DRAFT ANNEX TO ISPM 28: Vapour heat–modified atmosphere treatment for *Cydia pomonella* and *Grapholita molesta* on *Malus pumila* and *Prunus persica* (2017-037 and 2017-038)

Status box

This is not an official part of the annex to the standard and it will be modified by the IPPC Secretariat after adoption.	
Date of this document	2021-12-11
Document category	Draft annex to ISPM 28
Current document stage	*To* CPM for adoption
Major stages	2017-12 Topics *CATTS (Controlled Atmosphere/Temperature Treatment System) treatments against codling moth (*Cydia pomonella*) and western cherry fruit fly (*Rhagoletis indifferens*) in cherry* (2017-037) and *CATTS (Controlled Atmosphere/Temperature Treatment System) treatments against codling moth (*Cydia pomonella*) and oriental fruit moth (*Grapholita molesta*) in apple* (2017-038) submitted in response to the 2017-02 call for treatments. 2018-06 Technical Panel on Phytosanitary Treatments (TPPT) reviewed the submissions and requested further information from submitter. 2018-11 SC added the topics to the TPPT work programme with priority 3. 2019-07 TPPT discussed and merged the topics 2017-037 and 2017-038 (but excluding western cherry fruit fly (*Rhagoletis indifferens*)), revised the draft and recommended it to the SC for approval for consultation. 2020-02 SC approved for first consultation via e-decision (2020_eSC_May_10). 2020-07 First consultation. 2020-10 TPPT meeting reviewed the draft, approved the responses to consultation comments and recommended the draft for second consultation. 2021-03 SC approved for second consultation via e-decision (2021_eSC_May_11). 2021-07 Second consultation. 2021-10 TPPT revised and recommended to the SC for approval for adoption by the CPM 2021-12 SC approved for adoption by the CPM via e-decision (2022_eSC_May_05).
Treatment Lead	2018-06 Michael ORMSBY (NZ)
Notes	2020-02 Edited 2021-02 Edited 2021-10 Edited

Scope of the treatment

This treatment describes the vapour heat treatment under modified atmosphere of fruit of *Malus pumila* and *Prunus persica* to result in the mortality of eggs and larvae of *Cydia pomonella* and *Grapholita molesta* at the stated efficacy.[1]

[1] The scope of phytosanitary treatments does not include issues related to pesticide registration or other domestic requirements for contracting parties' approval of treatments. Treatments adopted by the Commission on Phytosanitary Measures may not provide information on specific effects on human health or food safety, which should be addressed using domestic procedures before contracting parties approve a treatment. In addition, potential effects of treatments on product quality are considered for some host commodities before their

Treatment description

Name of treatment	Vapour heat–modified atmosphere treatment for *Cydia pomonella* and *Grapholita molesta* on *Malus pumila* and *Prunus persica*
Active ingredient	n/a
Treatment type	Physical (vapour heat) and modified atmosphere
Target pests	*Cydia pomonella* (Linnaeus, 1758) (Lepidoptera: Tortricidae) and *Grapholita molesta* (Busck, 1916) (Lepidoptera: Tortricidae)
Target regulated articles	Fruit of *Malus pumila* (apple) and *Prunus persica* (peach and nectarine)

Treatment schedule

Exposure of fruit in a vapour heat and modified atmosphere chamber:

- with air temperature held at 45 °C or above;
- in a normal atmosphere with the concentration of oxygen (O_2) reduced to 1% or below, the concentration of carbon dioxide (CO_2) raised to 15% ± 1%, and the balance maintained with added nitrogen (N_2);
- to reach a fruit core temperature of 44.5 °C or above within not more than 2.5 hours;
- to maintain a fruit core temperature of 44.5 °C or above and relative humidity of 90% or above for at least 30 continuous minutes;
- to heat the fruit for at least three hours in total.

There is 95% confidence that the treatment according to this schedule kills not less than 99.9884% of eggs and larvae of *Cydia pomonella* and *Grapholita molesta*.

Other relevant information

The Technical Panel on Phytosanitary Treatments (TPPT) based its evaluation of this treatment on the research reported by Neven, Rehfield-Ray and Obenland (2006), which determined the efficacy of vapour heat and modified atmosphere on *Cydia pomonella* and *Grapholita molesta* in peaches and nectarines, and Neven and Rehfield-Ray (2006), which determined the efficacy of vapour heat and modified atmosphere on *Cydia pomonella* and *Grapholita molesta* in apples using a heating rate of 12 °C/hour. The TPPT also considered information on the effect of vapour heat and modified atmosphere on *Cydia pomonella* in Neven and Hansen (2010), Neven, Lehrman and Hansen (2014), Yokoyama and Miller (1987) and Yokoyama, Miller and Dowell (1991).

The efficacy of this schedule was calculated based on a total of 25 882 fourth- and fifth-instar larvae of *Cydia pomonella* treated with no survivors; the control survival was 89.6%.

The air humidity is lower at the beginning of the treatment to prevent condensation on the fruit and hence maintain fruit quality. To minimize effects on commodity quality, users should refer to Neven and Rehfield-Ray (2006) and Neven, Rehfield-Ray and Obenland (2006).

References

The present annex may refer to ISPMs. ISPMs are available on the International Phytosanitary Portal (IPP) at https://www.ippc.int/core-activities/standards-setting/ispms.

international adoption. However, evaluation of any effects of a treatment on the quality of commodities may require additional consideration. There is no obligation for a contracting party to approve, register or adopt the treatments for use in its territory.

Neven, L.G. & Hansen, L.D. 2010. Effects of temperature and controlled atmospheres on codling moth metabolism. *Annals of the Entomological Society of America*, 103: 418–423.

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Neven, L.G. & Rehfield-Ray, L. 2006. Confirmation and efficacy tests against codling moth and oriental fruit moth in apples using combination heat and controlled atmosphere treatments. *Journal of Economic Entomology*, 99: 1620–1627.

Neven, L.G., Rehfield-Ray, L.M. & Obenland, D. 2006. Confirmation and efficacy tests against codling moth and oriental fruit moth in peaches and nectarines using combination heat and controlled atmosphere treatments. *Journal of Economic Entomology*, 99: 1610–1619.

Yokoyama, V.Y. & Miller, G.T. 1987. High temperature for control of oriental fruit moth (Lepidoptera: Tortricidae) in stone fruits. *Journal of Economic Entomology*, 80: 641–645.

Yokoyama, V.Y., Miller, G.T. & Dowell, R.V. 1991. Response of codling moth (Lepidoptera: Tortricidae) to high temperature, a potential quarantine treatment for exported commodities. *Journal of Economic Entomology*, 84: 528–531.