Food and Agriculture Organization of the United Nations

International Plant Protection Convention

REPORT

Technical Panel on Phytosanitary Treatments

Virtual meeting
22 June 2023

IPPC Secretariat

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CONTENTS

1. Opening of the Meeting

1.1. Welcome by the IPPC Secretariat

[1] The International Plant Protection Convention (IPPC) Secretariat (hereafter referred to as "Secretariat") lead for the Technical Panel on Phytosanitary Treatments (TPPT) chaired the meeting and welcomed the following participants:

1. Mr David OPATOWSKI (TPPT Steward)
2. Mr Michael ORMSBY (New Zealand)
3. Mr Eduardo WILLINK (Argentina)
4. Mr Scott MYERS (USA)
5. Mr Daojian YU (China)
6. Mr Toshiyuki DOHINO (Japan)
7. Ms Vanessa Simoes Dias DE CASTRO (IAEA)
8. Mr Peter Llewellyn LEACH (Australia)
9. Ms Meghan NOSEWORTHY (Canada)
10. Mr Guoping ZHAN (China)
11. Mr Takashi KAWAI (Japan)
12. Mr Guy Hallman (Invited expert)
13. Ms Janka KISS (IPPC Secretariat, lead)
14. Mr Emmanuel Plarhar KRAH (IPPC Secretariat, Support)

[2] The full list of TPPT members and their contact details can be found on the International Phytosanitary Portal (IPP)[1].

1.2. Adoption of the agenda and election of the rapporteur

[3] The Secretariat welcomed the new member of the TPPT and introduced the agenda and it was adopted as presented in Appendix 1 to this report.

[4] Mr Scott MYERS was elected as the Rapporteur.

2. TPPT work programme

[5] The Secretariat introduced the summary of accomplishments in the previous year and summarized the workplan for the upcoming year.

3. Update from the SC May 2023

[6] Mr David OPATOWSKI (TPPT Steward), the Steward of the TPPT gave an update[2] on the recent developments arising from the recent meetings of the Standards Committee and the Standards Committee Working Group (SC-7).

[7] The TPPT has noted that although the SC didn't agree that the TPT submits treatment proposals direct;y, they agreed that the TPPT takes an active role in facilitating new treatment submissions.

[8] They also discussed the addition of phytosanitary treatments to commodity standards that were not reviewed by treatment expert, the only criteria for their addition being that they are used at least between two countries. They noted that this maybe confusing for contracting parties to distinguish between treatments that were reviewed (including the research supporting the treatment) against the requirements in ISPM 28, and the ones that are used bilaterally and may not be up to the same criteria.

[1] TPPT membership list: https://www.ippc.int/en/publications/81655/

[2] 03_TPPT_2023_Jun: https://www.ippc.int/en/work-area-publications/92279/

[9] The TPPT was also updated on the recent progress on the topic on the criteria for the addition of new treatments to ISPM 15. The TPPT noted that the SC-7 suggested to redraft the Specification and review the draft by another expert working group.

4. Proposals for new treatments

[10] According to the agreement of the Standards Committee, each TPPT members has gathered publications and treatments that could be submitted as proposals for new annexes to ISPM 28.

4.1. Possible treatment submissions from Florida Entomologist 2016, special issue 2

[11] Mr Guy Hallman introduced the proposals for new PTs[3] based on the Florida Entomologist 2016, special issue 2. He noted that most of the research behind these proposals were coordinated by IAEA. This issue contains a number of articles on phytosnitary treatments, listed in Table 1, and the TPPT noted that the first 7 treatments have a very high number of insects tested, they could be submitted as soon as possible. Since the target pest of the third one is already on the workprogramme, with a lower dose, that could be considered additionally within the same PT.

[12] Table 1. Possible PT submissions from Florida Entomologist 2016, Volume 99, Special Issue 2.

	Pages	Genus species	Family	Most tolerant stage present	Required response	Dose (Gy)	Numbers treated
1.	54-8	*Thaumatotibia leucotreta*	Tortricidae	5th instar	Prevent F1 moth flight or oviposition	109	124,493
2.	121-4	*Aonidiella aurantii*	Diaspididae	Adult female	Prevent F1 1st instar	222	32,101
3.	125-9	*Aspidiotus destructor*	Diaspididae	Adult	Prevent F1 1st instar	224	51,101
4.	130-3	*Trialeurodes vaporariorum*	Aleyrodidae	Late pupa	Prevent F1 eggs	108	33,625
5.	134-7	*Hemiberlesia lataniae*	Diaspididae	Adult female	Prevent F1 1st instar	209	31,877
6.	138-42	*Trogoderma granarium*	Dermestidae	Adult	Prevent F1 progeny	~100	~103,000
7.	166-70	*Planococcus citri*	Pseudococcidae	Ovipositing female	Prevent F1 progeny	150	73,530
8.	166-70	*Planococcus ficus*	Pseudococcidae	Ovipositing female	Prevent F1 progeny	150	10,293
9.	178-81	*Heliothis virescens*	Noctuidae	5th instar	Prevent adult emergence	166	14,366
10.	182-5	*Diatraea grandiosella*	Crambidae	Late pupa	Prevent F1 2nd instar	300	6075
11	182-5	*Diatraea saccharalis*	Crambidae	Late pupa	Prevent F1 2nd instar	300	5350

[13] The TPPT agreed that the authors of these articles would be contacted and asked if they would agree to proposing these treatments as annexes to ISPM 28, and encourage them to contact the IPPC contact point to request the submission be sent to the IPPC, possibly before the TPPT's face to face meeting in October 2023.

[3] 04_TPPT_2023_June: https://www.ippc.int/en/work-area-publications/92280/

[14] The TPPT noted that some data sets maybe done a long time ago, and the researchers may not be available anymore. The TPPT agreed that as long as published papers form the bases of these proposals, the submission could be progressed without the researcher, and facilitated through a contact point.

4.2. Cold treatment for *Bactrocera dorsalis* on *Citrus tankan*

[15] Mr Toshiyuki DOHINO, introduced the proposal for a new PT on the Cold treatment for *Bactrocera dorsalis* on *Citrus tankan*[4] and explained the research supporting it.

[16] The TPPT supported the submission of this treatment and noted that the number of treated insects may need to be adjusted according to agreed calculation method of the TPPT.

[17] One member requested clarification about the age of the laboratory colony the research was conducted with. It was explained the initial studies were conducted on a fresh colony, however the confirmatory study was conducted 10 years later on the laboratory colony. It was clarified that the lack of refreshment of the colony is due to the subsequent eradication of *Bactrocera dorsalis* from Japan. One members noted that although the research is really well conducted, it is of concern that laboratory colonies of *Bactrocera dorsalis* are often performing worse then wild colonies. This would need to be investigated further if the submission progresses.

[18] Another member noted that having a cold treatment for *Bactrocera dorsalis* on citrus is lacking, and since *Citrus tankan* is sometimes categorized as *C. sinensis*, research done on *C. sinensis* maybe available to support this treatment.

[19] The TPPT agreed that the Japanese NPPO would be contacted to request to submit this treatment.

4.3. Methyl iodide fumigation for *Carposina sasakii* on *Malus × domestica*

[20] Mr Takashi KAWAI, introduced the proposal for a new PT on Methyl iodide fumigation for *Carposina sasakii on Malus × domestica*[5].

[21] One member queried whether this treatment would be widely used since the fumigant is not registered to use in many places. However since this fumigant could be used as an alternative to methyl bromide, and is also quite effective, it could be picked up for use, especially after being adopted as a PT.

[22] The TPPT agreed that the submission would be welcome and they would examine the treatment further. The TPPT agreed that the Japanese NPPO would be contacted to request to submit this treatment.

4.4. Cold treatment for *Zeugodacus tau* on *Citrus sinensis*

[23] Ms Vanessa Simoes Dias DE CASTRO, introduced the proposal for a new PT on the Cold treatment for *Zeugodacus tau* on *Citrus sinensis*[6] and introduced the research she is the lead author for.

[24] It was noted that orange was used in the research as substrate and that it is not a good host. The same treatment is used by the US, but only as part of a systems approach and not as the standalone measure proposed here. It is considered valuable since there are not many treatments for *Zeugodacus tau*, and although it might generate a lot of discussion among contracting parties, this should be submitted in order to be examined further.

[25] The TPPT agreed that the US NPPO would be contacted to request to submit this treatment.

[4] 05_TPPT_2023_Jun: https://www.ippc.int/en/work-area-publications/92281/

[5] 07_TPPT_2023_Jun: https://www.ippc.int/en/work-area-publications/92283/

[6] 10_TPPT_2023_Jun: https://www.ippc.int/en/work-area-publications/92285/

4.5. Irradiation treatment for *Planococcus lilacinus*

[26] Mr Daojian YU (China), introduced the proposal for a new PT on the Irradiation treatment for *Planococcus lilacinus*[7].

[27] One member noted that PT 19 addresses the same target species at a different dose, and it was agreed that this could be recommended either as a revision to PT 19 or as a standalone submission.

[28] The TPPT agreed that the NPPO of China would be contacted to request to submit this treatment.

4.6. Combination of Modified Atmosphere and Irradiation Treatment for *Trogoderma granarium*

[29] Mr Guoping ZHAN (China), introduced the proposal for a new PT on the Combination of Modified Atmosphere and Irradiation Treatment for *Trogoderma granarium*[8].

[30] One member raised that the combination of irradiation and modified atmosphere could be complicated. One member noted that adults don't live very long anyways, and the controls indicate that the adults are dying, but it is unclear whether it is the effect of the treatment, the data didn't show how the dose effected the mortality. The larva stage would be best tested as it is known to survive longer. It is known that usually eggs are more tolerant to modified atmosphere, that should also be reviewed. It was also noted that the Florida Entomologist special issue mentioned under agenda item 4.1 contains a reference to a publication for a treatment for the same pest but for a lower irradiation dose. Until that submission is made, this could be considered for the workprogramme.

[31] The TPPT agreed that the NPPO of China would be contacted to request to submit this treatment.

4.7. Irradiation treatment for *Pseudococcus baliteus*

[32] Mr Guoping ZHAN (China), introduced the proposal for a new PT on the Irradiation treatment for *Pseudococcus baliteus*[9].

[33] One member noted that the treatment is proposed at 180 Gy to prevent the hatch of second instar larvae, although in the test there was no hatch at all after irradiation. It was explained, that the second instar was selected, since some eggs may have been present under the adults that were treated. There were a large number of eggs also tested with no hatch. This maybe further reviewed by the TPPT.

[34] The TPPT agreed that the NPPO of China would be contacted to request to submit this treatment.

4.8. Ethyl formate fumigation for *Halyomorpha halys*

[35] Mr Michael ORMSBY (New Zealand), introduced the proposal for a new PT on Ethyl formate fumigation for *Halyomorpha halys*[10].

[36] The TPPT noted that this used in New Zealand, and although the efficacy is modest because 3000 insects were tested only, it may suit the needs of some contracting parties meeting the appropriate level of protection needed.

[37] The TPPT agreed that an NPPO would be contacted to request to submit this treatment.

[7] 12_TPPT_2023_Jun: https://www.ippc.int/en/work-area-publications/92288/

[8] 14_TPPT_2023_Jun: https://www.ippc.int/en/work-area-publications/92290/

[9] 17_TPPT_2023_Jun: https://www.ippc.int/en/work-area-publications/92294/

[10] 19_TPPT_2023_Jun: https://www.ippc.int/en/work-area-publications/92296/

4.9. Vapour heat and cold treatments

[38] Mr Michael ORMSBY (New Zealand), introduced the proposal for a new PT on Vapour heat and cold treatments[11] as presented in the tables below.

Vapour heat treatment options for associated with *Citrus* species

Target Fruit Fly	*Citrus* Species	Treatment Schedule	Efficacy (95% LoC)	Reference
Anastrepha suspensa	*C. paradisi*	Heated (43.3-43.7°C air for >200 min) until core temp reached 43.3°C, then hold for 50 minutes before air-cooling.	>99.99%	Hallman et al. (1990)
		Heated (48°C air for >150 min) until core temp reached 44°C.	99.9974	Sharp (1993)
	C. sinensis	Heated (48°C air for >100 min) until core temp reached 44°C.	99.9974	Sharp & McGuire (1996)
Anastrepha ludens	*C. paradisi*	Heated (50°C air for >270 min) until core temp reached 48°C, with a dew point 2°C lower than fruit surface temperature.	99.9971	Mangan & Ingle (1994)
		Heated (46°C air for >300 min) until core temp reached 46°C.	99.9968	Mangan *et al.* (1998)
	C. sinensis	Heated (46°C air for >250 min) until core temp reached 46°C.	99.9970	
	C. reticulata	Heated (45°C air for >210 min) until core temp reached 45°C.	99.9971	

Published schedules for cold treatments for fruit flies associated with *Citrus* species (as referenced).

Target Fruit Fly	*Citrus* Species	Treatment and minimum duration		Efficacy (95% LoC)	Reference
Bactrocera dorsalis	*C. sinensis*	Maximum 0.9°C	16 days	99.9932%	Grout et al. (2011)
Ceratitis capitata	*C. sinensis*	Maximum 1°C	16 days	99.9833%	Hill et al. (1988)
	C. limon	Maximum 1°C	14 days	99.9943%	Jessup et al. (1993)
Bactrocera tryoni	*C. limon*	Maximum 1°C	12 days	99.9955%	Jessup et al. 1993
	C. sinensis	Maximum 1°C	16 days	99.996%	Hill et al. (1988)
Anastrepha fraterculus	*C. reticulata*	Maximum 2°C	23 days	99.9918%	Gastaminza et al. (2007) Willink et al. (2007)
Bactrocera carambolae *Bactrocera correcta*	*C. sinensis*	Maximum 3°C	16 days	>99.9973%	Myers et al. (2016)

[39] It was noted that there is a lot of information gathered for treatments for citrus fruits, and analyzing the gaps of existing PTs, a number of them were identified as potential treatment proposals. For example there is no vapour heat treatment for Anastrepha, and cold treatments are lacking for *Bactrocera dorsalis*, Anastrepha species and other Bactrocera species. Published papers are available on them. Some

[11] 22_TPPT_2023_Jun: https://www.ippc.int/en/work-area-publications/92299/

of these would be just additions to exiditing PTs and if the TPPT agrees that these gaps need to be filled, these could be considered.

[40] One member noted that hot water treatments could be considered as well as a gap. Some of these studies are old, but TPPT members agreed that some data is still available at the research organization and since they are published papers, they are considered useful.

[41] The TPPT agreed that an NPPO would be contacted to request to submit these treatments.

5. Discussion on the generic treatments impacting existing PTs 1-3 as they are all superseded by PT 39

[42] The TPPT postponed the discussion on this agenda item until the next face to face meeting.[12]

6. Preparation for the webinar on better treatment submissions

[43] The TPPT postponed the discussion on this agenda item[13].

7. Recommendations to the SC

[44] The TPPT

(1) *recommended* to the SC to add the following topics to the TPPT workprogramme in order to evaluate them further, once they are submitted by an NPPO or an RPPO:

a. Cold treatment of *Citrus sinensis* for *Zeugodacus tau*
b. Methyl iodide fumigation of *Carposina sasakii* on *Malus* × *domestica*
c. Combination of Modified Atmosphere and Irradiation Treatment for *Trogoderma granarium*
d. Irradiation treatment for *Pseudococcus baliteus*
e. Irradiation treatment for *Paracoccus marginatus*
f. Irradiation treatment for *Planococcus lilacinus*
g. Ethyl formate fumigation for *Halyomorpha halys*
h. Cold treatment for *Bactrocera dorsalis* on *Citrus tankan*
i. Irradiation treatment for *Thaumatotibia leucotreta*
j. Irradiation treatment for *Aonidiella aurantii*
k. Irradiation treatment for *Trialeurodes vaporariorum*
l. Irradiation treatment for *Hemiberlesia lataniae*
m. Irradiation treatment for *Trogoderma granarium*
n. Irradiation treatment for *Planococcus citri*
o. Vapour heat treatments for *Anastrepha suspensa* on *C. paradisi* and *C. sinensis*
p. Vapour heat treatments for *Anastrepha ludens* on *C. paradisi*, *C. sinensis* and *C. reticulata*
q. Cold treatment for *Bactrocera dorsalis* on *C. sinensis*
r. Cold treatment for *Ceratitis capitata* on *C. sinensis* and *C. limon*
s. Cold treatment for *Bactrocera tryoni* on *C. limon* and *C. sinensis*
t. Cold treatment for *Anastrepha fraterculus* on *C. reticulata*
u. Cold treatment for *Bactrocera carambolae* and *Bactrocera correcta* on *C. sinensis*

[12] 09_TPPT_2023_Jun: https://www.ippc.int/en/work-area-publications/92287/

[13] 02_TPPT_2023_Jun: https://www.ippc.int/en/work-area-publications/92300/

8. Close of the Meeting

[45] The Secretariat thanked the TPPT members for their participation and closed the meeting.

Appendix 1: Agenda

2023 JUNE VIRTUAL MEETING OF THE TECHNICAL PANEL ON PHYTOSANITARY TREATMENTS (TPPT)

AGENDA

	AGENDA ITEM	DOCUMENT NO.	PRESENTER
1.	Opening of the meeting		
1.1	Welcome by the IPPC Secretariat		KISS / ALL
1.2	Adoption of the agenda and election of the rapporteur	01_TPPT_2023_Jun	KISS / ALL
2.	Discussion of the TPPT work programme	All submissions: https://www.ippc.int/en/work-area-pages/draft-phytosanitary-treatments-and-relevant-documents/	
3.	Update from the SC May 2023	03_TPPT_2023_Jun	OPATOWSKI/ KISS
4.	Proposals for new treatments		ALL
4.1	Possible treatment submissions from Florida Entomologist 2016, special issue 2 - References: Special Issue 2, 2016, of the Florida Entomologist	04_TPPT_2023_Jun https://journals.flvc.org/flaent/issue/view/4278	HALLMAN
4.2	Proposal: Cold treatment for *Bactrocera dorsalis* on *Citrus tankan* - Reference: Yamamoto *et al* 2017	05_TPPT_2023_Jun 06_TPPT_2023_Jun	DOHINO
4.3	Proposal: Methyl iodide fumigation for *Carposina sasakii* on *Malus* × *domestica* - Reference: Soma *et al* 2023	07_TPPT_2023_Jun 08_TPPT_2023_Jun	KAWAI
4.4	Proposal: Cold treatment for *Zeugodacus tau* on *Citrus sinensis* - Reference: Dias *et al* 2023	10_TPPT_2023_Jun 11_TPPT_2023_Jun	DIAS
4.5	Proposal: Irradiation treatment for *Planococcus lilacinus* - Reference: Chen *et al* 2022	12_TPPT_2023_Jun 13_TPPT_2023_Jun	YU
4.6	Proposal: Combination of Modified Atmosphere and Irradiation Treatment for *Trogoderma granarium* - Reference: Mansour 2016 - Reference: Controlled atmosphere treatments: altered pressure	14_TPPT_2023_Jun 15_TPPT_2023_Jun 16_TPPT_2023_Jun	ZHAN
4.7	Proposal: Irradiation treatment for *Pseudococcus baliteus* - Reference: Zhao *et al* 2021	17_TPPT_2023_Jun 18_TPPT_2023_Jun	ZHAN
4.8	Proposal: Ethyl formate fumigation for *Halyomorpha halys*		ORMSBY

	AGENDA ITEM	DOCUMENT NO.	PRESENTER
	- Reference: Kawagoe *et al* 2022 - Supplemental tables: Kawagoe *et al* - Supplemental tables: Kawagoe *et al* (excel)	19_TPPT_2023_Jun 20_TPPT_2023_Jun 21_TPPT_2023_Jun	
4.9	Possible treatment submissions: vapour heat and cold treatments	22_TPPT_2023_Jun	ORMSBY
5.	Discussion on the generic treatments impacting existing PTs 1-3 as they are all superseded by PT 39.	09_TPPT_2023_Jun	HALLMAN/ALL
6.	Preparation for the webinar on better treatment submissions	02_TPPT_2023_Jun	KISS
7.	Recommendations to the SC		
8.	Close of the meeting		KISS