2019 FIRST CONSULTATION

1 July – 30 September 2019

Compiled comments for Draft PT: Irradiation treatment for the genus Anastrepha (2017-031)

Summary of comments

Name	Summary
Cuba	No hay comentarios , estamos de acuerdo con la propuesta de tratamiento.
European Union	Comments submitted by the European Commission on behalf of the European Union and its 28 Member States.
Malawi	Malawi supports draft irradiation treatment for the genus Anastrepha (2017-031)
South Africa	The National Plant Protection Organisation of South Africa (NPPOZA) has no comments and therefore accepts this standard.

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

FAO sequential number	Para	Text	T	Comment
1	G	(General Comment)	C	**Mexico** I support the document as it is and I have no comments *Category : SUBSTANTIVE*
2	G	(General Comment)	C	**Guyana** We support the document in its entirety and have no objection with it moving forward. *Category : SUBSTANTIVE*
3	G	(General Comment)	C	**European Union** The comments by the European Union and its 28 Member States are provided without prejudice to EU food safety legislation imposing limitations on the acceptance of irradiated goods. *Category : TECHNICAL*
4	G	(General Comment)	C	**Indonesia** Indonesia asks the status of previous PT regarding irradiation for some species of Anastrepha. Moreover, The irradiation dose for Anastrepha serpentina (PT 3) is higher than the irradiation dose on this draft. *Category : SUBSTANTIVE*
5	G	(General Comment)	C	**Barbados** Barbados has no changes to make to this draft. *Category : EDITORIAL*
6	G	(General Comment)	C	**Slovenia** Slovenia would like to formally endorse the EPPO comments submitted via the IPPC Online Comment System. *Category : TECHNICAL*
7	G	(General Comment)	C	**Bahrain** no comment *Category : TECHNICAL*
8	G	(General Comment)	C	**Australia** Extrapolating from treatment efficacy of 70 Gy without the knowledge of the most-tolerant stage (MTS), commodity and pest species tested is a generalised approach which may not always work for all commodities. MTS needs to be confirmed even if it is not found frequently in the fruit. Identifying MTS provides complete safety against all of the life-stages. The MTS in another vegetable or fruit is different (as seen in Medfly in various commodities) and may require higher dose if not lower which would still fall within the proposed treatment schedule. *Category : TECHNICAL*
9	G	(General Comment)	C	**Australia** Please provide the species name of Anastrepha in which studies were done suggesting an effective dose of 70 Gy prevented development

				to adults of 99.9968% eggs and larvae. Did the studies being considered for this treatment have >30,000 individuals tested? Which commodity was tested? Mention the fruit (and cultivar) to maintain consistency with other ISPMs that mention the commodity tested. *Category : TECHNICAL*
10	G	(General Comment)	C	**Thailand** Thailand has no objection on the proposed draft irradiation treatment for the genus Anastrepha *Category : SUBSTANTIVE*
11	G	(General Comment)	C	**Uruguay** We have no comments on this draft. We agree with the porposal as it is *Category : TECHNICAL*
12	G	(General Comment)	C	**China** The references only provides data on 4 species. Can these 4 species on behalf the whole genus? The data provided includes only four species and does not cover all economically important species. *Category : SUBSTANTIVE*
13	G	(General Comment)	C	**Malawi** Malawi supports the draft Irradiation treatment for the genus Anastrepha(2017-031) *Category : SUBSTANTIVE*
14	G	(General Comment)	C	**New Zealand** New Zealand supports the standard. Given the efficacy information was extrapolated to cover all hosts we encourage the panel to review the standard should evidence become available to show that the extrapolation of the treatment to cover all hosts of this pest is incorrect. *Category : SUBSTANTIVE*
15	G	(General Comment)	C	**Cuba** Estamos de acuerdo con la propuesta de tratamiento. *Category : TECHNICAL*
DRAFT ANNEX TO ISPM 28: Irradiation treatment for the genus Anastrepha (2017-031)				
16	1	**DRAFT ANNEX TO ISPM 28: IRRADIATION TREATMENT FOR THE GENUS *ANASTREPHA* (2017-031)**	C	**Korea, Republic of** The Republic of Korea suggests ISPM 28 Phytosanitary treaments for regulated pest. PT 3: Irradiation treatment for Anastrepha serpentina shoule be revoked. According PT 3, minimum absorbed dose is 100 Gy for Anastrepha serpentina, which is not consistant with new generic dosage for Anastrepha spp. " *Category : TECHNICAL*
17	11	2017-06 Treatment submitted in response to 2017-02 Call for treatments.	C	**Botswana** no comment *Category : EDITORIAL*

18	13	2018-05 SC added topic *Irradiation treatment for the genus* Anastrepha (2017-031) to the TPPT work programme with priority 1.	C	**Botswana** we agree *Category : SUBSTANTIVE*
19	13	2018-05 SC added topic *Irradiation treatment for the genus* Anastrepha (2017-031) to the TPPT work programme with priority 1.	C	**Botswana** we agree *Category : EDITORIAL*
20	13	2018-05 SC added topic *Irradiation treatment for the genus* Anastrepha (2017-031) to the TPPT work programme with priority 1.	C	**Botswana** we agree *Category : TECHNICAL*
21	13	2018-05 SC added topic *Irradiation treatment for the genus* Anastrepha (2017-031) to the TPPT work programme with priority 1.	C	**Botswana** we agree *Category : EDITORIAL*
22	20	**Notes**	C	**China** Adding the related reference for "2018-06 TPPT: efficacy was calculated based on data for A. ludens (most tolerant species within the genus)" Why A. ludens is the most tolerant species within Anastrepha? The scientific reference should be noted. *Category : SUBSTANTIVE*
23	24	This treatment describes the irradiation of fruits and vegetables at 70 Gy minimum absorbed dose to prevent the emergence of adults of *Anastrepha* spp. at the stated efficacy-[1].	P	**European Union** Typo. *Category : EDITORIAL*
24	24	This treatment describes the irradiation of fruits and vegetables at 70 Gy minimum absorbed dose to prevent the emergence of adults of *Anastrepha* spp. at the stated efficacy-[1].	P	**EPPO** Typo. *Category : EDITORIAL*
25	24	This treatment describes the irradiation of fruits and vegetables at 70 Gy minimum absorbed dose to prevent the emergence of adults of *Anastrepha* spp. at the stated efficacy.[1].	C	**Botswana** we agree *Category : EDITORIAL*
Treatment description				
26	27	**Name of treatment** Irradiation treatment for the genus *Anastrepha* (generic)	C	**Botswana** we concur *Category : EDITORIAL*
27	29	**Treatment type** Irradiation	C	**Botswana** we concur *Category : EDITORIAL*
28	30	**Target pest** Fruit flies of the genus *Anastrepha* (Schiner, 1868) (Diptera: Tephritidae)	C	**Botswana** we concur *Category : EDITORIAL*
29	31	**Target regulated articles** All fruits and vegetables that are hosts of the genus *Anastrepha*	C	**Botswana** we concur *Category : EDITORIAL*
Treatment schedule				

30	32	~~Treatment schedule~~Treatment schedule	P	**United States of America** The proposed treatment standard is a 70 gray dose for all members of the fruit fly genus Anastrepha. APHIS accepts a 70 gray dose for A. ludens, A. obliqua and A. suspensa. A 100 gray dose is required by APHIS for A. serpentina. Thus the primary concern for APHIS is efficacy against A. serpentina and all remaining Anastrepha species outside those previously mentioned. The justification for a 70 gray dose comes from a review by Hallman (2013) which synthesizes prior studies on the phytosanitary irradiation of commodities infested with Anastrepha larvae. According to Hallman (2013), the literature suggests that Anastrepha ludens is the most radio-tolerant member of the genus (Bustos et al. 1992, Bustos et al. 2004) and that confirmatory testing of 94,400 A. ludens done by Hallman and Martinez (2001) justifies the minimum dose of 70 Gy. Our comments are as follows: 1. The recommended dose would apply to >230 species of Anastrepha. As stated in Hallman (2013), there are 7 Anastrepha species of primary quarantine concern: A. ludens, A. obliqua, A. serpentina, A. suspensa, A. grandis, A. fraterculus and A. striata. If possible, it would be useful to have research conducted on all 7 species of primary quarantine concern, with at least a few thousand insects tested for each species. Specifically, data are lacking for both A. grandis (sparse data, n=170) and A. fraterculus (sparse data, n=218). Furthermore, several of the large-scale studies on Anastrepha spp. used a dose of 100 Gy in their confirmatory trials. We recommend the IPPC-TPPT consider requiring a higher generic dose for Anastrepha (e.g., 80-100 Gy), to account for the lack of data on 2 important quarantine species, and because of other limitations in the supporting research as listed below. 2. Information on insect colony history and taxonomic identifications is missing in some key publications used in support of this treatment standard. While the proposed standard is based on several independent studies, several studies do not provide information on the number of generations the test colonies were held prior to treatment. Additionally, APHIS guidelines for irradiation research ask that information on the species identification and deposition of voucher specimens be given. Such information is not present in several of the key studies cited. While it is unlikely that species level misidentification occurred during the study, the need for voucher specimens and thorough reporting of the method of identification is crucial for a genus like Anastrepha. 3. There is a minor concern about the specificity of the claims made in the standard. The draft standard claims "There is 95% confidence that the treatment according to this schedule prevents the development to the adult stage of not less than 99.9968% of eggs and larvae of Anastrepha spp.". The use of the 95% confidence interval for probit-9 level mortality implies there was experimental

				evidence, followed by statistical analysis, which supported this claim. While this statement is true for several important Anastrepha species, the language may give the false impression that there is direct evidence for the specific efficacy claim for all Anastrepha spp. We recommend adding a footnote that explains how the 95% confidence was calculated for a generic dose. Did you sum the research numbers from multiple studies, or base this on only the most tolerant species? 4. "Raw" data is not included or available in the supporting data. The strength of the studies that form the basis of this generic treatment could not be independently verified. These studies have been published previously, and have been used as the basis for irradiation doses already accepted by the IPPC and the USDA, and thus a thorough review of the work is not entirely necessary. However, the proposal does cite work presented in an FAO/IAEA newsletter as being used to support the treatment. The FAO/IAEA newsletter was not included in the attached references, nor was it peer reviewed. The newsletter does not present sufficient information to evaluate its reliability as a justification for the proposed treatment. References: Gould, W. P., & Hallman, G. J. (2004). Irradiation disinfestation of Diaprepes root weevil (Coleoptera: Curculionidae) and papaya fruit fly (Diptera: Tephritidae). Florida entomologist, 87(3), 391-393. Hallman, G. J., & Martinez, L. R. (2001). Ionizing irradiation quarantine treatment against Mexican fruit fly (Diptera: Tephritidae) in citrus fruits. Postharvest Biology and Technology, 23(1), 71-77. Norrbom, A. L., Barr, N. B., Kerr, P., & Mengual, X. (2018). Case 3772–Anastrepha Schiner, 1868 (Insecta, Diptera, Tephritidae): Proposed precedence over Toxotrypana Gerstaecker, 1860. The Bulletin of Zoological Nomenclature, 75(1), 165-170. Norrbom, A. L., Barr, N. B., Kerr, P., Mengual, X., Nolazco, N., Rodriguez, E. J., ... & Zucchi, R. A. (2018). Synonymy of Toxotrypana Gerstaecker with Anastrepha Schiner (Diptera: Tephritidae). Proceedings of the Entomological Society of Washington, 120(4), 834-842. *Category : TECHNICAL*
31	32	**Treatment schedule**	C	**Botswana** 70 Gy within the range recommended by ISPM 18; we concur *Category : TECHNICAL*
32	33	Minimum absorbed dose of 70 Gy to prevent the emergence of adults of *Anastrepha* spp~~. when irradiated as eggs and larvae~~..	P	**European Union** Because redundant with paragraph 34 and for consistency with the draft PTs 2017-015, 2017-025 and 2017-026. *Category : EDITORIAL*

33	33	Minimum absorbed dose of 70 Gy to prevent the emergence of adults of *Anastrepha* spp~~. when irradiated as eggs and larvae~~..	P	**EPPO** Because redundant with paragraph 34 and for consistency with the draft PTs 2017-015, 2017-025 and 2017-026. *Category : EDITORIAL*
34	33	Minimum absorbed dose of 70 Gy to prevent the emergence of adults of *Anastrepha* spp. when irradiated as eggs and larvae.	P	**Botswana** we concur *Category : TECHNICAL*
35	34	There is 95% confidence that the treatment according to this schedule prevents the development to the adult stage of not less than 99.9968% of eggs and larvae of *Anastrepha* spp.	C	**Botswana** we concur *Category : TECHNICAL*
36	35	This treatment should be applied in accordance with the requirements of ISPM 18 (*Guidelines for the use of irradiation as a phytosanitary measure*).	C	**Botswana** we agree *Category : TECHNICAL*
37	36	This irradiation treatment should not be applied to fruits and vegetables stored in modified atmospheres because modified atmospheres may affect the treatment efficacy.	C	**China** These sentence needs to check or add the related reference. Modified atmospheres may or may not affect irradiation treatment efficacy. The related reference should be noted. *Category : SUBSTANTIVE*
38	36	This irradiation treatment should not be applied to fruits and vegetables stored in modified atmospheres because modified atmospheres may affect the treatment efficacy.	C	**Botswana** we agree *Category : TECHNICAL*
Other relevant information				
39	37	**Other relevant information**	C	**Botswana** in agreement as it can be reviewed *Category : TECHNICAL*
40	37	**Other relevant information**	C	**Botswana** no comment *Category : EDITORIAL*
41	38	Since irradiation may not result in outright mortality, inspectors may encounter live, but non-viable *Anastrepha* spp. (larvae or puparia) during the inspection process. This does not imply a failure of the treatment.	C	**Kenya** This leave the treatment without an independent verification of efficacy and places a greater burden for assuring quarantine security on the research supporting the treatment *Category : TECHNICAL*
42	38	Since irradiation may not result in outright mortality, inspectors may encounter live, but non-viable *Anastrepha* spp. (larvae or puparia) during the inspection process. This does not imply a failure of the treatment.	C	**Kenya** This leave the treatment without an independent verification of efficacy and places a greater burden for assuring quarantine security on the research supporting the treatment *Category : TECHNICAL*
43	38	Since irradiation may not result in outright mortality, inspectors may encounter live, but non-viable *Anastrepha* spp. (larvae or puparia) during the inspection process. This does not imply a failure of the treatment.	C	**Botswana** we concur *Category : EDITORIAL*

44	39	The Technical Panel on Phytosanitary Treatments based its evaluation of this treatment on the research reviewed in Hallman (2013) and research reported in FAO/IAEA (2017).The efficacy of this schedule was calculated based on a total of 94 400 third-instar larvae of A. ludens treated in Citrus paradisi at 69 Gy with no viable adult emergence.	P	**European Union** This type of information is given for the other PTs. The relevant information was found in table 2 and paragraph 88 of the 2018-06 TPPT report, and is to be checked by the TPPT. *Category : SUBSTANTIVE*
45	39	The Technical Panel on Phytosanitary Treatments based its evaluation of this treatment on the research reviewed in Hallman (2013) and research reported in FAO/IAEA (2017).The efficacy of this schedule was calculated based on a total of 94 400 third-instar larvae of *A. ludens* treated in *Citrus paradisi* at 69 Gy with no viable adult emergence.	P	**EPPO** This type of information is given for the other PTs. The relevant information was found in table 2 and paragraph 88 of the 2018-06 TPPT report, and is to be checked by the TPPT. *Category : SUBSTANTIVE*
46	39	The Technical Panel on Phytosanitary Treatments based its evaluation of this treatment on the research reviewed in Hallman (2013) and research reported in FAO/IAEA (2017).	C	**Botswana** noted *Category : TECHNICAL*
47	39	The Technical Panel on Phytosanitary Treatments based its evaluation of this treatment on the research reviewed in Hallman (2013) and research reported in FAO/IAEA (2017).	C	**Botswana** noted *Category : EDITORIAL*
48	39	The Technical Panel on Phytosanitary Treatments based its evaluation of this treatment on the research reviewed in Hallman (2013) and research reported in FAO/IAEA (2017).	C	**Botswana** noted *Category : EDITORIAL*
49	39	The Technical Panel on Phytosanitary Treatments based its evaluation of this treatment on the research reviewed in Hallman (2013) and research reported in FAO/IAEA (2017).	C	**Botswana** noted *Category : EDITORIAL*
50	39	The Technical Panel on Phytosanitary Treatments based its evaluation of this treatment on the research reviewed in Hallman (2013) and research reported in FAO/IAEA (2017).	C	**Botswana** noted *Category : SUBSTANTIVE*
51	39	The Technical Panel on Phytosanitary Treatments based its evaluation of this treatment on the research reviewed in Hallman (2013) and research reported in FAO/IAEA (2017).	C	**Botswana** noted *Category : EDITORIAL*
52	40	Extrapolation of treatment efficacy to all fruits and vegetables was based on knowledge and experience that radiation dosimetry systems measure the actual radiation dose absorbed by the target pest independent of host commodity, and evidence from research studies on a variety of pests and commodities. These include studies on the following pests and hosts: *Anastrepha fraterculus (Eugenia uvalha, Malus pumila* and *Mangifera indica); A. ludens* (*Citrus paradisi, Citrus sinensis, M. indica* and artificial diet), *A. obliqua* (*Averrhoa ~~carambola~~ carambola, C. sinensis,*, and *Psidium guajaba); A. suspensa* (*A. carambola, C. paradisi* and *M. indica*),	P	**European Union** Typos. *Category : EDITORIAL*

		Bactrocera tryoni (*C. sinensis*, *Solanum lycopersicum*, *Malus ~~pumila~~indica*, ~~*M. indica*~~*M. pumila*, *Persea americana* and *Prunus avium*), *Pseudococcus jackbeardsleyi* (*Cucurbita* sp. and *Solanum tuberosum*), *Tribolium confusum* (*Triticum aestivum*, *Hordium vulgare* and *Zea mays*), *Cydia pomonella* (*M. pumila* and artificial diet) and *Grapholita molesta* (*M. pumila* and artificial diet) (Bustos *et al.*, 2004; Gould and von Windeguth, 1991; Hallman, 2004a, ~~b,~~ b and 2013; Hallman and Martinez, 2001; Hallman *et al*., 2010; Jessup *et al.*, 1992; Mansour, 2003; Tuncbilek and Kansu, 1966; von Windeguth, 1986; von Windeguth and Ismail, 1987; Zhan *et al*., 2016). It is recognized, however, that treatment efficacy has not been tested for all potential fruit and vegetable hosts of the target pest. If evidence becomes available to show that the extrapolation of the treatment to cover all hosts of this pest is incorrect, the treatment will be reviewed.		
53	40	Extrapolation of treatment efficacy to all fruits and vegetables was based on knowledge and experience that radiation dosimetry systems measure the actual radiation dose absorbed by the target pest independent of host commodity, and evidence from research studies on a variety of pests and commodities. These include studies on the following pests and hosts: *Anastrepha fraterculus (Eugenia uvalha, Malus pumila* and *Mangifera indica); A. ludens* (*Citrus paradisi*, *Citrus sinensis*, *M. indica* and artificial diet), *A. obliqua* (*Averrhoa ~~carambola C. sinensis~~carambola*, ~~,~~ *C. sinensis* and *Psidium guajaba); A. suspensa* (*A. carambola*, *C. paradisi* and *M. indica*), *Bactrocera tryoni* (*C. sinensis*, *Solanum lycopersicum*, *Malus ~~pumila~~indica*, *M. ~~indica~~pumila*, *Persea americana* and *Prunus avium*), *Pseudococcus jackbeardsleyi* (*Cucurbita* sp. and *Solanum tuberosum*), *Tribolium confusum* (*Triticum aestivum*, *Hordium vulgare* and *Zea mays*), *Cydia pomonella* (*M. pumila* and artificial diet) and *Grapholita molesta* (*M. pumila* and artificial diet) (Bustos *et al.*, 2004; Gould and von Windeguth, 1991; Hallman, 2004a, ~~b,~~ b and 2013; Hallman and Martinez, 2001; Hallman *et al*., 2010; Jessup *et al.*, 1992; Mansour, 2003; Tuncbilek and Kansu, 1966; von Windeguth, 1986; von Windeguth and Ismail, 1987; Zhan *et al*., 2016). It is recognized, however, that treatment efficacy has not been tested for all potential fruit and vegetable hosts of the target pest. If evidence becomes available to show that the extrapolation of the treatment to cover all hosts of this pest is incorrect, the treatment will be reviewed.	P	**EPPO** Typos. *Category : EDITORIAL*
54	40	Extrapolation of treatment efficacy to all fruits and vegetables was based on knowledge and experience that radiation dosimetry systems measure the actual radiation dose absorbed by the target pest independent of host commodity, and evidence from research studies on a variety of pests and commodities. These include studies on the following pests and hosts: *Anastrepha fraterculus (Eugenia uvalha,*	C	**Kenya** Further evidence possibly through a review paper needed to justify extrapolation of treatment efficacy to all fruits and vegetables. *Category : TECHNICAL*

		Malus pumila and *Mangifera indica); A. ludens* (*Citrus paradisi*, *Citrus sinensis, M. indica* and artificial diet), *A. obliqua* (*Averrhoa carambola C. sinensis*,, and *Psidium guajaba); A. suspensa* (*A. carambola*, *C. paradisi* and *M. indica*), *Bactrocera tryoni* (*C. sinensis*, *Solanum lycopersicum*, *Malus pumila*, *M. indica*, *Persea americana* and *Prunus avium*), *Pseudococcus jackbeardsleyi* (*Cucurbita* sp. and *Solanum tuberosum*), *Tribolium confusum* (*Triticum aestivum, Hordium vulgare* and *Zea mays*), *Cydia pomonella* (*M. pumila* and artificial diet) and *Grapholita molesta* (*M. pumila* and artificial diet) (Bustos *et al.*, 2004; Gould and von Windeguth, 1991; Hallman, 2004a, b, 2013; Hallman and Martinez, 2001; Hallman *et al*., 2010; Jessup *et al.*, 1992; Mansour, 2003; Tuncbilek and Kansu, 1966; von Windeguth, 1986; von Windeguth and Ismail, 1987; Zhan *et al*., 2016). It is recognized, however, that treatment efficacy has not been tested for all potential fruit and vegetable hosts of the target pest. If evidence becomes available to show that the extrapolation of the treatment to cover all hosts of this pest is incorrect, the treatment will be reviewed.		
55	40	Extrapolation of treatment efficacy to all fruits and vegetables was based on knowledge and experience that radiation dosimetry systems measure the actual radiation dose absorbed by the target pest independent of host commodity, and evidence from research studies on a variety of pests and commodities. These include studies on the following pests and hosts: *Anastrepha fraterculus (Eugenia uvalha, Malus pumila* and *Mangifera indica); A. ludens* (*Citrus paradisi*, *Citrus sinensis, M. indica* and artificial diet), *A. obliqua* (*Averrhoa carambola C. sinensis*,, and *Psidium guajaba); A. suspensa* (*A. carambola*, *C. paradisi* and *M. indica*), *Bactrocera dorsalis (Psidium guajava), B. tau (Cucurbita maxima), Bactrocera tryoni* (*C. sinensis*, *Solanum lycopersicum*, *Malus pumila*, *M. indica*, *Persea americana* and *Prunus avium*), *Pseudococcus jackbeardsleyi* (*Cucurbita* sp. and *Solanum tuberosum*), *Tribolium confusum* (*Triticum aestivum, Hordium vulgare* and *Zea mays*), *Carposina sasakii (Malus pumila), Cydia pomonella* (*M. pumila* and artificial diet) and *Grapholita molesta* (*M. pumila* and artificial diet) (Bustos *et al.*, 2004; Gould and von Windeguth, 1991; Hallman, 2004a, b, 2013; Hallman and Martinez, 2001; Hallman *et al*., 2010; Jessup *et al.*, 1992; Mansour, 2003; Tuncbilek and Kansu, 1966; von Windeguth, 1986; von Windeguth and Ismail, 1987; Zhan *et al*., 2016). It is recognized, however, that treatment efficacy has not been tested for all potential fruit and vegetable hosts of the target pest. If evidence becomes available to show that the extrapolation of the treatment to cover all hosts of this pest is incorrect, the treatment will be reviewed.	P	**China** These researches are suggested adding to this paragraph and relevant references are added. Theys have been published and adopted for developing the draft Annexes to ISPM 28. *Category : SUBSTANTIVE*
56	40	Extrapolation of treatment efficacy to all fruits and vegetables was based on knowledge and experience that radiation dosimetry systems measure the actual	C	**Botswana** noted

		radiation dose absorbed by the target pest independent of host commodity, and evidence from research studies on a variety of pests and commodities. These include studies on the following pests and hosts: *Anastrepha fraterculus (Eugenia uvalha, Malus pumila* and *Mangifera indica); A. ludens* (*Citrus paradisi, Citrus sinensis, M. indica* and artificial diet), *A. obliqua* (*Averrhoa carambola C. sinensis,,* and *Psidium guajaba); A. suspensa* (*A. carambola, C. paradisi* and *M. indica*), *Bactrocera tryoni* (*C. sinensis, Solanum lycopersicum, Malus pumila, M. indica, Persea americana* and *Prunus avium*), *Pseudococcus jackbeardsleyi* (*Cucurbita* sp. and *Solanum tuberosum*), *Tribolium confusum* (*Triticum aestivum, Hordium vulgare* and *Zea mays*), *Cydia pomonella* (*M. pumila* and artificial diet) and *Grapholita molesta* (*M. pumila* and artificial diet) (Bustos *et al.*, 2004; Gould and von Windeguth, 1991; Hallman, 2004a, b, 2013; Hallman and Martinez, 2001; Hallman *et al*., 2010; Jessup *et al.*, 1992; Mansour, 2003; Tuncbilek and Kansu, 1966; von Windeguth, 1986; von Windeguth and Ismail, 1987; Zhan *et al*., 2016). It is recognized, however, that treatment efficacy has not been tested for all potential fruit and vegetable hosts of the target pest. If evidence becomes available to show that the extrapolation of the treatment to cover all hosts of this pest is incorrect, the treatment will be reviewed.		*Category : TECHNICAL*
57	40	Extrapolation of treatment efficacy to all fruits and vegetables was based on knowledge and experience that radiation dosimetry systems measure the actual radiation dose absorbed by the target pest independent of host commodity, and evidence from research studies on a variety of pests and commodities. These include studies on the following pests and hosts: *Anastrepha fraterculus (Eugenia uvalha, Malus pumila* and *Mangifera indica); A. ludens* (*Citrus paradisi, Citrus sinensis, M. indica* and artificial diet), *A. obliqua* (*Averrhoa carambola C. sinensis,,* and *Psidium guajaba); A. suspensa* (*A. carambola, C. paradisi* and *M. indica*), *Bactrocera tryoni* (*C. sinensis, Solanum lycopersicum, Malus pumila, M. indica, Persea americana* and *Prunus avium*), *Pseudococcus jackbeardsleyi* (*Cucurbita* sp. and *Solanum tuberosum*), *Tribolium confusum* (*Triticum aestivum, Hordium vulgare* and *Zea mays*), *Cydia pomonella* (*M. pumila* and artificial diet) and *Grapholita molesta* (*M. pumila* and artificial diet) (Bustos *et al.*, 2004; Gould and von Windeguth, 1991; Hallman, 2004a, b, 2013; Hallman and Martinez, 2001; Hallman *et al*., 2010; Jessup *et al.*, 1992; Mansour, 2003; Tuncbilek and Kansu, 1966; von Windeguth, 1986; von Windeguth and Ismail, 1987; Zhan *et al*., 2016). It is recognized, however, that treatment efficacy has not been tested for all potential fruit and vegetable hosts of the target pest. If evidence becomes available to show that the extrapolation of the treatment to cover all hosts of this pest is incorrect, the treatment will be reviewed.	C	**Botswana** in agreement as it can be reviewed as and when necessary *Category : TECHNICAL*

58	40	Extrapolation of treatment efficacy to all fruits and vegetables was based on knowledge and experience that radiation dosimetry systems measure the actual radiation dose absorbed by the target pest independent of host commodity, and evidence from research studies on a variety of pests and commodities. These include studies on the following pests and hosts: *Anastrepha fraterculus (Eugenia uvalha, Malus pumila* and *Mangifera indica); A. ludens* (*Citrus paradisi, Citrus sinensis, M. indica* and artificial diet), *A. obliqua* (*Averrhoa carambola C. sinensis,*, and *Psidium guajaba); A. suspensa* (*A. carambola, C. paradisi* and *M. indica*), *Bactrocera tryoni* (*C. sinensis, Solanum lycopersicum, Malus pumila, M. indica, Persea americana* and *Prunus avium*), *Pseudococcus jackbeardsleyi* (*Cucurbita* sp. and *Solanum tuberosum*), *Tribolium confusum* (*Triticum aestivum, Hordium vulgare* and *Zea mays*), *Cydia pomonella* (*M. pumila* and artificial diet) and *Grapholita molesta* (*M. pumila* and artificial diet) (Bustos *et al.*, 2004; Gould and von Windeguth, 1991; Hallman, 2004a, b, 2013; Hallman and Martinez, 2001; Hallman *et al*., 2010; Jessup *et al.*, 1992; Mansour, 2003; Tuncbilek and Kansu, 1966; von Windeguth, 1986; von Windeguth and Ismail, 1987; Zhan *et al*., 2016). It is recognized, however, that treatment efficacy has not been tested for all potential fruit and vegetable hosts of the target pest. If evidence becomes available to show that the extrapolation of the treatment to cover all hosts of this pest is incorrect, the treatment will be reviewed.	C	**Botswana** in agreement as it can be reviewed *Category : TECHNICAL*
References				
59	49	~~**Hallman, G.J. & Martinez, L.R.** 2001. Ionizing irradiation quarantine treatment against Mexican fruit fly (Diptera: Tephritidae) in citrus fruits. *Postharvest Biology and Technology*, 23: 71–77.~~	P	**European Union** To be moved after Hallman, Levang-Brilz et al. (alphabetical order). *Category : EDITORIAL*
60	49	~~**Hallman, G.J. & Martinez, L.R.** 2001. Ionizing irradiation quarantine treatment against Mexican fruit fly (Diptera: Tephritidae) in citrus fruits. *Postharvest Biology and Technology*, 23: 71–77.~~	P	**EPPO** To be moved after Hallman, Levang-Brilz et al. (alphabetical order). *Category : EDITORIAL*
61	50	**Hallman, G.J., Levang-Brilz, N.M., Zettler, J.L. & Winborne, I.C.** 2010. Factors affecting ionizing radiation phytosanitary treatments, and implications for research and generic treatments. *Journal of Economic Entomology*, 103:~~1950–1963~~1950–1963.	P	**European Union** Typo. *Category : EDITORIAL*
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63	50	**Hallman, G.J., Levang-Brilz, N.M., Zettler, J.L. & Winborne, I.C.** 2010. Factors affecting ionizing radiation phytosanitary treatments, and implications for research and generic treatments. *Journal of Economic Entomology*, 103:~~1950–1963~~1950–1963.**Hallman, G.J. & Martinez, L.R.** 2001. Ionizing irradiation quarantine treatment against Mexican fruit fly (Diptera: Tephritidae) in citrus fruits. Postharvest Biology and Technology, 23: 71–77.	P	**EPPO** Moved after Hallman, Levang-Brilz et al. (alphabetical order). Typo. *Category : EDITORIAL*
64	53	**Tuncbilek, A.S. & Kansu, I.A.** 1966. The influence of rearing medium on the irradiation sensitivity of eggs and larvae of the flour beetle, *Tribolium confusum* J. du Val. *Journal of Stored Products Research* 32: ~~1–6~~1–6.	P	**European Union** Typo. *Category : EDITORIAL*
65	53	**Tuncbilek, A.S. & Kansu, I.A.** 1966. The influence of rearing medium on the irradiation sensitivity of eggs and larvae of the flour beetle, *Tribolium confusum* J. du Val. *Journal of Stored Products Research* 32: ~~1–6~~1–6.	P	**EPPO** Typo. *Category : EDITORIAL*
66	56	**Zhan, G.P., Shao, Y., Yu, Q., Xu, L., Liu, B., Wang, Y.J. & Wang, Q.L.** 2016.	P	**European Union** Typo. *Category : EDITORIAL*
67	56	**Zhan, G.P., Shao, Y., Yu, Q., Xu, L., Liu, B., Wang, Y.J. & Wang, Q.L.** 2016.	P	**EPPO** Typo. *Category : EDITORIAL*
68	56	**Zhao, J.P., Ma, J., Wu, M.T, Jiao, X.G., Wang, Z.G, Liang, F. & Zhan, G.P. 2017.** Gamma radiation as a phytosanitary treatment against larvae and pupae of Bactrocera dorsalis (Diptera: Tephritidae) .**Zhan, G.P., Li, B.S., Gao, M.X, Liu, B., Wang, Y.J., Liu, T. & Ren, L.L. 2014.** Phytosanitary irradiation of peach fruit moth (Lepidoptera: Carposinidae) in apple fruits. Radiation Physics and Chemistry, 103: 153–157.**Zhan, G.P., Ren, L.L., Shao, Y., Wang, Q.L., Yu, D.J., Wang, Y.J. & Li, T.X. 2015.** Gamma irradiation as a phytosanitary treatment of Bactrocera tau (Diptera: Tephritidae) in pumpkin fruits. Journal of Economic Entomology, 108(1): 88–94.**Zhan, G.P., Shao, Y., Yu, Q., Xu, L., Liu, B., Wang, Y.J. & Wang, Q.L.** 2016.	P	**China** These researches are suggested adding to this paragraph and relevant references are added. Theys have been published and adopted for developing the draft Annexes to ISPM 28. *Category : EDITORIAL*