

Discussion Document for the Importation of Fertilisers and Growing Media containing Plant Material

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Submissions

MAF Biosecurity New Zealand invites comments on the options for managing risks for future imports of these commodities.

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Introduction

MAF Biosecurity New Zealand (MAFBNZ) has implemented a review of all the low risk plant products currently not included in Import Health Standards. A number of new standards are currently being developed to accommodate these products. The purpose of the development of this Import Health Standard (IHS) is for it to serve as a framework for miscellaneous products used as fertilisers and growing media which do not currently belong in any other IHS. Importation has been previously managed by internal lists, import permits, and official correspondence confirming biosecurity clearance assuming basic requirements are met. Many products covered under this IHS have been imported for years and little change is being made to existing regulations. This framework will outline the set of requirements for certain groupings of products. Some groupings are products that are considered to be of extremely low biosecurity risk. These products are either processed to the point of little risk, or are currently being either inspected or treated on arrival.

This document discusses the risks associated with the importation of fertilisers, growing media and bioremediation products comprising:

- Plant products that have been produced by the decomposition of fresh or dry plant material (e.g. recycled cellulose wastes);
- Plant products produced as a by-product of other manufacturing, including oil seed meals used for fertiliser and composts that have been processed with heat (e.g. copra meal, cotton seed meal, mustard meal, neem meal, palm kernel meal, soybean meal and distillers dried grains);
- Other meals or husks derived from other seeds (e.g. cotton delinting by-product, ground nut shells);
- Other growing media units that have been manufactured from dried plant materials; and
- Commercially processed and manufactured fertilisers containing plant extracts and/or micro-organisms (e.g. algae fertilisers, mineral-based fertilisers, extracts of humic or fulvic acids).

This standard does not cover the requirements for importation of the following commodity classes:

- Coco peat and coir fibre products are prescribed in the import health standard [BNZ-COFP-IMPRT: Importation of Coco peat and Coir fibre Products](#)
- Oil seed meals and other plant products that are intended for animal feeds are prescribed in the import health standard [BNZ-PAFP-IMPRT: Importation of Processed Animal Feeds of Plant Origin](#)
- Excavated peat is prescribed in the import health standard [BMG-STD-SOWTR: Soil, rock, gravel, sand, clay, peat and water from any country](#)
- Growing media associated with the importation of nursery stock will be assessed on a case by case basis. The entry conditions for the growing media will be assessed and included on the permit to import nursery stock, issued in accordance with the import health standard [155.02.06: Importation of Nursery Stock](#).
- Manufactured inorganic fertilisers and growing media not containing any plant material and/or micro-organisms (e.g. perlite, vermiculite, rockwool) have no biosecurity requirements under this import health standard. Bulk imports of inorganic fertilisers are covered under the import health standard [152-08-04i: Importation of Bulk Fertiliser](#)
- Requirements for fertilisers or meals of inorganic or animal origin can be found at: <http://www.biosecurity.govt.nz/ihs/search>.

The purpose of this document is to outline the risks associated with imported fertilisers and growing media and discuss how MAFBNZ considers these are mitigated by the requirements. This assessment is not a risk analysis attempting to list all the species likely to contaminate these products. The products considered here are not a priority for a risk analysis because the products are highly processed and a very limited range of host-associated organisms are likely to be associated with these products. The majority of

associated organisms are likely to be hitchhikers that become associated during processing, handling or storage, but there is not enough information on the hitchhikers likely to occur on these products to make a full risk analysis worthwhile. It is more useful to identify generic approaches to limit contamination and detect if there are contamination problems with any of the products.

Background

MAFBNZ has over the past several years noticed an increasing number of requests to import commodities of plant origins which are used as fertilisers, additives to potting mixes and growing media. These are produced from a variety of sources, including processed minerals, extracts from bean and seed processing, and materials made up from other plant products.

Approximately 40 consignments of seed meals and other plant-based materials for use as fertilisers and growing media, excluding coco peat, have been imported in the last two and a half years (MAFBNZ Quancargo data). The majority of these consignments have come under a permit to import or an internal list stating their biosecurity requirements. These products can originate from any country. A range of importers are responsible for importing these consignments.

Various seed meals are frequently imported into the country for use as animal feed in large quantities. In contrast, seed meals for use as fertilisers have generally been imported in only small quantities, always bagged. The majority of high value products with additives specifically formulated as nutritional supplements for mushroom production have not been inspected on a regular basis following initial imports. Other non-branded products imported into New Zealand have been inspected on arrival.

Seed meal fertilisers are made from the extraction of oil from plant products, such as soybeans and various seeds. These meals are an enriched organic manure specifically processed and free from artificial toxins and chemicals (hence their use as an organic fertiliser). They contain nutrients and micronutrients that are helpful in preserving and nourishing soil (e.g. nitrogen, phosphorus, manganese, zinc). Soybean meal, for example, is mixed and sprayed with a minute amount of formaldehyde for denaturing. The product is dried at a temperature of 90°C for at least 30 minutes, before it is cooled to reduce the moisture content to between 4 and 6 percent. The product is then immediately packaged as it is propelled out of the cooling dryer.

Neem cake is the dried neem seed meal/oil collected during the cold extraction process to obtain pure neem seed oil. This is the residue from processed neem kernels. The kernels are pressed in a slow mechanical process under controlled temperature and the oil squeezed and removed. The residues left after the oil extraction from the neem seeds are grinded to a powder and packed.

Other fertilisers are produced using grain husks that have been grounded into a powdered or granule form, and which have also been heated during processing.

Hazards

Hazards are organisms that could be introduced into New Zealand and are capable of, or potentially capable of, causing unwanted harm. The hazard identification process begins with the collation of a list of organisms associated with the commodity. This is usually derived from scientific literature on the organisms associated with the original plant or the commodity in each country of origin. This approach is not feasible for the fertilisers and growing media pathway because it is virtually impossible to determine which specific organisms will be associated with the commodity based on the existing information.

An additional approach to hazard identification is to analyse records of border and post-border interceptions of organisms on imported fertilisers and growing media of plant origins. This provides direct evidence of association with the pathway, but does not provide a complete list of potential hazards.

The main type of hazard associated with these products is likely to be hitchhikers that become associated with the products during storage (for example, domestic pests such as spiders and ants which can occur on virtually all imported products depending on how and where they are stored prior to export). Other hitchhikers (for example weed seeds or soil organisms) may become associated with the products if contamination occurs during processing.

There have been no recorded interceptions of pests or contaminants on these types of consignments since 2003 (MAF Interceptions Database, accessed 3 November 2008). However, a number of interceptions have been recorded during this period on similar products intended for use as animal feeds or purely mineral fertilisers, but which are not included in the scope of this new IHS. There have been 46 consignments with interceptions of hitchhiker species (e.g. flies, spiders, ants and beetles) on seed meal products, mainly copra meal and canola meal, used for animal feeds. These products differ from those that are covered by this IHS, as fertilisers and growing media are usually processed and packaged in a way that prevents the likelihood of contaminants and infestation of hitchhiker species. In addition, there have been two interceptions of contaminants since 2003 on consignments of mineral-based fertilisers. In these 2 instances, the contaminants were a grass species (*Paspalum sp.*) and live insects of an undetermined species, which were also likely to be hitchhikers.

Host-associated organisms

Seed meals are made from the residue of grinding or crushing seed to extrude oils and are unlikely to contain any whole seeds. Heat is also applied in the processing, raising the core temperature to at least 85°C for 5 minutes. The combination of crushing and heat means that viable seeds are unlikely to occur as part of the products and therefore any organisms that survive only in viable seed are highly unlikely to be a hazard. Processing with heat is also likely to kill any insects. Fields (1992) found that most insects are not likely to survive more than 12 hours at 45°C, five minutes at 50°C, or only one minute at 60°C.

There is the potential for some fertilisers to contain beneficial living organisms either naturally or intentionally added. For example, some plant and mineral-based fertilisers contain fungi, bacteria or other micro-organisms that enhance plant growth. While many micro-organisms would be killed by the temperatures reached during processing, some fungi and bacteria are capable of surviving this combination of temperature and time.

In many products containing intentionally added organisms, the addition is made after processing. There is little evidence in the literature to suggest increased biosecurity risks associated with the presence of specific micro-organisms on plant-based fertilisers and growing media.

Contaminant-associated hitchhikers

Soil is a possible contaminant if materials are stored on the ground at any stage during processing. There are a number of significant hazards associated with soil should contamination occur, including weed seeds as well as insect pests, nematodes and pathogens. Freedom from visually detectable soil is a requirement for a wide range of imported items, from shoes to used vehicles.

Other potential contaminants include live arthropods, foliage and animal material. Much of this kind of contamination is only likely to occur when the product is not under cover from the external environment (e.g. drying outdoors in the sun) or if stored in conditions with high pest

populations nearby. The most likely source of contamination would be due to poor quality production standards, the lack of a buffer area or a bad weather event.

In many cases, the processing involved in the product's manufacture will make contamination highly unlikely, for example, if processing and packaging occurs indoors. Single ingredient products developed as a by-product from another process tend to be produced in large quantities in dedicated facilities. If proper measures are observed for cleanliness, the product should be homogeneous when manufactured. In general, the risks of contamination are very low as the manufacturing process generally enables the products to come straight out of the machinery.

Exposure and establishment

Products which will be used in potting mixes or placed directly in gardens increases the likelihood that species associated with these products would be able to establish, which poses a higher risk when compared with fruit brought in for human consumption, for example, where only a small proportion of the good is expected to end up in a compost bin or rubbish facility.

Potential measures for managing biosecurity risks

Given the potential risks of contamination and living organisms present with these products, a number of measures are available to MAFBNZ to mitigate these risks. These measures include the development of processes for assessing quality production and processing systems to reduce the risk of contamination, requesting certification, visual inspection and treatment.

Certification

Phytosanitary Certificate

The issuance of a phytosanitary certificate by the National Plant Protection Organisation (NPPO) of the country of origin is a suitable condition to ensure that the requirements of the relevant import health standard have been met by the exporting country. A phytosanitary certificate can be used to ensure that the NPPO of the exporting country has visually inspected the consignment for the presence of regulated pests.

Permit to Import

A permit to import provides a way of managing the importation of these types of products on a case-by-case basis, allowing for assessment of a specific product. For example, any risks associated with the presence of unknown or intentionally added organisms can be managed through the use of a permit. Information will need to be sought from importers to clarify whether there are any known micro-organisms in products and if they require approval from ERMA or the ACVM group of New Zealand Food Safety Authority (NZFSA).

Manufacturing Certificate

A manufacturing certificate is a useful requirement to confirm that any processing using heat complies with the requirements of MAFBNZ and mitigates possible biosecurity risks. Where a permit is not required, a certificate from the manufacturer can be useful to confirm identity and composition of the product.

Quality System Production

A quality production system aims to provide a consistent quality of product by setting standards for each stage of manufacturing or processing. It is particularly suitable for managing the risk of hitchhiker organisms associated with contamination during processing and storage, and can have a general focus where the exact pests likely to be associated with a product are uncertain. On goods where contaminants are likely to be common, there is a

historic requirement that they are inspected and treated if contaminated (e.g. tents and other hiking equipment).

An awareness of the necessity for cleanliness and regular monitoring and product checks is required. Regular monitoring by the supplier should identify contamination events caused by such incidents as a bad weather event. Importers and suppliers will need to provide suitable evidence that measures are in place to avoid contamination and monitor sites in the production process, potentially through the permit to import application process. A programme of auditing would be required to verify the quality of each manufacturing system.

Visual Inspection

Visual inspection by a trained inspector can be used in three main ways for managing biosecurity risks on goods being imported into New Zealand, as:

- a biosecurity measure, where the attributes of the goods and hazard organism provide sufficient confidence that an inspection will be able to achieve the required level of detection efficacy;
- an audit, where the attributes of the goods, hazard organisms and function being audited provide sufficient confidence that an inspection will confirm that risk management has achieved the required level of efficacy;
- a biosecurity measure in a systems approach, where the other biosecurity measures are not able to provide sufficient efficacy alone or have significant levels of associated uncertainty.

Visual inspection can take place along the whole production and post harvest pathway. Monitoring of the production system is considered good practice, and the grading process provides another opportunity for screening.

Pre-export inspection: MAF Biosecurity New Zealand may require that the NPPO of the exporting country samples and visually inspects the consignment for all regulated pests.

On arrival inspection: This is carried out in the destination country on arrival. The purpose of these inspections is to determine whether any potential quarantine pests are associated with the consignment.

Detection of regulated pests will result in the consignment being subjected to appropriate remedial action, which will reduce the risk to a very low level. This action would involve any treatment known to be effective against the target pests or diseases.

Treatments

A series of treatment options are available for mitigating the risks of contaminants. These treatments may be conducted either prior to export or on arrival in New Zealand depending on their availability in each of the countries.

Methyl Bromide

Methyl bromide fumigation is known to be effective against a range of pests, particularly arthropods, and is relatively easy to apply. Methyl bromide fumigation is available in many exporting countries or on arrival in NZ.

However, the reported effectiveness of methyl bromide as a quarantine treatment for seeds is variable. Based on trials done on the devitalisation of seeds, many weed seeds are likely to survive fumigation with methyl bromide (Biosecurity Australia 2002; Cassells 1995). However, work carried out byASUREQuality New Zealand (2002) to find methods for devitalising seed contaminants in dried sphagnum for export to Australia showed that by using a rate of 80g/m³ for 72 hrs at 21°C, adequate effectiveness was achieved if applied correctly.

Heat Treatment

Heat treatment, involving either steam or low humidity treatment maybe applied to consignments to devitalise seeds or kill other contaminants. Heat treatment at the rate of 85°C core temperature for 15 continuous hours is currently being used on a range of plant products. This type of treatment is considered as a suitable alternative when faced with the reshipping or destroying of a consignment. Heat treatment has the advantage of treating both internal and external contaminants and those that may not be identified in standard visual inspection procedures. For example, heat treatment is considered to be an effective measure for the devitalisation of seeds (MAFBNZ Treatment Standard, 2008).

Hot air treatment may damage the physical properties of specific products and could be an expensive option given the volume and value of some product. Steam treatment involving a very high relative humidity is another potential option for products which will not have their integrity affected by this type of treatment.

A requirement for mandatory heat treatment is likely to make the importation of high volume fertilisers and growing media unfeasible for many products and/or importers, due to the relatively high costs involved compared with the value of the product. Autoclave treatment is also mentioned in the IHS as an option if contamination is found. Autoclaving would be conducted at a minimum of 121°C for 30 minutes at 100KPa.

Irradiation

Gamma irradiation carried out at high doses (25kGy) is an effective treatment for seeds and other organisms in non-edible products¹, but is not available in many countries and is available in New Zealand only on a very small scale. Irradiation can devitalise seeds in a shorter timeframe than heat treatment and is less likely to cause damage to the product. Irradiation is an expensive treatment option, but could be used for specific ingredients in a high value product as part of the processing procedure.

Summary

The use of fertilisers and growing media containing plant material has considerable value for horticulture in New Zealand. The biosecurity risks of these products include contamination during processing and transit, and the potential for these products to contain harmful micro-organisms. With adequate measures in place to control the risks associated with contamination, importation of these products as specialised growing media or growth enhancers shall be possible.

Distinct measures could be placed on different groups of products depending on their biosecurity risk. The different types of commodities include oil seed meals and other dried plant products used for fertiliser and composts, manufactured fertilisers that may or may not contain micro-organisms, and other commercially processed and packaged fertilisers and growing media that contain plant extracts. For many of these products, MAFBNZ would need to ensure that there is a minimum standard of processing to ensure that any biosecurity risks are minimised.

MAFBNZ encourages the importation of products that are entirely free of pests and contaminants. The most suitable control would be a combination of documentation, visual inspection, and treatment where necessary. Import requirements have been separated for each major product type depending on their perceived biosecurity risk. The draft import health standard outlines the requirements for a permit to import, phytosanitary certificate and a certificate from the manufacturer depending on the type of product. A permit to import will be required for specified products which will allow MAFBNZ to assess any biosecurity risks

¹ The irradiation rate of 25kGy referred to in this document is based on project work: Wynn & Williams/Canensis (held on MAF files). This rate is currently in use in the MAF standard: Importation of Grain/Seeds for Consumption, feed or processing, Plant Health Requirements.

on a case-by-case basis. Where a permit is not required, a manufacturer's certificate will be necessary to confirm the identity and ingredients of the product, and specific processing details.

Products will be inspected on arrival to ensure freedom from contamination and infestation by extraneous materials, unless the products are highly manufactured extracts in retail packs. A precautionary fumigation treatment, which is applied to seed meals for use as animal feed, is not considered necessary for seed meal fertilisers as they are generally commercially manufactured and packaged to reduce the likelihood of contamination. If contamination is found, the material will require treatment. Heat treatment is an accepted treatment for these products in cases of incorrect documentation or contamination.

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