REQUIREMENTS FOR THE USE OF FUMIGATION AS A PHYTOSANITARY MEASURE

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ABSTRACT

The NPPO should ensure that the fumigation is effectively applied so that the critical parameters reach the required level throughout the bulk of the commodity to achieve the declared effectiveness.

Requirements for the application of fumigation, the use of fumigation equipment, and fumigation procedures must be met. Systems should be used to prevent contamination or contamination of the fumigated commodity. Recording and documentation requirements should be followed to enable auditing, verification or traceability.

Key words: Glossary of phytosanitary terms, fumigation, standard, treatment, monitoring, phytosanitary measures.

Traditionally, fumigation has been widely used to prevent the introduction and spread of regulated pests and therefore has a positive impact on biodiversity. However, fumigant gases such as methyl bromide and sulphuryl fluoride can adversely affect the environment. Thus, it is known that emissions of methyl bromide into the atmosphere destroy the ozone layer, and sulfuryl fluoride is recognized as a greenhouse gas. The CPM recommendation to replace or reduce the use of methyl bromide as a phytosanitary measure (CPM R-03, 2017) encourages contracting parties to use alternatives whenever possible. The environmental impact of fumigants can be mitigated by destruction (chemical destruction) or recovery, which can reduce gas emissions.

The purpose of fumigation as a phytosanitary measure is to achieve specified pest mortality rates.

Fumigation is carried out by treatment manufacturers or NPPOs at treatment facilities or at other suitable locations (such as cargo ship holds, shipping containers, warehouses, and under tarpaulin shelters).

Fumigation can be carried out at any stage of the value chain, for example:

- as an integral part of operations for the production or packaging of goods;
- after packing (for example, after the goods are packed for shipment);
- during storage;
- immediately before departure (for example, at centralized points in the port);
- during the transportation;
- upon arrival in the importing country (before or after unloading).

Fumigation should ensure the achievement of the required level of critical parameters (for example, concentration or dose, temperature, duration) in the entire mass of the goods, which allows you to achieve the declared efficiency.

The effectiveness of fumigation can be influenced by factors such as the moisture content of the product and the room used for fumigation, humidity, pressure and changes in the gas composition of the atmosphere created by the packaging or product. Other factors to be considered during fumigation include the depth of penetration of the fumigant, the sorption of the fumigant by the package or commodity, the specific gravity of the fumigant, circulation of the fumigant, and leakage from the fumigant room. In order to circulate the fumigant, it is necessary to take into account the size of the room and the differences in the layout of goods in crates, stacked at intervals (stacks), and goods loaded in bulk.

Some fumigants can react with certain goods or materials, which must be considered before fumigation (for example, phosphine actively reacts with copper and other metals and can affect the operation of electronics used in verification equipment or ventilation systems).

Figure 1.Preparation for fumigation

Processing procedures approved by the NPPO are subject to mandatory documentation. They should be designed to ensure that the critical parameters stated in the treatment scheme are achieved. Where pre-treatment and post-treatment processes are critical to achieving the required dose to achieve the required efficacy against target pests while maintaining product quality, procedures should include a description of these processes. They should also include contingency procedures and recommendations for corrective actions in the event of treatment failure or problems with critical treatment parameters.

The most common types of fumigation are single fumigant treatments. The widespread use of fumigants is based on their mechanism of action, which is usually effective against all groups of pests or one specific group (for example, arthropods, fungi, nematodes) and all or most stages of pest development. In general, treatment regimens for the fumigants used alone are simple and require a single application to achieve the stated efficacy with the required minimum concentration over the required period of time.

If the use of one fumigant does not provide the desired efficacy, another fumigant or other treatment may be added to the treatment scheme, provided that it does not render the product unfit for trade or that such treatment is acceptable for reasons of economy or logistical support.

Another treatment can be applied immediately before or after fumigation to increase the effectiveness of the combination treatment. For example, sequential application of fumigation and heat treatment may be necessary if the product is susceptible to damage caused by the high degree of exposure to each of the treatments applied separately, or different stages of development of the target pest are most resistant to different treatments.

Compared to a single fumigant treatment, combining simultaneous treatments with different fumigants, or combining fumigation with another type of treatment, may also be more beneficial in terms of efficiency, processing resistance, economy, environmental impact or logistics.

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