



Food and Agriculture
Organization of the
United Nations



International
Plant Protection
Convention

PT 41: Cold treatment for *Bactrocera zonata* on *Citrus sinensis*

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ISPM 28

Phytosanitary treatments for regulated pests

PT 41: Cold treatment for *Bactrocera zonata* on *Citrus sinensis*

Adopted 2022; published 2022

Scope of the treatment

This treatment describes the cold treatment of fruit of *Citrus sinensis*¹ to result in the mortality of eggs and larvae of *Bactrocera zonata* at the stated efficacy.²

Treatment description

Name of treatment	Cold treatment for <i>Bactrocera zonata</i> on <i>Citrus sinensis</i>
Active ingredient	n/a
Treatment type	Physical (cold)
Target pest	<i>Bactrocera zonata</i> (Saunders, 1842) (Diptera: Tephritidae)
Target regulated articles	Fruit of <i>Citrus sinensis</i>

Treatment schedule

1.7 °C or below for 18 continuous days.

There is 95% confidence that the treatment according to this schedule kills not less than 99.9916% of eggs and larvae of *Bactrocera zonata*.

The fruit must reach the treatment temperature before treatment exposure time commences. The fruit core temperature should be monitored and recorded, and the temperature should not exceed the stated level throughout the duration of the treatment.

This treatment should be applied in accordance with the requirements of ISPM 42 (*Requirements for the use of temperature treatments as phytosanitary measures*).

¹ *Citrus* species and hybrids are named according to the nomenclature in Cottin, R. 2002. *Citrus of the world – A citrus directory*, version 2.0. France, SRA INRA-CIRAD.

² 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 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.

Other relevant information

In evaluating this treatment, the Technical Panel on Phytosanitary Treatments considered issues associated with temperature regimes and thermal conditioning, taking into account the work of Hallman and Mangan (1997).

The efficacy of this schedule was calculated based on 35 733 third-instar larvae treated with no survivors. This number is based on 36 820 larvae, corrected per replicate for control mortality; the average control mortality was 2.06%.

This schedule was based on the work of Hallman *et al.* (2013a, 2013b), Hashem, Soliman and Soliman (2004) and Mohamed and El-Wakkad (2009). The schedule was developed using the cultivars ‘Valencia’ and ‘Navel’, and using larval mortality.

References

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

- Hallman, G.J. & Mangan, R.L.** 1997. Concerns with temperature quarantine treatment research. In: G.L. Obenauf, ed. *Proceedings of the 1997 Annual International Research Conference on Methyl Bromide Alternatives and Emissions Reduction*, San Diego, CA, 3–5 November 1997, pp. 79–1–79–4. Fresno, United States of America, Methyl Bromide Alternatives Outreach. www.mbao.org/static/docs/confs/1997-sandiego/papers/079hallman.pdf
- Hallman, G.J., Myers, S.W., Taret, G., Fontenot, E.A. & Vreysen, M.J.B.** 2013a. Phytosanitary cold treatment for oranges infested with *Bactrocera zonata* (Diptera: Tephritidae). *Journal of Economic Entomology*, 106: 2336–2340.
- Hallman, G.J., Myers, S.W., Wakkad, M.F. El, Tadrous, M.D. & Jessup, A.J.** 2013b. Development of phytosanitary cold treatments for oranges infested with *Bactrocera invadens* and *Bactrocera zonata* (Diptera: Tephritidae) by comparison with existing cold treatment schedules for *Ceratitis capitata* (Diptera: Tephritidae). *Journal of Economic Entomology*, 106: 1608–1612.
- Hashem, A.G., Soliman, N.A. & Soliman, A.M.** 2004. Effect of low temperatures on eggs and larvae of Mediterranean fruit fly and peach fruit fly inside fruits as a quarantine procedure. *Annals of Agricultural Science, Moshtohor*, 42: 345–356.
- Mohamed, S.M.A. & Wakkad, M.F. El** 2009. Cold storage as disinfestation treatment against the peach fruit fly, *Bactrocera zonata* (Saunders), (Diptera: Tephritidae) on Valencia orange. *Egyptian Journal of Applied Sciences*, 24: 290–301.

Publication history

This is not an official part of the standard

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| 2017-06 Treatment submitted in response to 2017-02 call for treatments. | 2021-03 TPPT meeting responded to consultation comments, revised the draft and recommended it for second consultation. |
| 2017-11 Technical Panel on Phytosanitary Treatments (TPPT) reviewed the submission (virtual meeting). | 2021-05 SC approved for second consultation via e-decision (2021_eSC_May_15). |
| 2018-04 IPPC Secretariat sent summary of discussion and requested further information from submitter. | 2021-07 Second consultation. |
| 2018-05 Standards Committee (SC) added the topic <i>Cold treatment for Bactrocera zonata on Citrus sinensis</i> (2017-013) to the TPPT work programme. | 2021-10 TPPT reviewed and recommended to the SC for approval for adoption by the CPM. |
| 2019-05 Submitter supplied additional information. | 2021-12 SC approved for adoption by the CPM via e-decision (2022_eSC_May_02). |
| 2019-07 TPPT revised the draft and recommended it to the SC for approval for consultation. | 2022-04 CPM-16 adopted the phytosanitary treatment. |
| 2020-02 SC approved for first consultation via e-decision (2020_eSC_May_09). | ISPM 28. Annex 41. <i>Cold treatment for Bactrocera zonata on Citrus sinensis</i> (2022). Rome, IPPC Secretariat, FAO. |
| 2020-07 First consultation. | Publication history last updated: 2022-04 |

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IPPC

The International Plant Protection Convention (IPPC) is an international plant health agreement that aims to protect global plant resources and facilitate safe trade.

The IPPC vision is that all countries have the capacity to implement harmonized measures to prevent pest introductions and spread, and minimize the impacts of pests on food security, trade, economic growth, and the environment.

Organization

- ◆ There are over 180 IPPC contracting parties.
- ◆ Each contracting party has a national plant protection organization (NPPO) and an Official IPPC contact point.
- ◆ 10 regional plant protection organizations (RPPOs) have been established to coordinate NPPOs in various regions of the world.
- ◆ The IPPC Secretariat liaises with relevant international organizations to help build regional and national capacities.
- ◆ The Secretariat is provided by the Food and Agriculture Organization of the United Nations (FAO).

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