Ministry for Primary Industries
Manatū Ahu Matua

Guidance Document

Phase 3 Mushroom Growing Medium

MPI.GD.PHASE3

25 May 2020

A guidance document issued by the Ministry for Primary Industries

New Zealand Government

Title

Guidance Document: Phase 3 Mushroom Growing Medium

About this document

The Ministry for Primary Industries (MPI) publishes a variety of guidance documents. Typically these provide further explanation for the import health standard (IHS) requirements; assist stakeholders to comply with the IHS requirements; explain MPI's role in biosecurity; and guide stakeholders on the required documentation.

Any guidance on how to comply with the applicable requirements is a suggestion of how to achieve compliance – and may not be the only way. Stakeholders are encouraged to discuss significant departures from the approaches outlined in this guidance document with MPI prior to use to avoid expending resources on the development of alternative approaches which may not be acceptable.

The term "must" is not typically used in guidance. In this particular document the term "must" is simply used when quoting or paraphrasing the requirements set out in the related Import Health Standard.

Related Requirements

This guidance document has been issued to accompany the Import Health Standard (IHS) for Phase 3 Mushroom Growing Medium.

Document history

Version Date	Part Changed	Change(s) Description
25 May 2020	All	New guidance document for **phase 3 mushroom growing medium**

Contact Details

For further information and questions about this guidance document, please contact;
Ministry for Primary Industries (MPI)
Biosecurity New Zealand
Plant Imports
PO Box 2526
Wellington 6140

Email: plantimports@mpi.govt.nz

Disclaimer

This guidance does not constitute, and should not be regarded as, legal advice. While every effort has been made to ensure the information in this guidance is accurate, the Ministry for Primary Industries does not accept any responsibility or liability whatsoever for any error of fact, omission, interpretation or opinion that may be present, however it may have occurred.

Copyright

Contents

Page

1 Purpose

(1) This guidance document has been issued to accompany the IHS: Phase 3 Mushroom Growing Medium and should be read in conjunction with that IHS.

(2) The document includes additional information on MPI requirements for import of growing medium inoculated with mushroom (*Agaricus bisporus*) spawn (i.e. phase 3 mushroom growing medium).

2 Background

(1) The IHS: Phase 3 Mushroom Growing Medium, which this guidance document accompanies, contains generic import requirements. These are the rules to manage the biosecurity risk of importing this type of product from all countries that can meet the requirements of the IHS and in doing so meet New Zealand's appropriate level of protection.

(2) This guidance document contains further information about how to meet the requirements set out in the IHS in order to import phase 3 mushroom growing medium.

(3) General information about importing plant products can be found here: www.mpi.govt.nz/importing.

3 Definitions

(1) Refer to Appendix 1 of the IHS for Phase 3 Mushroom Growing Medium.

4 Importation of phase 3 mushroom growing medium

(1) Phase 3 mushroom growing medium is produced using a mixture of horse manure, chicken manure, straw, gypsum and water that is composted at high temperatures. The composted product is known as 'phase 1 medium'. Phase 1 medium is then pasteurised for 8-10 hours and conditioned at a lower temperature for a further 2-3 days. The conditioned product is called 'phase 2 medium'.

(2) Phase 2 medium is inoculated with mushroom (*Agaricus bisporus*) spawn and incubated at around 25°C for approximately two weeks. During this time the mushroom mycelium colonises the growing medium; the colonised product is known as 'phase 3 mushroom growing medium'.

(3) This IHS applies only to mushroom growing medium that has been inoculated with *Agaricus bisporus* (common mushroom) spawn prior to export (i.e. phase 3 mushroom growing medium). All other fertilisers and growing media containing microorganisms must be imported as set out in the IHS for Fertilisers and Growing Media of Plant Origin.

(4) Phase 3 mushroom growing medium must also meet all relevant requirements set out in the IHS for Processed Animal Manure Products (ANMANURE.GEN).

(5) Mushroom spawn (*Agaricus bisporus*) must also comply with the requirements set out in the IHS for Microorganisms from All Countries (MICROIC.ALL) which is on the MPI website at: www.mpi.govt.nz/document-vault/1933.

4.1 *Basic Measures*

(1) *Basic Measures* are required to manage biosecurity risks associated with regulated organisms such as viable seeds and plant pest and disease organisms that may be associated with the raw ingredients. *Basic Measures* will also manage the risk associated with hitchhiker organisms, such as insects, that may become associated with a product during processing, handling or storage.

(2) *Basic Measures* will be assessed by MPI either during negotiation of an Export Plan or, where an Export Plan is not required, during the import permit application process. As a minimum, *Basic Measures* must include all requirements set out in part 2.1 of the IHS.

(3) *Basic Measures* include the requirement that the production facility in the exporting country is operating a quality production system. In order to be verified as operating a quality production system, the facility will need to be accredited by an external accreditation body as operating a quality management system (e.g. ISO).

(4) As part of the process for approving a production facility temperature profiles from multiple probes at various locations in phase 1 bunkers will be assessed to ensure that the minimum temperature requirement in the IHS can be attained (i.e. 65°C for at least 8 continuous hours):

a) this will include evaluating data from probes placed near the front of the bunker just above the floor (which is likely to be the coldest part of the bunker).
b) probe data from multiple batches of phase 1 compost may be assessed before a facility is approved.
c) based on this assessment, the Export Plan (or import permit) will identify the location of mandatory probe(s) that must be used to monitor each production run. Each production facility will be expected to retain records of temperature recordings from each production run that would be made available to MPI on request.

(5) Hygiene measures that are used at each production facility will be evaluated to ensure that these meet the requirements of clause 2.1(1)c) of the IHS.

(6) As well as demonstrating compliance with the specific *Basic Measures* identified in part 2.1 of the IHS (as described above), information must also be provided about other measures that are used as part of standard commercial production to monitor product quality and ensure freedom from regulated pests and viable seeds. For example this may include the following:

a) providing a list of all raw ingredients used to produce the phase 3 growing medium and describing how these are stored prior to processing;
b) describing any pre-composting stages, including information about mixing of ingredients, duration of, and temperatures attained during pre-composting;
c) providing a full description of the phase 1 composting process, which may include the following:
    i) describing any mixing that is done during phase 1 production;
    ii) identifying whether compost is transferred between bunkers during phase 1 production;
    iii) describing how temperature and moisture levels are monitored and controlled during phase 1 production;
    iv) identifying the duration of phase 1 composting and the maximum temperatures attained.
d) describing conditions used in phase 2 pasteurisation and conditioning, including;
    i) the duration of processing;
    ii) the temperatures attained;
    iii) how temperatures are monitored in each production run.
e) describing methods used to ensure product does not become contaminated after heat treatment (e.g. when being transferred between production tunnels), during spawning, or when packaging the product;
f) describing how phase 3 medium is packaged and transported prior to arrival in New Zealand.

(7) The methods that are used to produce mushroom *(Agaricus bisporus*) spawn that is free from regulated organisms should also be described. This should include identifying any third party organisations that produce the spawn and describing the procedures used by the third party to ensure the spawn is free from regulated organisms.

4.2 *MPI-Specified Measures*

(1) *MPI-Specified Measures* are required to manage pests that present a significant biosecurity risk. In the case of this IHS, *MPI-Specified Measures* are required to manage *Trichoderma aggressivum* and Mushroom virus X disease (MVX).

(2) One (or more) of the following *MPI-Specified Measures* must be applied prior to export of phase 3 mushroom growing medium to New Zealand:

a) country freedom;
b) pest free area;
c) systems approach.

4.2.1 Country freedom and pest free area

(1) Additional *MPI-Specified Measures* are not required when country freedom or pest free area status is recognised for both *T. aggressivum* and MVX in the exporting country.

(2) Country freedom status will only apply when:

a) all relevant requirements set out in ISPM 4: *Requirements for Pest Free Areas* are complied with;
b) the phytosanitary certificate includes the relevant additional declaration as specified in the IHS.

(3) If intending to import using the option of country freedom, the importer should discuss this with MPI at the time of import permit application.

(4) Pest free area status will only apply when:

a) information about pest free area status is provided by the manufacturer at the time of import permit application;
b) all relevant requirements set out in ISPM 4 are complied with and the phytosanitary certificate includes the relevant additional declarations as specified in the IHS;
c) MPI has reviewed and evaluated the implementation of the pest free area as described in ISPM 4.

(5) An Export Plan is not required when country freedom is recognised for the exporting country, or when a production facility is located in a pest free area.

(6) If country freedom or pest free area status is obtained for only *T. aggressivum*, additional *MPI-Specified Measures* (systems approach) will still be required to manage the risk associated with MVX.

(7) If country freedom or pest free area status is obtained for only MVX, additional *MPI-Specified Measures* (systems approach) will still be required to manage the risk associated with *T. aggressivum*.

4.2.2 Systems approach and Export Plans

(1) Where *MPI-Specified Measures* are applied prior to export as part of a systems approach, an Export Plan must be negotiated before new trade can commence.

(2) The Export Plan may be negotiated either between MPI and the NPPO or the exporting country or, if for operational reasons the NPPO is unable to negotiate an Export Plan, the Export Plan may be negotiated between MPI and another relevant party, such as an individual production facility.

a) where an Export Plan is negotiated between MPI and the NPPO of the exporting country, the Export Plan will detail how all facilities approved by the NPPO of the exporting country will meet all Basic and *MPI-Specified Measures* as set out in the IHS, and will provide the basis for MPI pathway assurance reviews;
b) where an NPPO is unable to negotiate an Export Plan, the Export Plan will be negotiated between MPI and another relevant party. The Export Plan will detail how a particular production facility will meet all Basic and *MPI-Specified Measures* as set out in the IHS, and will provide the basis for MPI pathway assurance reviews.

(3) Usually *MPI-Specified Measures* are based on qualitative information, expert judgement and experience, and quantitative data if available.

(4) The systems approach for managing *Trichoderma aggressivum* and Mushroom virus X disease consists of two independent measures that must be applied prior to export, and one that must be applied after the goods arrive in New Zealand (see part 4.6 of this guidance document). The pre-export independent measures are as follows:

a) Independent measure 1: Heat treatment of phase 1 growing medium at a minimum temperature of 65°C for 8 continuous hours. This is listed in the RMP and draft IHS as a 'basic measure', but is also a key independent measure required as part of the systems approach to manage risk associated with both *T. aggressivum* and Mushroom virus X disease. Clause 4.1(4) gives more information about how to verify that this temperature can be attained.

b) Independent measure 2: A combination of dependent measures relating to hygiene practices used at the phase 3 growing medium production facility, and testing to verify the efficacy of hygiene procedures.

i) the dependent measures relating to hygiene are described in clause 2.2.1(1)b) of the IHS;
ii) testing for *T. aggressivum* must include the testing measures set out clause 2.2.1(1)c) of the IHS;
iii) testing for Mushroom virus X disease must include the testing measures set out in clause 2.2.1(1)d) of the IHS.

(5) The third independent measure that is used as part of the systems approach is applied after the goods arrive in New Zealand, and is described in part 4.6 of this guidance document.

(6) As a minimum, an Export Plan will be required to address all components listed as *MPI-Specified Measures* in part 2.2.1 of the IHS and should include the following information:

a) a description of how the minimum time-temperature combination will be attained during phase 1 composting, and the steps that will be taken to verify that the minimum requirements are attained during each production run;
b) a description of hygiene measures used during production;
c) a description of testing and post-production monitoring that is undertaken to ensure freedom from *T. aggressivum*, including describing sampling methods that are used to ensure samples collected for testing are representative of each consignment;
d) a description of testing that is done to ensure freedom from signs or symptoms of Mushroom virus X disease, including describing sampling methods that are used to ensure samples collected for testing are representative of each consignment.

(7) When an Export Plan is negotiated, the Export Plan will also set out all *Basic Measures* as required under part 2.1 of the IHS. As a minimum the information identified in part 4.1 of this guidance document should be included in the Export Plan.

(8) When testing for *T. aggressivum*, the Export Plan must identify areas throughout the facility from which samples will be taken for testing. For example, when testing production equipment, this may include testing conveyors, winches, mixers, ground, trucks and the dispatch area etc. When testing air plates, this may include plates from beneath tunnels that are being emptied, on winches and in dispatch halls etc.

(9) When Export Plans are developed, recognised countries and/or production facilities will be listed on the MPI website.

4.3 Import permit

(1) An import permit will not be issued until MPI is satisfied that all biosecurity risk will be appropriately managed, and an Export Plan has been negotiated (where required).

(2) In cases where an Export Plan is not required, the import permit application should include a copy of the production protocol used to produce the phase 3 mushroom growing medium. The production protocol should identify all *Basic Measures* that are used to monitor product quality and ensure freedom from regulated pests and viable seeds as described in part 4.1 of this guidance document.

4.4 Approval of exporting countries and/or production facilities

(1) MPI will not approve an Export Plan until it is satisfied that all requirements of the IHS will be met.

(2) MPI will maintain a register on the MPI website which will list all countries and/or production facilities for which an Export Plan has been approved through the **online pest database**.

(3) Before an Export Plan is finalised, MPI may need to obtain further information from the NPPO or the manufacturer to verify that all criteria for producing phase 3 mushroom growing medium can be met, and that the risk management measures used at a particular facility will manage biosecurity risk.

(4) Where an Export Plan is negotiated, MPI may choose to audit a production facility to verify compliance with all requirements of the IHS, and with any additional measures agreed upon between the two parties when the facility is approved.

(5) All costs associated with approving a production facility, including evaluating information provided as part of the import permit application and costs for an on-site or desktop audit are to be met by the importer.

4.5 Inspection of product on arrival in New Zealand

(1) On arrival inspection of consignments may be required for MPI to verify compliance with the requirements of the IHS.

(2) Where an on arrival inspection is required, the MPI inspector will inspect the commodity to check for the presence of signs or symptoms of pests, soil, viable seeds, or any other visually detectable contaminants that would not be expected to be present in the product. Samples for inspection will be randomly selected from each lot within a consignment.

(3) If the visual inspection identifies any seeds that appear to be viable, these should be sent to an approved identification service provider for germination testing.

(4) Inspections of regularly imported commercial consignments by the same importer and supplier which have a history of compliance may have the inspection frequency or rates reduced at the discretion of MPI.

(5) To prevent contamination or degradation of the product all inspections will be done in a temperature controlled transitional facility or biosecurity control area that has been approved by MPI as suitable for inspecting plant products.

(6) The importer should contact MPI prior to the arrival of each consignment to make arrangements for the consignment to be transferred to a suitable transitional facility for inspection.

4.6 Post clearance conditions

(1) Phase 3 mushroom growing medium may be subject to post clearance conditions under section 27A of the Act. The post clearance conditions have been imposed in order to manage any residual risk that may be associated with imported phase 3 mushroom growing medium. A CTO direction will be made available on the MPI website that describes all post clearance conditions.

(2) The following post clearance conditions will be approved under section 27A of the Act for imposing on phase 3 mushroom growing medium:

a) All waste packaging material associated with imported growing medium must be disinfected onsite by steam treatment at a minimum temperature of 65°C for a minimum time of 8 continuous hours as soon as practical after each consignment is transferred to growing rooms. Waste may be disposed of in the usual waste stream following application of steam treatment. Temperature probes must be used to ensure that the desired temperature is attained. All waste packaging material must be securely stored in a sealed container before steam treatment is applied. Accurate records must be kept to identify the following:

   i) the date waste was generated;
   ii) the storage location of waste prior to steam treatment (if applicable);
   iii) the date steam treatment was applied; and
   iv) the location of temperature probes and the temperature that was attained.

b) All machinery that is used to process imported medium must be thoroughly cleaned after each use to remove all traces of organic matter. Any waste organic matter that is removed during cleaning must be disinfected onsite by steam treatment as described in clause (2)a) above.

c) Procedures must be put in place to ensure that any equipment or machinery used within growing rooms during mushroom production is:

   i) retained within the transitional facility, OR;
   ii) treated with a disinfectant that will be effective against fungi and viruses before removal from the facility.

d) The importer must put in place steps to ensure that all personnel entering the transitional facility:

   i) wear protective clothing that is either retained within the facility or discarded into a sealed waste bin on exit; AND
   ii) wear protective shoe covers or dedicated footwear that must be retained within the facility; AND
   iii) wear disposable gloves that are discarded into a sealed waste bin on exit from the facility; AND
   iv) use footbaths or absorbent foot mats when entering and exiting the facility.

e) The importer must ensure that any discarded clothing is disinfected as described in clause (2)a) of these post clearance conditions before final disposal.

f) A suitably qualified and experienced employee of the importer must be appointed to undertake daily inspections of the phase 3 growing medium once it has been processed and transferred to growing rooms. This must include visual inspection of all growing medium on each layer of shelving to ensure that there are no visible signs of *T. aggressivum*. Once fruiting bodies become visible, inspections must also look for signs or symptoms of MVX. Up to date records must be maintained, including the date and outcome of all daily inspections.

g) The following actions must be taken to verify that *T. aggressivum* is not present in imported phase 3 medium when any signs or symptoms of growth of *Trichoderma* species are observed in a growing room:

   i) if any signs of contamination by any species of *Trichoderma* are detected in a growing room, representative samples must be taken and sent by courier to an MPI-approved diagnostic facility for confirmation of identity. If *T. aggressivum* is identified within a sample, all actions identified in clause (2)h) of these post clearance conditions must be taken;
   ii) the importer must retain records of all samples that are submitted for testing, including the date of testing, number of samples submitted and the test results;
   iii) all *Trichoderma* infections must be closely monitored by the employee identified in clause (2)f) of these post clearance conditions. If there is any reason to suspect that signs or symptoms differ in any way to those usually caused by *Trichoderma* species already known to be present in New Zealand, and that the symptoms may instead be due to the

presence of *T. aggressivum*, MPI must immediately be informed and actions identified in clause (2)h) of these post clearance conditions must be taken.

h) If signs or symptoms of either *T. aggressivum* or MVX are suspected at any time, the importer must:

i) immediately secure the growing room and prevent any material being transferred to other areas of the facility – this must include sealing all entry and exit points for ventilation into the affected room; AND
ii) immediately notify the MPI pests and diseases hotline on 0800 80 99 66; AND
iii) ensure that no machinery or equipment used for producing or transporting mushrooms is removed from the site until further notice from MPI; AND
iv) ensure that no produce is removed from the site until further notice from MPI; AND
v) ensure that any personnel who have entered the growing area where either disease was detected do not enter any other areas within the facility. Any protective clothing worn by personnel that may have been contaminated must immediately be decontaminated in a way which will destroy the disease organism of concern, for example as described in clause (2)a) of these post-clearance conditions, before final disposal.

i) After final harvest all rooms and equipment must be cooked out using a steam treatment that ensures all spent growing medium reaches a minimum temperature of 65°C for a minimum of 8 continuous hours. Temperature probes must be used to ensure that the desired temperature is attained. Records of probe placement and temperature recording must be maintained.

j) All records required as part of these post clearance conditions must be retained for a minimum of seven years, and must be made available to MPI on request.

k) The importer must inform MPI if they become aware of any change in circumstances which may change the risk profile of the imported goods.

(3) All post clearance conditions must be followed unless phase 3 mushroom growing medium has been manufactured in a country or pest free area free from *T. aggressivum* and Mushroom virus X. If manufactured in a pest free area, the only mandatory post-clearance conditions are those listed in part 2.3 of the IHS.

(4) All testing that is done to confirm the identity of any species of *Trichoderma* that are detected within growing rooms will be at the expense of the importer.

(5) Clause (2)k) of the post clearance conditions requires an importer to notify MPI if they become aware of any change in circumstances which may alter the risk profile of the imported goods. Examples of when this may apply include:

a) if *T. aggressivum* or MVX disease is detected at an offshore mushroom growing facility using growing medium from a batch that is in transit to New Zealand;

b) if *T. aggressivum* or MVX disease is detected within an MPI approved phase 3 mushroom growing medium production facility;

c) if *T. aggressivum* or MVX disease is detected in a pest free area that is considered free from these organisms.

(6) The importer should make arrangements with the relevant identification service provider prior to the submission of any *Trichoderma* samples that require confirmation of identity. A list of approved identification service providers is available on the MPI website.

(7) MPI will require confirmation that an importer can comply with all post clearance conditions set out in the IHS before an import permit is issued.

(8) MPI reserves the right to audit production facilities using imported phase 3 mushroom growing medium to verify compliance with all relevant post clearance conditions. Audits may either be scheduled in advance, or unannounced. The importer will be expected to meet all costs associated with an audit.