



Food and Agriculture  
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International  
Plant Protection  
Convention

INTERNATIONAL STANDARD FOR PHYTOSANITARY MEASURES 28

PHYTOSANITARY TREATMENT

ISPM 28  
ANNEX 5

ENG

# PT 5: Irradiation treatment for *Bactrocera tryoni*

Produced by the Secretariat of the  
International Plant Protection Convention (IPPC)

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# ISPM 28

## Phytosanitary treatments for regulated pests

### PT 5: Irradiation treatment for *Bactrocera tryoni*

Adopted 2009; published 2021

#### Scope of the treatment

This treatment applies to the irradiation of fruits and vegetables at 100 Gy minimum absorbed dose to prevent the emergence of adults of *Bactrocera tryoni* at the stated efficacy. This treatment should be applied in accordance with the requirements outlined in ISPM 18<sup>1</sup> (*Guidelines for the use of irradiation as a phytosanitary measure*).

#### Treatment description

|                                   |  |
|-----------------------------------|--|
| <b>Name of treatment:</b>         | Irradiation treatment for <i>Bactrocera tryoni</i>                     |
| <b>Active ingredient:</b>         | N/A  |
| <b>Treatment type:</b>            | Irradiation  |
| <b>Target pest:</b>               | <i>Bactrocera tryoni</i> (Froggatt) (Diptera: Tephritidae)             |
| <b>Target regulated articles:</b> | All fruits and vegetables that are hosts of <i>Bactrocera tryoni</i> . |

#### Treatment schedule

Minimum absorbed dose of 100 Gy to prevent the emergence of adults of *Bactrocera tryoni*.

There is 95% confidence that the treatment according to this schedule prevents emergence of not less than 99.9978% of adults of *Bactrocera tryoni*.

Treatment should be applied in accordance with the requirements of ISPM 18.

#### Other relevant information

Since irradiation may not result in outright mortality, inspectors may encounter live, but non-viable *Bactrocera tryoni* (larvae and/or pupae) during the inspection process. This does not imply a failure of the treatment.

The Technical Panel on Phytosanitary Treatments based its evaluation of this treatment on the research work undertaken by Heather *et al.* (1991) that determined the efficacy of irradiation as a treatment for this pest in *Mangifera indica*.

Extrapolation of treatment efficacy to all fruits and vegetables 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. These include studies on the following pests and hosts: *Anastrepha ludens* (*Citrus paradisi* and *Mangifera indica*), *Anastrepha suspensa* (*Averrhoa carambola*, *Citrus paradisi* and *Mangifera indica*), *Bactrocera tryoni* (*Citrus sinensis*, *Lycopersicon lycopersicum*, *Malus pumila*,

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<sup>1</sup> The scope of phytosanitary treatments does not include issues related to pesticide registration or other domestic requirements for approval of treatments. Treatments also do not provide information on specific effects on human health or food safety, which should be addressed using domestic procedures prior to approval of 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.

*Mangifera indica*, *Persea americana* and *Prunus avium*), *Cydia pomonella* (*Malus pumila* and artificial diet) and *Grapholita molesta* (*Malus pumila* and artificial diet) (Bustos *et al.*, 2004; Gould & von Windeguth, 1991; Hallman, 2004, Hallman & Martinez, 2001; Jessup *et al.*, 1992; Mansour, 2003; von Windeguth, 1986; von Windeguth & Ismail, 1987). It is recognized, however, that treatment efficacy has not been tested for all potential fruit and vegetable hosts of the target pest. If evidence becomes available to show that the extrapolation of the treatment to cover all hosts of this pest is incorrect, then the treatment will be reviewed.

## References

The present standard refers to International Standards for Phytosanitary Measures (ISPMs). ISPMs are available on the International Phytosanitary Portal (IPP) at <https://www.ippc.int/core-activities/standards-setting/ispms>.

- Bustos, M.E., Enkerlin, W., Reyes, J. & Toledo, J.** 2004. Irradiation of mangoes as a postharvest quarantine treatment for fruit flies (Diptera: Tephritidae). *Journal of Economic Entomology*, 97: 286–292.
- Gould, W.P. & von Windeguth, D.L.** 1991. Gamma irradiation as a quarantine treatment for carambolas infested with Caribbean fruit flies. *Florida Entomologist*, 74: 297–300.
- Hallman, G.J.** 2004. Ionizing irradiation quarantine treatment against Oriental fruit moth (Lepidoptera: Tortricidae) in ambient and hypoxic atmospheres. *Journal of Economic Entomology*, 97: 824–827.
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- Heather, N.W., Corcoran, R.J. & Banos, C.** 1991. Disinfestation of mangoes with gamma irradiation against two Australian fruit flies (Diptera: Tephritidae). *Journal of Economic Entomology*, 84: 1304–1307.
- Jessup, A.J., Rigney, C. J., Millar, A., Sloggett, R.F. & Quinn, N.M.** 1992. Gamma irradiation as a commodity treatment against the Queensland fruit fly in fresh fruit. *Proceedings of the Research Coordination Meeting on Use of Irradiation as a Quarantine Treatment of Food and Agricultural Commodities*, 1990: 13–42.
- Mansour, M.** 2003. Gamma irradiation as a quarantine treatment for apples infested by codling moth (Lepidoptera: Tortricidae). *Journal of Applied Entomology*, 127: 137–141.
- von Windeguth, D.L.** 1986. Gamma irradiation as a quarantine treatment for Caribbean fruit fly infested mangoes. *Proceedings of the Florida State Horticultural Society*, 99: 131–134.
- von Windeguth, D.L. & Ismail, M.A.** 1987. Gamma irradiation as a quarantine treatment for Florida grapefruit infested with Caribbean fruit fly, *Anastrepha suspensa* (Loew). *Proceedings of the Florida State Horticultural Society*, 100: 5–7.

## Publication history

*This is not an official part of the standard.*

2006-04 CPM-1 added topic *Irradiation treatment for Bactrocera tryoni* (2006-119).

2006-12 TPPT developed draft text.

2007-05 SC approved draft text for MC.

2007-10 Sent for MC under fast-track process.

2008-07 TPPT revised draft text.

2008-12 SC revised draft text for adoption via e-decision.

2009-03 CPM-4 adopted Annex 5 to ISPM 28.

**ISPM 28. Annex 5** *Irradiation treatment for Bactrocera tryoni* (2009). Rome, IPPC, FAO.

2015-07 IPPC Secretariat incorporated editorial amendments and reformatted standards following revoking of standards procedure from CPM-10 (2015).

2016-04 CPM-11 noted ink amendments in relation to "effective dose".

2016-04 IPPC Secretariat incorporated ink amendments from CPM-11 (2016).

2021-04 IPPC Secretariat applied ink amendments as noted by CPM-15 (2021).

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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).

### International Plant Protection Convention Secretariat

[ippc@fao.org](mailto:ippc@fao.org) | [www.ippc.int](http://www.ippc.int)

### Food and Agriculture Organization of the United Nations

Rome, Italy

