**2010-106: Draft Annex to ISPM 28 - Vapour heat treatment for *Ceratitis capitata* on *Mangifera indica***

| **Comm. no.**  | **Para. no.**  | **Comment type**  | **Comment**  | **Explanation**  | **Country**  | **SC Responses** |
| --- | --- | --- | --- | --- | --- | --- |
| 1.  | *G*  | Substantive  | I support the document as it is and I have no comments |  | Singapore, Lao People's Democratic Republic, Canada, Thailand, Nepal, Barbados, Ghana, Belize, Australia  | Noted |
| 2.  | *G*  | Substantive  |  | To allow the standard to suit its purpose, while treatment specifications have been mentioned, it is recommended that the standard also include a section on those situationsl that make a treatment invalid (eg one of the probe fruit sttruggles to reach the target temperature and the treatment time has gone over 3 hours.)The standard may also consider a section on pre-treatment activities (thermal mapping to determine cold spotss, thermo-tolerance studies etc) posing as a reminder/check so that all the work needed to be done prior is done and finalized as they are not considered in the current draft. Those details will also link in well when contracting parties devleop their regulations for the complete confidence required by 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 temperature treatments. |
| 3.  | *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. applicable 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 C. capitata is present in order to verify that 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 B. 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)The TPPT decided that although if differences in reaction to VHT exist among populations of *C. capitata*, the robustness of this treatment as exemplified by the very large number (> 165,000) of the most tolerant stage (eggs) treated in confirmatory testing compensated for any differences. |
| 4.  | *G*  | Technical  |  | In case of mango, the value of ED may differ depending on the variety. Tests for various varieties should be conducted and the result of the tests should be noted in the references. | Korea, Republic of, NEPPO  | CONSIDERED, (BUT NOT INCORPORATED)The TPPT considers that given the very high value of the ED, the treatment would be efficacious even with moderate differences among varieties. |
| 5.  | *1*  | Editorial  | **Draft Annex to ISPM 28:2007: vVapour heat treatment for *Ceratitis capitata* on *mMangifera indica* (2010-106)** | "Vapour" and "Mangifera" with a capital. | EPPO, European Union, Georgia, Serbia  | INCORPORATED: M in Mangifera.CONSIDERED, (BUT NOT INCORPORATED): V in vapour |
| 6.  | *1*  | Editorial  | **Draft Annex to ISPM 28:2007: vapour heat treatment for *Ceratitis capitata* on M*mangifera indica* (2010-106)** | Editorial | United States of America, Mexico  | INCORPORATED:  |
| 7.  | *1*  | Translation  | **Draft Annex to ISPM 28:2007: vapour heat treatment for *Ceratitis capitata* on *mangifera indica* (2010-106)**  | "vapour heat treatment for Ceratitis capitata" should be translated into Spanish as "tratamiento con vapor caliente contra Ceratitis capitata" | OIRSA  | CONSIDERED, (BUT NOT INCORPORATED): Defer to Spanish editor |
| 8.  | *4*  | Editorial  | This treatment comprises the vapour heat treatment of fruit of *Mangifera indica* to result in the mortality of eggs and larvae (of all ages) of *Ceratitis capitata* (Mediterranean fruit fly) at the stated efficacy1. | Edit. 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: |
| 9.  | *4*  | Technical  | This treatment comprises the vapour heat treatment of fruit of *Mangifera indica* to result in the mortality of eggs and larvae (of all instarsages) of *Ceratitis capitata* (Mediterranean fruit fly) at the stated efficacy1. | More technically correct | United States of America, Mexico  | INCORPORATED: |
| 10.  | *4*  | Translation  | This treatment comprises the vapour heat treatment of fruit of *Mangifera indica* to result in the mortality of eggs and larvae (of all ages) of *Ceratitis capitata* (Mediterranean fruit fly) at the stated efficacy1.  | "This treatment comprises the vapour heat treatment of fruit of Mangifera indica to result in the mortality of eggs and larvae (of all ages) of Ceratitis capitata (Mediterranean fruit fly) at the stated efficacy." Should be translated into Spanish as "Este tratamiento consiste en el tratamiento con vapor caliente a frutos de Mangifera indica para provocar la mortalidad de los huevos y larvas (de todas las edades) de Ceratitis capitata (mosca mediterránea de la fruta) con el nivel de eficacia indicado." | OIRSA  | CONSIDERED, (BUT NOT INCORPORATED): Defer to Spanish editor |
| 11.  | *8*  | Translation  | **Treatment type** Physical (vapour heat)  | "Treatment type Physical (vapour heat)" should be translated into Spanish as "Tipo de tratamiento Físico (aplicación de vapor caliente)." | OIRSA  | CONSIDERED, (BUT NOT INCORPORATED): Defer to Spanish editor |
| 12.  | *9*  | Editorial  | **Target pest** *Ceratitis capitata* (Wiedemann)(Diptera: Tephritidae)(Mediterranean fruit fly) | Common name already given in paragraph [4]. | EPPO, European Union, Georgia, Serbia  | INCORPORATED |
| 13.  | *9*  | Editorial  | **Target pest** *Ceratitis capitata* (Wiedemann)(Diptera: Tephritidae)(Mediterranean fruit fly) | Edit | United States of America  | INCORPORATED |
| 14.  | *13*  | Editorial  | - at a minimum of 95% relative humidity | Dash missing. | EPPO, European Union, Georgia, Serbia  | MODIFIED: Because Annex 15 has dashes, they are included. |
| 15.  | *13*  | Editorial  | * at a minimum of 95% relative humidity;
 | For better understanding | OIRSA  | CONSIDERED, (BUT NOT INCORPORATED): Previous annexes do not use bullet points here |
| 16.  | *14*  | Editorial  | - withto air temperature increasing from room temperature to 47 °C  | 1) Dash missing. 2) "Exposure to... " (cf. PT 15, annex 15 of ISPM 28). | EPPO, European Union, Georgia, Serbia  | 1) MODIFIED: Because Annex 15 has dashes, they are included.2) CONSIDERED, (BUT NOT INCORPORATED): “with” is more correct than “to” in this use. |
| 17.  | *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 bullet points here |
| 18.  | *14*  | Substantive  | with air temperature ???increasing from room temperature to 47 °C  | VHT chanber temperature. Referring to iar temperature may be ambiguous. Also, this air temp might not translate to all VHT apparatus. Horizontal or vertical airflow VHT machines may differ in external vs internal fruit pulp ramp up temps. Might be better to refer to minimum ramp up times or temps, or furit pulp temp only. | New Zealand  | CONSIDERED, (BUT NOT INCORPORATED): This is a valid comment, but this point reflects the way in which the research supporting the treatment was done. |
| 19.  | *15*  | Editorial  | - for at least two hours or until fruit core temperature reaches 46.5 °C | 1) Dash missing. 2) Or "- for at least two hours, until..."? (cf. PT 15, annex 15 of ISPM 28). The meaning of the two sentences is slightly different. | EPPO, European Union, Georgia, Serbia  | 1) MODIFIED: Because Annex 15 has dashes, they are included.2) CONSIDERED, (BUT NOT INCORPORATED): Each schedule is based on different research which may result in slight differences in meaning. |
| 20.  | *15*  | Editorial  | * for at least two hours or until fruit core temperature reaches 46.5 °C;
 | For better understanding | OIRSA  | CONSIDERED, (BUT NOT INCORPORATED): Previous annexes do not use arrows here |
| 21.  | *15*  | Substantive  | for at least two hours or until fruit core ???temperature reaches 46.5 °C | Consistency between use ofg core and pulp temp?? Why do we also have to include a target air temp when teh fruuit core temp is the main target temp we are interested in ?? Prefer to have the sentence to read : with air temperature increasing from room temperature until the fruit core reaches 46.5C .... to avoid confusion especially if countries choose to refer to both as target temperatures (one for chamber and one for the fruit core) and the fact that treatments should perform strictly on those temps. - The air chamber temp can also be more that 47C if it is a full load of fruits bigger thatn mango adn airchamber temp tehn is used against the treatment instead of the fruit core temperature | New Zealand  | CONSIDERED, (BUT NOT INCORPORATED): “Core” is used in other VHT Standards that have been approved.Although concept that heated air treatments should only specify minimum internal temperature and time at that temperature, research supporting present treatment is not sufficiently robust to support this concept. |
| 22.  | *15*  | Technical  | for at least two hours or until fruit core temperature reaches 46.5 °C | The hot steam can reach the temperature in spending more or less time. What is important in treatment is that the temperature at the center of the fruit reaches 46.5 ° C. | COSAVE, Uruguay, Chile, Brazil, Peru, Argentina  | CONSIDERED, (BUT NOT INCORPORATED): It is not certain that if the heating period is < 2 h control will be achieved. |
| 23.  | *16*  | Editorial  | - followed by ten minutes at a minimum of 95% relative humidity in an air temperature of 47 °C and with fruit pulp temperature at a minimum of 46.5 °C (seed surface of largest fruit). | Dash missing. | EPPO, European Union, Georgia, Serbia  | MODIFIED: Because Annex 15 has dashes, they are included. |
| 24.  | *16*  | Editorial  | * followed by ten minutes at a minimum of 95% relative humidity in an air temperature of 47 °C and with fruit pulp temperature at a minimum of 46.5 °C (seed surface of largest fruit).
 | For better understanding | OIRSA  | CONSIDERED, (BUT NOT INCORPORATED): Previous annexes do not use arrows here |
| 25.  | *16*  | Substantive  | followed by ten minutes at a minimum of 95% relative humidity in an air temperature of 47 °C and with fruit pulp temperature at a minimum of 46.5 °C (seed surface of largest fruit).Delete “in an air temperature of 47 C”; or change “air temperature” to “minimum air temperature”﻿Ten minutes is too short.﻿ | 1.It is very difficult for fruit pulp temperature high up to 46.5 C under the air temperature of 47 C. 2.Ten minutes is too short. | China  | 1) MODIFIED: “minimum” inserted before “air temperature.2) CONSIDERED, (BUT NOT INCORPORATED): The research data support stated level of efficacy of this treatment as scheduled. |
| 26.  | *16*  | Substantive  | followed by ten minutes at a minimum of 95% relative humidity in an air temperature of 47 °C and with fruit pulp temperature at a minimum of 46.5 °C (seed surface of largest fruit). | It is considered that the 47C air temperature might bnot always be teh same as the treatment progresses. It often rises too. | New Zealand  | MODIFIED: to a minimum of 47°C |
| 27.  | *16*  | Technical  | followed by thirty ﻿ten minutes at a minimum of 95% relative humidity in an air temperature of 47 °C and with fruit pulp temperature at a minimum of 46.5 °C (seed surface of largest fruit).  | The efficacy of treatment of 10min of 46.5 C treatment could not guarantee the phytosanitary security. | China  | CONSIDERED, (BUT NOT INCORPORATED): The results support that 10 min was efficacious. |
| 28.  | *17*  | Substantive  | Recording interval is five minutes.?? Once the treatment is complete fruits are hydro-cooled in a shower ??of water to reach ambient temperatures in less than 40 minutes. | Recording... This should be in other relevant information cooling .... Type of cooling should not be the consideration as air cooling may also be possible in 40 mins. The specification may exclude the use of some VHT machines which can achieve the same treatment parameters | New Zealand  | 1) CONSIDERED, (BUT NOT INCORPORATED): This is where it is in the approved VHT: Annex 15, so it is left where it is for consistency.2) MODIFIED: changes made to reflect that cooling is not part of treatment. |
| 29.  | *17*  | Technical  | Recording interval is one five minutes. Once the treatment is complete fruits are hydro-cooled in a shower of water to reach ambient temperatures in less than 40 minutes. | 5 minutes recording interval is too large for 10 minutes duration. | China  | CONSIDERED, (BUT NOT INCORPORATED): Entire treatment is at least 2 h 10 min, so 5 min is adequate. Also, research supporting treatment done with this interval. |
| 30.  | *17*  | Technical  | Recording interval is five minutes. Once the treatment is complete fruits are hydro-cooled in a shower of water to reach ambient temperatures in less than 40 minutes. | What is the ambient temperature to be considered ??? Inside or outside the packinghouse? "In less than 40 minutes" is proposed to be deleted once it is not relevant for the treatment. | COSAVE, Uruguay, Chile, Brazil, Peru, Argentina  | INCORPORATED and other changes made to that phrase reflecting that cooling is not part of treatment. |
| 31.  | *18*  | Editorial  | The efficacy is: effective dose (ED)99.9968 at the 95% confidence level. | For better understanding | OIRSA  | CONSIDERED, (BUT NOT INCORPORATED): Previous annexes do not use colons here |
| 32.  | *18*  | Translation  | The efficacy is effective dose (ED)99.9968 at the 95% confidence level.  | "The efficacy is effective dose (ED)99.9968 at the 95% confidence level" should be translated as "La eficacia es: dosis efectiva (DE)99,9968 a un nivel de confianza de 95 %." | OIRSA  | NOTED. The Secretariat will forward to FAO translation services |
| 33.  | *19*  | Substantive  | **Other relevant information****Specifications on the accuracy and placement of temperature sensing devices in the largest fruit and at cool spots within the VHT apparatus might be required.** | Could b 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. |