Ministry for Primary Industries
Manatū Ahu Matua

# Risk Management Proposal:

*Proposed amendments to the IHS 155.02.05: Seeds for sowing.*

FOR PUBLIC CONSULTATION

**4th February 2020**

New Zealand Government

*Growing and Protecting New Zealand*

**Plant & Pathways Directorate**

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# Contents

Page

# Submissions

The Ministry for Primary Industries (MPI) invites comment from interested parties on the proposed new import health standard for pelleted seed imported as seeds for sowing. The proposed import health standard is supported by this risk management proposal.

The purpose of an import health standard is defined as follows in section 22(1) of the Biosecurity Act 1993 (the Act): "An import health standard specifies requirements that must be met to effectively manage risks associated with importing risk goods, including risks arising because importing the goods involves or might involve an incidentally imported new organism".

MPI must consult with interested parties in accordance with section 23 of the Act before issuing or amending an import health standard under section 24A of the Act. MPI therefore seeks formal comment on the proposed import health standard.

The following points may be of assistance in preparing comments:

- Wherever possible, comments should be specific to a particular matter discussed in this document and/or proposed change in the IHS through referencing section numbers or commodity names, as applicable.
- Where possible, reasons, data and supporting published references to support comments should be provided.
- The use of examples to illustrate particular points is encouraged.

MPI encourages respondents to forward comments electronically. Please include the following in your submission:

- The title of the consultation document in the subject line of your email;
- Your name and title (if applicable);
- Your contact details, including email, phone number/s and address; and
- Your organisation's name (if applicable).

Please send electronic submissions to: plantimports@mpi.govt.nz. Should you wish to send hardcopy submissions, please send them to the following address to arrive by close of business on 04th March 2020.

Plant Germplasm (Imports) Team
Plants & Pathways Directorate
Ministry for Primary Industries
PO Box 2526
WELLINGTON 6140
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Submissions received by the closure date will be considered during the development of the final draft IHS. Submissions received after the closure date may be held on file for consideration when the issued IHS is next revised/ reviewed.

### Official Information Act 1982

Please note that your submission is public information. Submissions may also be the subject of requests for information under the Official Information Act 1982 (OIA).

The OIA specifies that information is to be made available to requesters unless there are sufficient grounds for withholding it, as set out in the OIA. Submitters may wish to indicate grounds for withholding specific information contained in their submission, such as the information is commercially sensitive or they wish personal information to be withheld.

Any decision to withhold information requested under the OIA is reviewable by the Ombudsman.

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# Purpose

1. The purpose of this Risk Management Proposal (RMP) is to:
   - Provide background information on the biosecurity risks of, and associated with, pelleted seed and the phytosanitary measures proposed to manage those risks.
   - Provide information to support the consultation on the draft standard.
2. The risk management proposal is not itself the subject of consultation. However, MPI will accept comments and suggestions on the risk management proposal in order to improve future consultations on import health standards.

# Scope

3. The scope of this RMP is:
   - Background information relating to the biosecurity risks of, and associated with, pelleted seeds and current measures to manage those risks;
   - Relevant legislation and international obligations
   - Risk assessment and risk management;
   - Proposed phytosanitary measures to manage the biosecurity risks; and
   - Evaluation of the feasibility and practicality of implementing the proposed measures.

# Part 1: Background

4. Seeds imported as contaminants in lots of seed imported for sowing, including pelleted seed, present a biosecurity risk because the seed species may be:
   - a quarantine weed seed species - in 2016, the unwanted organism *Abutilon theophrasti* (velvetleaf) was found in fodder beet fields on a number of farms in New Zealand; the source of the velvetleaf was contaminated pelleted fodder beet seed (*Beta vulgaris*).
   - a carrier for seed-borne and/or seed transmitted diseases. Seeds of *Triticum* (wheat) imported as contaminants will not meet current IHS phytosanitary measures and may be harbouring regulated pest/s, such as the fungi *Tilletia controversa* or *T. indica*, or any other regulated pest that may cause economic impacts on relevant industries.
5. Pelleted seed is defined in the Import Health Standard 155.02.05: *Seeds for sowing* as 'Seed encased in a man-made nutritive or protective covering'.
6. Pelleted seed cannot be visually inspected for contaminants without having the man-made case removed. The addition of the case obscures the shape, the surface and weight of the seed enough that it is impossible to determine which species are present.
7. As a result of the velvetleaf incursion in 2016, MPI introduced new border clearance measures for pelleted seed to reduce the likelihood of entry of quarantine weed seeds and/or contamination[1], on this pathway. The new requirements were introduced through the issuance of a direction to an inspector under section 104(1) of the Act.

[1]Presence of a contaminating pest or unintended presence of a regulated article in or on a commodity, packaging, conveyance, container or storage place [CEPM, 1997; revised ICPM, 1999; CPM, 2018]

8. This direction requires that a representative sample of seeds be taken from each lot of pelleted seed or at a rate of one in ten lots on arrival in New Zealand and inspection and testing undertaken for the presence of quarantine weed seeds and/or any other contamination. Lots will only receive biosecurity clearance if the inspection/testing results are negative, meaning the lot is considered free from any quarantine weed seeds and/or contamination.
9. These measures were revised in 2017, because a high level of contamination by other regulated seed species was found in vegetable pelleted seed lots and less information existed about the level of contaminants in flower and greenhouse crop species. The new inspection and testing requirements are currently managed in several ways, depending on which one of the groups the applicable plant species has been categorised into. Three groups were defined: *Beta vulgaris*, Group 1, vegetables species and Group 2, flower and greenhouse crop species (lettuce and tomato rootstock) (see APPENDIX 1).
10. The group categorisations are based on the likelihood of introduction of weed seeds via a particular host seed species, the nature of the seed production system/s used to produce the seed and the ability to adequately survey planted seeds to prevent weed establishment in New Zealand.
11. All lots of pelleted seed of *Beta vulgaris* and Group 1 species must now be tested (at the expense of the importer) for the presence of any quarantine weed seeds and/or contamination.
12. For Group 2 species, imported as pelleted seed, a verification system was implemented at the ratio of one in ten pelleted seed lot. The selected lots are tested for the presence of any quarantine weed seeds and/or contamination.

## Commodity Description

13. The following species have been identified as eligible species for import into New Zealand from all countries as pelleted seed under IHS 155.02.05: *Seeds for Sowing*:

| | |
|---|---|
| *Ageratum houstonianum* | *Spinacia oleracea* |
| *Allium cepa* | *Lisianthus russellianus (= Eustoma grandiflorum)* |
| *Allium porrum* | *Lobelia* sp. |
| *Anethum graveolens* | *Lobularia maritima* |
| *Angelonia salicariifolia* | *Mimulus* sp. |
| *Antirrhinum* sp. | *Nemesia* sp. |
| *Apium graveolens* | *Nicotiana* sp. |
| *Begonia* sp. | *Ocimum basilicum* |
| *Bellis perennis* | *Origanum vulgare* |
| *Beta vulgaris* | *Papaver* sp. |
| *Brassica napus* | *Pentas* sp. |
| *Brassica oleracea* | *Pericallis hybrida (= Pericallis x hybrida)* |
| *Calceolaria* sp. | *Petroselinum crispum* |
| *Calibrachoa hybrida* | *Petunia* sp. |
| *Campanula* sp. | *Portulaca* sp. |

| | |
|---|---|
| *Celosia* sp. | *Primula* sp. |
| *Chaenorhinum* sp. | *Pyrethrum* sp. |
| *Chrysanthemum sp* | *Ranunculus* sp. |
| *Cichorium endivia* | *Rosmarinus officinalis* |
| *Cichorium intybus* | *Rudbeckia* sp. |
| *Cineraria maritima (= Senecio cineraria)* | *Salpiglossis sinuata* |
| *Daucus carota* | *Salvia officinalis* |
| *Dianthus* sp. | *Saxifraga* sp. |
| *Diascia barberae* | *Senecio cruentus (= Pericallis cruenta)* |
| *Dichondra* sp. | *Silene* sp. |
| *Digitalis* sp. | *Solenostemon scutellarioides* |
| *Eruca sativa* | *Streptocarpus* sp. |
| *Exacum affine* | *Sutera* sp. |
| *Foeniculum vulgare* | *Tagetes* sp. |
| *Gazania* sp. | *Tanacetum parthenium* |
| *Geranium* sp. | *Thymus vulgaris* |
| *Gerbera jamesoni* | *Torenia fournieri* |
| *Gloxinia speciosa (= Sinningia speciosa)* | *Trachelium caeruleum* |
| *Gypsophila* sp. | *Verbascum* sp. |
| *Helichrysum* sp. | *Verbena* sp. |
| *Heuchera* sp. | *Veronica* sp. |
| *Isolepis* sp. | *Viola* sp. |
| *Juncus* sp. | *Zinnia* sp. |
| *Lactuca sativa* | |
| *Laurentia axillaris (= Isotoma axillaris)* | |
| *Linaria* sp. | |
| *Pastinacea sativa* | |
| *Solanum lycopersicum* | |

## Trade

14. To date, eighty one different seed species (listed above) are eligible to be imported into New Zealand as pelleted seed. The majority of these seed species are flowers.
15. Between January 2017 and August 2019, 3567 lines of pelleted flower seed, 2513 lines of pelleted vegetable seed and 181 lines of pelleted fodder beet seed were imported into New Zealand.
16. Imports of pelleted seed are predominantly from the European Union (i.e. Denmark, France, Netherlands, Germany, Italy and Spain) and North America (USA).

17. Pelleted seeds are widely used because it allows precision drilling; it is a carrier of some crop protection treatments; and it improves the ability to handle the smallest of seeds.

18. Seed species are imported into New Zealand as pelleted seed for a variety of purposes, including forage for cows during the winter months, ornamental, human consumption and rootstock.

## Current Border Requirements

**NOTE:**

- All sampling and testing is at the importers expense.
- Because of the velvetleaf response, pelleted seeds from Italy are tested at a higher rate than from other countries.

### Pelleted fodder beet (*Beta vulgaris*) seed from all countries except Italy

19. All lots of pelleted *Beta vulgaris* seed grown in countries other than Italy and accompanied by an officially drawn and sealed (according to ISTA methodology) 'bare' sample of at least 31,540 seeds will have this 'bare' seed sample sent for seed analysis at a MPI-approved laboratory.

20. The 'bare' seed sample must be accompanied by documentation stating the following:
    - that it was sampled, labelled and sealed according to ISTA rules;
    - the same lot/line number or unique identifier as stated on the pellet seed lot;
    - species and variety name;
    - sample weight; and
    - date and signature of the sampler.

21. All lots of pelleted *Beta vulgaris* seed grown in countries other than Italy and **not** accompanied by a bare seed sample, as described above, will have a sample of at least 31,540 pelleted seeds drawn (according to ISTA methodology) and sent for seed analysis at a MPI-approved laboratory.

22. The lot will only receive biosecurity clearance if the laboratory results are negative, meaning the lot is considered free from any quarantine weed seeds and/or contamination.

### Pelleted fodder beet (*Beta vulgaris*) seed lots from Italy

23. Individual lots of pelleted *Beta vulgaris* seed grown in Italy and accompanied by an officially drawn and sealed (according to ISTA methodology) 'bare' sample of at least 48,480 seeds will have this 'bare' seed sample sent for seed analysis at a MPI-approved laboratory.

24. The 'bare' seed sample must be accompanied by documentation stating the following:
    - that it was sampled, labelled and sealed according to ISTA rules;
    - the same lot/line number or unique identifier as stated on the pellet seed lot;
    - species and variety name;
    - sample weight; and
    - date and signature of the sampler.

25. All lots of pelleted *Beta vulgaris* seed grown in Italy and **not** accompanied by a bare seed sample, as described above, a representative sample of at least 48,480 seeds will be drawn (according to ISTA methodology) and sent to a MPI-approved laboratory.

26. The lot will only receive biosecurity clearance if the laboratory results are negative, meaning the lot is considered free from any quarantine weed seeds and/or contamination.

## Pelleted seed lots (except *Beta vulgaris*) from all countries

### Group 1 (Vegetable species)

27. All lots of pelleted seed from species in Group 1 must be sampled (according to ISTA methodology) and a representative sample sent for seed analysis at a MPI-approved laboratory, according to the following specific measures:
    - The lot will be directed to a MPI-approved transitional facility where it will be held pending the return of the laboratory results.
        - For seed lots of 300,000 seeds or greater, a representative sample of at least 31,540 seeds will be drawn.
        - For seed lots of less than 300,000 seeds, at least 10% of the total size of the lot will be sampled.
    - The lot will only receive biosecurity clearance if the laboratory results are negative, meaning the lot is considered free from any quarantine weed seeds and/or contamination.

**OR**

28. All lots of pelleted seed from species in Group 1 accompanied by an officially drawn and sealed (according to ISTA methodology) 'bare' sample of at least 31,540 seeds will have this 'bare' seed sample sent for seed analysis at a MPI-approved laboratory, according to the following specific measures:
    - The 'bare' seed sample must be accompanied by documentation stating the following:
        - that it was sampled, labelled and sealed according to ISTA rules;
        - the same lot/line number or unique identifier as stated on the pellet seed lot;
        - species and variety name;
        - sample weight; and
        - date and signature of the sampler.
    - The lot will be directed to a MPI-approved transitional facility where it will be held pending the return of the laboratory results.
    - The lot will only receive biosecurity clearance if the laboratory results are negative, meaning the lot is considered free from any quarantine weed seeds and/or contamination.

### Group 2 (Flower species and *L. sativa* (lettuce) and *S. lycopersicum* (tomato))

29. Lots of pelleted seed from species in Group 2, including *L. sativa* and *S. lycopersicum*, will be sampled (according to ISTA methodology) and audit tested at 1:10 lots ratio. A representative sample will be sent for seed analysis at a MPI-approved laboratory, according to the following specific measures:
    - The lot will be directed to a MPI-approved transitional facility where it will be held pending the return of the laboratory results.
        - For seed lots of 300,000 seeds or greater, a representative sample of at least 31,540 seeds will be drawn.
        - For seed lots of less than 300,000 seeds, at least 10% of the total size of the lot will be sampled.

- The lot will only receive biosecurity clearance if the laboratory results are negative, meaning the lot is considered free from any quarantine weed seeds and/or contamination.

**OR**

30. All imported lots of pelleted seed from species in Group 2, including *L. sativa* and *S. lycopersicum,* accompanied by an officially drawn and sealed (according to ISTA methodology) 'bare' sample of at least 31,540 seeds, will have this 'bare' seed sample sent for seed analysis at a MPI-approved laboratory, according to the following specific measures:
    - The lot will be directed to a MPI-approved transitional facility where it will be held pending the return of the laboratory results.
    - The 'bare' seed sample must be accompanied by documentation stating the following:
        - that it was sampled, labelled and sealed according to ISTA rules;
        - the same lot/line number or unique identifier as stated on the pellet seed lot;
        - species and variety name;
        - sample weight; and
        - date and signature of the sampler.
    - The lot will only receive biosecurity clearance if the laboratory results are negative, meaning the lot is considered free from any quarantine weed seeds and/or contamination.

# Part 2: Context

## Objective

31. MPI's objective is to ensure the known biosecurity risks associated with the importation of pelleted seed are managed appropriately and are consistent with New Zealand's domestic legislation and international obligations.

## Domestic legislation

32. The New Zealand biosecurity system is regulated through the Biosecurity Act. Section 22 of the Act describes the meaning of an IHS, and requires that the IHS specifies requirements to be met for the effective management of risks associated with importing risk goods (including plants and plant products) into New Zealand.
33. MPI is the government authority responsible for the administration of the Act.
34. MPI engages with interested parties and affected New Zealand stakeholders when major amendments are made to an IHS.
35. MPI follows MPI guidance for decision-makers and procedures for the amendment of an IHS and consultation on proposed amendments.

## International obligations

36. Where possible, phytosanitary measures are aligned with international standards, guidelines and recommendations as per New Zealand's obligations under Article 3.1 of the World Trade Organisation (WTO) Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement), WTO 1995 and section 23(4)(c) of the Act .
37. The SPS Agreement states that phytosanitary measures must not discriminate unfairly between countries or between imported or domestically produced goods and, where there is a choice of

phytosanitary measures to reduce risk to an acceptable level, WTO members must select the least trade restrictive measure.

# Part 3: Risk Assessment

## Source information

38. The following information was used to inform the appropriate measures for the development of this RMP:
    - Relevant literature and database searches;
    - MPI's Emerging Risk System;
    - Stakeholder feedback; and
    - Interception records (APPENDIX 2).

39. The risks associated with pelleted seed are summarised in the table below. Further evidence supporting the statements in the table follows.

| Question | Factors to consider |
|---|---|
| What is the relative risk associated with the commodity category? | Seed for sowing is a form of germplasm, identified under ISPM 32[2] as the highest risk commodity category (category 4). This categorisation is based on a combination of the degree of processing and the end use of the commodity. |
| What is the relative risk of the commodity within the commodity category?<br><br>Which groups of pests and pathogens are most important on the commodity? | Seed for sowing is a lower risk type of germplasm ("plants for planting") compared to whole plants and some types of cuttings, because seeds are usually dried and removed from other plant parts such as fleshy fruits or pods. Drying and removal of other plant parts reduces the numbers and types of associated invertebrates.<br><br>On the other hand, there are a range of pathogens associated with seed. Few of these cause visible symptoms on the seed.<br><br>Seed is often harvested and sorted mechanically. As a result, there are a range of contaminants associated with seed for sowing. These include soil, seeds of species other than the commodity and other extraneous plant material.<br><br>Pelleted seed, has undergone additional processing following harvest (application of a coating which may contain pesticides and/ or fertilisers). As a result, the numbers and types of associated vertebrates are reduced further. Pelleted seed is also likely to result in a further reduction in contamination that is not the same size and shape of the seed. |
| What are the minimum requirements for seed for sowing?<br><br>What is managed by the minimum requirements and what is not? | The minimum requirements for seed for sowing are based largely on visual inspection of the seed to detect contamination, infestation and other irregularities (such as seed which is discoloured, which may indicate disease). In the majority of cases, there is no post-entry quarantine. Pathogens and invertebrates that are known to be transmitted through seed for sowing are usually managed by additional requirements that can be carried out in the country of export or in New Zealand in few cases. |

[2] Link to ISPM 32 https://www.ippc.int/static/media/files/publication/en/2016/01/ISPM_32_2009_En_2015-12-22_PostCPM10_InkAmReformatted.pdf

| | |
|---|---|
| | For pelleted seed, the minimum requirements are likely to be less effective at detecting certain types of contamination. The coating applied to the seed means that it is not possible to confirm the presence of contamination which is a similar size, shape and weight to the commodity species. This type of contamination is most commonly seed of other species. |
| What values are at risk in New Zealand from pests, pathogens and contamination associated with pelleted seed? | The main risks associated with pelleted seed come from the presence of contaminating seed. The risk either results from the contaminating seed being a weed or from the contaminating seed having associated pathogens.<br><br>In general, contaminating seed which is picked up during the harvest of a crop is likely to be a weed of that crop and similar crops. Therefore the impacts are most likely to be economic. Where the contaminating seed has associated pathogens, the impacts will depend on the pathogen and its host range. |
| What is the level of knowledge about contamination in pelleted seed? | Contamination types and levels in pelleted seed will depend on a wide range of factors, and may be difficult to predict reliably without knowledge of specific crop production systems. On the other hand, there have been recent analyses of the results of onshore tests conducted on imported pelleted seed. The analyses allow some general conclusions to be drawn and some categories to be proposed. |

# Summary of risk

### Entry and Exposure

40. For the purposes of biosecurity, contamination risks of imported seed lots include: soil, regulated pest(s), seed species that have been assessed as a weed risk, unidentified seeds and plant material.

41. As determined by the Import Health Standard 155.02.05: *Seeds for sowing*, on arrival in New Zealand seeds must be made available for inspection and examination by MPI Inspectors at the importer's expense. Further, each line of seed must undergo inspection to **verify** that the seed and associated documentation is compliant with the requirements of this IHS; an officially drawn sample will be inspected for contaminants from each line as per MPI current procedures.

42. The importation of pelleted seeds enables the entry to New Zealand of quarantine weed seeds and/or regulated pest(s) because the coating process changes the shape and weight of the seeds making visual inspection for contamination at the New Zealand border almost impossible.

43. In this RMP, quarantine weed seeds and/or regulated pest(s) are considered to have entered New Zealand if viable seeds of a species other than the commodity are present together with the host seed pellet at a low infestation level after biosecurity clearance. In addition, pelleted seed is usually high value and is likely to be planted. Therefore contaminants, even if at a low level per seed, are likely to be planted and exposed to the New Zealand environment. In February 2016, velvetleaf was found on a small number of farms in the South Island where it was not known to be present. All positive detections in the South Island were directly linked to fodder beet crops grown from a number of lines of pelleted fodder beet (*Beta vulgaris var. rapacea*) seeds originated from Italy and exported from Denmark.

44. Seed species grown under greenhouse/glasshouse or in the field can be responsible for the introduction of a new organism such as a genetically modified organism or a new species to the New Zealand environment as a contaminant.

45. The import health standard states that seeds for sowing must be free from unidentified seed. Unidentified seed species (contaminant in *Dianthus* and *Lactuca sativa*) may increase the likelihood of introduction of a new species into the New Zealand environment where its biological traits are unknown.

46. Results from onshore tests undertaken on pelleted seed since the implementation of emergency border measures in 2016 have been analysed. The onshore tests, which involved dissection of pellets, were undertaken between 1st May 2016 and 6th December 2019 for all three categories of pelleted seed: *Beta vulgaris*; vegetables (Group 1); flowers, tomato as rootstock and lettuce (Group 2).

47. Between 1st May 2016 and 6th December 2019, 265 onshore tests were undertaken on imported lots of pelleted *Beta vulgaris* seed. Analysis of the test results showed contamination rates were high across these imports.

48. During the same period, 150 tests were undertaken for pelleted vegetable seeds (Group 1). This difference in the number of tests taken for this group in relation to the number of tests done for *Beta vulgaris* can be explained by the fact that initial measures prior to 2017 were that only one in ten lots was sampled and tested; and after 2017, all lots were sampled and onshore tested.

49. Contamination rates were variable across the different species in Group 1, as highlighted in Figure 1 (below). During 1st May 2016 and 6th December 2019, 54% of pelleted carrot seed lots imported and tested onshore were contaminated. In total, 13 lots were tested onshore, where seven lots contaminated.

50. Contamination rates of other seeds species from this group with ten or more onshore tests performed during the same period were: Leek (10% of the 60 lots tested onshore were contaminated); Celery (11% of the 27 lots tested onshore were contaminated); Endive (57% of the 7 lots tested were contaminated) and Fennel (18% of the 17 lots tested onshore were contaminated) (see Figure 1).

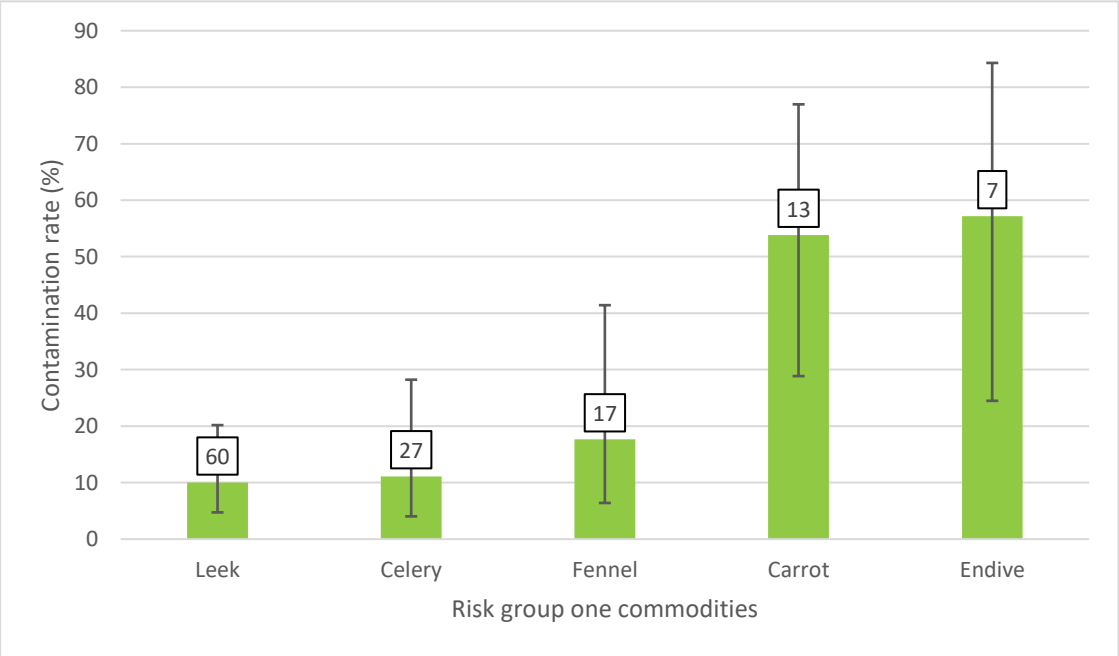


*Figure 1 - Contamination rates (95 % confidence interval) for pelleted seed species from Group 1 with ten or more laboratory tests done during the period 1st May 2016 to 6th December 2019). Other species listed in Group 1 were not added to this table because the number of laboratory tests was less than five. Number of onshore tests performed for each group is shown in each box.* ***NOTE:*** *Contamination rate in this document is defined as the percentage of number of lots tested onshore which contaminants (other regulated seed species) were found.*

51. Although contamination levels were not as high as those found in pelleted seed lots of *Beta vulgaris*, pelleted vegetable seed lots had a much higher level of contamination than pelleted seed lots from Group 2 (flowers, lettuce and tomato for the purpose of rootstock), as shown in Figure 2 (below). Analysis of the *Beta vulgaris* lots imported and onshore tested inform that 28% of the 265 lots were contaminated. Out of the 150 tests performed on seed species from Group 1, 22% were found contaminated. The contamination rate for seed species tested from Group 2 was 5% on 461 tests performed onshore.

52. **NOTE:** As the implementation of an audit test as a measure for seed species of Group 2 (flower species, lettuce and tomato for the purpose of rootstock) was introduced in 2017, onshore tests are from the period of 30st August 2017 to 6th December 2019.


*Figure 2 - Contamination rates (95 % confidence interval) for pelleted seeds of Beta vulgaris, Group 1 & 2 species (1st May 2016 to 6th December 2019). Number of onshore tests performed for each group is shown in each box.* ***NOTE:*** *Contamination rate in this document is defined as the percentage of number of lots tested onshore which contaminants (other regulated seed species) were found.*

53. A number of different contaminants were found inside seed pellets from seed species in all the groups. Some of them include: unidentified species, *Allium sp., Solanum sp., Brassica sp. Setaria sp., Triticum aestivum, Avena sativa* and *Chenopodium sp.*, among others (APPENDIX 2). In addition, pelleted seeds are not able to have any of the contaminant(s) found removed by usual seed cleaning processes such as gravity separators. Because all pelleted seeds have the same shape and weight, meaning that host species cannot be separated from the contaminants. Therefore, the biosecurity risk must be managed through different processes.

54. There were 461 tests performed in flower, lettuce, and tomato for the purpose of rootstock crops group (Risk Group 2) during the period of 30st August 2017 until 6th December 2019. The contamination rate for those with more than ten imported lots and tested onshore were the following: *Petunia sp*. (there were 37 lots tested which 5% were contaminated); *Dianthus* sp. (there were 25 lots tested of which 8% were contaminated); *Lactuca sativa* (there were 181 lots tested of which 4% were contaminated); *Lobelia sp.* (there were 31 lots tested of which 6% were contaminated); *Begonia sp.* (there were 52 lots tested of which 2% were contaminated) and *Lisianthus sp*. (there were 50 lots tested of which 4% were contaminated).

55. Less than 10 imported lots of pelleted tomato seed for the purpose of rootstock were tested under the audit testing regime. No contaminants were found on any of the lots tested as a result of the audit testing.

56. Although the majority of flower species imported into New Zealand are grown indoors in greenhouses in the exporting country, this is not the case for all. Species from the genera *Bellis, Chaenorrhinum, Juncus, Lobelia* and *Saxifraga* are known to be grown in the field in different countries of origin prior to be imported from a re-export country to New Zealand. Overall, seeds growing outside in the exporting country are more likely to have weeds or other species growing as voluntaries around them, and therefore weed seeds and/or other seeds are more likely to be present in the lot, such was the case for *Lobelia* and *Juncus*.

57. In the context of seeds growing in greenhouses (i.e. flower species) in the exporting country, the likelihood of seeds growing alongside weeds and/or other species and these contaminants entering New Zealand together with the host species is considered to be low; but the proportion of those contaminants to be present on the lot is uncertain. Testing onshore informed that lots of *Portulaca*, *Dichondra* and *Lisianthus* were found to have other plant species in the same pellet as the host species.

58. Information provided by the industry informed MPI that 95% of all pellet flower seeds either as F1 hybrid (i.e. from plants grown indoors in greenhouses) or from open pollinated plants at the place of production are sold in New Zealand to commercial nurseries. These nurseries grow each of these seeds for retail market in New Zealand as plants for planting targeting the home garden market.

59. A small percentage is then sold online to home gardeners as pellet seeds and also to small growers who may supply locally grown flowers to their local markets. It is considered likely that if any weed seed had been inadvertently planted, and if the seeds germinated, they would likely be weeded out by gardeners as the seedlings are different to the intended flower species and not desirable.

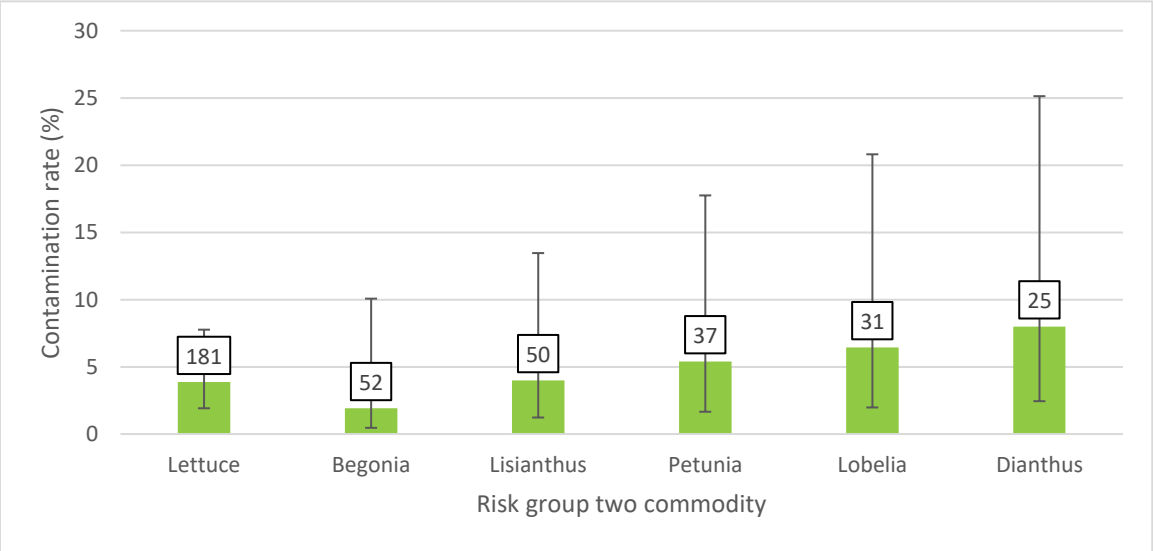


*Figure 3 - Contamination rate with 95 % confidence intervals for risk group two commodities with 10 or more laboratory tests during 30st August 2017 to 6th December 2019. Number of onshore tests performed for each group is shown in each box. NOTE: Contamination rate in this document is defined as the percentage of number of lots tested onshore which contaminants (other regulated seed species) were found.*

60. In summary, analysis of results of onshore tests of pelleted seed at the border since emergency measures were introduced in 2016, show that:

- Although, the contamination rate is not statistically different between the *Beta vulgaris* group and Group 1*, Beta vulgaris* group has the highest rate of contamination (28% out of 265), followed by Risk Group1 – vegetables (22% out of 150) (Figure 2).
- Risk Group 2 - flowers, lettuce and tomato has a contamination rate significantly lower than for the other two groups (5% out of 461) (Figure 2).
- Contamination rates are variable across the different seed species onshore tested in Group 1 and Group 2 (Figure 1 and 3).

**Establishment and spread**

*Contaminant as a quarantine weed*

61. The assessment of establishment of a regulated pest, including a quarantine weed seed via the pelleted seed pathway is made on the basis that the pest has formed a self-sustaining population in New Zealand. The likelihood of establishment in the New Zealand environment (beyond one season) is uncertain, but it can be high depending on the species.
62. In general, contaminating seed which is picked up during the harvest of a crop is likely to be a weed of that crop and similar crops. If the commodity seed is planted then the contaminants will be planted at the same time. If the contamination is present at even a very low level of infestation (per seed of the commodity) then, given the number of commodity seeds sown, there is a reasonable chance that the contaminant seed will find conditions suitable somewhere in New Zealand to germinate and develop into a plant that can reproduce and form a new population.
63. Velvetleaf (*Abutilon theophrasti*) can be used as an example to illustrate the potential for a very low level of infestation by contaminant seed to lead to establishment of a difficult to control weed species.
64. In February 2016, velvetleaf was found on a small number of farms in the South Island where it was not previously known to be present. All positive detections in the South Island were directly linked to fodder beet crops grown from a number of lines of fodder beet (*Beta vulgaris* var. *rapacea*) seed pellets originated from Italy and exported from Denmark.
65. A single velvetleaf plant originating from one viable seed can drop up to 17,000 seeds once growing in the field. Therefore, even if a contaminant seed is present at a very low level in seed for sowing, a single germinating plant has the potential to form the basis of an established population.
66. Velvetleaf seeds can survive for up to 50 years in soil and germinate in large numbers in cultivated areas such as field crops. Propagation is always by seeds, which are produced in large numbers, and dispersed by opening of each carpel with a vertical slit along the outer edge. Velvetleaf is difficult to control because it is resistant to many herbicides, and normal weed management practices don't work at controlling it. It keeps emerging over summer and autumn. Seeds can lie dormant in soil and then germinate years later. This often happens in response to cultivation and movement of soil (cabi.org, 2019).
67. Certain *Solanum* species are not present in New Zealand and are regulated organisms. Solanum species unable to be identified to species level were found as contaminants in lots of pelleted seeds. The species *Solanum elaeagnifolium*, for example, is known to be an invasive species capable to out compete native flora and it is recognised as an unwanted organism under the Biosecurity Act.

*Contaminant as a vector for diseases*

68. Crops grown under greenhouse/glasshouse conditions are not free from weeds or contaminant seeds. Weed or contaminant seeds grown in greenhouses or in the field can act as environmental

reservoirs for regulated pests. Environmental reservoirs of regulated pests that are transmitted between plants of the same or different species by vectors such as bumblebees, whiteflies, thrips or aphids have the potential to be transmitted back into outdoor commercial crops via these insects.

69. The steps to introduction for most pathogens present with a contaminant seed, taking for example serious viruses and viroids like *Pepino mosaic virus* or *Potato spindle tuber viroid* (regulated pests of species of *Solanum*), would be:

    - Seed of weed or contaminant plant is infected with virus/viroid either on the seed coat or in the embryo.
    - Infected seed contaminates lot of seed for sowing (and gets pelletized)
    - Infected seed is planted along with the seed for sowing lot
    - Seed pellet dissolves, and seed germinates

70. The plant which grows from the infected seed survives long enough for the virus to be transmitted from the plant (via mechanical transmission, a vector, seed, pollen etc) (MPI, 2016).

71. Bumblebees are often used for pollination in commercial tomato production; the bumblebee species *Bombus impatiens* and *B. terrestris* contribute to the spread of the seed transmitted virus, *Pepino mosaic virus* (PeMV), between tomato plants (Shipp et al, 2008; Lacasa et al., 2003). *Bombus terrestris* is the most common bumblebee in New Zealand and it can be found throughout the country. Bumblebees can also transmit PepMV between different species: from tomato plants into the weed species *Datura stramonium*, and from this species back into tomato again (Stobbs et al., 2009; MAF, 2012).

72. Therefore, a greenhouse where a host species for this virus grows as a contaminant plant and it is infected with this virus, *Pepino mosaic virus*, can act as a source of inoculum. If bumblebees are present in commercial greenhouses and can get out readily through ventilation etc to the outdoor environment, the virus present in this contaminant plant may be vectored from the initial infected plant to other plants inside the greenhouse and also outside to commercial crops.

73. Some of the reported genera of contaminant seed (*Lolium* and *Triticum*) can be associated with species of *Tilletia*. Taking *T. indica* as an example, the events that must occur for an introduction are as follows:

74. Seed of a susceptible host plant species that is growing as a weed amongst the commodity plant species to be imported as seed for sowing is infected with *Tilletia* – an infected seed is basically transformed into millions of *Tilletia* spores encased in a seed coat.

    - Infected seed contaminates lot of seed for sowing (and gets pelletized)
    - Infected seed is planted along with the seed for sowing lot
    - Seed pellet dissolves, releasing millions of spores into the soil
    - Spores germinate in the soil and infect host plants.

75. When these steps are considered, there is a higher probability of introduction (entry and establishment) for a single infected seed that holds millions of *Tilletia* spores, even if there is a small number of contaminant seeds in a lot, than for pathogens that require the seed to germinate for the pathogen to be transmitted (as in the previous example).

*Contaminant as a new organism*

76. In 2018, 189.8 million hectares of genetically modified crops were planted across the world (ISAAA.org, 2019). Commercially genetically modified events of specific crops such as *Brassica napus* var. *oleifera* among others is known to be grown and sold internationally. MPI has specific

measures in place for these species as seeds for sowing and in some cases as plants for planting too.

77. *Brassica sp* have been intercepted as contaminant in lots of vegetable (*Allium ampeloprasum* and *Cichorium endivia*) pelleted seeds. If seeds from genetically modified *Brassica napus* resistant to herbicide are imported into New Zealand as a contaminant they may grow as weeds amongst other crops therefore a usual tool for prevention of establishment (herbicide) will not be as effective. Once plants are established, any that produce seed will establish a reservoir of GM seed in the soil, from which new plants can grow.

78. Genetically modified seeds can easily spread through a commercial crop because they will germinate and grown like any other plant. Once in the environment, genetically modified crops may also have the ability to breed with related weed species, and different and more herbicides might have to be used to control these plants.

79. In greenhouse systems, effective sanitation and weed control may lead to elimination of a genetically modified plant during the growing season. However, lack of an adequate sanitation at the end of the previous season will lead to a recurrence of genetically modified plants.

### Economic impacts

80. Imported pelleted seeds can harbour risk material that can result in economic impact to New Zealand. Economic impacts may potentially arise from the cost of response activities, immediate trade impacts for some organisms (e.g. loss of GM free status), long term management costs, impacts on efficacy of current pest management including integrated pest management, impacts on production (lower quality/quantity of commercial crop) or the cost of meeting additional requirements for exports to some countries.

81. The likelihood of eradication success once quarantine weed seeds and/or regulated pest(s) have established in the New Zealand environment declines rapidly as the land area involved increases. New Zealand has eradicated only seven weed species – all had barely formed self-sustaining populations before their removal (doc.govt.nz, 2019).

82. As an example, the weed velvetleaf causes serious economic damage to agricultural production, particularly maize, soybeans and cotton. Other crops that this weed has been associated with include: beans, tobacco, alfalfa, peanuts and sugar beet (cabi.org, 2019). According to Cropsciences. bayer.com (2019) velvetleaf is one of the worst agricultural weeds in corn and sugar beet in North America. It has the ability to compete for light and water with the crop and releases allelochemicals that reduce growth and emergence of neighbouring plants. Velvetleaf causes high yield losses and interferes with harvesting. In soybean, 72% crop loss can be caused by infestation of velvetleaf, while 70% crop loss has been recorded in maize (cabi.org, 2019).

83. The MPI costs of the 2016 Velvetleaf Response were approximately $3.6 million. In November 2017 the Velvetleaf Response was formally transitioned into the Velvetleaf Long Term Management Programme. The MPI costs for this programme to date (September 2019) are approximately $350,000. These figures do not include the costs of velvetleaf management borne by others e.g. Regional Councils, industry bodies or farmers. These figures also do not include the economic costs of reduced production associated with the weed. It is too soon to know what the ongoing economic consequences of the 2016 velvetleaf incursion into New Zealand will be. An analysis conducted by New Zealand Institute of Economic Research in 2017 estimated that the incursion could have significant economic impacts and could reduce GDP by between $294 and $484 million by 2030. These figures come with a high level of uncertainty as the analysis was based on the limited knowledge of that time and a number of assumptions were made after discussions with industry stakeholders, MPI officials and scientific experts.

84. Contamination in the form of undeclared viable seeds such as *Solanum* sp. (contaminant in *Daucus carota*), *Portulaca* sp. (contaminant in *Lobelia*), *Daucus carota* (contaminant in *Pastinaca* and *Lactuca sativa*), *Lolium* sp.(contaminant in *Beta vulgaris, Daucus carota* and *Lactuca sativa*) and *Agrostis* sp. (contaminant in *Portulaca*), which have all been intercepted from imported pelleted seed lots (Appendix 2), can act as vectors for seed transmitted diseases that may affect economically important crops in New Zealand.

    i. One species of *Portulaca, Portulaca oleraceae,* is a known vector for the regulated seed transmitted pest *Cucumber green mottle mosaic virus* (CGMMV). This virus is highly contagious and can be transmitted via contact, machinery, shoes and hands, among others. Its viral particles are stable, and the virus can be maintain its infectivity for a long period of time. In New Zealand, the impact of establishment of CGMMV would be greatest for the squash and pumpkin industry. Given the annual sales value of butternut squash, pumpkin, melon and other cucurbitaceae grown in New Zealand ($~51 million) the direct economic impact in the first year of CGMMV establishing in a New Zealand crop is likely to be in the millions of dollars.

    ii. *Daucus carota* is a host for the regulated pest '*Candidatus* Liberibacter solanacearum' haplotypes C and D. Diseased host species would have their yield and quality impacted when infected with this pathogen. In 2018 carrot seed exports totalling $30.3m went to Continental Europe (Fresh Facts.co.nz 2018). Domestic sales of carrots (fresh and processed) were valued at $56 million in 2018, and exports were valued at $8.5 million (fresh), $1.8 million (processed) (Fresh Facts.co.nz 2018).

    iii. *Solanum* species, such as *Solanum nigrum*, *Solanum lycopersicum*, *Solanum melongena*, *Solanum muricatum* and *Solanum jasminoides* among other species are known to be hosts for the regulated seed transmitted pest *Potato spindle tuber viroid* (PSTVd). The viroid is highly contagious and can be transmitted between plants by touch, either by plants rubbing against each other or people touching plants. The use of cutting or pruning tools or contaminated machinery or any form of physical contact between plants can result in disease transmission (MAF, 2012). Other regulated seed-transmitted pests with similar mode of transmission known to infect species of *Solanum*, i.e.*Tomato apical stunt viroid*, *Tomato chlorotic dwarf viroid* and the virus *Pepino mosaic virus,* can also be transmitted by bumblebees (MAF, 2012).Tomatoes and capsicums and potatoes are all important crops in New Zealand. If PSTVd did establish in New Zealand crops, financial losses due to PSTVd are likely to be greater in potato and tomato crops. In Capsicum, there may be financial losses due to the costs of testing for and removing asymptomatic infected plants. Domestic sales of tomatoes (outdoor, processed and greenhouse) were valued at $141.5 million in 2018, and exports (greenhouse) were valued at $9.6 million (fresh), $3.1 million (processed) (Fresh Facts.co.nz 2018). Domestic sales of potatoes (fresh/table and processed) were valued at $139 million in 2018, and exports (fresh and processed) were valued at $26.4 million (fresh), $114.9 million (processed) (Fresh Facts.co.nz 2018).

    iv. *Lolium* and *Triticum* seeds have been found as contaminants in pelleted seeds and they can carry spores of *Tilletia* species. Together with *Agrostis* seeds they can be carriers of different plant pathogenic smuts. *Tilletia* species are important pathogens which can establish from ungerminated seed – millions of spores can be present in a single infected grain of the host species. In New Zealand, the majority of wheat grain produced is for the domestic market, therefore direct economic impacts may be lower than in countries which have a large export market. However, there will be indirect effects of an increase in importing wheat. Additional control costs could also be incurred by growers were *Tilletia indica* and/or *T. controversa* to establish in New Zealand such as changes to integrated pest management systems, increased treatment costs and funding of trials to test resistant cultivars (MPI, 2015). Species of *Tilletia* could also impact the export market for seed production. The value of arable exports was $236 million for the year ended June 2019.

Exports of ryegrass (*Lolium*) were valued at $55,070,000 in 2018. The annual production of barley, wheat, maize and oats is around 950,000 tonnes according the New Zealand Grain & Seed Trade Association (NZGSTA.co.nz, 2019).

# Part 4: Risk Management

### Pre-export inspection and phytosanitary certification

85. Pre-export inspection and phytosanitary certification of risk goods by the National Plant Protection Organisation (NPPO) of the exporting country ensures that the requirements of the relevant IHS have been met by that country.

86. A phytosanitary certificate can provide verification that lots of pelleted seed are free from visually detectable contaminants, such as other viable seed, soil, contaminant animal or plant material or other extraneous matter. The certificate can also be used to provide additional verification for other steps of the seed pelleting process, if the NPPO has sufficient oversight over this.

### Verification on arrival in New Zealand

87. Upon arrival in New Zealand, importers must make the seeds and accompanying documentation available for inspection by an MPI inspector, as per the current Import Health Standard (IHS) 155.02.05: Seeds for sowing requirements.

88. If a lot is found to harbour a quarantine weed seed after it has been analysed by an MPI-approved seed testing facility, the importer will be offered the option of having the lot reshipped or destroyed.

89. Pelleted seeds are examined using purity testing to determine the number and identity of other seeds in a test sample (i.e. quarantine weed seed and other contaminants).

### A. Purity Testing

90. The purpose of purity testing is to assess the levels of contamination from other seed and organic matter (other crop seed and weed seed, leaves, stems, badly broken seed, etc) and inorganic matter (stones, soil etc) (Sansor.org. (2019).

91. The sampling and purity test is performed in accordance with ISTA methodology. This is designed to ensure that the assessment made is representative of the seed lot from which the submitted sample is drawn. Seed purity is assessed through visual inspection to identify, where possible for the species being assessed, the genus and/or species of seeds present and the types of other contaminants.

### Options Analysis

*Beta vulgaris and vegetable crops*

92. The adoption of testing for each seed lot for pelleted *Beta vulgaris* and vegetable seeds is justified, because the contamination rate found during the period of 2016 until 2019 was high and the type of contaminants included quarantine weed seeds and seeds with specific requirements.

93. As highlighted previously in this document, the contamination rate is not statistically different between the *Beta vulgaris* group and Group 1 (vegetables), *Beta vulgaris* group has the highest rate of contamination (28% out of 265), followed by Group1 (vegetables) (22% out of 150).

94. Seed species found as contaminants on both groups do have specific requirements under the import health standard 155.02.05: Seeds for sowing for regulated pests where seeds is a pathway, e.g. *Solanum sp.; Lolium sp.; Daucus carota; Triticum aestivum; Hordeum vulgare*. Quarantine weed seeds were also found in the case of *Beta vulgaris*, e.g. *Silybum marianum.*

95. Some contaminants were identified to genus level belonging either from

- genera with species where the import specification is 'requires assessment'. Seed species listed in the Plant Biosecurity Index (PBI) as 'requires assessment' cannot be imported into New Zealand, or
- genera where some species are widely grown as garden flowers, while some are known to be invasive weeds, e.g. *Malva sp*.

*Tomato rootstock*

96. Audit testing for lots of pelleted tomato seeds imported for the purpose of rootstock showed no contaminants on all lots tested during 2017 until 2019. Therefore, the introduction of specific measures on this commodity is not warranted. Further, pelleted tomato seeds are imported to be sold to commercial nurseries which grow each seed for grafting on other Solanaceae species such as eggplant, peppers and tomatoes. This particular end use of the seed after biosecurity clearance means that any contaminants are likely to be identified and destroyed during normal nursery production practices, reducing risk to an acceptable level.

*Flower species*

97. The level of contamination found on this group was low in comparison to the other two groups. The majority of seed species found as contaminants were other flower species. As a result, mandatory purity testing is not warranted for pelleted flower seeds. The majority of pelleted flower seeds imported into New Zealand are sold to commercial nurseries (approx. 95%), where the seeds are grown indoors, in greenhouses. Commercial nurseries grow these seeds to sell as plants for planting in pots for the home garden market. Only a small percentage of pelleted flower seeds is sold online for home gardeners and small growers.

98. The management of contaminants on pelleted flower seeds after biosecurity clearance in greenhouses and home gardeners (i.e manual rouging and/or herbicide application) is considered to reduce to an acceptable level the biosecurity risk associated with the low level of contamination found on this group

99. Moreover, contaminants found on pelleted flower seeds were largely other flower species (APPENDIX 2).

*Lettuce*

100. According to HortNZ, lettuce is one of the ten key vegetables that are staple to the Kiwi diet. In 2016, 8,400 tonnes were produced in New Zealand. Lettuce is grown in different areas of the country. It is not an export crop due to its short shelf life. According to the industry approximately 500 different seed lots of lettuce are imported annually, where the largest lot may have 9 million pellets and the smallest 100,000 pellets (Hortz.co.nz, 2020).

101. Although, the contamination level found was of 4%, in terms of absolute numbers, pelleted lettuce seeds shown to have 3 times more contaminants than pelleted *Lisianthus* seeds with the same contamination rate.

102. Common seed species found as contaminants were field crop seed species, e.g. *Daucus carota* and *Lolium sp*. These contaminant seeds do have specific requirements listed in the import health standard.

103. The adoption of an audit testing with moveable tiers of compliance (option 4 – see below) for pelleted lettuce seed lots arriving into New Zealand is justified, because:

i. Contrary to how pelleted flower seeds are managed after biosecurity clearance, pelleted lettuce seeds are sown either directly to the ground or start in seed trays and plant out after approx.4-5 weeks.

ii. Lettuce will grow in large field areas to supply consumer demand across the country, therefore there is biosecurity risk associated with the presence of contaminants that can act as carrier of regulated pests or as a regulated weed is higher in comparison to pelleted flower seeds.

# Part 5: Proposed IHS requirements

It is proposed to amend IHS 155.02.05: *Seeds for sowing*, through addition of a new section under **Part 1: General Requirements** as follows.

## 1.9 Seed imported as pelleted seed

(1) On arrival in New Zealand seeds must be made available for inspection and examination by MPI Inspectors at the importer's expense.

(2) All imported lots of pelleted seed must be held in a MPI-approved transitional facility pending the return of the laboratory results.

(3) In addition to meeting all the applicable requirements of **Part 1: General Requirements** of this standard, all pelleted seed lots must be accompanied by the following:

- a phytosanitary certificate which must meet the requirements set under Part 1.5.2 of the IHS 155.02.05: Seeds for sowing.
- an Orange Seed Analysis Certificate (SAC) issued by an ISTA-accredited seed testing laboratory or a Seed Analysis Certificate issued by an AOSA-accredited seed testing laboratory which must meet the criteria listed under Part 1.5.2 of the IHS 155.02.05: Seeds for sowing.

*Beta vulgaris and vegetable species*

(4) In addition to 1.9 (3), on arrival pelleted seed lots of *Beta vulgaris* and vegetable species must have a representative sample officially drawn and sealed (according to ISTA methodology) from each lot of pelleted seed and tested for purity at a MPI-approved laboratory for the presence of quarantine weed seeds and other contaminants. The options for the representative samples are:

**Option 1:** A 'bare' seed sample of at least 31,540 seeds accompanying the pelleted seed lot, which includes an official label issued by the ISTA-accredited seed laboratory stating:

- that the seeds have been sampled, labelled and sealed according to ISTA rules;
- the same lot/line number or unique identifier as stated on the pelleted seed lot;
- the species and variety name;
- the sample weight, and
- the date, name and signature of the ISTA accredited/approved sampler.

**Option 2:** For individual lots of pelleted seed not accompanied by a bare seed sample, a representative sample of at least 31,540 seed pellets will be drawn according to ISTA methodology and sent for seed analysis at a MPI approved laboratory at the importers expense.

**Option 3:** For individual lots of pelleted seed of less than 300,000 seeds and not accompanied by a bare seed sample, a representative sample of at least 10% of the total size of each lot will be drawn according to ISTA methodology and sent for seed analysis at a MPI approved laboratory at the importers expense.

For individual lots of pelleted seed of 300,000 pellet seeds or greater, and not accompanied by a bare seed sample, a representative sample of at least 31,540

pellet seeds will be drawn according to ISTA methodology and sent for seed analysis at a MPI approved laboratory at the importers expense.

(5) The Options apply as follows:

a) For pelleted *Beta vulgaris* seed grown in all countries except Italy, Options 1 and 2 are applicable.

b) For pelleted *Beta vulgaris* seed grown in Italy, Option 1 and 2 are applicable, but the representative sample must be of at least 48,480 seeds.

c) For pelleted vegetable seed of species grown in all countries, Options 1 and 3 are applicable.

*Lettuce*

(6) In addition to 1.9(3) importers of pelleted seed lots of lettuce grown in all countries must comply with the option listed below:

**Option 4:** On arrival, pelleted seed lots of lettuce must have a representative sample officially drawn and sealed (according to ISTA methodology) and tested for purity at a MPI-approved laboratory for the presence of quarantine weed seeds and other contaminants.

i. For individual lots of pelleted seed of less than 300,000 seeds and not accompanied by a bare seed sample, a representative sample of at least 10% of the total size of each lot will be drawn according to ISTA methodology and sent for seed analysis at a MPI approved laboratory at the importers expense.

ii. For individual lots of pelleted seed of 300,000 pellet seeds or greater, and not accompanied by a bare seed sample, a representative sample of at least 31,540 pellet seeds will be drawn according to ISTA methodology and sent for seed analysis at a MPI approved laboratory at the importers expense

Two tiers of compliance check will be used to validate phytosanitary certification details against the actual lot. These are, for each importer and species imported:

iii. A random compliance check on one in ten lots; and
iv. A random compliance check on one in twenty lots.

Initially, one complete compliance check, selected randomly, per ten lots shall be carried out to validate phytosanitary certification details (free from quarantine weeds and other contaminants) against the actual lot.

Where significant compliance is demonstrated over time (ten consecutive compliance checks validate conformance), the regime can be raised to one complete compliance check per twenty lots.

If a compliance check identifies a non-conformance (quarantine weed seed or a contaminant), the level of compliance check will drop a tier.

**Guidance**

- If a one in twenty compliance check identifies a non-conformance, the level of compliance check will reduce to one in ten compliance check tier. Or, if a one in ten compliance check identifies a non-conformance, the next ten lots shall be fully reconciled.
- For flower pelleted seed lots MPI reserves the right to undertake validation audits to confirm that consignments of pellet seed flowers are free from quarantine weed seeds. Audits may be conducted on a random basis and it will be conducted at an MPI approved facility at the expense of the importer.

# Part 6: Feasibility & Practicality of measures

### A. Purity Testing

104. The mandatory visual inspection and purity testing onshore on a bare seed sample or seed pellet sample as proposed in the following section '*Proposed IHS requirements*' is operationally feasible and effectively manages the risk posed by the introduction of a regulated (quarantine) weed seeds and/or contaminant (s) for the following reason:

a) Purity testing analysis performed in an ISTA accredited laboratory under the ISTA guidelines is an efficacious tool.

- Purity testing performed onshore in an MPI-approved ISTA accredited laboratory will verify the purity of the seed lot. If the seed lot is not pure, the testing will determine the nature of the contamination, and the identity of contaminant seeds or pests, thereby enabling the risk of the contaminant to be assessed and managed appropriately.
- An ISTA accredited laboratory has to adhere to the ISTA Accreditation Standard, the ISTA Rules for Seed Testing, have competent staff and appropriate equipment and demonstrate its independence of judgement and integrity in relation to sampling and testing. This provides an appropriate level of assurance to MPI that the results are reliable because it follows an internationally recognized methodology.

# Part 7: REFERENCES


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## APPENDIX 1: Pelleted seed species in Groups 1 and 2 (listed in the Plant Biosecurity Index (PBI)

| Group 1 |
|---|
| **Vegetable species** |
| *Allium cepa* |
| *Allium porrum* |
| *Allium ampeloprasum* |
| *Apium graveolens* |
| *Brassica napus* |
| *Brassica oleracea* |
| *Cichorium intybus* |
| *Cichorium endivia* |
| *Daucus carota* |
| *Foeniculum vulgare* |
| *Pastinacea sativa* |
| *Spinacia oleracea* |

| Group 2 |
|---|
| **Vegetable species** |
| *Lactuca sativa* |
| *Solanum lycopersicum* |
| **Flower species** |
| *Ageratum houstonianum* |
| *Anethum graveolens* |
| *Antirrhinum* sp. |
| *Angelonia salicariifolia* |
| *Begonia* sp. |
| *Bellis perennis* |
| *Calceolaria* sp. |
| *Calibrachoa hybrida* |
| *Campanula* sp. |
| *Celosia* sp. |
| *Chaenorhinum* sp. |
| *Cineraria maritima (= Senecio cineraria)* |
| *Chrysanthemum* sp. |
| *Dianthus* sp. |
| *Diascia barberae* |
| *Dichondra* sp. |
| *Digitalis* sp. |
| *Exacum affine* |
| *Eruca sativa* |
| *Gazania* sp. |
| *Geranium* sp. |
| *Gerbera jamesoni* |

| Group 2 |
| --- |
| *Gloxinia speciosa (= Sinningia speciosa)* |
| *Gypsophila* sp. |
| *Helichrysum* sp. |
| *Heuchera* sp. |
| *Isolepis* sp. |
| *Juncus* sp. |
| *Laurentia axillaris (= Isotoma axillaris)* |
| *Linaria* sp. |
| *Lisianthus russellianus (= Eustoma grandiflorum)* |
| *Lobelia* sp. |
| *Lobularia maritima* |
| *Mimulus* sp. |
| *Nemesia* sp. |
| *Nicotiana* sp. |
| *Ocimum basilicum* |
| *Origanum vulgare* |
| *Papaver* sp. |
| *Pentas* sp. |
| *Pericallis hybrida (= Pericallis x hybrida)* |
| *Petroselinum crispum* |
| *Petunia* sp. |
| *Portulaca* sp. |
| *Primula* sp. |
| *Pyrethrum* sp. |
| *Ranunculus* sp. |
| *Rosmarinus officinalis* |
| *Rudbeckia* sp. |
| *Salpiglossis sinuata* |
| *Salvia officinalis* |
| *Saxifraga* sp. |
| *Senecio cruentus (= Pericallis cruenta)* |
| *Silene* sp. |
| *Solenostemon scutellarioides* |
| *Streptocarpus* sp. |
| *Sutera* sp. |
| *Tagetes* sp. |
| *Tanacetum parthenium* |
| *Thymus vulgaris* |
| *Torenia fournieri* |
| *Trachelium caeruleum* |
| *Verbascum* sp. |
| *Verbena* sp. |
| *Veronica* sp. |
| *Viola* sp. |
| *Zinnia* sp. |

## APPENDIX 2 – Interception Data between 1st May 2016 and 6th December 2019

| Commodity | Contaminants |
|---|---|
| *Allium ampeloprasum* | *Lactuca sativa; Brassica sp., unidentified seed; Solanum sp., Daucus carota; Beta vulgaris* |
| *Apium graveolens* | *Amaranthus sp., Poa sp.,* |
| *Begonia* | *Eustoma grandiflorum* |
| *Beta vulgaris* | *Triticum aestivum; Fallopia convolvulus; Hordeum vulgare; Galium aparine; Avena sp; Helianthus annuus; Avena sativa; Carthamus lanatus; Lolium sp.; Brassica sp.; Convolvulus arvensis; Ipomoea sp.; Calystegia sp.; Convolvulus sp.; Triticum sp.; Convolvulaceae; Paspalum sp.; Coriandrum sativum; Spinacia oleracea; Silybum marianum; Avena fatua; Galium sp; Malva sp.; Trifolium repens; Daucus carota; Secale cereale; Paspalum dilatatum; Paspalum sp.* |
| *Brassica napus* | *Cichorium intybus; Galium sp.* |
| *Cichorium intybus; Cichorium endivia* | *Chenopodium album; Lactuca sp; Chenopodium sp.; Dianthus sp.; Echinochloa sp.; Bassia sp.; Medicago lupulina; Nepeta sp.; Brassica sp.; Setaria sp.; Allium sp., Helminthotheca echioides, Anethum graveolens, Solanum sp.* |
| *Daucus carota* | *Chenopodium sp.; Cichorium intybus; Solanum sp.; Lolium sp.; Polygonum aviculare; Cirsium vulgare; Rumex sp.; Galium sp; Torilis arvensis, Galium sp., Malva sp.* |
| *Dianthus* | *Unidentified seed, Heuchera sp.* |
| *Dichondra repens* | *Lobelia sp., Petunia sp.* |
| *Foeniculum vulgare* | *Valerianella locusta; Solanum sp.; Allium sp.; Solanum lycopersicum* |
| *Juncus effusus* | *Viola sp.* |
| *Lactuca sativa* | *Allium sp.; Trifolium repens; Daucus carota; Lolium sp.; Unidentified seed* |
| *Lobelia* | *Portulaca sp.; Spergularia sp.* |
| *Lisianthus* | *Lobelia sp.* |
| *Mix Salad* | *Chenopodium sp.; Helminthotheca echioides; Nepeta sp.; Galium sp.; Allium sp.; Echinochloa sp.; Setaria sp.; Solanum sp.; Sonchus oleraceus* |
| *Pastinaca sativa* | *Daucus carota; Phalaris paradoxa; Sherardia arvensis; Allium sp.; Trifolium pratense; Brassica sp.; Secale cereale; Solanum sp.; Petroselinum crispum; Chenopodium sp.;* |
| *Petunia xhybrida* | *Lobelia sp.; Unidentified seed* |
| *Portulaca* | *Agrostis sp.* |
| *Senecio* | *Begonia sp.* |