Food and Agriculture Organization of the United Nations

International Plant Protection Convention

REPORT

Technical Panel on Phytosanitary Treatments

Virtual meeting
24 May 2022

IPPC Secretariat

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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. Mr Walther ENKERLIN HOEFLICH (IAEA)
8. Mr Peter LEACH (Australia)
9. Ms Meghan NOSEWORTHY
10. Mr Guoping ZHAN
11. Mr Takashi KAWAI
12. Mr Guy HALLMAN (Invited Expert)
13. Ms Janka KISS (IPPC Secretariat, lead)
14. Mr Artur Shamilov (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 introduced the agenda and it was adopted as presented in Appendix 1 to this report.

[4] Mr Peter LEACH was elected as the Rapporteur.

2. TPPT work programme – addressing comments from first consultation

2.1. Irradiation treatment for *Pseudococcus jackbeardsleyi* (2017-027)

[5] Mr Walther ENKERLIN HOEFLICH, the Treatment Lead introduced the revised draft PT, the comments received during the first consultation and the responses prepared to those comments[2]. He explained that additional questions were asked of the submitter in order to better answer the comments, these were also shared with the TPPT[3]. The TPPT considered the recommendations of the Technical Panel on the Glossary regarding terminology[4].

[6] The TPPT reviewed the responses provided by the treatment lead and discussed the most contentious comments.

[7] **Colony fitness**. One of the major comments queried about the replenishment of the colony and whether pest populations collected from other geographical regions were used. The TPPT suggested that 98% development into second instar in the controls in the three experiments suggests a healthy colony (raw data was provided by the submitter). They stated that there are currently no prescriptive guidelines for the establishment of insect colonies. General agreement is that colonies are more robust when they include insects from a wide range of geographical regions. But the TPPT is unaware of any scientific publications that clearly identifies that the size of the founding population or the number of locations

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

[2] 2017-027, 02_TPPT_2022_May_Rev1,

[3] 04_TPPT_2022_May, 05_TPPT_2022_May

[4] 03_TPPT_2022_May

insects are collected from prevents/reduces the impact of maintaining insects in laboratory cultures and if this does influence the radiotolerance of the insects.

[8] **Survivorship of the colony**. The comment also requested information on the survivorship of the colony at each developmental stage and fecundity of the organisms in the colony, and whether the infestation rate used in the experiments was not excessive. They also queried the species of pumpkin used. The TPPT agreed that the additional data provided by the submitter shows for the controls a healthy insect colony with high fecundity and fertility rates. The number of 2nd instars from the F1 generation in the controls and the low rate of mortality (no more than 2%), suggests that there was no detrimental effect of the infestation rate. The submitter confirmed that the species of pumpkin used in the experiments is *Cucurbita. pepo*.

[9] **Replicates.** The comment notes that the large-scale experiment in potato was only conducted once, while two replicates at different times were conducted on pumpkin. The comment suggested that a minimum of four replicates in each of the host commodity performed over a period of time to maximize natural variation in response within the experimental units should be recommended. The TPPT considered adequate the 3 replicates used in the study (2 on pumpkins and 1 on potatoes) as in previous cases.

[10] **Host commodity**. Another concern was that *P. jackbeardsleyi* is a host on a number of economically important commodity, including banana, rambutan, durian and pineapple, which is traded internationally. They suggested it is premature to recommend a minimum dose of 166 Gy for phytosanitary treatment of *P. jackbeardsleyi* infestation in any host commodity and that a generic dose should be supported by data on a range of species that adequately represents major quarantine pests within the taxa, with large-scale confirmatory trials being conducted. The TPPT clarified that all adopted irradiation treatments are applicable to all host commodities of the target pest. The number of insects tested (97,089 in potatoes and 34,423 in pumpkin) and the results showed no 2nd instar development using 150 Gy (absorbed dose of 133 to 164 Gy). This provides a 95% confidence that the treatment according to this schedule prevents offspring developing to the second-instar nymph stage from not less than 99.9977% (probit 9.08) of mature adult females of *P. jackbeardsleyi*.

[11] Extrapolation of treatment efficacy to all fruits vegetables and ornamental plants 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 support this.

[12] **Condition of host**. The comment suggested, that information on the condition of the commodity at the time of the study should also be provided. The TPPT noted that insecticide free potatoes and pumpkins were used in the dose-response and confirmatory tests. Fruits were mature as they are stored in warehouses before sale (photos are available showing the stage of the infested fruits upon request to the IPPC Secretariat).

[13] **Most tolerant life stage**. The comment suggested that the report by Zhan et al. 2016 cites Shao *et al.* 2013, which determined the most radiation-tolerant state of *P. jackbeardsleyi* to be the late female stage, which was used in the experiments by Zhan et al. The comment queried of the methodology details of the dose-response testing that determined the most radio-tolerant developmental stage in the Shao *et al*. 2013 study. The TPPT stated that the submitter presented the number of insects used in the tests and the developmental data. For each developmental stage and each irradiation dose and the control, three replicates were conducted (based on additional information provided by the submitter). Results clearly show that the most tolerant stage is the late adult female.

[14] **Scope**. Another comment suggested to reword the scope in order to clarify the pest development stage that is prevented from appearing by the treatment, however the TPPT only agreed to a small modification in order to stay consistent with the scope of other PTs and true to the content of the study.

[15] The TPPT also reviewed the draft PT and agreed to the above mentioned minor change to the scope to specifically indicate that the development of the F1 second instar nymphs are prevented.

[16] The efficacy was originally calculated as reported in the 2020 October TPPT virtual meeting report. However the TPPT amended the efficacy calculation slightly based on the recent information provided by the submitter (Appendix 2) changing the efficacy from 99.9964% to 99.9977%.

[17] The TPPT

(1) *Recommended* the following draft PT to the Standards Committee (SC) for approval for the second consultation: Irradiation treatment for *Pseudococcus jackbeardsleyi* (2017-027)

(2) *Recommended* the responses for the comments for approval by the SC

3. Work planning and priorities for 2022

3.1. Overview of the TPPT workprogramme

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

3.2. Possibility of a face to face meeting in 2022

[19] It was agreed to have a face to face meeting for the 12-16 September 2022.

4. Updates

4.1. International Plant Health Conference

[20] This agenda item was deferred.

5. Close of the Meeting

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

Appendix 1: Agenda

2022 MAY 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 - Introduction of new members		KISS / ALL
1.2	Adoption of the agenda and election of the rapporteur	01_TPPT_2022_May	KISS / ALL
2.	TPPT work programme – addressing comments from first consultation	All submissions: https://www.ippc.int/en/work-area-pages/draft-phytosanitary-treatments-and-relevant-documents/	
2.1	Irradiation treatment for *Pseudococcus jackbeardsleyi* (2017-027)		ENKERLIN
	- Consultation comments	02_TPPT_2022_May	
	- Terminology suggestions from the Technical Panel on the Glossary	03_TPPT_2022_May	
	- Response to TPPT query 1	04_TPPT_2022_May	
	- Response to TPPT query 2	05_TPPT_2022_May	
	- Draft PT	2017-027	
3.	Work planning and priorities for 2022		
3.1	Overview of the TPPT workprogramme	06_TPPT_2022_May	KISS/Leads
3.2	Possibility of a face to face meeting in 2022		ALL
4.	Updates		
4.1	International Plant Health Conference		SHAMILOV
5.	Close of the meeting		KISS

Appendix 2: Efficacy calculation for Irradiation treatment for *Pseudococcus jackbeardsleyi* (2017-027)

[22] The actual counts from the data provided was used and estimates for the remaining uncounted half of the tested potatoes/pumpkins. As per the IPPC procedure manual the formula is the one used for comparing actual numbers (**μ - (STD × 1.645)**) rather than estimating from the means (**μ - (STD × √(1+1/r))**).

[23] The calculations were as follows:

1. Actual counts of half the exposed potatoes/pumpkins add up to **83,905** (potatoes = 59,260, 127 pumpkins = 24,645)
2. Estimated counts from the exposed but uncounted potatoes would be **37,829**
3. Estimated counts from the exposed but uncounted pumpkins would be 5,575 + 4,203 = **9,778**

[24] Giving a total count of 83,905 + 37,829+ 9,788 = **131,512** that gives an overall efficacy of **99.9977%** (probit 9.08) at the 95% LoC.