Risk Discussion Document for the Importation of Coco Peat

MAF Biosecurity New Zealand Discussion Paper No: 2008/02

Prepared for MAF Biosecurity New Zealand
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ISBN No: 978-0-478-32127-2 (online)
ISSN No: 1177-7532 (online)

May 2008

Submissions

As part of the consultative process in the development of the import health standard for the importation into New Zealand of **Coco Peat and Coir Fibre Products**, MAFBNZ has distributed the following draft documents for public consultation and comment:

- **Draft Import Health Standard for Coco Peat and Coir Fibre Products**
- **Risk Discussion Document for the Importation of Coco Peat**

Submissions on these draft documents should be forwarded to MAFBNZ by close of business on **11 June 2008**. Depending on the results of consultation, it is anticipated that the new requirements will be in as soon as possible after consultation. MAFBNZ encourages respondents to forward comments electronically to the email address below. However, should you wish to forward submissions in writing, please send them to the address that follows:

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This publication is available on the MAFBNZ website at www.biosecurity.govt.nz

Additional information on 'Making a submission' can also be viewed from this web page. Requests for further copies should be directed to the above address.

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Introduction

Recently an incidence of new to New Zealand weeds growing from coco peat blocks and potting mixes occurred in two plant nurseries. The development of an import health standard, planned for this year, has now become urgent following this weeds incursion. Interim measures for importation, involving actions on or post arrival are not manageable or sustainable and a longer term solution is required.

The purpose of this document is to outline the risks associated with imported coco peat and discuss how these might be mitigated. This is not a full risk assessment attempting to list to species all the organisms that are likely to contaminate these products, but broadly considers treatments or actions. Coco peat is the main focus of the document but other coir products are given a brief mention. MAF Biosecurity New Zealand (MAFBNZ) invites comments on the options for managing risks for the future.

Background

Coconut fibre products derived from the husk of coconuts have been imported into New Zealand for many years. For biosecurity purposes these can be divided into coco peat used as a growing medium and coir fibre used for other purposes. Samples of coco peat briquettes were examined more than 20 years ago and considered to be low risk at the time.

COCO PEAT (OR COIR PEAT)

Coco peat for horticulture is produced either from the finer fibres and pith as a by-product of extraction of coarser fibres or by chopping and crushing the entire husk pieces into chips or crush. Traditionally husks have been soaked (retting) to reduce salt levels prior to mechanically removing fibres but it is now common to remove fibres without soaking and compensate by a short wash with addition of chemical buffers. Drying in the open follows machine extraction of the pith or chip production. Screening to various particle sizes is then carried out if required and the product is finally machine-compressed.

Coco peat is mostly imported and sold as compressed products: bales, blocks, briquettes, discs, pots and grow slabs or grow bags. The bales, blocks and briquettes are either broken down for use in potting mix or are directly retailed for garden use. Grow slabs and bags are used in hydroponic growing, the coco peat being packed in toughened, ultraviolet resistant polythene, ready for seedling starter blocks to be placed directly on to bag slits. These slabs and bags remain in use for typically 9 to12 months for greenhouse vegetable crops but can be used for several years, especially for some flower crops. The inner side of the polythene is black, maintaining a dark environment. After such use, the coco peat from grow slabs and bags has a lower risk of containing viable seeds. Discs and starter blocks are used for seed germination and adhesive-moulded coco peat planting pots can be planted directly into the ground where they break down after a few months. A small amount of uncompressed coco peat has been imported from the Netherlands with small amounts of a beneficial fungus added.

The value of coco peat to horticulture and its rapidly increased use in New Zealand during the last 2 to 3 years can be attributed to the following qualities: it has excellent water retention and aeration properties, thus reducing water use; it is a renewable substitute for peat which aids preservation of New Zealand's peat reserves and it is environmentally friendly being reusable, biodegradable and renewable.

Most coco peat is imported into New Zealand from Sri Lanka and a small amount is imported from India. There are other countries which are potential exporters to New Zealand (e.g. Malaysia and Mexico). Coco peat is supplied to New Zealand from Sri Lanka by four major and a few smaller producers and exporters. In New Zealand at least half of the coco peat is imported by one company and a few other companies import significant amounts. These companies supply a larger number of growers, distributors, potting mix producers and nurseries.

COIR FIBRE USED FOR OTHER PURPOSES

Large fibres cleaned of fine material are a lower risk than coco peat, especially when the pathway is not horticultural. These fibres are used for making rope, domestic mats, weed or erosion control mats, matting for mattress production, hanging basket liners, brooms, brushes, and in a range of other industrial uses. A number of these products are heated significantly during processing.

There is very little biosecurity risk with these products. Depending on processing and packaging, the only risk 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). Such risks are similar to those of other processed plant fibres and it is proposed that these products should be inspected on arrival, and only periodically if imported frequently.

Coco Peat Risks

There are no organisms specifically associated with coconut fibre, which comes from inside the coconut husk. Coco peat must be defined as a risk good because there are opportunities for contamination during processing, storage and packaging (and this is known to have occurred) and because of its use as a growing medium, which increases the likelihood of establishment of contaminant species. Contaminants or the pests or diseases associated with contaminants could be of concern. These risks include seeds, other plant material, soil, animal materials and insects.

Information acquired from the recent weed incursion provides the best understanding of the weed seed risk. This is listed on the MAFBNZ website:
http://www.biosecurity.govt.nz/regs/imports/plants/coco-peat

MAFBNZ is conducting risk assessments for these weeds, covering likelihood of establishment and potential impacts of the species found. The biological information also helps indicate how the coco peat may have become contaminated with weed seeds. The species found have similar dispersal mechanisms; they have seeds that fall to the ground very near the parent plant and are distributed mostly through the movement of soil and debris. They are not generally wind or animal dispersed over long distances. This suggests that the plants that were the source of the seeds were growing in very close proximity (probably within a metre or two) of where the coco peat was being processed, and that if a good buffer zone from weeds is kept the material should remain free of seeds.

Apart from weed seeds, there are other potential hazards associated with coco peat if contamination occurs during processing. Soil is a likely contaminant only if husk or coco peat is 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 and disease. Freedom from visually detectable soil is a requirement for a wide range of imported items, from shoes to used vehicles, including products similar to coco peat such as excavated peat, sand and clay.

Other potential contaminants include live arthropods and animal material. Much of this kind of contamination is only likely to occur when the product is not under cover (during drying, usually about a day in good weather) or if stored in conditions with high pest populations nearby. The survival of some pests, for example larger arthropods, is likely to be reduced by the compression of the processed coco peat (8:1 or more for slabs, about 6:1 for blocks and 4:1 for bales).

Potential measures for managing biosecurity risks of coco peat

Given the potential risks associated with coco peat, a number of specific measures are available to mitigate these risks. These measures can generally be categorised into two main approaches: preventing contamination during processing and treatment of the product that may have become contaminated.

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 suitable for managing the risk of hitchhiker organisms associated with contamination during processing and storage, even where the exact pests likely to be associated with a product are uncertain.

A quality system approach can be used to prevent possible contamination of coco peat at the supply source. Systems can be controlled from collection of husk pieces at copra factories to wrapping of the finished product. If all hazard points are addressed the coco peat should be uncontaminated. Systems can vary in different ways to manage cleanliness but still achieve the same result (e.g. maintenance of buffer zones or walls; drying on concrete or deep buffer layers).

There is an existing quality production system scheme for coco peat imported into the Netherlands (the RHP product certification scheme provided by the RHP Foundation). Set up primarily for the horticultural industry in the Netherlands, RHP is now accepted as an industry standard in many countries. At least two regular suppliers to New Zealand of coco peat are accredited under the RHP product certification scheme. The RHP system monitors many properties of the products that are not of phytosanitary concern, but will be of value to the grower (e.g. pH, salt levels, nutrient levels) as well as incorporating a seed grow-out test and seedling identification. However it does have a tolerance for seeds, expressed as less than 8 tropical weeds (germinated plants) per m^2 which is not considered appropriate for New Zealand. The tested sample size is 10 litres per container of product.

It is feasible to accept a quality production system for coco peat exported to New Zealand based on the existing RHP system or similar system, as long as those aspects that are not considered appropriate for New Zealand (such as the seed tolerance) are adapted to meet New Zealand requirements. A permit to import will be required, with importers supplying details of their production methods prior to issuance. The process for applying for a permit can be used to gain further information on the systems of production used by exporters and to gather a fuller understanding of supply sources.

Sampling through visual inspection or grow out tests

Inspection of compressed product is carried out by destructive analysis of the samples taken. Sampling to check for contamination can be done either through visual examination of thinly spread product under a magni-lamp (particularly good for contaminants such as soil, leaf material and larger seeds) or a grow-out test, where the product is kept, fertilised and watered for 3 weeks to see if any seeds germinate from it (good for all seeds).

Various sample sizes and tolerance levels for contamination found can be set, depending on the requirements of the importing country.

Some grow-out tests will be part of quality production systems. Government sampled grow-out tests, conducted either by the exporting country NPPO or MAFBNZ, would mean that

consignments would need to be held in the exporting country or in a MAF transitional facility upon arrival in New Zealand for a period of approximately 3 weeks.

Treatments

A series of treatment options are available for mitigating the risks of contaminants for coco peat. These treatments may be conducted either prior to export or on arrival in New Zealand depending on their availability in each of the countries. No treatment can be applied prior to compressing the products because there are no facilities at this point in the processing.

Heat Treatment

Heat treatment at the MAFBNZ-recommended rate of 85ºC core temperature for 15 continuous hours is currently being used on coco peat products since the incursion was detected. Heat treatment is considered to be an effective measure for the devitalisation of seeds (MAFBNZ treatment standard). However, hot air treatment damages the physical properties of coco peat, and is expensive as a permanent option for the volume and value of the product. Heat treatment also ruins the UV properties of polythene grow slabs and bags.

Steam treatment involving a very high relative humidity is also expensive and would not be available in most regions.

Any form of heat treatment on a permanent basis is likely to make the importation of coco peat unfeasible, or at least restrict it to a fraction of the current volume, and will require alternative products to be found.

Methyl Bromide

Methyl bromide fumigation is known to be effective against a range of pests and micro-organisms and is relatively easy to apply. Methyl bromide fumigation is available either at the ports of export or on arrival in NZ.

If used as a soil fumigant it will control many seeds (Bromide Compounds Ltd), but its reported effectiveness 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). Work carried out by AsureQuality 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/m^3 for 72 hrs at 21°C, adequate effectiveness was achieved if applied correctly. These are very high rates compared to other uses of methyl bromide. Higher rates have been used with other potting mix trials for another export destination. The effectiveness of methyl bromide on full containers of stacked pallets of compressed and shrink-wrapped coco peat is uncertain, but the effectiveness would almost certainly be reduced by the packaging. To achieve the required penetration it would be necessary to perforate or tear the shrink wrapping and restack.

Ethylene Oxide

Ethylene oxide fumigation is used for quarantine purposes in Australia for seed devitalisation at the following rate: under initial minimum vacuum of 50 kilopascals at 1500g/m3 for 4 hours at 50°C; or 1500g/m3 for 24 hours at 21°C. Ethylene oxide is known to be effective for seed devitalisation and as a general steriliser. It is listed as a seed devitalisation treatment in several Australian regulations. This fumigant is not available for use in New Zealand, but may be available in some exporting countries. Ethylene oxide fumigation is considerably more expensive than methyl bromide and has similar health and environmental disadvantages.

Irradiation

Irradiation treatment is mentioned here only as it is gaining popularity and may well become a more widely used quarantine treatment in the future. Gamma irradiation carried out at very high doses (25kGy) is an effective treatment for seeds and other organisms in non-edible products[1], but is not available in Sri Lanka or New Zealand. Irradiation can devitalise seeds in a shorter timeframe than heat treatment and is less likely to cause damage to the product. However, irradiation is a very expensive treatment option, particularly for low monetary value products of coco peat. To ship consignments to the closest available treatment facility in Australia (Steritech) would also involve considerable shipping and handling costs.

Certification

The issuance of a phytosanitary certificate by the National Plant Protection Organisation 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.

[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.

Options for consideration by MAFBNZ and stakeholders

No single measure from those listed above is likely to a suitable approach for coco peat entering New Zealand as a growing medium. MAFBNZ therefore proposes a combination of measures be used.

A number of options incorporating measures to mitigate the risks associated with coco peat products require consideration. The measures proposed under all options are:

- the issuance of a phytosanitary certificate by the National Plant Protection Organisation of the country of origin;
- all coco peat imported into New Zealand comes from sources that have a quality production system approved by MAFBNZ prior to permit issuance;
- pre-export grow out test carried out by exporting country NPPO;
- visual inspection on arrival, sample size of 1% of the consignment.

The following options are being considered in relation to the measures above. Note that one or more of these options could be included in the proposed import health standard.

Option A: Additional Grow-out Tests

This option has an additional grow out test on arrival, in addition to the grow-out tests prior to exporting, and visual inspection on arrival. In the recent incursion it was noted that the seedlings growing out from the blocks were clumped and not randomly distributed. It is possible that any form of testing from samples could miss seeds, but an additional test provides a greater degree of confidence that seeds have not been missed. This approach would require a consignment to be held in a MAF transitional facility for a period of approximately 3 weeks.

Option B: Tolerance Level for Seeds

On some pathways or products there are tolerance levels for seeds entering New Zealand, while on others, any seeds found in the samples taken are considered unacceptable. The tolerance level depends on the risks associated with seeds on the pathway.

MAFBNZ is considering the tolerance level of any sampling conducted on coco peat. If the tolerance level is zero, then any seeds found would mean that the consignment would need to be treated (see below), reshipped or destroyed. For example, an agreed tolerance level for weed seeds, if any other than zero, could be from 0 to 2 seeds per sample. In this example any seeds found in the consignment, would require identification. If the seeds found were new to New Zealand, then heat treatment, reship or destroy would be the available options. If the seeds found were not new to New Zealand, then the option would be to take a second sample with a zero tolerance level. If seeds were also found in this sample, then that the consignment would need to be treated (see below), reshipped or destroyed.

Option C: Ethylene Oxide

Ethylene oxide is proposed as an alternative to visual inspection and grow out tests on arrival. It could also be used to treat a consignment where tests have indicated contaminants are present. However, this option depends on the availability of ethylene oxide in the exporting country and New Zealand, and the cost. At this stage it isn't considered likely to be widely used.

Option D: Heat Treatment

Heat treatment is not considered a feasible option for all imported coco peat. However, if a consignment has contaminants detected, it would be a suitable option for treating the consignment instead of reshipping or destroying. Because of the cost and the damage to the product, it is only likely to be used as a last resort.

Option E: Product Grading

Distinct measures could be placed on different groups of products depending on their perceived biosecurity risk. As mentioned in the background, it is considered that grow bags and slabs (when used as intended) pose a lower risk than bales or blocks. This has been recognised by MAFBNZ by allowing the current interim measure of post entry control for registered greenhouses. It is not proposed that there be provision for post entry control beyond the current interim measure. There is not enough information to justify different actions for grow bags and slabs in the IHS, but some trials are underway. If a lower risk is proven at a later date, consideration could then be given to removing inspection on arrival for these products.

Summary

The use of coco peat as a growing medium has considerable value for horticulture in New Zealand. The biosecurity risks are hitchhikers as a result of contamination during processing. With adequate measures in place to control the risks associated with contamination, continued importation of coco peat as an affordable growing medium should be possible.

With no obvious effective and feasible treatment available, the best control would be a combination of a quality production system, grow out testing and visual inspection, and could include some of the above options. The draft Import Health Standard gives one combination, involving a documented quality production system, a grow-out test in the exporting country and a visual inspection on arrival with a zero tolerance for seeds or other forms of contamination. Treatment with ethylene oxide in the exporting country is also given as an alternative measure if access to this treatment is available.

References:

Biosecurity Australia (2002) *Import Risk Analysis for the Importation of bulk maize* (Zea mays L.) from the United States of America. Biosecurity Australia, Canberra.

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Cassells, J., Collins, P.J. & Banks, H.J. (1995). *Devitalisation of maize and sorghum by methyl bromide and chloropicrin*. CSIRO Division of Entomology Technical Report No. 61