DRAFT ANNEX TO ISPM 28: Irradiation treatment for *Aspidiotus destructor*(2021-029)

**Status box**

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| 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** | 2024-05-24 |
| **Document category** | Draft annex to ISPM 28 |
| **Current document stage** | *To* 2024-05 Technical Panel on Phytosanitary Treatments (TPPT) meeting |
| **Major stages** | 2021-11 Treatment submitted.2021-12 TPPT reviewed and recommended the addition of the following topic to the TPPT work programme to be presented to the Standards Committee (SC).2022-04 Standards Committee (SC) added the topic *Irradiation treatment for* *Aspidiotus destructor* (2021-029) to the TPPT work programme with priority 1.2022-09 TPPT discussed the supporting data and further information from the submitter, review another paper (Khan at al. 2016) to potentially establish another treatment within this topic, thanked Mr Daojian YU, and agreed to assign Mr Guoping ZHAN as the lead to this topic (2021-029).2024-02 TPPT agreed to continue evaluation 2024-05 Secretariat requested additional information from submitter 2024-05 Submitter replied 2024-06 TPPT reviewed treatment  |
| **Steward history** | 2021-11 Mr Daojian YU (CN)2022-09 Mr Guoping ZHAN (CN) |
| **Notes** |  |

Scope of the treatment

1. This treatment describes the irradiation at 150 Gy or 224 Gy minimum absorbed dose to prevent development to F1 generation gravid females or to prevent development to the first-instar nymph stage of progeny from gravid females of *Aspidiotus* *destructor* at the stated efficacy[[1]](#footnote-2).

Treatment description

1. **Name of treatment** Irradiation treatment for *Aspidiotus destructor*
2. **Active ingredient** n/a
3. **Treatment type** Irradiation
4. **Target pest** *Aspidiotus destructor* Signoret (Hemiptera: Diaspididae)
5. **Target regulated articles** All hosts of *Aspidiotus destructor*

Treatment schedule

Schedule 1: Minimum absorbed dose of 150 Gy to prevent the development of F1 generation gravid females in *Aspidiotus destructor*.

1. There is 95% confidence that the treatment according to this schedule prevents the development of F1 generation gravid females in not less than 99.9897% of gravid females of *Aspidiotus destructor.*
2. Schedule 2: Minimum absorbed dose of 224 Gy to prevent the development of F1 generation first-instar nymph stage in *Aspidiotus* *destructor*.
3. There is 95% confidence that the treatment according to this schedule prevents the development of F1 generation first-instar nymph stage from not less than 99.9941% of gravid females of *Aspidiotus* *destructor*.
4. This treatment should be applied in accordance with the requirements of ISPM 18 (*Requirements* *for the use of irradiation as a phytosanitary measure*).
5. This treatment should not be applied to all hosts stored in a modified atmosphere because the modified atmosphere may affect the treatment efficacy.

Other relevant information

1. Because irradiation may not result in outright mortality, inspectors may encounter live but non-viable *Aspidiotus destructor* (eggs, nymphs or adults) during the inspection process. This does not imply a failure of the treatment.
2. The Technical Panel on Phytosanitary Treatments (TPPT) based its evaluation of the treatment on the researchers reported by Follett (2006) and additional data, which determined the efficacy of irradiation as a treatment for this pest on *Cucurbita moschata* (Duchesne), and of Khan et al. (2016‎) which determined the efficacy of irradiation as a treatment for this pest in Mango plantlets (*Mangifera indica* L.).
3. The efficacy of schedule 1 was calculated based on a total of 28989 gravid females treated with no development of F1 generation gravid females (Follett 2006).
4. The efficacy of schedule 2 was calculated based on a total of 42005 gravid females treated with no development of F1 generation first-instar nymph stage (Khan et al. 2016‎).
5. This number is based on 51101 gravid females, corrected for overall F1 generation first-instar nymph stage control mortality of 17.8% according to the dose response test data.
6. Extrapolation of treatment efficacy to all hosts 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 fraterculus* (*Eugenia pyriformis, Malus pumila* and *Mangifera indica*); *Anastrepha ludens* (*Citrus paradisi, Citrus sinensis, Mangifera indica* and artificial diet), *Anastrepha obliqua* (*Averrhoa carambola*, *Citrus sinensis* and *Psidium guajava*); *Anastrepha suspensa* (*Averrhoa carambola*, *Citrus paradisi* and *Mangifera indica*), *Bactrocera tryoni* (*Citrus sinensis*, *Solanum lycopersicum*, *Malus domestica*, *Mangifera indica*, *Persea* *americana* and *Prunus avium*), *Cydia pomonella* (*Malus pumila* and artificial diet) and *Grapholita molesta* (*Malus pumila* and artificial diet), *Pseudococcus jackbeardsleyi* (*Cucurbita* sp. and *Solanum tuberosum*), *Tribolium confusum* (*Triticum aestivum*, *Hordeum vulgare* and *Zea mays*) (Bustos *et al*., 2004; Gould and von Windeguth, 1991; Hallman, 2004a, 2004b, 2013; Hallman and Martinez, 2001; Hallman et al., 2010; Jessup et al., 1992; Mansour, 2003; Tunçbilek and Kansu, 1996; von Windeguth, 1986; von Windeguth and Ismail, 1987; Zhan *et al*., 2016). It is recognized, however, that treatment efficacy has not been tested for all potential 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, the treatment will be reviewed.

References

1. 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>.

**Follett, P. A.,** 2006. Irradiation as a phytosanitary treatment for *Aspidiotus destructor* (Homoptera: Diaspididae). *Journal of Economic Entomology*, 99 (1): 1138-1142.

**Khan, I., Salahuddin, B. and Rahman H. U.** 2016. Mortality and growth inhibition of γ-irradiated *Aspidiotus* *destructor* (Hemiptera: Diaspididae) on mango (Sapindales: Anacardiaceae) plantlets. Florida Entomologist, 99(Special Issue 2): 125-129.‎

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 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. [↑](#footnote-ref-2)