



Alternative phytosanitary treatment options for khapra beetle (*Trogoderma granarium*) – As of 20 August 2021

Background

Current approved phytosanitary treatments known to be effective against khapra beetle (methyl bromide fumigation treatment and heat treatment) are not viable options for some products and exporting countries.

We have explored the use of modified (including controlled) atmosphere treatments, such as carbon dioxide and reduced oxygen as an alternative treatment to manage khapra beetle.

The basis for using modified or controlled atmospheres to manage post-harvest insect infestations is that insects, including khapra beetle, are aerobic organisms, requiring oxygen for their survival. Modifying the atmosphere composition within the treated enclosure, by decreasing oxygen (O₂) concentration or increasing carbon dioxide (CO₂) concentration, has a detrimental effect on their survival.

The International Standards for Phytosanitary Measures (ISPM) No 44 (2021) '[Requirements for the use of modified atmosphere treatments as phytosanitary measures](#)' provides technical guidance for National Plant Protection Organizations (NPPOs) on the application of this treatment.

Provisional alternative phytosanitary measures – Controlled atmosphere treatment

The provisional measures¹ we are proposing were developed through an extensive research of literature (including unpublished data), and evaluation of the treatments for stored product pests, with a focus on khapra beetle studies.

Provisional measures are subject to change as further data and information becomes available.

1. High carbon dioxide (CO₂) atmosphere under altered pressure

The proposed schedule for high CO₂ atmosphere under altered pressure is:

- ≥ 95% CO₂ at 20°C (for the commodity and the air in the treatment enclosure) at 20 bar for a minimum duration of 5 consecutive hours (with additional time for pressure build-up and pressure release).

OR

- ≥ 95% CO₂ at 20°C (for the commodity and the air in the treatment enclosure) at 30 bar for a minimum duration of 3 consecutive hours (with additional time for pressure build-up and pressure release).

Note: This treatment requires a commercial/industrial scale pressurised disinfestation chamber.

¹ [ISPM 5](#): A phytosanitary regulation or procedure established without full technical justification owing to current lack of adequate information. A provisional measure is subjected to periodic review and full technical justification as soon as possible.



2. High carbon dioxide CO₂ atmosphere at atmospheric pressure

The proposed schedule for high CO₂ atmosphere at atmospheric pressure is:

- ≥ 80% CO₂ concentration at ≥ 25°C (for the commodity and the air in the treatment enclosure) at atmospheric pressure for a minimum duration of 28 consecutive days.

3. Low oxygen (O₂) with Nitrogen (N₂) balance at atmospheric pressure

The proposed schedule for low O₂ with N₂ balance at atmospheric pressure:

- ≤ 1% O₂ concentration at ≥ 25°C and <28°C (for the commodity and the air in the treatment enclosure) at atmospheric pressure for a minimum duration of 22 consecutive days

OR

- ≤ 1% O₂ concentration at ≥ 28°C (for the commodity and the air in the treatment enclosure) at atmospheric pressure for a minimum duration of 12 consecutive days.

Application requirements

We are working on developing a treatment application methodology which will outline the requirements treatment providers must follow when applying modified atmosphere treatments. This will include requirements for consignment and packaging suitability, critical parameter monitoring and documentation, and any other requirements deemed necessary to ensure treatment success.

Certification requirements

The following certification will be required:

- a) A phytosanitary certificate from the NPPO of the exporting country certifying that the treatment has been applied in accordance with Australia's requirements and methodology (currently in development)
- b) A treatment certificate from the treatment provider stating the treatment details.

Remedial action(s) for non-compliance

In an event that live khapra beetle is found in a consignment that has been treated with a provisional controlled atmosphere treatment, we will apply remedial action(s) which may include either export or destruction. Controlled atmosphere treatments will be offered as a provisional treatment option. This means that non-compliance will be monitored closely and will inform the longevity of this measure.

Feedback

We are engaging with peak industry bodies on the proposed alternative treatment options. Importers and treatment providers interested in using controlled atmosphere treatments are encouraged to register their interest via email: offshoretreatments@agriculture.gov.au

Registered stakeholders will be engaged directly during development and implementation of this option.