorized by the NPPO in the country in which the phytosanitary treatments are conducted or initiated (the latter when fumigation takes place during transport). This authorization normally includes approval of both treatment facilities and treatment providers. The NPPO should set requirements for ~~entity~~ treatment providers authorization, including training of personnel, fumigation ~~procedures and~~ procedures, adequate ~~equipment~~equipment and storage conditions. Specific procedures appropriate for each ~~entity~~ facility, provider and commodity treatment should also be approved by the NPPO.	P	**EPPO** Please see the comment on "entities" in paragraph 140. An important aspect to be included *Category : TECHNICAL*
451	142	Treatment entities should be authorized by the NPPO in the country in which the phytosanitary treatments are conducted or initiated (the latter when fumigation takes place during transport). This authorization normally includes approval of ~~both~~ treatment ~~facilities and treatment~~ providers. The NPPO should set requirements for entity authorization, including training of personnel, fumigation procedures and adequate equipment. Specific procedures appropriate for each entity and commodity treatment should also be approved by the NPPO.	P	**APPPC** *Category : SUBSTANTIVE*
452	142	Treatment entities should be authorized by the NPPO in the country in which the phytosanitary treatments are conducted or initiated (the latter when fumigation takes place during transport). This authorization normally includes approval of both treatment facilities and treatment providers. The NPPO should set	C	**APPPC** (104) New Zealand (7 Sep 2018 8:32 AM) Re. "This authorization normally includes approval of both treatment facilities and treatment providers. The NPPO should set requirements for entity authorization, including training of

		requirements for entity authorization, including training of personnel, fumigation procedures and adequate equipment. Specific procedures appropriate for each entity and commodity treatment should also be approved by the NPPO.		personnel, fumigation procedures and adequate equipment. Specific procedures appropriate for each entity and commodity treatment should also be approved by the NPPO." This could have significant implementation issues. In NZ the treatment provider may be separate from the treatment facility (e.g. seaport area set aside for fumigation and approved as a MPI approved transitional facility for fumigation). For export MB fumigation generally occurs insitu under tarpaulings for logs and this area is not an authorised area. *Category : SUBSTANTIVE*
453	143	NPPOs or, where appropriate, other government department or agency should maintain a list of authorized ~~entities~~ or licesned entities, respectively, capable of undertaking fumigation, including, where appropriate, approved facilities and approved providers.	P	**Canada** To highlight the role of other department or agency that licenses treatment entities. *Category : SUBSTANTIVE*
454	143	NPPOs should maintain a list of authorized entities capable of undertaking fumigation, including, where appropriate, approved facilities and approved providers.	C	**Sri Lanka** This section should have a concurrence to Standard on authorization of entities. The conditions given in the Authorization of entities should be applicable for Fumigation facility authorization as well *Category : SUBSTANTIVE*
455	143	NPPOs should maintain a list of authorized ~~entities~~ treatment providers capable of undertaking fumigation, including, where appropriate, approved ~~facilities and approved providers~~facilities.	P	**European Union** Please see the comment on "entities" in paragraph 140. *Category : TECHNICAL*
456	143	~~NPPOs~~ NPPO's should maintain a list of authorized entities capable of undertaking fumigation, including, where appropriate, approved facilities and approved providers.	P	**Ghana** *Category : EDITORIAL*
457	143	NPPOs should maintain a list of authorized ~~entities~~ treatment providers capable of undertaking fumigation, including, where appropriate, approved ~~facilities and approved providers~~facilities.	P	**EPPO** Please see the comment on "entities" in paragraph 140. *Category : TECHNICAL*
458	143	NPPOs should maintain a list of authorized entities capable of undertaking fumigation, including, where appropriate, approved facilities and approved providers. The NPPO should maintain an audit schedule and ensure that appropriately trained NPPO personnel perform the audit of the treatment provider/ entity	P	**Australia** clarification *Category : TECHNICAL*
459	143	NPPOs should maintain a list of authorized entities capable of undertaking fumigation, including, where appropriate, approved facilities and approved providers.	C	**Mauritius** Would suggest that the NPPO should maintain and publish (website) a list of authorized entities.... *Category : SUBSTANTIVE*

460	143	NPPOs should maintain a list of authorized entities capable of undertaking fumigation, including, where appropriate, approved facilities and approved providers.	C	**Mauritius** It is felt that this ISPM should a few diagrams and flowcharts for better illustration of the procedures *Category : EDITORIAL*
461	143	NPPOs should maintain a list of authorized entities capable of undertaking fumigation, including, where appropriate, approved facilities and approved providers.	C	**Mauritius** Would suggest that the NPPO should maintain and publish (website) a list of authorized entities.... *Category : SUBSTANTIVE*
7.2 Monitoring and auditing				
462	144	~~7~~6.2 **Monitoring and auditing**	P	**Japan** *Category : EDITORIAL*
463	144	~~7~~6.2 **Monitoring and auditing**	P	**APPPC** (67) New Zealand (5 Sep 2018 2:21 AM) *Category : EDITORIAL*
464	145	The NPPO or, where appropriate, other government department or agency of the country in which the fumigation is conducted or initiated is responsible for the monitoring and auditing of treatment entities. Continuous supervision of fumigations should not be necessary, provided treatment programmes are properly designed and can be verified to ensure a high degree of system integrity for the entity, process and commodity in question. The monitoring and auditing should be sufficient to detect and correct deficiencies promptly.	P	**Canada** To highlight the role of other department or agency that licenses treatment entities. *Category : SUBSTANTIVE*
465	145	The NPPO of the country in which the fumigation is conducted or initiated is responsible for the monitoring and auditing of treatment entities. Continuous supervision of fumigations should not be necessary, provided treatment ~~programmes~~ protocol are properly designed and can be verified to ensure a high degree of system integrity for the entity, process and commodity in question. The monitoring and auditing should be sufficient to detect and correct deficiencies promptly.	P	**Viet Nam** In conformity with other section in this draft ISPM. According to the report of SC-7 (2018), They recommended not using "treatment programme"because this may cause confusion. *Category : SUBSTANTIVE*
466	145	The NPPO of the country in which the fumigation is conducted or initiated is responsible for the monitoring and auditing of treatment entities. Continuous supervision of fumigations should not be necessary, provided treatment programmes are properly designed and can be verified to ensure a high degree of system integrity for the entity, process and commodity in question. The monitoring and auditing should be sufficient to detect and correct deficiencies promptly.	C	**Sri Lanka** The text in this section seems to be more related to entities authorized by the NPPO for performing fumigation. In that sense, it will be better to amalgamate 7. and 7.2 and making a concurrence to standard (proposed) on Authorization of entities. However, even if an entity was not authorized, each and every fumigation activity should be supervised by the NPPO and timely audits are required to evaluate the capacity of service providers to continuously provide fumigation services. *Category : TECHNICAL*
467	145	The NPPO of the country in which the fumigation is conducted or initiated is responsible for the monitoring and auditing of treatment ~~entities~~facilities and providers. Continuous supervision of fumigations should not be necessary,	P	**European Union** Please see the comment on "entities" in paragraph 140. *Category : TECHNICAL*

		provided treatment programmes are properly designed and can be verified to ensure a high degree of system integrity for the ~~entity~~facility, process and commodity in question. The monitoring and auditing should be sufficient to detect and correct deficiencies promptly.		
468	145	The NPPO of the country in which the fumigation is conducted or initiated is responsible for the monitoring and auditing of treatment entities. Continuous supervision of fumigations should not be necessary, provided treatment ~~programmes~~ procedures are properly designed and can be verified to ensure a high degree of system integrity for the entity, process and commodity in question. The monitoring and auditing should be sufficient to detect and correct deficiencies promptly.	P	**European Union** "Treatment programme" is a confusing term because it may be confused with the Glossary term "treatment schedule". It is suggested to use the term "treatment procedures" which makes it clear what is intended here (please also see the comment on "treatment protocol" in paragraph 66). *Category : TECHNICAL*
469	145	The NPPO of the country in which the fumigation is conducted or initiated is responsible for the monitoring and auditing of treatment ~~entities~~facilities and providers. Continuous supervision of fumigations should not be necessary, provided treatment ~~programmes~~ procedures are properly designed and can be verified to ensure a high degree of system integrity for the ~~entity~~facility, process and commodity in question. The monitoring and auditing should be sufficient to detect and correct deficiencies promptly.	P	**EPPO** "Treatment programme" is a confusing term because it may be confused with the Glossary term "treatment schedule". It is suggested to use the term "treatment procedures" which makes it clear what is intended here (please also see the comment on "treatment protocol" in paragraph 66). Please see the comment on "entities" in paragraph 140. *Category : TECHNICAL*
470	145	The NPPO of the country in which the fumigation is conducted or initiated is responsible for the monitoring and auditing of treatment entities. Continuous supervision of fumigations should not be necessary, provided treatment ~~programmes~~ protocol are properly designed and can be verified to ensure a high degree of system integrity for the entity, process and commodity in question. The monitoring and auditing should be sufficient to detect and correct deficiencies promptly.	P	**Japan** In conformity with other section in this draft ISPM. According to the report of SC-7 (2018), They recommended not using "treatment programme" because this may cause confusion. *Category : SUBSTANTIVE*
471	145	The NPPO of the country in which the fumigation is conducted or initiated is responsible for the monitoring and auditing of treatment entities. Continuous supervision of fumigations should not be necessary, provided treatment ~~programmes~~ protocol are properly designed and can be verified to ensure a high degree of system integrity for the entity, process and commodity in question. The monitoring and auditing should be sufficient to detect and correct deficiencies promptly.	P	**APPPC** (117) Japan (8 Sep 2018 4:35 AM) In conformity with other section in this draft ISPM. According to the report of SC-7 (2018), They recommended not using "treatment programme"because this may cause confusion. *Category : SUBSTANTIVE*
472	145	The NPPO of the country in which the fumigation is conducted or initiated is responsible for the monitoring and auditing of treatment entities. Continuous supervision of fumigations should not be necessary, provided treatment ~~programmes~~ protocols are properly designed and can be verified to ensure a high degree of system integrity for the entity, process and commodity in question. The	P	**Argentina** For consistency. *Category : TECHNICAL*

		monitoring and auditing should be sufficient to detect and correct deficiencies promptly.		
473	145	The NPPO of the country in which the fumigation is conducted or initiated is responsible for the monitoring and auditing of treatment entities. Continuous supervision of fumigations should not be necessary, provided treatment ~~programmes~~ protocols are properly designed and can be verified to ensure a high degree of system integrity for the entity, process and commodity in question. The monitoring and auditing should be sufficient to detect and correct deficiencies promptly.	P	**Uruguay** For consistency *Category : TECHNICAL*
474	145	The NPPO of the country in which the fumigation is conducted or initiated is responsible for the monitoring and auditing of treatment entities. Continuous supervision of fumigations should not be necessary, provided treatment ~~programmes~~ protocols are properly designed and can be verified to ensure a high degree of system integrity for the entity, process and commodity in question. The monitoring and auditing should be sufficient to detect and correct deficiencies promptly.	P	**COSAVE** For consistency. *Category : TECHNICAL*
475	146	Treatment entities should meet monitoring and auditing requirements set by the ~~NPPO~~NPPO or, where appropriate, other government department or agency. These requirements may include:	P	**Canada** To highlight the role of other department or agency that licenses treatment entities. *Category : SUBSTANTIVE*
476	146	Treatment ~~entities~~ providers should meet monitoring and auditing requirements set by the NPPO. These requirements may include:	P	**European Union** Please see the comment on "entities" in paragraph 140. *Category : TECHNICAL*
477	146	Treatment ~~entities~~ providers should meet monitoring and auditing requirements set by the NPPO. These requirements may include:	P	**EPPO** Please see the comment on "entities" in paragraph 140. *Category : TECHNICAL*
478	147	access for the NPPO or, where appropriate, other government department or agency for audit, including unannounced visits	P	**Canada** To highlight the role of other department or agency that licenses treatment entities. *Category : SUBSTANTIVE*
479	148	a system to maintain and archive treatment records and provide NPPOs or, where appropriate, other government department or agency with access to these	P	**Canada** To highlight the role of other department or agency that licenses treatment entities. *Category : SUBSTANTIVE*
480	148	a system to maintain and archive treatment records and provide ~~NPPOs~~ NPPO's with access to these	P	**Ghana** *Category : EDITORIAL*
481	149	corrective action to be taken in the event of ~~non-compliance~~nonconformance.	P	**Canada** If the programme requirements are not met, it is nonconformance. Non-compliance is not meeting the requirements of the importing country. *Category : SUBSTANTIVE*
7.3 Prevention of infestation after fumigation				

482	150	~~7~~6.3 **Prevention of infestation after fumigation**	P	**Japan** *Category : EDITORIAL*
483	150	~~7~~6.3 **Prevention of infestation after fumigation**	P	**APPPC** (68) New Zealand (5 Sep 2018 2:21 AM) *Category : EDITORIAL*
484	150	**7.3 Prevention of infestation and re-infestation after fumigation**	P	**United States of America** Commodity safeguarding from re-infestation by the same pest should be prevented. *Category : TECHNICAL*
485	151	The consignment owner is responsible for prevention of infestation and contamination after fumigation and may cooperate with the treatment provider on how to achieve this. Measures should be implemented ~~to prevent~~ possible infestation or contamination of the commodity after fumigation. The following measures that may be ~~required~~applied include:	P	**Viet Nam** Re. "Measures should be implemented to prevent possible infestation or contamination of the commodity after fumigation. The following measures may be required: etc. etc." this would have potential implementation issue with export of large consignments. e.g. these measures may be applicable for small consignments e.g. seeds but not logs. *Category : SUBSTANTIVE*
486	151	The consignment owner is responsible for prevention of infestation and contamination after fumigation and may cooperate with the treatment provider on how to achieve this. Measures should be implemented to ~~prevent~~ possible infestation or contamination of the commodity after fumigation. The following measures that may be ~~required:~~ applied include:	P	**Korea, Republic of** *Category : SUBSTANTIVE*
487	151	The consignment owner is responsible for prevention of infestation and contamination after fumigation and may cooperate with the treatment provider on how to achieve this. Measures should be implemented to prevent possible infestation or contamination of the commodity after fumigation. The following measures may be required:	C	**APPPC** (69) New Zealand (5 Sep 2018 2:22 AM) This requirement should not apply to fumigation of imported goods. Suggest the WG review this requirement, as it is not applicable to all commodity types. *Category : TECHNICAL*
488	151	The consignment owner is responsible for prevention of infestation and contamination after fumigation and may cooperate with the treatment provider on how to achieve this. Measures should be implemented to prevent possible infestation or contamination of the commodity after fumigation. The following measures may be required:	C	**APPPC** 105) New Zealand (7 Sep 2018 8:36 AM) Re. "Measures should be implemented to prevent possible infestation or contamination of the commodity after fumigation. The following measures may be required: etc. etc." this would have potential implementation issue with export of large consignments. e.g. these measures may be applicable for small consignments e.g. seeds but not logs. *Category : SUBSTANTIVE*
489	151	The consignment owner is responsible for prevention of infestation and contamination after fumigation and may cooperate with the treatment provider on how to achieve this. Measures should be implemented to ~~prevent~~ possible	P	**APPPC** 143) APPPC (12 Sep 2018 3:08 AM) Re. "Measures should be implemented to prevent possible infestation or contamination of the commodity after fumigation. The following measures may be required: etc. etc."

		infestation or contamination of the commodity after fumigation. The following measures that may be ~~required~~applied include:		this would have potential implementation issue with export of large consignments. e.g. these measures may be applicable for small consignments e.g. seeds but not logs (135) New Zealand (12 Sep 2018 2:07 AM) *Category : SUBSTANTIVE*
490	151	The consignment owner is responsible for prevention of infestation and contamination after fumigation and may cooperate with the treatment provider on how to achieve this. Measures should be implemented to prevent possible infestation or contamination of the commodity after fumigation. The following measures that may be ~~required~~applied:	P	**APPPC** (150) Philippines (12 Sep 2018 3:45 AM) May be applied seems to be less prescriptive. *Category : EDITORIAL*
491	151	The consignment owner is responsible for prevention of infestation and contamination after fumigation and may cooperate with the treatment provider on how to achieve this. Measures should be implemented to prevent possible infestation or contamination of the commodity after fumigation. The following measures may be required: - clean out container before treatment	P	**United States of America** Suggest adding a clean container or clean out container before treatment *Category : TECHNICAL*
492	151	The consignment owner is responsible for prevention of infestation and contamination after fumigation and may cooperate with the treatment provider on how to achieve this. Measures should be implemented to prevent possible infestation or contamination of the commodity after fumigation. The following measures that may be ~~required~~applied:	P	**Philippines** The measures may be applied but requiring it may be too prescriptive. *Category : SUBSTANTIVE*
493	151	The treatment facility should provide the necessary measures to prevent possible ~~consignment owner is responsible for prevention of~~ infestation ~~and~~ or contamination ~~after fumigation and may cooperate with~~ of the treatment ~~provider on how to achieve this. Measures should be implemented to prevent possible infestation or contamination of the~~ commodity after fumigation. The following measures may be required:	P	**Argentina** For consistency with ISPM 42. *Category : TECHNICAL*
494	151	The treatment facility should provide the necessary measures to prevent ~~consignment owner is responsible for prevention of~~ possible infestation ~~and~~ or contamination of the commodity after ~~fumigation and~~ fumigation. The following measures may ~~cooperate with the treatment~~be required: ~~provider on how to achieve this. Measures should be implemented to prevent possible infestation or contamination of the commodity after fumigation. The following measures may be required:~~	P	**Uruguay** For consistency with ISPM 42 *Category : TECHNICAL*
495	151	The treatment facility should provide the necessary measures to prevent possible ~~consignment owner is responsible for prevention of~~ infestation ~~and~~ or	P	**COSAVE** For consistency with ISPM 42. *Category : TECHNICAL*

		contamination ~~after fumigation and may cooperate with~~ of the ~~treatment~~commodity after fumigation ~~provider on how to achieve this~~. ~~Measures should be implemented to prevent possible infestation or contamination of the commodity after fumigation.~~ The following measures may be required:		
496	153	packing the commodity immediately in pest-proof ~~packing~~packaging	P	**Argentina** Glossary term should be used. *Category : TECHNICAL*
497	153	packing the commodity immediately in pest-proof ~~packing~~packaging	P	**Uruguay** Glossary term should be used *Category : TECHNICAL*
498	153	packing the commodity immediately in pest-proof ~~packing~~packaging.	P	**COSAVE** Glossary term should be used. *Category : TECHNICAL*
499	155	dispatching the commodity immediately. - to provide notification (within an agreed timeframe) to the NPPO upon a major change in management, ownership, policy/ process, site/location, non-conformity, or the outsourcing of phytosanitary activities to a third party entity.	P	**Australia** Additional point required for clarification. *Category : TECHNICAL*
500	155	dispatching the commodity immediately.	C	**APPPC** 1) Nepal (15 Jul 2018 3:26 AM) Instead of immediately word it is better to keep as soon as possible. Some time this immediately word may cause difficulty. *Category : SUBSTANTIVE*
501	155	dispatching the ~~commodity immediately~~commoditywithin a practical and realistic time frame..	P	**APPPC** (106) New Zealand (7 Sep 2018 8:40 AM) Suggest restrict the use of "immediately" in standards. In this instance, the NPPO should consider setting a realistic post fumigation period. E.g. MPI imposes a post fumigation exposure period within which logs/wood must be loaded after fumigation. *Category : TECHNICAL*
7.4 Labelling				
502	156	~~7~~6.4 **Labelling**	P	**Japan** *Category : EDITORIAL*
503	156	~~7~~6.4 **Labelling**	P	**APPPC** (70) New Zealand (5 Sep 2018 2:23 AM) *Category : EDITORIAL*
504	157	Commodities may be labelled with fumigation lot numbers or other features of identification (e.g. locations of packaging and the treatment facility, dates of packing and fumigation) allowing trace-back for non-compliant consignments. When used, labels should be easily identifiable and placed on visible locations.	C	**Jamaica** Change Commodities may to commodities should. *Category : SUBSTANTIVE*

505	157	Commodities may be labelled with fumigation lot numbers or other features of identification (e.g. locations of packaging and the treatment facility, dates of packing and fumigation) allowing trace-back for non-compliant consignments. ~~When used, labels~~ Labels should be easily identifiable and placed on visible locations.	P	**Iran** *Category : EDITORIAL*
506	157	Commodities may be labelled with fumigation lot numbers or other features of identification (e.g. locations of ~~packaging~~ packing and the treatment facility, dates of packing and fumigation) allowing trace-back for non-compliant consignments. When used, labels should be easily identifiable and placed on visible locations.	P	**Argentina** Packaging referred to the material used in supporting, protecting or carrying a commodity according to ISPM 5, and should be used in ISPM with this meaning. *Category : TECHNICAL*
507	157	Commodities may be labelled with fumigation lot numbers or other features of identification (e.g. locations of ~~packaging~~ packing and the treatment facility, dates of packing and fumigation) allowing trace-back for non-compliant consignments. When used, labels should be easily identifiable and placed on visible locations.	P	**Uruguay** Packaging is defined in ISPM 5 as the material used in supporting, protecting or carrying a commodity, therefore the term packaging should be used in ISPMs with this meaning. *Category : TECHNICAL*
508	157	Commodities may be labelled with fumigation lot numbers or other features of identification (e.g. locations of ~~packaging~~ packing and the treatment facility, dates of packing and fumigation) allowing trace-back for non-compliant consignments. When used, labels should be easily identifiable and placed on visible locations.	P	**COSAVE** Packaging referred to the material used in supporting, protecting or carrying a commodity according to ISPM 5, and should be used in ISPM with this meaning. *Category : TECHNICAL*
8. Documentation				
509	158	~~8~~7. **Documentation**	P	**Japan** *Category : EDITORIAL*
510	158	~~8~~7. **Documentation**	P	**APPPC** (71) New Zealand (5 Sep 2018 2:23 AM) *Category : EDITORIAL*
511	159	The NPPO or, where appropriate, other government department or agency/ of the country in which the fumigation is conducted or initiated is responsible for ensuring that treatment providers keep appropriate records, such as raw data on fumigant concentration and temperature recorded during treatment. Accurate record keeping is essential to allow for trace-back capability.	P	**Canada** To highlight the role of other department or agency that licenses treatment entities. *Category : SUBSTANTIVE*
512	159	The NPPO of the country in which the fumigation is conducted or initiated is responsible for ensuring that treatment providers maintain documents of procedures keep appropriate records, such as raw data on fumigant concentration and temperature recorded during treatment. Accurate record keeping is essential to allow for trace-back capability. In cases of non-compliance or new or unexpected phytosanitary situations, documentation should be made available on request as described in ISPM 13 (Guidelines for the notification of non-compliance and emergency action).	P	**Viet Nam** To include not only "record keeping" but also "documentation of procedures" in this section. To respond if non-compliace occurs *Category : SUBSTANTIVE*
513	159	The NPPO of the country in which the fumigation is conducted or initiated is responsible for ensuring that treatment providers keep appropriate records, such as	P	**European Union** More precise (see paragraph 171).

		raw data on fumigant concentration and temperature recorded during ~~treatment~~treatments. Accurate record keeping is essential to allow for trace-back capability.		*Category : EDITORIAL*
514	159	The NPPO of the country in which the fumigation is conducted or initiated is responsible for ensuring that treatment providers use approved fumigants and keep appropriate records, such as raw data on fumigant concentration and temperature recorded during treatment. Accurate record keeping is essential to allow for trace-back capability.	P	**European Union** Fumigants need to be approved as plant protection products first, then the NPPO can supervise the fumigation process. *Category : TECHNICAL*
515	159	The NPPO of the country in which the fumigation is conducted or initiated is responsible for ensuring that treatment providers use approved fumigants and keep appropriate records, such as raw data on fumigant concentration and temperature recorded during ~~treatment~~treatments. Accurate record keeping is essential to allow for trace-back capability.	P	**EPPO** Fumigants need to be approved as plant protection products first, then the NPPO can supervise the fumigation process. More precise (see paragraph 171). *Category : EDITORIAL*
516	159	The NPPO of the country in which the fumigation is conducted or initiated is responsible for ensuring that treatment providers maintain documents of procedures and keep appropriate records, such as raw data on ~~fumigant concentration and temperature~~ treatment parameters recorded during treatment. Accurate record keeping is essential to allow for trace-back capability. The NPPO is also responsible for documentation related to NPPO procedures.	P	**Japan** To include not only "record keeping" but also "documentation of procedures" in this section. Add desctiption of "documentation by the NPPO". *Category : SUBSTANTIVE*
517	159	The NPPO of the country in which the fumigation is conducted or initiated is responsible for ensuring that treatment providers maintain documents of procedures and keep appropriate records, such as raw data on ~~fumigant concentration and temperature~~ treatment parameters recorded during treatment. Accurate record keeping is essential to allow for trace-back capability. The NPPO is also responsible for documentation related to NPPO procedures.	P	**APPPC** (124) Japan (9 Sep 2018 9:58 AM) To include not only "record keeping" but also "documentation of procedures" in this section. Add desctiption of "documentation by the NPPO". *Category : SUBSTANTIVE*
518	159	The NPPO of the country in which the fumigation is conducted or initiated is responsible for ensuring that treatment providers keep appropriate records, such as raw data on fumigant concentration and temperature recorded during treatment. Accurate record keeping is essential to allow for trace-back capability. In cases of non-compliance or new or unexpected phytosanitary situations, documentation should be made available on request as described in ISPM 13 (Guidelines for the notification of non-compliance and emergency action).	P	**APPPC** (10) Nepal (25 Jul 2018 4:24 AM) *Category : SUBSTANTIVE*
8.1 Documentation of procedures				
519	160	**~~8~~7.1 Documentation of procedures**	P	**Japan** *Category : EDITORIAL*
520	160	**~~8~~7.1 Documentation of procedures**	P	**APPPC** (72) New Zealand (5 Sep 2018 2:24 AM) *Category : EDITORIAL*

521	161	Procedures should be documented to ensure that commodities are fumigated in accordance with the treatment schedule. Process controls and operational parameters should be established to provide the operational details necessary for ~~a specific~~ the authorization of a treatment ~~entity~~provider. Calibration and quality control procedures should be documented by the treatment provider. Where appropriate, a written document on procedures should include the following:	P	**European Union** Please see paragraph 142 and the comment on "entities" in paragraph 140. *Category : TECHNICAL*
522	161	Procedures should be documented to ensure that commodities are fumigated in accordance with the treatment schedule. Process controls and operational parameters should be established to provide the operational details necessary for a specific authorization of a treatment entity. Calibration and quality control procedures should be documented by the treatment provider. ~~Where appropriate, a~~ A written document on procedures should include the following:	P	**European Union** It is always necessary. *Category : SUBSTANTIVE*
523	161	Procedures should be documented to ensure that commodities are fumigated in accordance with the treatment schedule. Process controls and operational parameters should be established to provide the operational details necessary for ~~a specific~~ the authorization of a treatment ~~entity~~provider. Calibration and quality control procedures should be documented by the treatment provider. ~~Where appropriate, a~~ A written document on procedures should include the following:	P	**EPPO** It is always necessary Please see paragraph 142 and the comment on "entities" in paragraph 140. *Category : TECHNICAL*
524	161	Procedures should be documented to ensure that commodities are fumigated consistently in accordance with the treatment schedule. Process controls and operational parameters should be established to provide the operational details necessary for a specific authorization of a treatment entity. Calibration and quality control procedures should be documented by the treatment provider. Where appropriate, a written document on procedures should include the following:	P	**Japan** To clarify the requirements on documentation procedures. In conformity with draft ISPM "Requirements for the use of modified atmosphere treatments as phytosanitary measures" and "ISPM 42 Requirements for the use of temperature treatments as phytosanitary measures". *Category : SUBSTANTIVE*
525	161	Procedures should be documented to ensure that commodities are fumigated consistently in accordance with the treatment schedule. Process controls and operational parameters should be established to provide the operational details necessary for a specific authorization of a treatment entity. Calibration and quality control procedures should be documented by the treatment provider. Where appropriate, a written document on procedures should include the following:	P	**APPPC** (125) Japan (9 Sep 2018 10:01 AM) To clarify the requirements on documentation procedures. In conformity with draft ISPM "Requirements for the use of modified atmosphere treatments as phytosanitary measures" and "ISPM 42 Requirements for the use of temperature treatments as phytosanitary measures" *Category : SUBSTANTIVE*
526	163	~~orientation and configuration of the commodity during fumigation~~	P	**APPPC** *Category : SUBSTANTIVE*
527	163	orientation and configuration of the commodity during fumigation	C	**APPPC** (107) New Zealand (7 Sep 2018 8:41 AM) Whilst it would be best practice to provide the appropriate packing configuration to those that pack the consignment in a sea container, this currently does not happen. Information is proposed to be provided on a sea container declaration to inform packers to

				allow space for air circulation and monitoring tubes. *Category : TECHNICAL*
528	168	~~training of personnel~~	P	**European Union** To be put as the last indent (more logical order). *Category : EDITORIAL*
529	168	~~training of personnel~~	P	**EPPO** To be put at the last indent (more logical order). *Category : EDITORIAL*
530	169	labelling (if required), record keeping, and documentation requirements. - equipment calibration records - Records on available equipment used in fumigation	P	**Sri Lanka** *Category : TECHNICAL*
531	169	labelling (if required), ~~,~~ record ~~keeping,~~ keeping and documentation requirements~~.~~ - training of personnel.	P	**European Union** Useless comma. "Training of personnel" to be put as the last indent (more logical order). *Category : EDITORIAL*
532	169	labelling (if required), record ~~keeping,~~ keeping and documentation requirements - training of personnel.	P	**EPPO** Useless comma. "Training of personel" to be put at the last indent (more logical order). *Category : EDITORIAL*
8.2 Record keeping				
533	170	~~8~~7.2 **Record keeping**	P	**Japan** *Category : EDITORIAL*
534	170	~~8~~7.2 **Record keeping**	P	**APPPC** (73) New Zealand (5 Sep 2018 2:24 AM) *Category : EDITORIAL*
535	171	The treatment provider should keep appropriate records for each treatment application. These records should be made available to the NPPO or, where appropriate, other government department or agency of the country in which the fumigation is conducted or initiated for auditing and verification purposes or trace-back.	P	**Canada** To highlight the role of other department or agency that licenses treatment entities. *Category : SUBSTANTIVE*
536	172	Appropriate records for fumigation as a phytosanitary measure should be retained by the treatment provider for at least ~~one year~~ two years to enable the trace-back of treated lots. Information on individual fumigation records may include data on:	P	**Ghana** *Category : SUBSTANTIVE*
537	174	identification of ~~enclosure~~ entity (treatment facility/enclosure and treatment ~~provider~~provider)	P	**Canada** Additional clarity *Category : TECHNICAL*

538	176	~~equipment calibration records~~	P	**Sri Lanka** Equipment calibration records are done in accordance with the manufacturer recommendation. This details are collected once in a defined period. Therefore, the calibration records are not relevant to record at each fumigation activity *Category : TECHNICAL*
539	177	commodity ~~fumigated~~fumigated and key characteristics (e.g. moisture content, presence of bark, if packaged etc)	P	**Canada** Additional information *Category : TECHNICAL*
540	178	target regulated pest	P	**OIRSA** Para ser coherente con la terminología empleada en la NIMF 42 se recomienda adicionar la palabra "reglamentada" (ver: punto 6.2 Mantenimiento de registros). *Category : TECHNICAL*
541	179	packer, grower and place of production of the commodity - Name and address of an exporter and importer, city and country of destination.	P	**APPPC** (98) Thailand (6 Sep 2018 9:06 AM) Thailand would like to add additional record data for fumigation that is important for tracing including - Name and address of an exporter and importer, city and country of destination. *Category : SUBSTANTIVE*
542	179	packer, grower and place of production of the commodity - Name and address of an exporter and importer, city and country of destination.	P	**Thailand** Thailand would like to add additional record data for fumigation that is important for tracing including - Name and address of an exporter and importer, city and country of destination. *Category : SUBSTANTIVE*
543	180	fumigation lot ~~number~~number and other identifying markings or characteristics	P	**European Union** Suggestion to merge paragraphs 180 and 182 because of the explanation given in paragraph 157. *Category : EDITORIAL*
544	180	fumigation lot ~~number~~number or other identifying markings or characteristics	P	**EPPO** Suggestion to merge paragraphs 180 and 182 because of the explanation given in paragraph 157. *Category : EDITORIAL*
545	182	~~identifying markings or characteristics~~	P	**European Union** Suggestion to merge paragraphs 180 and 182 because of the explanation given in paragraph 157. *Category : EDITORIAL*
546	182	~~identifying markings or characteristics~~	P	**EPPO** Suggestion to merge paragraphs 180 and 182 because of the explanation given in paragraph 157. *Category : EDITORIAL*
547	183	date of fumigation and name of individual performing the ~~fumigation~~fumigation - Position and number of gas sample lines within enclosure	P	**Canada** Additional information for fumigation record *Category : TECHNICAL*

548	183	date and time of fumigation (start and end) and name of individual performing the fumigation	P	**Sri Lanka** *Category : TECHNICAL*
549	183	date and duration of fumigation and name of individual performing the fumigation	P	**APPPC** (97) Thailand (5 Sep 2018 12:52 PM) In addition to a date of fumigation, the duration of fumigation treatment should also be recorded because the completion of the fumigation treatment is depended on a certain period of time. *Category : SUBSTANTIVE*
550	183	date and duration of fumigation and name of individual performing the fumigation	P	**Thailand** In addition to a date of fumigation, the duration of fumigation treatment should also be recorded because the completion of the fumigation treatment is depended on a certain period of time. *Category : SUBSTANTIVE*
551	183	date and duration of fumigation and name of individual performing the fumigation	P	**Iran** *Category : TECHNICAL*
552	185	the lowest air and commodity temperature and humidity levels	P	**Sri Lanka** *Category : TECHNICAL*
553	185	the lowest air and commodity temperature	C	**APPPC** (75) New Zealand (5 Sep 2018 2:27 AM) Same comment as per 5.2.7. The wording of this requirement would mean that wherever product temperature is specified the fumigators would also have to measure the temperature in the enclosure. Most fumigation specifications state either minimum product temperature or minimum ambient temperature. They don't usually specify both. To require measurement of both would add time and cost to most fumigation. *Category : TECHNICAL*
554	186	fumigant dose and concentration records	C	**European Union** Is "fumigant dose" the right term? Shouldn't it be "fumigant dosage (dose rate)"? (see paragraph 122). The TPPT is invited to reconsider the terminology. *Category : TECHNICAL*
555	186	fumigant dose and concentration records	C	**EPPO** Is "fumigant dose" the right term? Shouldn't it be "fumigant dosage (dose rate)"? (see paragraph 122). The TPPT is invited to reconsider the terminology. *Category : TECHNICAL*
556	186	fumigant dose and concentration ~~records~~records including time of reading	P	**APPPC** (99) Thailand (6 Sep 2018 9:07 AM) Time of reading fumigant concentration values at certain intervals should be recorded to monitor an appropriate increase of

				concentration against time. *Category : SUBSTANTIVE*
557	186	fumigant dose and concentration ~~records~~records including time of reading	P	**Thailand** Time of reading fumigant concentration values at certain intervals should be recorded to monitor an appropriate increase of concentration against time. *Category : SUBSTANTIVE*
558	187	fumigant volumes (dose rate) calculated and added throughout fumigation. - duration of fumigation	P	**Ghana** *Category : TECHNICAL*
559	187	fumigant volumes (dose rate) calculated and added throughout fumigation.	C	**European Union** Is "fumigant volumes (dose rate)" the right term? Shouldn't it be "fumigant dosage (dose rate)" or "total amount of fumigant"? (see paragraph 122). The TPPT is invited to reconsider the terminology. *Category : TECHNICAL*
560	187	fumigant volumes (dose rate) calculated and added throughout fumigation.	C	**EPPO** Is "fumigant volumes (dose rate)" the right term? Shouldn't it be "fumigant dosage (dose rate)" or "total amount of fumigant"? (see paragraph 122). The TPPT is invited to reconsider the terminology. *Category : TECHNICAL*
=8.3 Documentation by the NPPO				
561	188	=**8.3 Documentation by the NPPO**	P	**Ghana** *Category : EDITORIAL*
562	188	=~~8~~7.3 **Documentation by the NPPO**	P	**Japan** *Category : EDITORIAL*
563	188	=~~8.3~~7.3**Documentation by the NPPO**	P	**APPPC** (76) New Zealand (5 Sep 2018 2:27 AM) *Category : EDITORIAL*
564	189	All NPPO procedures should be appropriately documented and records, including those of monitoring inspections made and phytosanitary certificates issued, should be maintained for at least ~~one year~~two years. In cases of non-compliance or new or unexpected phytosanitary situations, documentation should be made available upon request as described in ISPM 13 (*Guidelines for the notification of non-compliance and emergency action*).	P	**Ghana** *Category : SUBSTANTIVE*
565	189	All NPPO procedures should be appropriately documented and records, including those of monitoring inspections made and ~~phytosanitary~~ Phytosanitary certificates issued, should be maintained for at least one year. In cases of non-compliance or new or unexpected phytosanitary situations, documentation should be made available upon request as described in ISPM 13 (*Guidelines for the notification of non-compliance and emergency action*).	P	**Ghana** *Category : EDITORIAL*

566	189	All NPPO procedures should be appropriately documented and records, including those of monitoring inspections made and phytosanitary certificates issued, should be maintained for at least one year. In cases of non-compliance or new or unexpected phytosanitary situations, documentation should be made available upon request as described in ISPM 13 (*Guidelines for the notification of non-compliance and emergency action*).	C	**Mauritius** There is no provision for any mechanism for the NPPO of the importing country to verify whether the Treatment/fumigation certificate accompanying the consignment has been issued by an entity recognized by the NPPO of the exporting country. IN many instances the fumigation is not endorsed on the Phytosanitary certificate issued by the NPPO, The importer produced a PC and a fumigation certificate. Consequently NPPO of importing country cannot verify. *Category : TECHNICAL*
9. Inspection				
567	190	~~98.~~ **Inspection**	P	**Japan** *Category : EDITORIAL*
568	190	~~98.~~ **Inspection**	P	**APPPC** (77) New Zealand (5 Sep 2018 2:28 AM) *Category : EDITORIAL*
569	190	**9. Inspection**	C	**Ecuador** Si la fumigación se hace durante el transporte, cómo se puede realizar la inspección. *Category : TECHNICAL*
570	191	Inspection should be carried out by the NPPO of the exporting ~~country,~~ country or its authorized entity and may be carried out by the NPPO of the importing country, to determine compliance with phytosanitary import requirements. Where live non-target pests are found after fumigation, the NPPO should consider if their survival indicates a fumigation failure and whether additional phytosanitary measures may be necessary.	P	**Viet Nam** Some countries operate an regulatory system which allows an NPPO authorized entity or person to carry out inspections. Also refers to the draft ISPM on authorization of entities to perform phytosanitary actions. *Category : SUBSTANTIVE*
571	191	Inspection should be carried out by the NPPO of the exporting ~~country~~country or its authorized entity, and may be carried out by the NPPO of the importing country, to determine compliance with phytosanitary import requirements. Where live non-target pests are found after fumigation, the NPPO should consider if their survival indicates a fumigation failure and whether additional phytosanitary measures may be necessary.	P	**Korea, Republic of** Some countries operate an regulatory system which allows an NPPO authorized entity or person to carry out inspections. Also refers to the draft ISPM on authorization of entities to perform phytosanitary actions. *Category : SUBSTANTIVE*
572	191	Inspection should be carried out by the NPPO of the exporting country, and may be carried out by the NPPO of the importing country, to determine compliance with phytosanitary import requirements. Where live non-target pests are found after fumigation, the NPPO should consider if their survival indicates a fumigation failure and whether additional phytosanitary measures may be necessary. The NPPO of the importing country may inspect documentation and records for treatments conducted during transport to determine compliance with phytosanitary import requirements.	P	**APPPC** (116) Japan (8 Sep 2018 4:21 AM) To ensure consistency with the requirement of "ISPM 42 Requirements for the use of temperature treatments as phytosanitary measures". There are exmaples that he NPPO of the importing country inspects documentation and records for fumigation treatments conducted during transport. *Category : SUBSTANTIVE*

573	191	Inspection should be carried out by the NPPO of the exporting ~~country~~country or its authorized entity, and may be carried out by the NPPO of the importing country, to determine compliance with phytosanitary import requirements. Where live non-target pests are found after fumigation, the NPPO should consider if their survival indicates a fumigation failure and whether additional phytosanitary measures may be necessary.	P	**APPPC** (144) APPPC (12 Sep 2018 3:13 AM) Some countries operate an regulatory system which allows an NPPO authorized entity or person to carry out inspections. Also refers to the draft ISPM on authorization of entities to perform phytosanitary actions. *Category : SUBSTANTIVE*
574	191	Inspection should be carried out by the NPPO of the exporting country, or its authorized entity of the exporting country, and may be carried out by the NPPO of the importing country, to determine compliance with phytosanitary import requirements. Where live non-target pests are found after fumigation, the NPPO should consider if their survival indicates a fumigation failure and whether additional phytosanitary measures may be necessary.	P	**APPPC** (108) New Zealand (7 Sep 2018 8:46 AM) Some countries operate an regulatory system which allows an NPPO authorized entity or person to carry out inspections. Also refers to the draft ISPM on authorization of entities to perform phytosanitary actions. *Category : SUBSTANTIVE*
10. Responsibilities				
575	192	~~109~~. **Responsibilities**	P	**Japan** *Category : EDITORIAL*
576	192	~~109~~. **Responsibilities**	P	**APPPC** (79) New Zealand (5 Sep 2018 2:31 AM) *Category : EDITORIAL*
577	193	The NPPO of the country in which the fumigation is conducted or initiated is responsible for the ~~evaluation, approval~~ evaluation and ~~auditing~~ approval of ~~the application of~~ fumigation as a phytosanitary measure~~, including~~. The NPPO should audit the fumigation performed by the NPPO itself and by other authorized treatment entities. In cases where NPPOs do not authorize fumigation entities, other government department or agencies should audit the fumigation performed by the licensed entity. However, when fumigation is conducted or completed during transport, the NPPO or, where appropriate, other government department or agency of the exporting country is usually responsible for authorizing or licensing the ~~entity~~ entity, respectively, applying the fumigation during transport and the NPPO of the importing country is responsible for verifying if the fumigation requirements have been met. The NPPO of the exporting country is responsible when fumigation applied during transport is used for phytosanitary certification.	P	**Canada** To highlight the role of other department or agency that licenses treatment entities. *Category : SUBSTANTIVE*
578	193	The NPPO of the country in which the fumigation is conducted or initiated is responsible for the evaluation, approval and auditing of the application of fumigation as a phytosanitary measure, including fumigation performed by the NPPO itself and by other authorized treatment ~~entities~~providers. However, when fumigation is conducted or completed during transport, the NPPO of the exporting country is usually responsible for authorizing the ~~entity~~ treatment provider	P	**European Union** Please see the comment on "entities" in paragraph 140. *Category : TECHNICAL*

		applying the fumigation during transport and the NPPO of the importing country is responsible for verifying if the fumigation requirements have been met.		
579	193	The NPPO of the country in which the fumigation is conducted or initiated is responsible for the evaluation, approval and auditing of the application of fumigation as a phytosanitary measure, including fumigation performed by the NPPO itself and by other authorized treatment ~~entities~~providers. However, when fumigation is conducted or completed during transport, the NPPO of the exporting country is usually responsible for authorizing the ~~entity~~ treatment provider applying the fumigation during transport and the NPPO of the importing country is responsible for verifying if the fumigation requirements have been met.	P	**EPPO** Please see the comment on "entities" in paragraph 140. *Category : TECHNICAL*
580	193	The NPPO of the country in which the fumigation is conducted or initiated is responsible for the evaluation, approval and auditing of the application of fumigation as a phytosanitary measure, including fumigation performed by the NPPO itself and by other authorized treatment entities. However, when fumigation is conducted or completed during transport, the NPPO of the exporting country is usually responsible for authorizing the entity applying the fumigation during transport and the NPPO of the importing country is responsible for verifying if the fumigation requirements have been met.	C	**Mexico** Mexico has no comments on this draft standard. We agree with the document as it is *Category : TECHNICAL*
581	193	The NPPO of the country in which the fumigation is conducted or initiated is responsible for the evaluation, approval and auditing of the application of fumigation as a phytosanitary measure, including fumigation performed by the NPPO itself and by other authorized ~~treatment~~ entities. However, when fumigation is conducted or completed during transport, the NPPO of the exporting country is usually responsible for authorizing the entity applying the fumigation during transport and the NPPO of the importing country is responsible for verifying if the fumigation requirements have been met.	P	**Argentina** For consistency. *Category : TECHNICAL*
582	193	The NPPO of the country in which the fumigation is conducted or initiated is responsible for the evaluation, approval and auditing of the application of fumigation as a phytosanitary measure, including fumigation performed by the NPPO itself and by other authorized treatment entities. However, when fumigation is conducted or completed during transport, the NPPO of the exporting country is usually responsible for authorizing the entity applying the fumigation during transport and the NPPO of the importing country is responsible for verifying if the fumigation ~~requirements have~~ schedule has been met.	P	**Uruguay** Glossary term should be used *Category : TECHNICAL*
583	193	The NPPO of the country in which the fumigation is conducted or initiated is responsible for the evaluation, approval and auditing of the application of fumigation as a phytosanitary measure, including fumigation performed by the NPPO itself and by other ~~authorized treatment~~ authorized entities. However, when	P	**COSAVE** For consistency. *Category : TECHNICAL*

		fumigation is conducted or completed during transport, the NPPO of the exporting country is usually responsible for authorizing the entity applying the fumigation during transport and the NPPO of the importing country is responsible for verifying if the fumigation ~~requirements have~~ schedule has been met.		
584	194	To the extent necessary, it is the NPPO's responsibility to cooperate with other national and international regulatory agencies concerned with the development, approval and health and safety risks of the fumigation, including the training and certification of personnel conducting the fumigation, the authorization of treatment providers, and the approval of treatment facilities. Their respective responsibilities should be identified to avoid requirements that are overlapping, conflicting, inconsistent or not technically justified.	P	**Viet Nam** Add "health and" and "risks" in paragraph No 194 like "health and safety risks". Although safety and health issues are important, this was removed from the ISPM as countries commented because it should not be part of an ISPM. and added in this para as one of NPPO's responsibilities. So, to more clarify this issue. *Category : SUBSTANTIVE*
585	194	To the extent necessary, it is the NPPO's responsibility to cooperate with other national and international regulatory agencies concerned with the development, approval and safety of the fumigation, including the training and certification of personnel conducting the fumigation, the authorization of treatment ~~providers,~~ providers and the approval of treatment facilities. Their respective responsibilities should be identified to avoid requirements that are overlapping, conflicting, inconsistent or not technically justified.	P	**European Union** Useless comma. *Category : EDITORIAL*
586	194	To the extent necessary, ~~it is~~ the ~~NPPO's responsibility to~~ NPPO should cooperate with other national and international regulatory agencies concerned with the development, approval and safety of the fumigation, including the training and certification of personnel conducting the fumigation, the authorization of treatment providers, and the approval of treatment facilities. ~~Their~~ The respective responsibilities of the NPPO and the other regulatory agencies should be identified to avoid requirements that are overlapping, conflicting, inconsistent or ~~not technically justified~~unjustified.	P	**European Union** The paragraph has been modified to improve clarity and follow more logically from the introductory words 'to the extent necessary'. This is also coherent with our comments on the draft ISPM on Modified atmosphere treatments (para 141). *Category : EDITORIAL*
587	194	To the extent necessary, ~~it is~~ the ~~NPPO's responsibility to~~ NPPO should cooperate with other national and international regulatory agencies concerned with the development, approval and safety of the fumigation, including the training and certification of personnel conducting the fumigation, the authorization of treatment ~~providers,~~ providers and the approval of treatment facilities. ~~Their~~ The respective responsibilities of the NPPO and the other regulatory agencies should be identified to avoid requirements that are overlapping, conflicting, inconsistent or ~~not technically justified~~unjustified.	P	**EPPO** Useless comma. The paragraph has been modified to improve clarity and follow more logically from the introductory words 'to the extent necessary'. This is coherent with the recommendation made by the IPPC Regional Workshop in Bukovo for the draft ISPM on Modified atmosphere treatments (para 141) *Category : EDITORIAL*
588	194	To the extent necessary, it is the NPPO's responsibility to cooperate with other national and international regulatory agencies concerned with the development, approval and health and safety risks of the fumigation, including the training and	P	**APPPC** (112) Japan (7 Sep 2018 3:51 PM) Add "health and" and "risks" in paragraph No 194 like "health and safety risks".

		certification of personnel conducting the fumigation, the authorization of treatment providers, and the approval of treatment facilities. Their respective responsibilities should be identified to avoid requirements that are overlapping, conflicting, inconsistent or not technically justified.		Although safety and health issues are important, this was removed from the ISPM as countries commented because it should not be part of an ISPM. and added in this para as one of NPPO's responsibilities. So, to more clarify this issue. *Category : SUBSTANTIVE*
589	194	~~To the extent necessary, it~~ It is the NPPO's responsibility ~~to cooperate with other national and international regulatory agencies concerned with~~ the ~~development, approval and safety of the fumigation, including the~~ training and certification of personnel conducting the fumigation, the authorization of treatment ~~providers~~entities, and the approval of treatment facilities. Their respective responsibilities should be identified to avoid requirements that are overlapping, conflicting, inconsistent or not technically justified.	P	**Argentina** For consistency. Deleted text because cooperation with international organizations is outside the scope of this standard that deals with application of fumigation. *Category : TECHNICAL*
590	194	~~To the extent necessary, it~~ It is the NPPO's responsibility ~~to cooperate with other national and international regulatory agencies concerned with~~ the ~~development, approval and safety of the fumigation, including the~~ training and certification of personnel conducting the fumigation, the authorization of treatment ~~providers~~entities, and the approval of treatment facilities. Their respective responsibilities should be identified to avoid requirements that are overlapping, conflicting, inconsistent or not technically justified.	P	**Uruguay** For consistency. Deleted text because cooperation with international organizations is outside the scope of this standard that deals with application of fumigation. *Category : TECHNICAL*
591	194	~~To the extent necessary, it~~ It is the NPPO's responsibility ~~to cooperate with other national and international regulatory agencies concerned with~~ the ~~development, approval and safety of the fumigation, including the~~ training and certification of personnel conducting the fumigation, the authorization of treatment ~~providers~~entities, and the approval of treatment facilities. Their respective responsibilities should be identified to avoid requirements that are overlapping, conflicting, inconsistent or not technically justified.	P	**COSAVE** For consistency. Deleted text because cooperation with international organizations is outside the scope of this standard that deals with application of fumigation. *Category : TECHNICAL*
APPENDIX 1: Chemical properties of some common fumigants (at 25 °C)				
592	197	**APPENDIX 1: Chemical properties of some common fumigants (at 25 °C)**	C	**China** It would be helpful to add "APPENDIX5: Guidance for fumigation efficacy studies". 1. This guide is very useful for researchers engaged in fumigation treatment. 2. Placing it in a standard text can indicate that the guidance is officially recognized and can be more widely adopted and applied. *Category : SUBSTANTIVE*
593	197	**APPENDIX 1: Chemical properties of some common fumigants (at 25 °C)**	C	**APPPC** (95) New Zealand (5 Sep 2018 3:34 AM) it would be helpful to have another table about the pros and cons of each fumigant reactions with materials and efficacy.

				Category : TECHNICAL
594	198	**Fumigant active substance**	C	**Philippines** We suggest to make the labels on this table be visible. *Category : TECHNICAL*
595	204	**Specific gravity (gas) (air = 1.0)**	C	**APPPC** (151) Philippines (12 Sep 2018 3:45 AM) Please make the categories visible. *Category : EDITORIAL*
596	266	~~Phosphine~~Phosphine Liquid phosphine (Phosphine 2% + CO_2 98%)	P	**Sri Lanka** Suggest to consider addition of liquid phosphine which is a mixture of CO2 and Phosphine *Category : SUBSTANTIVE*
APPENDIX 2: Examples of formulae to calculate the amount of fumigant required				
597	293	**APPENDIX 2: Examples of formulae to calculate the amount of fumigant required**	C	**APPPC** (145) APPPC (12 Sep 2018 3:21 AM) The formula in appendix 2 is wrong. It should be revised to this formula: Amount of fumigant (ℓ) = [Volume of Enclosure(m3) × Target Dosage(g/m3) × (273 + Temperature(℃)) × 22.4ℓ × 100] divides by [Atmospheric Pressure(atm) × Molecular Weight of Fumigant(g) × 273 × % fumigant purity] (133) Korea, Republic of (10 Sep 2018 10:05 AM) It should be rewritten. *Category : TECHNICAL*
598	294	~~Sufficient fumigant should be applied to ensure that the required minimum concentration, as stated in the treatment schedule, is achieved. The amount of fumigant may be calculated with an appropriate formula.~~	P	**European Union** Redundant with paragraph 123. *Category : EDITORIAL*
599	294	~~Sufficient fumigant should be applied to ensure that the required minimum concentration, as stated in the treatment schedule, is achieved. The amount of fumigant may be calculated with an appropriate formula.~~	P	**EPPO** Redundant with paragraph 123. *Category : EDITORIAL*
600	298	The fumigant purity is the percentage of active ~~ingredient~~ substance in the chemical product as indicated on the label.	P	**EPPO** "Active substance" is the term used in paragraph 198, and the term "chemical" is used in paragraphs 35 and 197. *Category : EDITORIAL*
601	302		C	**Korea, Republic of** The formula in appendix 2 is wrong. It should be revised to this formula: Amount of fumigant (ℓ) = [Volume of Enclosure(m3) × Target Dosage(g/m3) × (273 + Temperature(℃)) ×

				22.4ℓ × 100] divides by [Atmospheric Pressure (atm) × Molecular Weight of Fumigant(g) × 273 × % fumigant purity] It should be rewritten.(See Attachment.) *Category : TECHNICAL*
602	303	The fumigant purity is the percentage of active ~~ingredient of~~ substance in the chemical product as indicated on the label.	P	**European Union** "Active substance" is the term used in paragraph 198, and the term "chemical" is used in paragraphs 35 and 197. "In" is used instead of "of" in paragraph 298. *Category : EDITORIAL*
603	303	The fumigant purity is the percentage of active ~~ingredient of~~ substance in the chemical product as indicated on the label.	P	**EPPO** "Active substance" is the term used in paragraph 198, and the term "chemical" is used in paragraphs 35 and 197. "In" is used instead of "of" in paragraph 298. *Category : EDITORIAL*
APPENDIX 4: Examples of formulae to calculate concentration–time product (CT)				
604	339	**Potential implementation issues**	C	**APPPC** (109) New Zealand (7 Sep 2018 8:47 AM) Fumigator competency in undertaking fumigations will be an issue for countries that do not have a dedicated quarantine treatment programme. In particular the use of electronic monitoring and continual monitoring requirements, whilst improving best practice, will require capacity building to initiate. *Category : SUBSTANTIVE*
605	340	This section is not part of the standard. The Standards Committee in May 2016 requested the Secretariat to gather information on any potential implementation issues related to this draft. Please provide details and proposals on how to address these potential implementation issues.	C	**Nigeria** There is a need to build the implementation capacity of NPPOs from developing countries .This is to enable proper authorization of treatment entities and effective monitoring and audit . *Category : SUBSTANTIVE*
606	340	This section is not part of the standard. The Standards Committee in May 2016 requested the Secretariat to gather information on any potential implementation issues related to this draft. Please provide details and proposals on how to address these potential implementation issues.	C	**Jamaica** Standard does not address safety requirements of fumigation. *Category : SUBSTANTIVE*
607	340	This section is not part of the standard. The Standards Committee in May 2016 requested the Secretariat to gather information on any potential implementation issues related to this draft. Please provide details and proposals on how to address these potential implementation issues. APPENDIX5: Guidance for fumigation efficacy studies	P	**APPPC** (17) China (3 Sep 2018 10:42 AM) 1.This guide is very useful for researchers engaged in fumigation treatment. 2.Placing it in a standard text can indicate that the guidance is officially recognized and can be more widely adopted and applied. *Category : SUBSTANTIVE*