**2009-109: Draft Annex to ISPM 28 - Vapour heat treatment for *Bactrocera dorsalis* on *Carica papaya* var. *Solo***

| **Comm. no.**  | **Para. no.**  | **Comment type**  | **Comment**  | **Explanation**  | **Country**  | **TPPT responses** |
| --- | --- | --- | --- | --- | --- | --- |
| 1.  | *G*  | Editorial  |  | It may be worth looking into this treatment applicability to other varieties of papaya. | United States of America  | Considered, (but not incorporated): Unfortunately, data provided are only for ‘Solo” |
| 2.  | *G*  | Substantive  | I support the document as it is and I have no comments |  | Lao People's Democratic Republic, Canada, Georgia, Nepal, Barbados, Dominica, Ghana, Belize, Australia  | Noted |
| 2.  | *G*  | Substantive  | I support the document as it is and I have no comments |  | Burundi, Gabon  | Noted |
| 4.  | *G*  | Substantive  |  | To allow this standard to suit its purpose, while treatment specifications are mentioned, it is recommended that teh standard also include a section ono thos situation that make a treatment invalid eg on of the probe fruit struggles to reach teh target core temperature and the treatment time has gone over the 3 hours.The standards may slso consider a section on pre-treatment activities (thermal mapping to determine cold spotes, thermo-tolerance studies etc) posing as a remider /check so that all the work need to be done rpiro is done and finalized as they are not considered in the current draft. Those details will aslo link ;in well when contracting parties develop their regulations for teh complete confidence required by the importing countries. | New Zealand  | Considered, (but not incorporated): It is understood that situations that do not satisfy the treatment schedule make the treatment invalid. Pre-treatment activities are not part of the treatment schedule and may vary depending on the treatment facility. In any case, some of this information will be provided in an upcoming ISPM on requirements for the use of temperature treatments. |
| 5.  | *G*  | Substantive  | ﻿Japan appreciates and supports development of phytosanitary treatments as international standards that can be used by a wide range of countries. With the understanding that the standard treatments should meet the requirements described in section 3 of ISPM 28, especially versatility of the treatment e.g. application to a wide range of countries, the proposed treatment schedule needs to be reviewed and verified taking into account the possible variation in heat tolerance of fruit fly population in different regions. In this context, available research data supporting existing treatment schedules should be collected from countries where *B. dorsalis ﻿*is present in order to verify the proposed treatment schedule achieves the stated efficacy in a wide range of countries. For this purpose, Japan is willing to provide the IPPC Secretariat with available research data which were submitted by exporting countries, subject to the approval of these countries. In addition, target regulated articles should be specified at cultivar level. ﻿ | According to the hot immersion test data submitted by the exporting countries when requesting export of their products to Japan, there is difference in Lethal time for 99% mortality (LT99) for all stages of Bactrocera cucurbitae between two countries. This result shows possible difference between fruit fly populations in terms of heat tolerance. LT99 of B. cucurbitae after hot water immersion at 45°C is as follows. LT99 of egg is 36.97 (country A) and 76.94 (Country B). LT99 of 1st instar is 30.98 (country A) and 63.31 (country B). LT99 of 2nd instar is 28.40 (country A) and 44.35 (country B). LT99 of 3rd instar is 12.35 (country A) and 15.55 (country B). LT99 is recalculated based on the raw data by Japan. With regard to differences in fruit variety, Yoshinaga et al. (2009) and Omura et al. (2014) suggested difference in mango variety had an effect on the mortality rate in vapour heat treatment. References: Masakuni Yoshinaga, Seiki Masaki and Toshiyuki Dohino. 2009. Vapor heat mortality tests on the eggs of the oriental fruit fly, Bactrocera dorsalis, infesting different sizes and varieties of fresh mango. Res. Bull. Pl. Prot. Japan No. 45: 41-47 Kazutaka Omura, Toshiyuki Dohino, Masahiro Tanno, Isao Miyazaki and Norihito Suzuki. 2014. Vapor Heat Mortality Tests on the Eggs of Oriental Fruit Fly, Bactrocera dorsalis , Infesting Different Fruit Shape of Fresh Mango.Res. Bull. Pl. Prot. Japan No. 50 : 1 -8 | Japan  | Considered, (but not incorporated): Recent studies done in Japan and at the FAO/IAEA laboratories in Seibersdorf, Austria, with *B. dorsalis* from different countries found no significant difference in efficacy at doses that cause near 100% efficacy. Therefore, it is concluded that the treatment can be done regardless of country of export. |
| 6.  | *G*  | Technical  | Disagree | This schedule was based on the research of Santos (1996), but eggs was not the most thermotolerant in this research. So it is not reasonable to develope the treatment schedule based on this research. | China  | Considered, (but not incorporated): Santos (1996) did not determine the most thermotolerant stage. However, the previous studies (BPI-PQS & JICA 1988 listed in the references) identified the egg stage of *B.dorsalis* as the most thermotolerant stage among egg and larval stages infesting papaya.. |
| 7.  | *G*  | Technical  |  | The appropriate ED as an international standards should be more than 99.99. However, The value of ED is described at 99.86 in this draft and thus, this draft is needed to be amended that ED should be raised to over 99.99. | Korea, Republic of, NEPPO  | Considered, (but not incorporated): The effective dose is calculated based on what the research supports.(See responses to comments 43, 44 and 45) |
| 8.  | *G*  | Technical  | ﻿ | (1) According to Santos (1996) referred to the draft ISPM, the experiment was conducted using Dacus dorsalis in Philippine. However, "The Bactrocera dorsalis complex of fruit flies in Asia. Drew & Hancock (1994)" showed B. dorsalis is not present in Philippines. This inconsistency needs to be addressed. (2) Since references to the draft ISPM, Corcoran, R.J. (2001) and Santos, W. (1996), are not disclosed, it is difficult to technically examine the proposed treatment schedule. References to the proposed treatment schedules should be provided as far as possible for member countries’ scrutiny. | Japan  | Considered, (but not incorporated):  (1) It has since been shown that the species that Drew & Hancock (1994) separated from *B. dorsalis* in the Philippines is, in fact, *B. dorsalis*. (Schutze et al (2015) Synonymization of key pest species within the Bactrocera dorsalis species complex (Diptera: Tephritidae): taxonomic changes based on a review of 20 years of integrative morphological, molecular, cytogenetic, behavioural and chemoecological data. Systematic Entomology, Volume 40: 456–471.)(2) Agreed. |
| 9.  | *1*  | Editorial  | **Draft AnnNNex to ISPM 28:2007: Vvapour heat treatment for *Bactrocera dorsalis* on *Carica papaya* var. Solo﻿﻿*solo* (2009-109)** | ANNex to Annex; capital letter to "Vapour" and to "Solo"; should ‘Solo’ be in italics if it is a cultivar name? | EPPO, European Union, Georgia, Serbia  | INCORPORATED: Already corrected in version 2014-04-23. |
| 10.  | *1*  | Editorial  | **Draft AnnNNex to ISPM 28:2007: vapour heat treatment for *Bactrocera dorsalis* on *Carica papaya* var. *solo* (2009-109)** | Edit | United States of America, Mexico  | INCORPORATED: Already corrected in version 2014-04-23. |
| 11.  | *1*  | Technical  | **Draft ANNex to ISPM 28:2007: vapour heat treatment for *Bactrocera dorsalis* complex? on *Carica papaya* var. *solo* (2009-109)** | The draft standard should be clearer to address whether the pest of concern is referring to the Bactrocera dorsalis complex . If the basis is on the work of Santos in 1996, it would be good to verify if the species Santos worked on was in fact the complex in 1996 or actually a different Bactrocera species after the complex issue has been more defined. This is important as classification of the oriental fruit fly is more clearer now as compared to 1996. If the VHT has no differentiation in terms of efficacy for the different species, then it would best to indicate so in the standard for more clarity. | Singapore  | CONSIDERED, (BUT NOT INCORPORATED): It is now known that the species researched in the Philippines for this study is *B. dorsalis*.(Schutze et al (2015) Synonymization of key pest species within the Bactrocera dorsalis species complex (Diptera: Tephritidae): taxonomic changes based on a review of 20 years of integrative morphological, molecular, cytogenetic, behavioural and chemoecological data. Systematic Entomology, Volume 40: 456–471.)  |
| 12.  | *1*  | Translation  | **Draft ANNex to ISPM 28:2007: vapour heat treatment for *Bactrocera dorsalis* on *Carica papaya* var. *solo* (2009-109)**  | "Vapour heat treatment for Bactrocera dorsalis on Carica papaya var. solo" Should be translated into Sapnish as "Tratamiento con vapor caliente contra Bactrocera dorsalis en Carica papaya var. Solo" | OIRSA  | The Secretariat will forward to FAO translation services |
| 13.  | *2*  | Editorial  |

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| **Status box**  |
| This is not an official part of the standard and it will be modified by the IPPC Secretariat after adoption. |
| **Date of this document** | 2014-04-23 |
| **Document category** | Draft Annex XX to ISPM 28:2007 |
| **Current document stage** | 2014-04 SC approved for MC |
| **Major stages** | 2009 Vapour heat treatment for *Bactrocera dorsalis on* *Carica papaya* var. s*Solo* submitted2010-07 TPPT reviewed treatment and requested additional information2012-05 SC placed treatment on hold pending submission of data2012-12 TPPT requested additional information2013-02 TPPT sent Final notice letter to Submitter through Secretariat2013-05 Submitter responded2013-07 TPPT reviewed submitter response and recommended to SC for MC2013-09 TPPT approved treatment schedule (virtual meeting)2014-02 SC approved draft treatment for MC via e-decision |
| **Treatment lead** | 2009-01 Ms Alice BAXTER (ZA)2012-12 Mr Guy HALLMAN (US) |
| **Secretariat notes** | 2013-09 Formatted in accordance with new requirements2013-09 Secretariat started using previously revised footnote relating treatment adoption2014-04 Editor edited the text  |

 | Edit | United States of America  | Considered, (but not incorporated):  ‘Solo’ should remain beginning with a capital letter. |
| 14.  | *4*  | Editorial  | This treatment comprises the vapour heat treatment of fruit of *Carica papaya* var. Solo ﻿to result in the mortality of eggs and larvae (all ages) of *Bactrocera dorsalis* (oriental fruit fly) at the stated efficacy1. | Cf Title | EPPO, European Union, Georgia, Serbia  | INCORPORATED |
| 15.  | *4*  | Editorial  | This treatment comprises the vapour heat treatment of fruit of *Carica papaya* toresult in the mortality of eggs and larvae (all ages) of *Bactrocera dorsalis* (oriental fruit fly) at the stated efficacy1. | The Secretariat should ensure that all treatments not include the common name because common names are varied across regions and across languages. In addition, common names have not been included in adopted standards. | United States of America  | INCORPORATED |
| 16.  | *4*  | Technical  | This treatment comprises the vapour heat treatment of fruit of *Carica papaya* toresult in the mortality of eggs and larvae (all instarsages) of *Bactrocera dorsalis* (oriental fruit fly) at the stated efficacy1. | More technically correct | United States of America  | INCORPORATED |
| 17.  | *4*  | Translation  | This treatment comprises the vapour heat treatment of fruit of *Carica papaya* toresult in the mortality of eggs and larvae (all ages) of *Bactrocera dorsalis* (oriental fruit fly) at the stated efficacy1.  | "This treatment comprises the vapour heat treatment of fruit of Carica papaya to result in the mortality of eggs and larvae (all ages) of Bactrocera dorsalis (oriental fruit fly) at the stated efficacy" should be translated into Spanish as "Este tratamiento consiste en el tratamiento con vapor caliente de frutos de Carica papaya para provocar la mortalidad de los huevos y larvas (de todas las edades) de Bactrocera dorsalis (mosca oriental de la fruta) con la eficacia indicada" | OIRSA  | The Secretariat will forward to FAO translation services |
| 18.  | *6*  | Editorial  | **Name of treatment** Vapour heat treatment for *Bactrocera dorsalis on* *Carica papaya* var. s*Solo* | Edit | United States of America  | CONSIDERED, (BUT NOT INCORPORATED): ‘Solo’ should remain beginning with a capital letter.  |
| 19.  | *6*  | Translation  | **Name of treatment** Vapour heat treatment for *Bactrocera dorsalis on* *Carica papaya* var. *Solo*  | "Vapour heat treatment" should be translated into Spanish as "tratamiento con vapor caliente" | OIRSA  | The Secretariat will forward to FAO translation services |
| 20.  | *8*  | Editorial  | **Treatment type** Physical (vapour heat treatment) | Cf. PT 15 (annex 15 of ISPM 28). | EPPO, European Union, Georgia, Serbia  | INCORPORATED |
| 21.  | *8*  | Translation  | **Treatment type** Physical (vapour heat treatment) | "Vapour heat treatmente" should be translated into Spanish as "tratamiento con vapor caliente" | OIRSA  | The Secretariat will forward to FAO translation services |
| 22.  | *9*  | Editorial  | **Target pest** *Bactrocera dorsalis* (Hendel) (Diptera: Tephritidae)(oriental fruit fly) | Common name already given in paragraph [4]. | EPPO, European Union, Georgia, Serbia  | INCORPORATED |
| 23.  | *9*  | Editorial  | **Target pest** *Bactrocera dorsalis* (Hendel) (Diptera: Tephritidae)(oriental fruit fly) | Ensure that the Sectretariat make these draft standards consistent with adopted standards (i.e. Species name, author, family/order information, no common name listed) | United States of America  | INCORPORATED |
| 24.  | *10*  | Editorial  | **Target regulated articles** Fruit of *Carica papaya* (L.) ﻿var. *Solo* (L.) | Place "(L.)" directly after "Carica papaya" (i.e. before "var. Solo"). Solo is the cultivar name and should not be italics. | EPPO, European Union, Georgia, Serbia  | INCORPORATED: L. after species but without parentheses. |
| 25.  | *10*  | Editorial  | **Target regulated articles** Fruit of *Carica papaya (L.)*var. s*Solo* (L.) | Linnaeus described the species, not the variety. | United States of America  | 1. INCORPORATED: ‘L.’ after species, but without parentheses.. 2. CONSIDERED, (BUT NOT INCORPORATED): ‘Solo’ should remain beginning with a capital letter. |
| 26.  | *12*  | Substantive  | Exposure in a certified vapour heat chamber: | Tghis will factor the crticial treatment certification issues whcih can include determining teh cold spots and the tryp of resistenace thermal device to be used etc. | New Zealand  | CONSIDERED (BUT NOT INCORPORATED):Certification of treatment facilities, although important to the commercial implementation of a phytosanitary treatment, is beyond the scope of phytosanitary treatment standards. |
| 27.  | *12*  | Translation  | Exposure in a vapour heat chamber:  | "Exposure in vapour heat chamber" should be translated into Spanish as "Exposición en una cámara de vapor caliente" | OIRSA  | The Secretariat will forward to FAO translation services |
| 28.  | *13*  | Editorial  | - at a minimum of 95% relative humidity | Dash missing. | EPPO, European Union, Georgia, Serbia  | INCORPORATED Already corrected in version 2014-04-23. |
| 29.  | *13*  | Editorial  | * at a minimum of 95% relative humidity;
 | For better understanding | OIRSA  | CONSIDERED, (BUT NOT INCORPORATED): Previous annexes do not use semi colons here |
| 30.  | *14*  | Editorial  | - with air temperature increasing from room temperature to 47 °C | Dash missing. | EPPO, European Union, Georgia, Serbia  | INCORPORATED Already corrected in version 2014-04-23. |
| 31.  | *14*  | Editorial  | * with air temperature increasing from room temperature to 47 °C;
 | For better understanding | OIRSA  | CONSIDERED, (BUT NOT INCORPORATED): Previous annexes do not use semi colons here |
| 32.  | *14*  | Substantive  | with air ???temperature increasing from room temperature to 47 °C | Chamber temp?? Also, this air temp might not translate to all VHT apparatuses. Horixontal or vertical airflow VHT machines may differ in extermnal vs internal furit pulp ramp up temps? Might be better to refer to minimum ramp times and temp, or fruit pulp temp only. | New Zealand  | CONSIDERED, (BUT NOT INCORPORATED): Good points, but this draft reflects what was done in the research supporting the schedule, and until efficacy under these other suggestions are known it is safer to adhere to schedule based on the research. |
| 33.  | *15*  | Editorial  | - for at least three hours or until fruit core temperature reaches 46 °C | 1) Dash missing. 2) Or "- for at least three hours, until..."? (cf. PT 15, annex 15 of ISPM 28). The meaning of the two sentences is slightly different. | EPPO, European Union, Georgia, Serbia  | INCORPORATED Already corrected in version 2014-04-23. |
| 34.  | *15*  | Editorial  | * for at least three hours or until fruit core temperature reaches 46 °C;
 | For better understanding | OIRSA  | CONSIDERED, (BUT NOT INCORPORATED): Previous annexes do not use semi colons here |
| 35.  | *15*  | Substantive  | for at least three hours or until fruit core??? temperature reaches 46 °C | Consistency between th use of cor and pulp temp?? Note the comments supplied under Part 1 for para 15 of HTFA for B. melanotus and B. xanthodes also apply. | New Zealand  | CONSIDERED, (BUT NOT INCORPORATED): The only approved VHT (Annex 15) uses “core”. |
| 36.  | *15*  | Technical  | pre-heating for at least three hours or until fruit core temperature reaches 46 °C | More technically correct | United States of America  | CONSIDERED, (BUT NOT INCORPORATED): The only approved VHT (Annex 15) does not use “pre-heating” |
| 37.  | *15*  | Technical  | for at least three hours or until fruit core temperature reaches 46 °C | This period can be relative. The relevant thing is that the treatment meet its efficacy when the temperature in the pulp of the fruit reaches 46 ° C. | COSAVE, Uruguay, Chile, Brazil, Peru, Argentina  | CONSIDERED, (BUT NOT INCORPORATED): It is not certain that if the heating period is < 3 h control will be achieved. |
| 38.  | *16*  | Editorial  | - followed by 70 minutes at a minimum of 95% relative humidity in an air temperature of 47 °C and with fruit pulp temperature at a minimum of 46 °C. | Dash missing. | EPPO, European Union, Georgia, Serbia  | INCORPORATED Already corrected in version 2014-04-23. |
| 39.  | *16*  | Editorial  | * followed by 70 minutes at a minimum of 95% relative humidity in an air temperature of 47 °C and with fruit pulp temperature at a minimum of 46 °C.
 | For better understanding | OIRSA  | INCORPORATED Already corrected in version 2014-04-23. |
| 40.  | *17*  | Substantive  | Once the treatment is complete fruit are air???-cooled. | Suggest removing the "air" as some systems use water cooling and this should be acceptable. There should be some parameters mentioned fo the cooling (temp, time etc) There is no mention here of recording interval time to be consistent withVHT for Carica papaya. | New Zealand  | MODIFIED: for clarity. |
| 41.  | *17*  | Technical  | Once the treatment is complete fruit are air-cooled.  | Clarify whether this air cooling is cooled to ambient temperature or to a specified temperature, and whether or not it should be cooled by ambient air or artificial means (air-conditioned or cooled). In addition, can hydro-cooling be substituted, and if so, under what conditions? | United States of America  | MODIFIED: for clarity. |
| 42.  | *18*  | Editorial  | The efficacy is: effective dose (ED)99.86 at the 95% confidence level. | For better understanding | OIRSA  | CONSIDERED, (BUT NOT INCORPORATED): Previous annexes do not use colons here |
| 43.  | *18*  | Substantive  | The efficacy is effective dose (ED)99.86 at the 95% confidence level. | The efficacy dose (ED) 99.86 is apparently lower than other adopted phytosanitary treatments. | Japan  | CONSIDERED, (BUT NOT INCORPORATED): An estimated 25,332 eggs were treated with no survivors. |
| 44.  | *18*  | Technical  | The efficacy is effective dose (ED)99.86 at the 95% confidence level.  | We would like to request TPPT to re-check about percentage of effective dose (ED) because it is less than the probit 9 standard for quarantine treatment efficacy. | Thailand  | CONSIDERED, (BUT NOT INCORPORATED): It is < probit 9. An estimated 25,332 eggs were treated with no survivors. |
| 45.  | *18*  | Translation  | The efficacy is effective dose (ED)99.86 at the 95% confidence level.  | "The efficacy is effective dose (ED)99.86 at the 95% confidence level." should be translated into Spanish as "La eficacia es: dosis efectiva (DE)99.86 a un nivel de confianza de 95%" | OIRSA  | The Secretariat will forward to FAO translation services |
| 46.  | *19*  | Substantive  | **Other relevant information****Specifications on the accuracy adn placement ofd temparature sensing devices at cool spots and teh frequency of monitoring may be requried.** | This additional point could be considered for addition. | New Zealand  | CONSIDERED, (BUT NOT INCORPORATED): Considerations such as this are part of operational considerations and need not be in the Standard. A new ISPM on requirements for the use of temperature treatments will have this type of information. |