Understanding unmanaged biosecurity risks to the arable industry

Photo of European corn borer (*Ostrinia nubilalis*) larva

Source: John C. French Sr., Retired, Universities: Auburn, GA, Clemson and U of MO, Bugwood.org

1. Executive Summary

This report looked at the biosecurity risks associated with imported seeds for sowing. It examined seed and grain interception data from the 31/08/2023 to 19/06/2025.

It focused on those arable pests of higher concern, including those pests listed as priority pests, quarantine pests requiring additional declarations, regulated (quarantine) weed seeds and those considered notifiable organisms by MPI.

The assessment covered 97 crop species of which 58 species did not have any recorded interceptions (Appendix 1).

There were 16 records of arable pests of higher concern (Table 1). These include:

- One record of brown marmorated stink bug (BMSB, *Halyomorpha halys*) which was intercepted on perennial ryegrass (*Lolium perenne*).
- Three records of black-grass (*Alopecurus myosuroides*) which was intercepted in ryegrass (*L. perenne* and *L. multiflorum*) in 2025.
- Four records of pea-weevil (*Bruchus pisorum*) and one record of broadbean weevil (*B. rufimanus*) detected in pea consignments.
- No viruses were reported in the interception data provided.

The horizon scanning emerging pests and diseases of importance to the arable sectors are listed in Section 6. These were classified based on increased international concern, spread overseas, or new information becoming available which elevated a pest threat. Emerging pests which this author believed should be followed up with MPI risk assessors included:

- European corn borer (*Ostrinia nubilalis*)
- Wheat blast (*Pyricularia oryzae*) Triticum line

Several pests were recommended for consideration for adding onto the SGRR's pest list. These included:

- Palmer amaranth (*Amaranthus palmeri)*
- Ghost snail (*Bulimulus sporadicus*) - this recommendation is purely based on its similarities to the other gastropods on the SGRR priority pest list.
- Sunn pest or cereal bug (*Eurygaster integriceps)*
- Hairy darkling beetle (*Lagria villosa)*
- European corn borer (*Ostrinia nubilalis*)

The report highlights inconsistencies between some of MPI's regulatory tools, particularly between the Plant Biosecurity Index (PBI), the Official New Zealand Pest Register (ONZPR), and the Schedule of Regulated (Quarantine) Weed Seeds. Several weed species have prohibited entry under the PBI yet are listed as "not assessed" or are absent from ONZPR, increasing the risk of misinterpretation by importers and weakening pathway clarity. The following weed species should be assessed and included in the ONZPR database.

- *Aethusa cynapium* (Fool's parsley)
- *Ageratum conyzoides* (Billygoat weed)
- *Carduus nutans* (Nodding thistle)
- *Galega officinalis* (Goat's rue)
- *Fallopia japonica* (Japanese knotweed, *Polygonum cuspidatum*, *Reynoutria japonica*)
- *Silybum marianum** (milk/variegated thistle)

In addition, the below weed species should be followed up by MPI for further consideration. These include:

- MPI to include Palmer amaranth in PBI as 'prohibited entry'
- MPI to include tall water hemp in PBI as 'prohibited entry'
- Request MPI separate *Salsola tragus* from the *Salsola kali* in PBI and ONZPR based on its distinction at the subspecies and species level.

Contents

2. Aim

The aim of this report was to understand the biosecurity risks in or on imported seeds for sowing. The crops assessed represent the arable seed sector.

3. Methodology

The seed and grain interception data provided by MPI cover consignments from 31/08/2023 until 19/06/2025. The interception data provided by MPI is anonymised, with no country, no importer or volume information provided. This means that the data is only used to understand general trends. The assessment process paid particular attention to the:

- Pests detailed in the SGRR unwanted organism list (live version as of March 2026);
- Arable pests detailed in the SGRR priority pest list (live version as of March 2026);
- Additional declaration pests of concern in the seeds for sowing import health standard (as at March 2026);
- Weed species listed in the Schedule of Regulated (Quarantine) Weed Seeds[1]; and
- Priority pests for other industry groups, particularly where an Operational Agreement is in place.

The interception data covered 97 crop types[2]. The definitions, caveats and considerations of the interception data are detailed in Appendix 2-3 of this report. The crop species are detailed as specified in the Biosecurity Levy Order (Response-Arable Crops) 2023. They included:

(a) cereal seed (includes barley, oats, rye, or wheat that is grown in New Zealand for use in feed grain or as milling grain; and cereal silage)

(b) forage or turf seed (includes beets, brassicas, chicory, grass (any type), legumes (includes pulses), lucerne, plantain).

(c) maize seed (includes corn and maize for grain, silage and seed)

(d) non-forage seed (includes vegetable seed such as tomato, capsicum, carrot, radish, brassica, which also includes oilseed such as rape, sunflower, linseed, soybean)

[1] MPI's schedule of regulated (quarantine) weed seed is available at https://www.mpi.govt.nz/dmsdocument/7111. Refer to Section 1.2: Incorporation of material by reference.

[2] Leek (*Allium porrum*) and wild leek (*A. ampeloprasum*) were included in the 2025 interception data request

4. Results

Information for 97 seed species were provided by MPI. Because the interception data provided by MPI is anonymised with no country, importer or volume information provided, data is interpreted to understand general trends only.

58 crop species had no interceptions recorded on the seed for sowing pathway (summarised in Appendix 1). This could be the result of no regulated species being intercepted or could be due to importers opting to treat consignments instead of undertaking lab identification.

A total of 936 interception records were provided by MPI. Of these only 27 were recorded as regulated interceptions (3%), 353 were unknown interceptions (38%) (e.g. pests unable to be identified past the genus level or regulatory status unknown) and 11 records were not assessed (1%) (e.g. the pest record went to the Plant Imports team for direction).

The majority (66%) of 'unknown interceptions' were for radish (*Raphanus sativus*) seed (234 records) these were predominantly fungal detections of *Alternaria* spp. (97%)[3]. Table 1 details those seed import pathways with:

- an SGRR unwanted organism detected,
- another sectors GIA priority pest detected (where known),
- an additional declaration pest detected (as specified in Seeds for Sowing (155.02.05)),
- a pest specified in MPI's priority list of potentially invasive pests and diseases[4] detected,
- a weed from MPI's NIPR (National Interest Pest Response)[5] programme detected, or
- a pest of higher concern detected (i.e. based on international records of pests of higher economic or environmental impact).

5. Alignment between PBI and ONZPR

As highlighted in the 2024 report. Several weed seeds are listed as 'entry prohibited' in the PBI (Plant Biosecurity Index), while when searched in ONZPR 'Pests of concern to NZ' or 'Imports to NZ' subcategories, they are classified as 'not assessed' or are simply not listed, resulting in 'no matching records found'.

The author acknowledges MPI directs importers to regard any not listed pest as 'regulated' and treat in accordance with Approved Biosecurity Treatments (MPI-ABTRT) or directs importers to contact MPI (Plant Imports) (Appendix 3). Nonetheless, to minimise the likelihood of misinterpretation between the ONZPR subcategories, it is suggested that weed seeds included in MPI's Regulated (Quarantine) Weed Seeds should also be listed in ONZPR. The following species are prohibited in PBI but are 'not listed' or 'not assessed' in ONZPR and are present in New Zealand:

- *Aethusa cynapium* (Fool's parsley)
- *Ageratum conyzoides* (Billygoat weed)
- *Carduus nutans* (Nodding thistle)
- *Galega officinalis* (Goat's rue)

- *Fallopia japonica* (Japanese knotweed, Polygonum cuspidatum, Reynoutria japonica)
- *Silybum marianum** (milk/variegated thistle)

Of those species listed above, only milk/variegated thistle (*Silybum marianum**) is included in the Department of Conservation's list of environmental weeds in New Zealand 2024 (McAlpine and Howell, 2024).

Recommendation: These weed species should be assessed and included in the ONZPR database.

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[3] As part of MPI's BP2 – Border Services process and system clarification project (2023) *Alternaria* fungi were made non-regulated on the radish seed pathway. These records have an 'unknown' regulatory status in this report.

[4] MPI's priority list of potentially available invasive pests and diseases is available at: https://www.mpi.govt.nz/biosecurity/pests-and-diseases-not-in-new-zealand/priority-list-of-potentially-invasive-pests-and-diseases/

[5] MPI's National Interest Pest Response programme is available at: https://www.mpi.govt.nz/biosecurity/exotic-pests-and-diseases-in-new-zealand/long-term-biosecurity-management-programmes/national-interest-pest-responses-programme/

Table 1: Seed import pathways with unwanted organisms/pests or weeds detected (SGRR, GIA priority, declaration, MPI priority invasive list, or higher-concern pests).

Year	Count	Pest scientific name	Common name or acronym	Pest type	Commodity	Common name	Plant Biosecurity Index (PBI) requirements (Seed for sowing import requirements 155.02.05)	Notes and recommendations
Cereal seed (barley oats, rye or wheat)								
2023	2	*Fusarium langsethiae*	Fusarium	Fungus	*Hordeum vulgare*	Barley	Hordeum	Barley imports are restricted to approved countries. *Fusarium langsethiae* is a weak pathogen infecting small grain cereals. Reportedly becoming an increasing issue in the EU with little known about its epidemiology. Believed to be transmitted by aphids (Drakulic et al. 2017). *F. langsethiae* is listed as regulated in MPI's ONZPR (official NZ pest register). While *F. langsethiae* is considered seed-borne, historic research has established that it does not systemically transmit from the seed to seedlings or other plant parts (Opoku 2012).

Year	Count	Pest scientific name	Common name or acronym	Pest type	Commodity	Common name	Plant Biosecurity Index (PBI) requirements (Seed for sowing import requirements 155.02.05)	Notes and recommendations
2024	1	*Ostrinia nubilalis*	European corn borer	Insect				European corn borer is distributed across the Northern Hemisphere, and is present in Europe, Asia, North Africa, and North America. It is primarily a pest of plants in the family Poaceae (grasses) and is a major pest in corn-growing regions of the US. European corn borer is listed as regulated in MPI's ONZPR. Seed is an uncertain pathway for European corn borer (RPLI, 2026)
Forage or turf seed								
2024	1	*Aethusa cynapium*	Fool's parsley or poison parsley	Seed	*Brassica napus*	Rapeseed	Brassica napus	Rapeseed can be imported from all countries. Fool's parsley is prohibited entry (PBI) and is listed in MPI's schedule of regulated (quarantine) weed seeds as contaminant. It is not a SGRR priority pest and is not listed in MPI's ONZPR.

Year	Count	Pest scientific name	Common name or acronym	Pest type	Commodity	Common name	Plant Biosecurity Index (PBI) requirements (Seed for sowing import requirements 155.02.05)	Notes and recommendations
2024	1	*Conium maculatum*	Poison hemlock	Seed				Poison hemlock is naturalised in NZ since 1872. Entry is prohibited into NZ. It is not a SGRR priority pest but is an agricultural pest for NZ because of its poisonous nature to livestock. It is listed as not assessed in MPI's ONZPR.
2025	1	*Sorghum halepense*	Johnson grass	Seed	*Lolium multiflorum*	Annual ryegrass	Agropyron	Ryegrass seed can be imported from all countries. Johnson grass is one of the plant species in MPI's National Interest Pest Response Programme and MPI are working towards eradicating Johnson grass from New Zealand. It is an agricultural pest for NZ but is not a SGRR priority pest. It is listed as a regulated and unwanted organism in MPI's ONZPR.
2025	1	*Alopecurus myosuroides*	Black-grass	Seed	*Lolium multiflorum*	Annual ryegrass	Agropyron	Ryegrass seed can be imported from all countries. Black-grass is a SGRR priority pest.

Year	Count	Pest scientific name	Common name or acronym	Pest type	Commodity	Common name	Plant Biosecurity Index (PBI) requirements (Seed for sowing import requirements 155.02.05)	Notes and recommendations
2025	2				*Lolium perenne*	Perennial ryegrass		There are no measures for black-grass in the *Agropyron* schedule. Black-grass has triggered three responses in NZ in recent years. MPI has introduced enhanced inspections at the border as part of its 'small seed procedure' to mitigate the possible import of black-grass seeds. It is listed as a regulated and unwanted organism in MPI's ONZPR.
2023	1	*Halyomorpha halys*	BMSB, Brown Marmorated Stink Bug	Insect	*Lolium perenne*	Perennial ryegrass		BMSB is a SGRR priority pest. It is a polyphagous pest of concern to NZ and feeds on around 300 hosts including maize. SGRR is a signatory to the BMSB OA. BMSB is listed as a regulated and unwanted organism in MPI's ONZPR.
Pea seed								
2023	1		Pea weevil	Insect	*Pisum sativum*	Peas	Pisum	

Year	Count	Pest scientific name	Common name or acronym	Pest type	Commodity	Common name	Plant Biosecurity Index (PBI) requirements (Seed for sowing import requirements 155.02.05)	Notes and recommendations
2024	3	*Bruchus pisorum*						Pea seed can only be imported from approved countries under the *Pisum* schedule. Pea weevil is an internally borne SGRR priority pest. There is an IHS treatment in place for peas (fumigation - SST16 ABTRT). Treatment is required to be completed offshore, prior to export, or on arrival in NZ by an MPI approved treatment provided. Pea weevil is on the regulated pest list for peas and beans. It is assumed these detections were from seed being directed for treatment on arrival. It is listed as a regulated and unwanted organism in MPI's ONZPR.
2024	1	*Bruchus rufimanus*	Broadbean weevil					Broadbean weevil is regulated and listed as an unwanted organism by ONZPR and is on the pest list for the *Pisum* and *Vicia* schedules and is an internally borne pest. It is assumed fumigation SST16 would control

Year	Count	Pest scientific name	Common name or acronym	Pest type	Commodity	Common name	Plant Biosecurity Index (PBI) requirements (Seed for sowing import requirements 155.02.05)	Notes and recommendations
								broadbean weevil based on its similarities to pea weevil.
Radish seed								
2024	1	*Sorghum halepense*	Johnson grass	Seed	*Raphanus sativus*	Radish	Raphanus sativus	Radish seed can be imported from all countries under the *Raphanus* schedule. Johnson grass is an agricultural pest for NZ but is not a SGRR priority pest. It is listed as a regulated and unwanted organism in MPI's ONZPR.

There were 16 records of arable pests of higher concern (Table 1). These include:

- One record of brown marmorated stink bug (BMSB, *Halyomorpha halys*) which was intercepted on perennial ryegrass (*Lolium perenne*).
- Three records of black-grass seeds (*Alopecurus myosuroides*) which were intercepted in ryegrass (*L. perenne* and *L. multiflorum*) in 2025.
- Four records of pea-weevil (*Bruchus pisorum*) and one record of broadbean weevil (*B. rufimanus*) detected in pea consignments.
- No viruses were reported in the interception data provided.

6. Horizon scanning

A horizon scan of risks to the arable sector was undertaken. A range of sources were monitored to obtain information on new emerging risks, including: International Seed Federation (ISF) notifications, MPI's emerging risk reports, WTO notifications, EPPO and NAPPO pest alerts, international databases, scientific literature, industry publications, member feedback and relevant seed and grain conferences.

The horizon scanning identified a suite of emerging pest risks relevant to arable crops, driven by increased global trade, climate-enabled range expansion, resistance evolution, and changing regulatory environments overseas. These organisms warrant proactive monitoring and, in some cases, reassessment or clarification of their regulatory status within New Zealand's biosecurity system. The report used the SGRR pest-specific risk assessment framework (Appendix 4)

Pests are reported alphabetically. The horizon scanning period covered the 31/08/2023 to 18/03/2026. A summary of recommendations from the horizon scanning have been provided in Section 7.

Amaranthus palmeri (Palmer amaranth)

Palmer amaranth is an annual dioecious weed species. It is native to the southwestern United States and northern Mexico but has spread across most of the U.S (EPPO, 2014). It is reported as present in Spain, Italy, Greece, Cyprus, Portugal, Turkey and is considered transient in many additional European countries (Matzrafi et al. 2025), with restricted occurrences in Argentina, Brazil, parts of Africa, Asia, and Australia. While not considered in New Zealand there is concern around possible entrance via imported second-hand machinery (FAR, 2025). In the EU it has been believed to have spread through contaminated seed or feed (EPPO, 2014). Its rapid spread is driven by climate adaptability, high seed production, herbicide resistance (9 herbicide groups) and its fast growth. Palmer amaranth has been shown to transfer herbicide-resistance genes to other closely related weeds through interspecific hybridization (Jiao et al. 2023). A 2023 study looking at the potential for Palmer amaranth to invade China and determined that future scenarios would be mainly in Beijing, Tianjin, and Hebei (warm temperate zone, semi-moist continental monsoon climate) (Jiao et al. 2023). Some warmer parts of NZ could be suitable for establishment. While nutritious for humans, it can be toxic to livestock (cattle, pigs, sheep) due to high nitrate and oxalate levels (Matzrafi et al. 2025). Palmer amaranth can cause season-long yield losses in major row crops, frequently exceeding 90% in cotton, corn (maize), and soybeans if unmanaged

Photo of Palmer amaranth (*Amaranthus palmeri*) inflorescences

Source: Rebekah D. Wallace, University of Georgia, Bugwood.org

Palmer amaranth is not listed in MPI's Plant Biosecurity Index (PBI). In the PBI most eligible *Amaranthus* species have basic seed import conditions apart from those species that are prohibited. Palmer amaranth is not listed in MPI's Schedule of Regulated (Quarantine) Weed Seeds. Palmer amaranth is listed in MPI's ONZPR as regulated but not as notifiable or unwanted. Palmer amaranth seeds were not intercepted in the data provided by MPI, but other non-regulated *Amaranthus* species were detected on a range of seed lines (*Brassica* spp. Trifolium spp., *Cynodon dactylon* and *Daucus carota*). Without further country or interception information it is difficult to determine whether these interceptions represent a possible gap in the import requirements. Suggest adding Palmer amaranth to the priority pest list because of its import potential (on machinery), establishment potential and spread potential.

Recommendation: Add *Amaranthus palmeri* to SGRR's priority pest list. Get MPI to include Palmer amaranth in PBI as 'prohibited entry'

Amaranthus tuberculatus (Tall water hemp)

Tall water hemp is a fast-growing, dioecious summer annual plant that can reach up to 2–3 m tall. It is native to eastern North America but has spread to parts of Europe, the Middle East, and other regions through trade (including contaminated grain) (EPPO, 2021). It was introduced into Asia (Israel and Jordan), the western United States and Europe (CABI 2016). Within Europe, tall water hemp is present in a number of environments, including floodplains and banks of rivers (Sánchez Gullón & Verloove, 2013), ruderal habitats including railway tracks, port areas (EPPO, 2021) and to a lesser extent crop fields (Pellizzari et al., 2015). Tall water hemp prefers warm, moderately moist, nitrogen-rich sites in full sunlight (Costea et al. 2005). Interference by tall water hemp has been shown to reduce yield, with 270 plants/m^2 reducing maize yield by 74% (Illinois/United States) (EPPO, 2021).

Photo of *Amaranthus tuberculatus* (Tall water hemp) seedlings

Source: John D. Byrd, Mississippi State University, Bugwood.org

Tall water hemp is not listed in MPI's Schedule of Regulated (Quarantine) Weed Seeds. Tall water hemp is not listed in MPI's Plant Biosecurity Index (PBI). It is listed in MPI's ONZPR as a regulated pest but not as notifiable or unwanted. A review of the 2023-25 MPI provided interception data indicated tall water hemp was not detected but other non-regulated *Amaranthus* species were.

Recommendation: Continue monitoring. Get MPI to include tall water hemp in PBI as 'prohibited entry'

Chaetocnema pulicaria (Corn flea beetle)

The corn flea beetle (*Chaetocnema pulicaria*) is a small (c. 1.6 mm) but economically important pest of maize and corn and is the primary vector of Stewart's wilt (*Pantoea stewartii*) a plant pathogenic bacterium. The corn flea beetle is distributed throughout the eastern half of the United States, including the Midwest, and ranges from the Canadian border south to Florida and Texas (Schattman et al. 2024). The beetle transmits Stewart's wilt through feeding wounds, with Stewart's wilt able to overwinter in adult beetles' guts and be seasonally reintroduced into crops. US modelling predicts a northward expansion of damaging beetle populations and Stewart's wilt as winter temperatures increase (Schattman et al. 2024). Corn flea beetles can fly and may be wind-dispersed, but are not seed-transmitted. Long-distance spread via trade is considered unlikely, except where larvae are moved in plants with soil (Esker et al. 2002). Most import regulations, including those in New Zealand, focus on the bacterium (Stewart's wilt) rather than the beetle.

Photo of corn flea beetle (*Chaetocnema pulicaria*) and direct feeding damage.

Source: University of Illinois at Urbana-Champaign , Bugwood.org

Recommendation: Continue monitoring corn flea beetle distribution.

Erthesina fullo (Yellow spotted stink bug, YSSB)

Yellow spotted stink bug (YSSB) is a large (18-23 mm) true bug characterised by a dark brown to black body with numerous yellow spots, and yellow-banded legs. It has five nymphal instars before reaching the adult stage, and adults may overwinter in sheltered sites before resuming activity in spring (MWLR, 2026). YSSB is native to East and Southeast Asia (including China, Japan, Taiwan, Vietnam and surrounding areas). It is a phytophagous species which can feed on several economically important tree species (fruit trees, forest and ornamental trees (EPPO, 2021). It shares many similarities with brown marmorated stink bug regarding its biology and behaviour. While not present in NZ it has been previously intercepted and is considered a hitchhiker pest. Key pathways for YSSB are assumed to be passengers, luggage, containers, general cargo or used machinery and vehicles. There is no evidence that YSSB is seed-transmitted and its spread is principally via adult and immature life stages as a hitchhiker. Based on a host plant and pest status report from China (Mi et al, 2020), YSSB is not a key arable pest species.

Enlarged photo of the adult yellow spotted stink bug (YSSB, Erthesina fullo)

Source: Pest and Diseases Image Library (PaDIL) , Bugwood.org

Recommendation: Continue monitoring YSSB as signatories to BMSB OA.

Eurygaster integriceps (Sunn pest)

Sunn pest or cereal bug is a small light-brown shield beetle (c. 12 mm), both nymphs and adults feed on cereal crops; females lay eggs on stems, leaves or nearby weeds, with nymphs undergoing five instars before adulthood (Edde, 2022). The species has a univoltine (one generation per year) life cycle, overwintering as adults in leaf litter and migrating to host crops in spring. It is native to large areas of the northern hemisphere: Northern Africa, the Balkans (e.g., Greece, Bulgaria), western and central Asia (Turkey, Iran, Syria, Iraq, Kazakhstan, Uzbekistan, Afghanistan, Pakistan) and parts of Russia (Edde, 2022). There is some overlap between the approved countries the sunn pests is recorded and approved countries for wheat seed for sowing imports (e.g. Greece). It primarily attacks grasses (Poaceae), with wheat (*Triticum aestivum*) being the most economically significant host. It also feeds on barley, rye, oats and related cereals by piercing plant tissue with its stylet and sucking sap. It is one of the most serious insect pests of wheat in the Middle East (Mackesy and Moylett, 2018). Natural spread occurs via adult flight and migration to crops during favourable weather. Long-distance spread between countries is typically through human-mediated movement of infested plant materials, grain consignments, machinery, or in contaminated seed lots (Edde, 2022, Mackesy and Moylett, 2018). Given the economic importance of wheat to NZ this report suggests adding Sunn pest to the priority pest list because of its spread potential, establishment potential and climate suitability.

Photo of the back of the adult sunn pest (*Eurygaster integriceps*)

Source: Natasha Wright, Braman Termite & Pest Elimination, Bugwood.org

Recommendation: Add *Eurygaster integriceps* (Sunn pest) to the SGRR priority pest list

Lagria villosa (Hairy darkling beetle)

Hairy darkling beetle is a Tenebrionidae beetle that has become an invasive, polyphagous agricultural pest in parts of South America, particularly Brazil (introduced in 1976). It is native to Africa and is believed to be widespread across the western, south-eastern and eastern parts of Africa. The adult beetles feed on a wide range of crops, including maize, beans, strawberries, soybean, potato, and other horticultural plants. The adults cause direct feeding damage and yield losses, especially under warm, dry conditions, while the larvae are generally associated with soil damage. It is a known vector of *Pseudomonas syringae* pv. *garcae*, *Pseudomonas cichorii*, *Fusarium subglutinans* and *Burkholderia gladioli* (JKI, 2022). It was placed on the EPPO Alert List in 2025; following interceptions in imported produce in Europe (table grapes, stems of basil, chewing khat) and because of its broad host range, potential to cause economic significant losses and invasion risk (EPPO, 2025). There is no evidence that it is internally seed transmitted or seed borne. Climatically the likelihood of *L. villosa* establishing in NZ is lower because of its successful tropical/sub-tropical spread outside its native Africa into large parts of South America where climates include warm temperatures and dry periods that resemble NZ's warmer Northern regions (EPPO, 2025). It is a regulated and unwanted organism in MPI's ONZPR. Based on its import potential, host range, vector status and potential to cause economic loss it is recommended Hairy darkling beetle is added to the SGRR priority pest list.

Photos of hairy dark beetle adult and larvae

Sourced from Carlos Alexandre Mattos Raposo and (c) Vinia Zaayman

Recommendation: Add *Lagria villosa* (Hairy darkling beetle) to SGRR priority pest list

Liriomyza (Leafminers)

Liriomyza is a genus of small flies (<3 mm long, Diptera: Agromyzidae) commonly known as leafminers. The larvae feed by mining inside leaf tissues, creating serpentine tunnels that damage photosynthetic tissue and reduce plant vigour and marketability. Some species also cause stippling damage from adult feeding and oviposition punctures on leaves. Key economically important pest species include *Liriomyza sativae* (vegetable leafminer), *Liriomyza trifolii* (American serpentine leafminer), and *Liriomyza huidobrensis* (serpentine/pea leafminer) they occur in the Americas, Europe, Africa, Asia and parts of Oceania, but not NZ, and have spread to multiple new regions over recent decades.

This genus attacks many vegetable and ornamental crops including beans, lettuce, peas, tomatoes, celery, cucurbits, potatoes and chrysanthemums, as well as many weeds. Their increasing distribution is attributed to the global trade in plant material, including contaminating nursery stock and fresh produce. *Liriomyza huidobrensis* and *L. sativae* have established in new regions in recent decades. There is no evidence that *Liriomyza* spp. are "seed transmitted" as pests inside viable seeds. Their life cycle involves feeding on or within leaves rather than within seeds. *Liriomyza huidobrensis*, *L. sativae* and *L. trifolii* are regulated and unwanted in MPI's ONZPR.

Photo of the American serpentine leafminer (*Liriomyza trifolii*)

Source: Central Science Laboratory, Harpenden, British Crown, Bugwood.org

Recommendation: Continue monitoring for change in distribution.

Ostrinia nubilalis (European corn borer)

The European corn borer is native to Europe and was introduced to North America in the early 20th century. It impacts corn crops in France, Spain, Italy, and Poland (Pintilie et al. 2023). In North America, the European corn borer is found in eastern Canada and in every U.S. state east of the Rocky Mountains. In the U.S. studies are showing a gradual northward range expansion and increased damage in higher-latitude regions, likely linked to climate change and altered cropping systems. Reports from northern Europe indicate emerging or increasing impacts on non-traditional hosts such as hemp, reinforcing its adaptable, polyphagous nature (Gagnon and Baute, 2024). In North America, the pest remains widespread, with ongoing concerns about resistance to Bt maize influencing management practices rather than distribution (Sappington, 2024). European corn borer caterpillars damage corn by chewing tunnels through many parts of the plant, leading to a decrease in agricultural yield. It is listed in the ONZPR as a regulated pest and unwanted organism. It was intercepted on barley coming into NZ in the 2023-25 interception data.

Photo of European corn borer (*Ostrinia nubilalis*) larva causing direct feeding damage on corn

Source: Mariusz Sobieski, Bugwood.org

Recommendation: Add *Ostrinia nubilalis* (European corn borer) to the SGRR priority pest list.

Pegohylemyia gnava (Lettuce seed fly)

Very little published scientific literature on lettuce seed fly was found in the literature. It is in the Anthomyiidae group which also includes onion maggot (*Delia antiqua*) and is reported in Europe (Dusek, 1974). However, there were very few distribution and host species records. Because there was no strong evidence in pest databases or entomological literature that *P. gnava* causes significant crop damage or economic losses, it is considered unlikely that it is a major agricultural pest.

Recommendation: No further action.

Pyricularia oryzae Triticum lineage (Wheat blast disease)

Wheat blast, caused by the *Triticum* lineage of *Pyricularia oryzae*, is a fungal disease of wheat (*Triticum aestivum*) that causes significant economic damage in South America and has since spread to Bangladesh and Africa (Zambia) (EPPO, 2025). The main host of *P. oryzae Triticum* lineage is bread wheat, *Triticum aestivum*. Although, it is reported on other Poaceae hosts including durum wheat (*Triticum durum*), oat (*Avena strigosa*), rye (*Secale cereale*), triticale (x *Triticosecale*) and barley (*Hordeum vulgare*) alongside several wild grasses (e.g. *Cynodon* spp., *Digitaria* spp., and *Lolium* spp.) (EPPO, 2025). For wheat *P. oryzae* Triticum lineage infects all aboveground parts of the plant. The most damaging symptom in the field is head (spike) blast. Typical head blast symptoms include partial or complete spike bleaching and shrivelled and deformed grains. Grain yield losses have been reported in the range of 10-100% (EPPO, 2025). Yield loss is attributed to reduced spike weight, low grain filling and sterility issues. *Pyricularia oryzae Triticum* lineage can also be transmitted by seeds (EPPO, 2025). The pathogen can survive in seeds for up 22 months. Seed transmission is the primary method of long-distance dispersal of the disease (EPPO, 2025). *Pyricularia oryzae* is not listed as a regulated pest in *Triticum* import health standard schedule. It is not currently considered present in an 'approved country'[6] for wheat seed imports and is listed as 'not assessed' in the ONZPR. An EPPO alert on wheat blast was released in 2025.

[6] Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom and United States of America

Photo of Symptomatic head discolouration.

Source: Pawan Kumar Singh, International Maize and Wheat Improvement Center (CIMMYT)

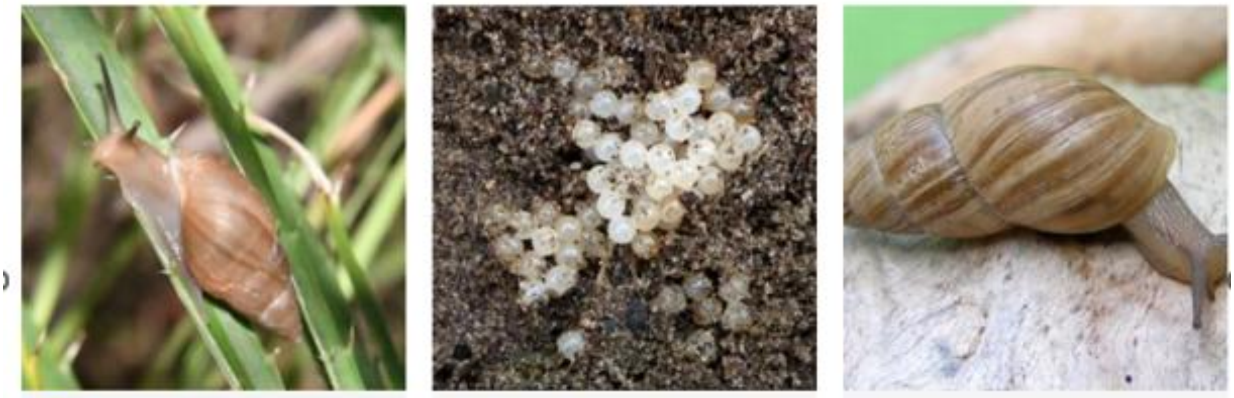
Recommendation: Continue distribution monitoring and send *Pyricularia oryzae* Triticum lineage (Wheat blast disease) to MPI's Emerging Risk System for further assessment.

Ghost snail (*Bulimulus sporadicus* syn *B. bonariensis*)

The ghost snail (*Bulimulus sporadicus*) is native to South America and has spread to south-eastern areas of the United States. It was detected in Australia at the Port of Brisbane in March 2025[7] but is not considered established in Australia (Business Queensland, 2025). Ghost snails are small land snails (adults 20-30 mm) with pale brown to off-white bodies and tan shells with faint banding. While primarily detritivores (feed on dead plant material) they can also damage live plants, especially seedlings and already stressed trees.

[7] https://www.agriculture.gov.au/about/news/rapid-response-bulimulus-snails

These snails pose several risks to agriculture either directly via crop damage, crop contamination, infrastructure issues and yield losses or indirectly by impeding irrigation channels. They are associated with moist, humid conditions rather than dry or arid habitats, and are most active under warm, humid conditions typical of subtropical to tropical climates (Rabelo et al. 2022). They are known to feed on a range of plants including citrus, blueberries, cotton, soybeans and peanuts, making them a threat to multiple horticultural industries (Business Queensland, 2025). Because ghost snails reproduce rapidly and adults can self-fertilise, even small infestations can grow quickly in warm, humid conditions. They spread through soil, mulch, plant material, shipping containers and machinery (Business Queensland, 2025).



Photos of adult ghost snails and egg cluster.

Source: Jacksonville shells, jaxshells.org and silviolamothe, iNaturalist

Recommendation: Continue monitoring to determine if *Bulimulus sporadicus* (ghost snail) needs to be included onto the SGRR priority pest list based on its similarities with other gastropods on the SGRR priority pest list.

Salsola tragus (Prickly Russian thistle or tumbleweed)

Prickly Russian thistle was included in this report based on feedback. Prickly Russian thistle or tumbleweed, is an annual herb in the family Amaranthaceae (formerly Chenopodiaceae). Native to Eurasia, it has become an invasive species across arid and semiarid regions of North America and other continents, known for its rolling, seed-dispersing form. It is best adapted to arid and semi-arid climates, where its drought tolerance gives it a competitive edge. While there may be regions in NZ where *S. tragus* could establish, in general the NZ environment would not be favourable for *S. tragus*.

There is nomenclature confusion within the *Salsola* genus with subspecies being listed as synonyms in PBI and ONZPR. Two *Salsola* species are eligible for entry into NZ under basic conditions (NZ PBI), these include *Salsola kali* (prickly saltwort or prickly glasswort) and *Salsola ruthernica* (Russian thistle) (Figure 1). The *S. kali* record in MPI's ONZPR considers *S. tragus* and *S. pestifer* as synonyms of *S. kali*. This is likely the result of these species being treated as a subspecies of *Salsola kali*.

Figure 1 extract of the *Salsola* records in MPI's Official New Zealand Pest Register.

Plant name	Other name(s)	Seeds for sowing (SS) Import specification
		Search for SS schedule
Salsola kali	Salsola pestifer, Salsola tragus	Basic
Salsola ruthenica	–	Basic

No *Salsola* spp. are listed in MPI's schedule of regulated quarantine weed seeds[8].

Salsola kali is recorded in NZ (naturalised 1853, NZPCN). *S. kali* is listed as present (observed) in iNaturalist with observations ranging from Cape Reinga in Northland as far as Birdlings flat in Canterbury (iNaturalist).

Salsola tragus has historically been recorded in NZ under the synonym *Salsola ruthenica.* This record is based on a report of a historic localised detection in NZ at Molesworth Station, inland Marlborough, in 1947 (Flora of NZ 1988). No further records of *Salsola tragus* were found during the review.

Photo of *Salsola tragus* tumbleweed form displaying its ability to roll and disperse seed.

Source: Russ Kleinman, Western New Mexico University Department of Natural Sciences and the Dale A. Zimmerman Herbarium.

Recommendation: Request MPI separate *Salsola tragus* from *Salsola kali* in PBI and ONZPR. No further monitoring recommended.

7. Summary of recommendations

Based on the horizon scanning the following recommendations have been made. The SGRR Board should consider adding the following pests to SGRR's priority pest list:

- *Eurygaster integriceps* (Sunn pest)
- *Ostrinia nubilalis* (European corn borer)
- *Bulimulus sporadicus* (ghost snail). Continue to monitor. This recommendation is based purely on its similarities to the other gastropods on the SGRR priority pest list.

The following pests should be followed up with MPI for further consideration. These include:

- MPI to include Palmer amaranth in PBI as 'prohibited entry'
- MPI to include tall water hemp in PBI as 'prohibited entry'
- *Pyricularia oryzae* Triticum lineage (Wheat blast disease) to be provided to MPI's Emerging Risk System for further assessment.
- Request MPI separate *Salsola tragus* from *Salsola kali* in PBI and ONZPR based on its distinction at the subspecies and species level.

8. Updated SGRR Priority Pest Information

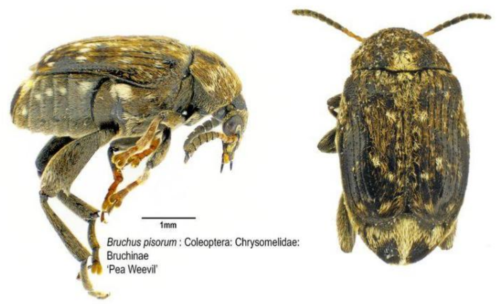
The horizon scan (31/08/2023–18/01/2026) assessed risks to the arable sector from pests already listed as SGRR priority pests. The scan focused on changes in distribution, regulatory status, or other notifiable findings, particularly where these could affect economic outcomes or yields. Updates for SGRR priority pests are provided in Table 2 and are reported in alphabetical order by scientific name. The SGRR Pest Specific Risk Assessment Methodology is included in Appendix 4 and is further detailed in the Seed & Grain Readiness and Response: Readiness Framework.

A range of sources was monitored to update the SGRR priority pest information, including International Seed Federation (ISF) notifications, MPI emerging risk reports, WTO notifications, EPPO and NAPPO pest alerts, international databases, and scientific literature (including Google Scholar).

Table 2: SGRR priority pests updated information with changes to distribution, regulatory status or other notifiable findings which may affect economic outcomes or crop yields

[8] ttps://www.mpi.govt.nz/dmsdocument/7111

Crop Group	Crop	Common Name (Pest)	Scientific Name (Pest)	Representative image	Pest Class	Regulatory Status	Unwanted	Notifiable	Distribution	Increased Regulation	Other (economic impact)
Cereals, Maize	Wheat	Wheat curl mite, WCM	*Aceria tosichella*	 Source: USDA	Mite	Regulated	Yes	No			Since 2025, research has found the economic impact of WCM is larger and more variable than previously thought because of: virus complexes, co-infections and climate effects. Genetic variation (cryptic lineages) is an area of increased studies. Studies have also focused on predictive modelling for biosecurity and economics and virus-mite interactions driving economic severity.
Cereals, Forage or turf seed	Barley, wheats, oats, red/white clover	Turnip moth	*Agrotis segetum*	 Source: Merle Shepard, Gerald R.Carner, and P.A.C Ooi, Bugwood.org	Insect	Regulated	Yes	No			Turnip moths are causing an increased uncertainty in farming systems because of their insecticide tolerance potential and regional survival ability under variable climates (Wang et al. 2024). Turnip moth control is becoming more difficult due to the pest's soil-dwelling behaviour and pesticide tolerance, resulting in increased spending on insecticides, monitoring, and the need for further investment in integrated pest management (IPM).

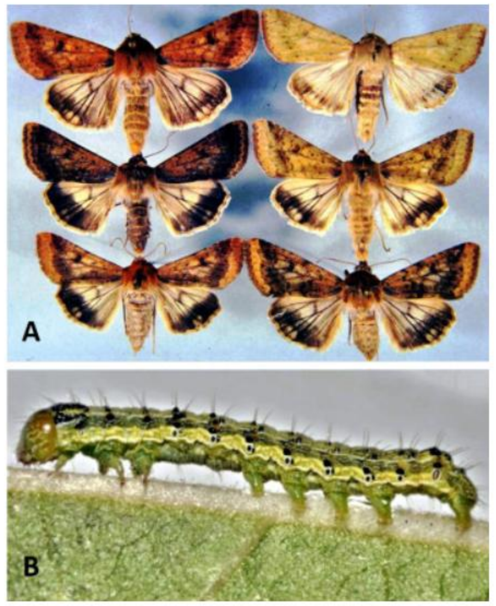
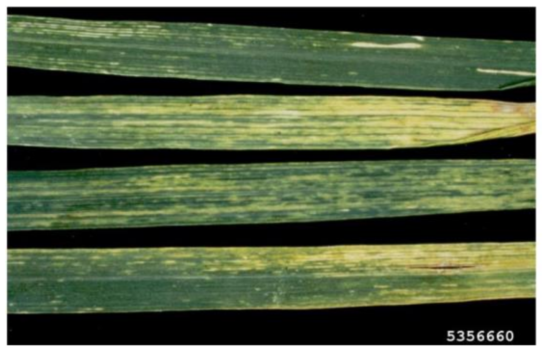
Crop Group	Crop	Common Name (Pest)	Scientific Name (Pest)	Representative image	Pest Class	Regulatory Status	Unwanted	Notifiable	Distribution	Increased Regulation	Other (economic impact)
Cereals	Barley, wheats, oat	Black grass	*Alopecurus myosuroides*	 Source: Kurt Stuber CCBY SA	Weed	Regulated	Yes	No	Localised detections in Canterbury in 2025 triggered renewed surveillance		Black-grass remains one of the most serious problems in winter cereal monoculture in Europe because of herbicide resistance to winter wheat control options (Papapanagiotou et al. 2025). A 2014 study combined national-scale density and resistance data with crop yield maps and an economic model to estimate that the annual cost of resistance in black-grass in England is £0.4bn in lost gross profit (2014 prices), and annual wheat yield loss due to resistance is 0.8 million tonnes (Varah et al. 2020). There have been several responses in NZ resulting in a cost to industry under GIA obligations.
Legume Crops	Peas	Pea weevil	*Bruchus pisorum*	 Source MPI: pea weevil	Insect	Regulated	Yes	No	NZ border interceptions continue – off shore or on-arrival fumigation required for pea consignments		Pea weevil detections are being investigated by BSI as part of a B3 project trialling low power X-ray technology and image analysis – 'Automated sensing technologies to detect concealed invertebrates'. This work is showing positive correlations in its ability to detect concealed invertebrates.

Crop Group	Crop	Common Name (Pest)	Scientific Name (Pest)	Representative image	Pest Class	Regulatory Status	Unwanted	Notifiable	Distribution	Increased Regulation	Other (economic impact)
Legume Crops	Beans	Chinese bruchid	*Callosobruchus chinensis*	 Source: Minden Pictures, 80110968	Insect	Regulated	Yes	No			The majority of studies focus on control of Chinese bruchid. A 2026 study found that the volatile compound trans-3-hexen-1-ol is strongly bound by an odorant-binding protein (OBP19) in *C. chinensis* antennae and elicits strong antennal and behavioural attraction which has the potential to be used in lure and kill strategies (Wang et al. 2026).
Cereals	Wheat	Mediterranean white snail vineyard snail	*Cernuella virgata*	 Source: WoRMS. Kapeller, Rudolf	Gastropod	Regulated	Yes	No			Research is focusing on research for better management and improved monitoring for economic costs. Precise, comprehensive economic impact models for *C. virgata* alone are rare, with most studies estimates incorporating multiple snail species that co-occur in agricultural systems. The Australian grain system estimates a loss of $170 million per year (Kosciolek et al. 2024), because of contamination, downgrading or rejection of grain and additional management and control expenses.

Crop Group	Crop	Common Name (Pest)	Scientific Name (Pest)	Representative image	Pest Class	Regulatory Status	Unwanted	Notifiable	Distribution	Increased Regulation	Other (economic impact)
Cereals	Wheat	conical snail pointed snail	*Cochlicella acuta*	 Source: 1185940475, iStock	Gastropod	Regulated	Yes	No			No obvious evidence of increased spread or changes to regulatory measures. Research is focused on management practices and integrated pest control (e.g., molluscicide use, cultural control). Extension guides still emphasise farm-level biosecurity to reduce human-assisted movement (GRDC, 2023).
Maize	Maize	Spotted stalk borer	*Chilo partellus*	 Source: Khan et al. 2020	Insect	Regulated	Yes	No			No obvious evidence of increased spread or changes to regulatory measures. Research is focused on: Genetic resistance breeding in maize (Kaur, et al. 2025) and sorghum (Prabhas et al. 2025) Field-based management options (Nega and Getu, 2025).
Maize	Maize	Goss' wilt of maize	*Clavibacter michiganensis* subsp. *nebraskensis* syn. *Clavibacter nebraskensis*	 Source: T. Jackson-Ziems, Nebraska-Lincoln University, USA	Bacteria	Regulated	Yes	No	Goss' wilt was recently reported in Mexico and South Africa.	Added to the EPPO Alert List in 2025 because of its potential to impact on maize in the EPPO region.	Concern around its increasing spread. There is no chemical treatment available to control Goss's wilt in the field. *C. nebraskensis*-resistant hybrids have been recently developed.

Crop Group	Crop	Common Name (Pest)	Scientific Name (Pest)	Representative image	Pest Class	Regulatory Status	Unwanted	Notifiable	Distribution	Increased Regulation	Other (economic impact)
Maize	Maize	Maize/corn leafhopper	*Dalbulus maidis*	 Adult and late instar nymphs of the corn leafhopper, Dalbulus maidis, vector of maize rayado fino virus. Source: Nault, 1980	Insect	Regulated	Yes	No			Recent work highlights the economic impact of *D. maidis* and notes increasing concern due to outbreaks and crop losses in countries like Brazil and Argentina; this reflects rising pest prominence rather than new introductions (Moya-Raygoza 2025). Maize leafhopper is a vector of maize pathogens, including corn stunt spiroplasma (*Spiroplasma kunkelii*), maize bushy stunt phytoplasma (MBSP), and maize rayado fino virus (MRFV). These diseases are transmitted in persistent, propagative manners, meaning the pathogen replicates in the insect's body (Moya-Raygoz, 2025).
Maize	Maize	Northern corn rootworm	*Diabrotica barberi*	 Source: R.L. Croissant, Bugwood.org	Insect	Regulated	Yes	No			No obvious evidence of increased spread or changes to regulatory measures. Research is focused on the entire corn rootworm complex (includes *D. virgifera virgifera*). In the US Northern corn rootworm continues to remain susceptible to many Bt proteins used in transgenic maize (Pereira et al. 2024).

Crop Group	Crop	Common Name (Pest)	Scientific Name (Pest)	Representative image	Pest Class	Regulatory Status	Unwanted	Notifiable	Distribution	Increased Regulation	Other (economic impact)
Maize	Maize	Western corn rootworm	*Diabrotica virgifera virgifera*	 Source: Klejdysz, Tomasz	Insect	Regulated	Yes	No			A recent study identified WCR as a vector of the bacterial disease (late-season decline) in maize caused by *Pantoea ananatis* (Obasa, K., & Santiago-González, 2025). Spatial risk modelling based on climate trends and maize distribution indicates in Europe WCR is projected to expand toward central and western regions under warming scenarios by mid-21st century (2034–2074 projections) (Grozea, 2025)
Maize	Maize	Brown marmorated stink bug	*Halyomorpha halys*	 A brown marmorated stink bug (*Halyomorpha halys*). Source: MPI BMSB	Insect	Regulated	Yes	Yes		Australia has revised its seasonal pest reporting questionnaires for vessels.	Recent surveys and distribution data show that *H. halys* continues to spread in Europe and North America, where it is now recognized as causing yield losses in fruit, nuts, and field crops, which remains central to economic assessments of its pest status (Noël et al. 2024)

Crop Group	Crop	Common Name (Pest)	Scientific Name (Pest)	Representative image	Pest Class	Regulatory Status	Unwanted	Notifiable	Distribution	Increased Regulation	Other (economic impact)
Maize	Maize	Corn earworm	*Helicoverpa zea*	 Source: Sloderbeck, Kansas State University, Department of Entomology	Insect	Regulated	Yes	No			*H. zea* continues to be a leading pest of corn, cotton, tomato, and other major crops across the Americas, with substantial economic losses due to yield damage and control costs. Its evolving resistance to major control tools (Bt crops and insecticides) increases management costs and risk of crop loss, raising its economic significance even where regulatory status hasn't changed (Taylor et al 2024).
Cereals	Wheat	HPV	*High plains wheat mosaic virus*	 Source: William M. Brown Jr., Bugwood.org	Virus	Regulated	Yes	No			No obvious distribution or recent regulatory changes. A USDA: ARS project was initiated in 2024 to characterise seed transmission rates and synergistic interactions between cereal viruses (e.g., High plains wheat streak mosaic virus, Wheat streak mosaic virus) and to assess epidemiology and management strategies. This project is set to finish September 2026. It is intended to help provide a better understanding of seed transmission and epidemiology (ARS, 2024).

Crop Group	Crop	Common Name (Pest)	Scientific Name (Pest)	Representative image	Pest Class	Regulatory Status	Unwanted	Notifiable	Distribution	Increased Regulation	Other (economic impact)
Forage or turf seed	Lucerne	Alfalfa weevil	*Hypera postica*	 Source: MPI alfalfa weevil	Insect	Regulated	Yes	No			A 2025 study documented the presence and seasonal distribution of H. postica in alfalfa seed fields in southern Alberta, Canada, where it is of economic importance for seed producers (Chennamkulangara et al. 2025). The study found high densities of weevils in seed crops can influence yield, quality, and pest management costs in a sector where premiums and contracts depend on seed quality and purity.
Maize	Maize	Maize lethal necrosis (MLN) disease	*Maize chlorotic mottle virus* (MCMV)	 Source: Nelson, Bewbaker and Hu, Department of Tropical Plant and Soil Sciences	Virus	Regulated	Yes	No			A 2024 study on MLN confirmed that resistance to MCMV and potyviruses significantly affects disease severity, highlight the need for continuing breeding for resistance in commercial maize production (Gentzel et al 2024). The study showed that lines resistant to MCMV had dramatically lower virus levels early in infection, which has implications for yield and disease management costs in breeding programs and seed production systems (Kavai et al 2025).

Crop Group	Crop	Common Name (Pest)	Scientific Name (Pest)	Representative image	Pest Class	Regulatory Status	Unwanted	Notifiable	Distribution	Increased Regulation	Other (economic impact)
Maize	Maize, wheat, sorghum	SCMV	*Sugarcane mosaic virus*	 Source: Sholeh et al. 2019	Virus	Regulated	Yes	No			This review found no obvious evidence of expanding distribution for Sugarcane mosaic virus. Recent research has instead focused on host susceptibility (Chen et al. 2025) and strain complexity (Vamsi et al. 2023, Taheri et al. 2025) to help mitigate the impact of SCMV.
Maize	Maize	Rio IV Maize virus	*Mal de Rio Cuarto Virus*	 Source: Carpane et al. 2012	Virus	Regulated	Yes	No	EPPO lists MRCV as present in Argentina but absent or uncertain in neighbouring regions (e.g., Brazil, Uruguay).		Research is focused on continuing to evaluate maize hybrids for tolerance / resistance (INTA, 2021).
Legume Crops	Beans, Peas	Legume pod borer	*Maruca vitrata*	 Source: Ko Ko Maung, Bugwood.org	Insect	Regulated	Yes	No			Pantropical insect pest of leguminous crops. Research is focusing on management practice and resistance development in the legume trade (Chandana et al. 2026, Vijayakumari et al. 2025), Yadav et al. 2025).

Crop Group	Crop	Common Name (Pest)	Scientific Name (Pest)	Representative image	Pest Class	Regulatory Status	Unwanted	Notifiable	Distribution	Increased Regulation	Other (economic impact)
Maize	Maize	Stalk rot/leaf blight	*Pantoea ananatis*	 Source: Pérez et al. 2009	Bacteria	Regulated	Yes	No			Recent plant pathology research reports leaf blight caused by *P. ananatis* in rice breeding plots in the U.S. in 2024, indicating active pathogenic episodes and ongoing epidemiological interest (de Paula et al. 2026).
Maize	Maize	Bacterial wilt	*Pantoea stewartii*	 Source: Alison Robertson, Bugwood.org	Bacteria	Regulated	Yes	No	First report of *Pantoea stewartii* subsp. *stewartii* in Iran (Alvandi et al. 2025)	Mexico's NPPO officially confirmed absence from *Pantoea stewartii* subsp. *stewartii* and officially invalidated earlier records of bacterial wilt of maize (EPPO, 2025)	A recent study undertook an inter-laboratory comparative assessment of molecular tests and genome analysis (of Italian strains) and helped enhance the understanding of molecular methods for diagnosing and identifying pathogens in maize seeds (Scala et al. 2025)

Crop Group	Crop	Common Name (Pest)	Scientific Name (Pest)	Representative image	Pest Class	Regulatory Status	Unwanted	Notifiable	Distribution	Increased Regulation	Other (economic impact)
Maize	Maize	Downy mildew	*Peronosclerospora philippinensis*	 Source: Bob Kemerait, University of Georgia, Bugwood.org	Fungi	Regulated	Yes	No		The USDA/APHIS formally removed *P. philippinensis* from the Plant Pathogen Select Agent List at the end of 2024. This relaxes some bioterrorism-related plant health regulations previously applied (e.g. containment, reporting)	
Maize	Maize	Tar spot	*Phyllachora maydis*	 Source: Ed Zaworski, Bugwood.org	Fungi	Regulated	Yes	No	Distribution is continuing to expand within the Americas, particularly in the U.S. corn belt and into new states		A 2026 review on the genetic and molecular interactions between *P. maydis* and maize highlighted that, despite significant yield losses and geographic expansion, robust genetic resistance sources in maize are still lacking and that *P. maydis* continues to pose an emerging threat and recommended further research into host susceptibility and pathogen virulence mechanisms (Rogers et al. 2026).

Crop Group	Crop	Common Name (Pest)	Scientific Name (Pest)	Representative image	Pest Class	Regulatory Status	Unwanted	Notifiable	Distribution	Increased Regulation	Other (economic impact)
Vegetable seed	Brassicas	Cruciferae flea beetle	*Phyllotreta cruciferae*	 Source: Whitney Cranshaw, Colorado State University, Bugwood.org	Insect	Regulated	Yes	No			Research publications note increasing restrictions on certain insecticides (e.g., older systemic neonicotinoids in the EU) and a general shift toward integrated pest management approaches as chemical options become more regulated and less effective (Mittapelly et al. 2024)
Cereals	Wheat	Larger grain borer, LAGB	*Prostephanus truncatus*	 Source: Russell IPM	Insect	Regulated	Yes	No	First record in Botswana (2024), continued spread in Ethiopia		Recent modelling suggested LAGB would survive in Oceania with a potential suitability of .25 (West Coast to 1 in the warmer North Island) (Harman, 2024)
Vegetable seed	Brassicas	Cabbage stem flea weevil	*Psylliodes chrysocephala*	 Source: AJ Cann, Knighton	Insect	Regulated	Yes	No			Recent studies (2024–2026) emphasise increasing pest pressure rather than geographic expansion, with CSFB described as a key pest of oilseed rape in Europe (Kettle et al. 2025). This is the result of restrictions and bans on neonicotinoid seed treatments.

Crop Group	Crop	Common Name (Pest)	Scientific Name (Pest)	Representative image	Pest Class	Regulatory Status	Unwanted	Notifiable	Distribution	Increased Regulation	Other (economic impact)
Maize	Maize	Cornstunt spiroplasma	*Spiroplasma kunkelii*	 Source: M Hunter, NYS IPM	Bactria	Regulated	Yes	No			The risk of cornstunt spiroplasma is tied primarily to presence of insect vectors rather than seed or commodity trade (Cornell, 2024). Long-distance movement of the insect vector (*Dalbulus maidis*) via atmospheric transport/storm systems (Toloy, 2024).
Cereals	Wheat	Karnal bunt	*Tilletia indica*	 Source: Ruben Durán, Washington State University, Bugwood.org	Fungi	Regulated	Yes	Yes	In the USA (Arizona) regulated areas are being reduced over time as surveillance shows low persistence of KB		KB is a fungal pest that affects wheat quality. In the US this plant disease is regulated because trading partners require that U.S. wheat be certified as grown in areas free of KB. Recent studies have focused on the future spread potential of KB based on climate change as a key concern.
Cereals	Barley, oats, grass seed crops	European crane fly	*Tipula paludosa*	 Source: Dani Barchana, Bugwood.org	Insect	Regulated	Yes	No	First record in Morocco (and North Africa) (Starkevich et al. 2025).		*Tipula paludosa* is known as agricultural pest in Europe whose larvae damage pastures, spring cereals, corn, Brassica crops, other vegetables and ornamentals. *Tipula paludosa* is native to northern Europe. It is considered an invasive species in the US and Canada.

Crop Group	Crop	Common Name (Pest)	Scientific Name (Pest)	Representative image	Pest Class	Regulatory Status	Unwanted	Notifiable	Distribution	Increased Regulation	Other (economic impact)
Legume Crops	Peas	Pea early browning virus	*Tobravirus: Pea early browning virus*	 Source: CABI, Database	Virus	Regulated	Yes	No			This review found no obvious evidence of changes for Pea early browning virus distribution or regulation.
Cereals, maize	Barley, wheat, maize	Khapra beetle	*Trogoderma granarium*	 Source: James D. Young, USDA APHIS PPQ, Bugwood.org	Insect	Regulated	Yes	Yes		Australia has updated import conditions. Pest risk analysis (PRA) work continues into 2025 and 2026 to assess pathways and refine ongoing measures. In Nov 2025 – khapra beetle was detected in Australia in imported nappy pants.	Recent modelling studies indicate that T. *granarium* potential habitat suitability is increasing globally, particularly under climate change scenarios, which could lead to expansion into areas with major grain production such as North America and Europe (Harman et al., 2025). Interceptions at ports of entry have increased, suggesting human-mediated spread remains highly active.

Crop Group	Crop	Common Name (Pest)	Scientific Name (Pest)	Representative image	Pest Class	Regulatory Status	Unwanted	Notifiable	Distribution	Increased Regulation	Other (economic impact)
Cereals	Barley, wheat	Warehouse beetle	*Trogoderma variabile*	 Source: Pest and Diseases Image Library (PaDIL) , Bugwood.org	Insect	Regulated	Yes	No			There have been no major regulatory or distribution changes for *T. variabile*. Recent studies have focused on pest management such as preventing infestation (e.g., novel packaging repellents) and integrated pest management practices (Han et al. 2024) rather than documenting large economic shifts.
Forage or turf seed	Polyphagous	Spodoptera Species	Various	 Source: Frank Peairs, Colorado State University, Bugwood.org	Insect	Regulated	Yes	No	*Spodoptera frugiperda* recorded in western Iran (Lorestan Province) (Asadollah et al. 2026). FAW is established in NZ.		Most publications are FAW focused. Studies emphasise that in regions like India, environmental and climatic variables interact to shape the distribution and survival of FAW, posing an ongoing threat to major cereals like maize and potentially other staple grains (Murugasridevi et al. 2025).

9. References

Agricultural Research Service (ARS), U.S. Department of Agriculture. (2024). *Research project: Seed transmission, epidemiology, and management of high plains wheat mosaic and wheat streak mosaic viruses in sweet corn* (USDA ARS Project No. 5082-22000-002-011-R).

Alfayyadh, M., Najim, S., & Khalid, J. (2002). Description of sunn pest (Hemiptera: Scutelleridae) and *Camponotus* spp. (Hymenoptera: Formicidae) as their predator from the wheat fields of Thi-Qar Province, southern Iraq. *IOP Conference Series: Journal of Physics, 1664*, 012142. https://doi.org/10.1088/1742-6596/1664/1/012142

Alvandi, H., Taghavi, S. M., Zarei, S., Ansari, M., Heidari, M., Fazliarab, A., Aeini, M., Portier, P., & Osdaghi, E. (2025). Monitoring the occurrence and distribution of Stewart's wilt of maize in Iran. *Plant Disease*. Advance online publication. https://doi.org/10.1094/PDIS-03-25-0509-SR

Cornell Cooperative Extension. (2024). *Corn stunt: A new disease and insect vector for new regions*.

Costea, M., Weaver, S. E., & Tardif, F. J. (2005). The biology of invasive alien plants in Canada. 3. *Amaranthus tuberculatus*. *Canadian Journal of Plant Science, 85*, 507–522.

de Paula, S., Belmar, S., Giebler, M., Ferreira, A. C., Ronning, B., Jia, Y., Pedrozo, R., Leach, J. E., Luna, E., & Nicolli, C. (2026). Unraveling the dynamics of *Pantoea ananatis*. *Phytopathology*. Advance online publication. https://doi.org/10.1094/PHYTO-12-25-0394-SA

Department of Agriculture, Fisheries and Forestry (DAFF). (2025a). *Management of vessels during the brown marmorated stink bug (BMSB) risk season*.

Department of Agriculture, Fisheries and Forestry (DAFF). (2025b). *Khapra beetle measures: Update to pest risk analysis*.

Drakulic, J., Bruce, T. J. A., & Ray, R. V. (2017). Direct and host-mediated interactions between *Fusarium* pathogens and herbivorous arthropods in cereals. *Plant Pathology, 66*, 3–13. https://doi.org/10.1111/ppa.12546

Dusek, J. (1974). The bionomics of some species of blossom flies (Anthomyiidae, Diptera).

Edde, P. A. (2022). Field crop arthropod pests of economic importance: *Eurygaster integriceps*. Elsevier.

EPPO. (2021a). *Amaranthus tuberculatus* datasheet. EPPO Global Database.

EPPO. (2021b). *Erthesina fullo* found in Albania. EPPO Reporting Service.

EPPO. (2025a). *Lagria villosa* quick scan.

EPPO. (2025b). Wheat blast disease (*Pyricularia oryzae* Triticum lineage). EPPO Alert List.

EPPO. (n.d.). *Clavibacter nebraskensis*—Goss's bacterial wilt and leaf blight. EPPO Global Database.

Esker, P. D., Obrycki, J., & Nutter, F. W. (2002). Temporal distribution of *Chaetocnema pulicaria* populations in Iowa. *Journal of Economic Entomology, 95*(4), 739–747.

Esker, P. D., & Nutter, F. W. (2002). Assessing the risk of Stewart's disease of corn. *Phytopathology, 92*(6), 668–670.

Foundation for Arable Research. (2025). *On-farm biosecurity: Invasive weeds in maize systems*.

Gagnon, A., & Baute, T. (2024). *Ostrinia nubilalis* biological control programmes in Canada, 2013–2023.

Gautam, S., & Gadhave, K. R. (2025). Impact of wheat resistance genes on wheat curl mite fitness and wheat streak mosaic dynamics. *Viruses, 17*(7), 1010. https://doi.org/10.3390/v17071010

Gentzel, I. N., Paul, P., Wang, G. L., & Ohlson, E. W. (2024). Effects of maize chlorotic mottle virus resistance. *Phytopathology, 114*(2), 484–495. https://doi.org/10.1094/PHYTO-05-23-0171-R

Global Invasive Species Database. (2026). *Salsola tragus* species profile.

Grains Research and Development Corporation. (2023). *Nail the snails: A national practical guide*.

Grozea, I. (2025). Predicting the potential spread of *Diabrotica virgifera virgifera*. *Ecological Modelling*.

Han, G. D., Yeo, S., Moon, T., Kim, J., & Na, J. (2024). Packaging methods to protect against *Trogoderma variabile*. *Journal of Stored Products Research, 106*, 102287. https://doi.org/10.1016/j.jspr.2024.102287

Harman, R. R., Morrison, W. R., Ludwick, D., & Gerken, A. R. (2024). Predicted range expansion of *Prostephanus truncatus*. *Journal of Economic Entomology, 117*(4), 1686–1700. https://doi.org/10.1093/jee/toae085

Harman, R. R., Morrison, W. R., Altunç, Y. E., Athanassiou, C. G., & Gerken, A. R. (2025). Increasing global risk of khapra beetle invasion. *Scientific Reports, 15*, 26064. https://doi.org/10.1038/s41598-025-11690-8

Hosseini-Chegeni, A., Mirderikvand, M., & Tavakoli, M. (2026). Molecular and haplotype evidence of fall armyworm invasion. *Journal of Asia-Pacific Entomology, 29*(2), 102543. https://doi.org/10.1016/j.aspen.2026.102543

Jiao, X., Long, M., Li, J., Yang, Q., & Liu, Z. (2023). Invasive history of *Amaranthus palmeri*. *Agronomy, 13*, 2498. https://doi.org/10.3390/agronomy13102498

Kaur, R., Kaur, G., Ashmita, N., Jindal, J., Kumar, R., Kumar, P., Vikal, Y., & Sharma, P. (2025). Genomic regions associated with *Chilo partellus* resistance. *Frontiers in Genetics, 16*. https://doi.org/10.3389/fgene.2025.1577830

Khan, Z., Khan, M. S., Ain, Q. U., et al. (2020). Chemical control of *Chilo partellus*. *International Journal of Tropical Insect Science, 40*, 1–12. https://doi.org/10.1007/s42690-019-00044-3

Manaaki Whenua – Landcare Research New Zealand Ltd. (2026). *Yellow spotted stink bug – Erthesina fullo*.

McAlpine, K. G., & Howell, C. J. (2024). *List of environmental weeds in New Zealand 2024*. Department of Conservation.

Ministry for Primary Industries. (2023a). *Registers and lists for pests and diseases*.

Ministry for Primary Industries. (2023b). *National interest pest responses programme*.

Murugasridevi, K., Manivasagam, V. S., & Manalil, S. (2025). Spatial prediction of *Spodoptera frugiperda* expansion. *Scientific Reports, 15*, 38632. https://doi.org/10.1038/s41598-025-22589-9

Navia, D., de Mendonça, R. S., Skoracka, A., et al. (2013). Wheat curl mite and transmitted viruses. *Experimental and Applied Acarology, 59*, 95–143. https://doi.org/10.1007/s10493-012-9633-y

Nega, A., & Getu, E. (2025). Evaluation of plant products against *Chilo partellus*. *PLoS ONE, 20*(4), e0319097. https://doi.org/10.1371/journal.pone.0319097

New Zealand Plant Conservation Network. (n.d.). *Exotic weeds and invasive plants in New Zealand*.

Obasa, K., & Santiago González, J. (2025). Corn rootworm as vectors of *Pantoea ananatis*. *Crops, 5*(5), 74.

Opoku, N. (2012). *Study of Fusarium langsethiae infection in UK cereals* (Doctoral thesis, Harper Adams University). Harper Adams University Repository.

Papapanagiotou, A. P., Vasilakoglou, I., Alvanou, M. V., et al. (2025). Blackgrass resistance. *Genes, 16*(10), 1169. https://doi.org/10.3390/genes16101169

Pérez-y-Terrón, R., Cepeda Villegas, M. A., Cuellar, A., et al. (2009). Detection of *Pantoea ananatis* in Mexico. *Australasian Plant Disease Notes, 4*, 96–99.

Rabelo, M. M., Dimase, M., & Paula Moraes, S. V. (2022). Ecology of invasive land snail. *Frontiers in Insect Science, 2*, 1056545. https://doi.org/10.3389/finsc.2022.1056545

Rogers, A., Jaiswal, N., Caldwell, D. L., et al. (2026). Tar spot pathogen interactions. *Molecular Plant-Microbe Interactions*. Advance online publication. https://doi.org/10.1094/MPMI-01-26-0009-IRW

Schattman, R. E., Merrill, S. C., & Tracy, W. F. (2024). Climate vulnerability of corn crops. *Environmental Entomology, 53*(6), 1102–1110. https://doi.org/10.1093/ee/nvae099

Sholeh, A. Sugiharto B. and Hardian S. A., 2019. Monitoring Sugarcane mosaic virus (SCMV) on Recent Sugarcane Varieties in East Java, Indonesia. Journal of Applied Sciences, 19: 647-653.

Snihur, H., Shevchenko, T., Shevchenko, O., & Kyrychenko, A. (2025). Seed transmission in cereal viruses. *Plant Protection Science, 61*, 201–221.

Taylor, K. L., Quackenbush, J., Lamberty, C., et al. (2024). Polygenic response to Bt crops. *BMC Genomics, 25*, 1247. https://doi.org/10.1186/s12864-024-1247

Van Eeden, Z. (2025). Biological control of *Agrotis segetum*. *African Entomology*. https://doi.org/10.17159/2254-8854/2025/a23652

Varah, A., Ahodo, K., Coutts, S. R., et al. (2020). Costs of human-induced evolution. *Nature Sustainability, 3*, 63–71. https://doi.org/10.1038/s41893-019-0450-8

Verloove, F. (2019). *Amaranthus tuberculatus*. Botanic Garden Meise.

Vijayakumari, N., Shanthi, M., Anusha, N., et al. (2025). Insecticide resistance in *Maruca vitrata*. *Legume Research, 48*(4).

Wang, P., Jin, M., Wu, C., et al. (2024). Population genomics of *Agrotis segetum*. *BMC Biology, 22*, 42. https://doi.org/10.1186/s12915-024-01844-x

Wang, Z.-Q., An, J.-Z., Liu, Q., et al. (2026). Attractants for *Callosobruchus chinensis*. *Pesticide Biochemistry and Physiology, 216*, 106790. https://doi.org/10.1016/j.pestbp.2025.106790

Yadav, T., Chaudhary, A. K., Kumar, P., et al. (2025). Seasonal incidence of insect pests on cowpea. *Journal of Advances in Biology & Biotechnology, 28*(8), 1167–1174.

Appendix 1: Import pathways of interest with no interception records for the period 31/08/2023 to 19/06/2025

Import pathways of interest with no interception records for the period 31-8-2023 until 19-06-2025	Examples of common names	PBI requirements (Seed for sowing import requirements 155.02.05 under)
Achillea millefolium	yarrow	Basic
Agropyron cristatum	crested wheat grass	Agropyron
Agrostis capillaris	brown top	Agrostis
Agrostis stolonifera	creeping bent grass	Agrostis
Agrostis tenuis	common bent grass	Agrostis
Allium ampeloprasum	wild leek	Basic
Allium porrum	leek	Basic
Arachis hypogaea	peanut	Arachis hypogaea
Barbarea verna	land cress	Basic
Brassica fruticulosa	Mediterranean cabbage	Basic
Brassica japonica	mibuna, mizuna	Basic
Brassica nigra	mustard	Basic
Brassica oxyrrhina	smooth-stemmed turnip	Basic
Brassica tournefortii	Asian mustard, pale cabbage	Basic
Bromus auleticus	grass	Agropyron
Bromus catharticus	brome grass	Agropyron
Bromus coloratus	coloured brome	Agropyron
Bromus stamineus	grass	Agropyron
Bromus tectorum	cheatgrass	Agropyron

Cicer arietinum	chickpea, garbanzo	Cicer
Cichorium intybus	chicory, witloof	Basic
Citrullus lanatus	watermelon	Cucumis
Cucumis melo	honeydew melon, melon, rockmelon, musk melon	Cucumis
Cucumis sativus	cucumber, gherkin	Cucurbitaceae
Cucurbita maxima	giant pumpkin, marrow, pumpkin, squash	Cucurbitaceae
Cucurbita moschata	butternut, pumpkin, squash	Cucurbitaceae
Cucurbita pepo	courgette, pumpkin, scallopini, squash, zucchini	Cucurbitaceae
Cynosurus cristatus	crested dog's tail	Basic
Echinochloa crus-galli	cockspur grass, barn grass, barnyard grass, Echinochloa colona	Echinochloa
Festuca arundinacea syn. Lolium arundinaceum	tall fescue	Agropyron
Festuca gigantea	giant fescue, Lolium giganteum	Agropyron
Festuca glauca	blue fescue	Agropyron
Festuca trachyphylla	hard fescue	Agropyron
Glycine max	soybean	Glycine
Holcus lanatus	Yorkshire fog	Agropyron
Lablab purpureus	Dolichos lablab, hyacinth bean	Lablab
Lathyrus sativus	Indian pea	Basic
Linum usitatissimum	flax, linseed	Linum usitatissimum
Lobularia maritima	sweet alyssum	Basic
Lolium x hybridum	hybrid rye grass	Agropyron

Lotus corniculatus	bird's-foot trefoil	Lotus
Lotus pedunculatus	big trefoil, greater bird's-foot-trefoil	Lotus
Nasturtium officinale	watercress, yellowcress	Basic
Panicum capillare	Witchgrass	Panicum
Pennisetum clandestinum	green millet, kikuyu grass	Echinochloa
Pennisetum glaucum	green millet	Echinochloa
Phalaris aquatica	harding grass	Agrostis
Phalaris canariensis	canary grass	Agrostis
Phaseolus spp.	Bean	Phaseolus
Phleum pratense	Timothy	Agropyron
Plantago major	broadleaf plantain	Basic
Rhamphospermum arvense	charlock mustard, field mustard, wild mustard	Basic
Secale cereale	rye, ryecorn	Agropyron
Sinapis alba syn. *Brassica alba*	white mustard	Basic
Solanum lycopersicum	tomato	Solanum lycopersicum
Solanum melongena	Eggplant	Solanum
Vigna spp.	Beans	Vigna

Appendix 2: Definitions

A1 and A2 Quarantine Pest: The A1 and A2 Lists include the pests which EPPO recommends to be regulated as quarantine pests, in the national phytosanitary regulations of EPPO Member Countries. These recommendations are based on appropriate documentation, and since the 2000s on Pest Risk Analyses (PRAs).

Basic seed: Refers to seed listed in the Plant Biosecurity Index under "Import Specification for Seed for Sowing". These seed only need to meet Part 1 of the Seeds for sowing IHS.

EPPO: European Plant Protection Organisation

Growing season inspection: Visual inspection by a person authorized by the NPPO during period or periods of the year when plants actively grow in an area, place of production or production site.

IPPC: International Plant Protection Convention, as deposited with FAO in Rome in 1951 and as subsequently amended [FAO, 1990].

IHS: Seeds for sowing: Import Health Standard (155.02.05): MPI maintained import requirements for seed for sowing

ISPM: International Standard for Phytosanitary Measures are the international standards adopted by the Conference of FAO, the Interim Commission on Phytosanitary Measures or the Commission on Phytosanitary Measures, established under the IPPC [CEPM, 1996; revised CEPM, 1999].

MPI Schedule of Regulated (Quarantine Weed Seed): MPI maintained list detailing weed seed of quarantine concern.

Non-regulated pest: A pest listed in ONZPPR which requires no further action upon detection.

Notifiable Organism: Pests and diseases that must be reported to MPI, if spotted in New Zealand. As defined here: https://www.mpi.govt.nz/dmsdocument/6403-Biosecurity-Notifiable-Organisms-Order-2016

Official New Zealand Pest Register: MPI database which informs on the quarantine status for an organism as either regulated or non- regulated for New Zealand.

Officially tested: Tested by a laboratory approved by the exporting country NPPO if performed offshore or by the importing country NPPO if performed on-shore

Pelleted seed: Seed encased in a man-made nutritive or protective covering (refer to Appendix 4 in Seeds for Sowing: Import Health Standar)

Plant Biosecurity Index: MPI search system for identifying the status of plant species for importing to New Zealand.

Unwanted Organism: organisms determined to be capable of causing harm to natural or physical resources or human health) in New Zealand. Refer to Ministry for Primary Industries list: https://www.mpi.govt.nz/biosecurity/about-biosecurity-in-new-zealand/registers-and-lists/

Regulated Pest: A quarantine pest or a regulated non- quarantine pest listed in ONZPR as being regulated for New Zealand. Note: If an intercepted organism is not listed in ONZPR, the NPPO must contact MPI to establish the regulatory status.

Appendix 3: Caveats and considerations for the interception data

An organism's regulatory status may be regulated, non-regulated, not assessed or unknown. This is based on the regulatory status information for the organism and is available in the Official New Zealand Pest Register (ONZPR). The regulatory status of an organism can change over time because of new information, and so the classifications in this report may no longer reflect the current ONZPR classification.

Interception information may not be fully accurate because of limitations in the way the data is provided, stored or can be extracted from MPI's import database.

Not all interceptions go for taxonomic identification, as some interceptions importers are offered the ability to treat consignments instead of laboratory identification. This situation may not be captured in the interception data provided by MPI.

Additionally, the data does not capture those consignments that entered NZ and were released without incident.

Not all pests and diseases that undergo taxonomic identification can be classified to a species level. If an intercepted organism can only be identified to a family or genus level it will often be treated as regulated based on the inability to confirm its non-regulated status. This can over-inflate the actual non-compliance rates of a pathway. A summary of MPI's list of genera or family including notifiable, high impact, or otherwise significant species is included in Appendix 1.

The Seeds for Sowing Import Health Standard provides the option for seed lots to be tested on shore in New Zealand at an MPI-approved laboratory as a risk management measure for many quarantine pests. The interception data records include pest interceptions on seed lots which have gone for onshore testing to meet the standard (e.g. pea weevil in pea consignments). The detection of these pests is an example of the onshore testing measures working and does not necessarily represent a pathway failure.

If a quarantine pest is detected in a seed lot, the lot will be rejected and either re-shipped or destroyed, it will not be released into NZ, unless there is a measure that can be applied onshore to effectively manage the risk (for example, fumigation performed onshore to manage risk from insect pests).

The interception data did not include any import quantity information, so no comment has been made about the volume of seed imported for each pathway. The data was used to understand general trends only.

The interception data provided was anonymised, with no country and no importer information provided. This means that the data was only used to understand general trends.

This report does not consider contaminant crop seeds detected within a seed lot. MPI classifies crop contaminants as 'non-regulated' detections, meaning a seed lot would be released without further measures applied if no 'regulated' pests were detected. Some of these crop contaminants have a unique IHS schedule with specific phytosanitary measures. It is unknown what risk contaminant crops represent, it is assumed contaminant crops will be removed by the grower during general agricultural practices e.g. rouging, agri-chemical applications etc.

For example, tomato or capsicum contaminant seeds in a *Brassica oleracea* seed lot.

While the utmost care has been taken when analysing and interpreting data the author acknowledges that some analysis errors may have occurred.

Appendix 4 SGRR Pest Specific Risk Assessment Methodology

Methodology

1. Generate an initial pest list associated with specific crop hosts (or group of crops).

2. If necessary, triage the initial pest list to create a short-list. Reasons for removing pests from the initial list may include: a lack of information, narrow host/crop range, impact is on lower value/importance crops, considered to be low risk.

3. Complete risk assessment for each pest by reviewing pest biology and scanning the literature for information on host crops, entry potential, establishment potential, spread potential, and impact. Information is obtained from the scientific literature, international and national databases, datasheets (pest risk analyses), industry and government websites, and other sources. Information used to assess the example pests is shown in Appendix 4.

4. Allocate a score (Low, Medium, High) to each risk parameter (entry, establishment, spread, impact) based on a qualitative decision of the technical information.

5. Determine the Likelihood score and Overall Risk score by combining risk parameter scores using the Qualitative Risk Analysis matrices in Table 5. Descriptive definitions for Likelihood score and Overall Risk are given in Table 5.

6. Determine pest rankings and relative risks based on Overall Risk scores. This method of pest risk assessment was developed by Biosecurity Australia, and is a well-tested approach which has been used for the horticulture sector and adapted for the New Zealand context.

Table 5: Description of qualitative risk parameters for pest-specific risk assessment

<table>
<tr><th>Risk Parameter</th><th>Description</th><th>Scores</th></tr>
<tr><td>Number of host crops</td><td>Number of hosts affected by a pest</td><td>Numerical value</td></tr>
<tr><td>Entry potential</td><td>Assesses the potential of a pest, disease or weed to enter New Zealand taking into account any existing controls at the border (e.g. import health standards, pathways).</td><td>High
Medium
Low</td></tr>
<tr><td>Establishment potential</td><td>Assesses the potential for a pest, disease or weed to establish in New Zealand. Potential may be determined by host availability, alternative hosts, vectors, suitability of the environment, reproductive strategy, existing cultural practices and control measures.</td><td>High
Medium
Low</td></tr>
<tr><td>Spread potential</td><td>Assesses the potential for the pest or disease to spread following establishment on a host plant (or plants) to other susceptible host plants. Factors considered might include suitability of the environment, presence of natural barriers, potential for movement with commodities or by vectors, potential vectors, and potential natural enemies of the pest.</td><td>High
Medium
Low</td></tr>
<tr><td>Likelihood score</td><td>Obtained by combining the descriptive scores for (Entry×Establishment) × Spread, using the Qualitative Risk Matrix for Likelihood Score:
<table>
<tr><th colspan="5">Qualitative Risk Analysis Matrix – Likelihood Score</th></tr>
<tr><th rowspan="2">Likelihood</th><th colspan="4">Combine in order of entry, establishment and spread</th></tr>
<tr><th>High</th><th>Medium</th><th>Low</th><th>Negligible</th></tr>
<tr><td>High</td><td>High</td><td>Medium</td><td>Low</td><td>Negligible</td></tr>
<tr><td>Medium</td><td>Medium</td><td>Low</td><td>Low</td><td>Negligible</td></tr>
<tr><td>Low</td><td>Low</td><td>Low</td><td>Extremely low</td><td>Negligible</td></tr>
<tr><td>Negligible</td><td>Negligible</td><td>Negligible</td><td>Negligible</td><td>Negligible</td></tr>
</table>
Descriptive definitions of Likelihood:
High: event would be very likely to occur
Medium: event would occur with an even probability
Low: event would be unlikely to occur
Extremely low: event would be very unlikely to occur
Negligible: event would almost certainly not occur</td><td>High
Medium
Low
Extremely low
Negligible</td></tr>
<tr><td>Impact</td><td>Assesses the economic, environmental and social consequences of a pest or disease to affect an industry or the wider New Zealand economy. Examples might be taken from overseas where similar pest or disease incursions have occurred. Impact assessment includes market access impacts, ability for mitigation or control, and other factors.

Impact assessment takes into consideration the economic value of the crop (or crops) affected by the pest, disease, or weed. For example, if the pest affects most seed and grain crops then its impact would score at the high end of the scale, while a pest affecting fewer crops would score at the low end.</td><td>High
Medium
Low</td></tr>
</table>