USDA Animal and Plant Health Inspection Service
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Importation of turban squash (*Cucurbita maxima*) from the Republic of Korea into the United States for consumption

A Qualitative, Pathway Initiated Pest Risk Assessment

Version 1

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Executive Summary

The purpose of this report is to assess the pest risks associated with importing commercially produced fresh fruit of turban squash *Cucurbita maxima* (Cucurbitaceae), from the Republic of Korea into the United States for consumption.

Based on the internal request submitted by Plant Protection and Quarantine (PPQ), we considered the pathway to include the fresh fruit, with a stem of one inch or less in length, of *Cucurbita maxima* (turban squash) for consumption. The fruit will be free of soil and debris and fruit that is damaged or obviously infested will be culled. The pest risk ratings depend on the application of all conditions of the pathway as described in this document; fresh turban squash fruit produced under different conditions were not evaluated and may pose a different pest risk.

We used scientific literature, port-of-entry pest interception data, and information from the government of the Republic of Korea to develop a list of pests with quarantine significance for the United States. These are pests that occur in the Republic of Korea on any host and are associated with the commodity plant species anywhere in the world.

The following organisms are candidates for pest risk management because they have met the threshold for unacceptable consequences of introduction and can follow the commodity import pathway.

Pest type	Taxonomy	Scientific name	Likelihood of Introduction
Insect	Diptera: Tephritidae	*Bactrocera depressa* (Shiraki)	Medium
Virus	Martellivirales: Virgaviridae	*Tobamovirus viridimaculae* (cucumber green mottle mosaic virus)	Low

The detailed examination and choice of appropriate phytosanitary measures to mitigate pest risk are addressed in a separate document.

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1. Introduction

1.1. Background

The purpose of this report is to present PPQ's assessment of the pest risk associated with the importation of commercially produced fresh fruit of turban squash (*Cucurbita maxima* Duchesne) from the Republic of Korea (referred to as the export area) into the United States[1] (referred to as the pest risk analysis or PRA area) for consumption.

This is a qualitative risk assessment. The likelihood of pest introduction is expressed as a qualitative rating rather than using numerical terms. This methodology is consistent with guidelines provided by the International Plant Protection Convention (IPPC) in the International Standard for Phytosanitary Measures (ISPM) No. 11, "Pest Risk Analysis for Quarantine Pests" (IPPC, 2021). The use of biological and phytosanitary terms is consistent with ISPM No. 5, "Glossary of Phytosanitary Terms" (IPPC, 2024).

As defined in ISPM No. 11, this document comprises Stage 1 (Initiation) and Stage 2 (Risk Assessment) of risk analysis. Stage 3 (Risk Management) will be covered in a separate document.

1.2. Initiating event

The importation of fruits and vegetables for consumption into the United States is regulated under Title 7 of the Code of Federal Regulations, Part 319.56 Subpart L – Fruits and Vegetables (7 CFR §319.56, 2025) and as described in the Agricultural Commodity Import Requirements. Under this regulation, the entry of cucumber from the Republic of Korea into the PRA area is only authorized from December 1 to April 30, and is not authorized at other times of the year (ACIR, 2025). This commodity risk assessment was initiated in response to a request by the Republic of Korea to change the federal regulation to allow entry year-round.

1.3. Potential weediness of the commodity

In some cases, an imported commodity could become invasive in the PRA area. If warranted, we analyze the commodity for weed risk.

A weed risk analysis is not required when (a) the commodity is already enterable into the PRA area from other countries, (b) the commodity plant species is widely established cultivated in the PRA area, or (c) the imported plant part(s) cannot easily propagate on its own or be propagated. We determined that the weed risk of turban squash does not need to be analyzed because it is already enterable into the PRA area from other countries (ACIR, 2025) and is widely cultivated (NASS, 2019).

1.4. Description of the pathway

A pathway is "any means that allows the entry or spread of a pest" (IPPC, 2024). In the context of this document, the pathway is the commodity to be imported. The following description includes those conditions and processes the commodity undergoes from production through

[1]The *United States* includes all states, the District of Columbia, Guam, the Northern Mariana Islands, Puerto Rico, the U.S. Virgin Islands, and any other territory or possession of the United States.

importation and distribution that may have an impact on pest risk and therefore were considered in our assessment. Commodities produced under different conditions were not considered.

1.4.1. Description of the commodity
The specific pathway of concern is the importation of fresh fruit of *Cucurbita maxima* (turban squash), with a stem of one inch or less in length, for consumption.

1.4.2. Summary of the production, harvest, post-harvest, shipping, and storage conditions considered
The fruit will be imported year-round for consumption. The fruit may have a short stem of one inch or less and will be free of soil and debris. Fruit that is damaged or obviously infested will be culled. No other production, harvest, post-harvest, shipping, or storage conditions were considered during this assessment.

2. Pest List and Pest Categorization

The pest list is a compilation of plant pests of quarantine significance to the United States. This list includes pests that are present in the Republic of Korea on any host and are known to be associated with *Cucurbita maxima* anywhere in the world. Pests are considered quarantine significant if they (a) are not present in the PRA area, (b) are actionable at U.S. ports of entry, (c) are regulated non-quarantine pests, (d) are under federal official control, or (e) require evaluation for regulatory action. Consistent with ISPM No. 5, pests that meet any of these definitions are considered "quarantine pests" and are candidates for analysis. Species with a reasonable likelihood of following the pathway into the PRA area are analyzed to determine their pest risk potential.

2.1. Pest list
We developed the pest list based on scientific literature, port-of-entry pest interception data, and information provided by the government of the Republic of Korea. We listed the pests that are of quarantine significance to the PRA area in Table 1. For each pest, we provided evidence for the pest's presence in the Republic of Korea and its association with *Cucurbita maxima*. We indicated the plant parts with which the pest is generally associated and, if applicable, provided information about the pest's distribution in the United States. Pests that are likely to remain associated with the harvested commodity in a viable form are indicated by bolded text and are listed separately in Table 2.

Table 1. List of quarantine pests associated with *Cucurbita maxima* anywhere in the world and present in the Republic of Korea on any host

Pest name	**Presence in the Republic of Korea**	**Host association**	**Plant part(s)** [2]	**Considered further?**[3]
INSECT: Coleoptera: Chrysomelidae *Aulacophora indica* (Gmelin)	Lee et al., 2005; KNAM-IN, 2021	Abe and Matsuda, 2005; Barroga, 2002	Leaves (Abe and Matsuda, 2005; Lewis and Metcalf, 1996) Flowers, roots, young fruit (based on general feeding behavior)(Wang et al., 2020)	No, primary feeding occurs on leaves. Feeding on young fruit is reported on 'pumpkin' (Wang et al., 2020), however, it is unclear if fruit of *C. maxima* is affected. Adult beetles are mobile and would not remain associated with mature fruit or once fruit is harvested. Present in Guam (UGIC, 2023), the Northern Mariana Islands, and American Samoa (CABI, 2025).
INSECT: Diptera: Agromyzidae *Liriomyza huidobrensis* (Blanchard)	Maharjan et al., 2014	Foba et al., 2015; Mulholland et al., 2022	Leaves (Bertolaccini et al., 2019); (Foba et al., 2015)	No. Present in Hawaii (Scheffer, 2000) and Guam (CABI, 2025).
INSECT: Diptera: Tephritidae *Bactrocera depressa* (Shiraki); syns. *Zeugodacus depressus* Shiraki, *Paradacus depressus* (Shiraki)	**Han et al., 1994; NIBR, 2018**	**Han et al., 2017; Mun et al., 2003**	**Fruit (Han et al., 2017; Han et al., 1994; Okadome, 1962)**	**Yes, this fruit fly feeds internally in fruit (Han et al., 2017; Okadome, 1962).** **See notes in Section 2.2.**

[2] The plant part(s) listed are those for the plant species under analysis. If the information has been extrapolated, such as from plant part association on other plant species, we note that.

[3] "Yes" indicates simply that the pest has a reasonable likelihood of being associated with the harvested commodity; the level of pest prevalence on the harvested commodity (low, medium, or high) is qualitatively assessed as part of the Likelihood of Introduction assessment (section 3).

Pest name	**Presence in the Republic of Korea**	**Host association**	**Plant part(s)** [2]	**Considered further?**[3]
INSECT: Lepidoptera: Crambidae *Diaphania indica* (Saunders); syn. *Palpita indica* (Saunders)	Choi et al., 2009; Goh et al., 2004; Jeon et al., 2006	Waterhouse, 1993	Leaves (Waterhouse, 1993) Fruit (based on general feeding behavior on other cucurbit hosts) (Choi et al., 2009; Nair and Sehgal, 2023; Shelke and Kunkalikar, 2021)	No, see notes in section 2.2. Present in the continental United States, American Samoa, the Northern Mariana Islands (CABI, 2025), and Guam (Schreiner, 1991).
INSECT: Lepidoptera: Noctuidae *Chrysodeixis eriosoma* (Doubleday)	ESK, 1994; Ronkay, 1982	Waterhouse, 1993	Flowers, fruits, leaves (based on general feeding behavior) (Roberts, 1979)	No, see notes in section 2.2. Present in Hawaii (UHIM, 2025) and Guam (Muniappan and Esguerra, 1999).
INSECT: Thysanoptera: Thripidae *Frankliniella intonsa* (Trybom)	Cho et al., 2001; Goh et al., 2004; Jeong et al., 2018	Nakahara and Minoura, 2015	Flowers (Nakahara and Minoura, 2015)	No.
INSECT: Thysanoptera: Thripidae *Megalurothrips usitatus* (Bagnall)	Kang et al., 2012	Reyes, 1994	Flowers (based on general feeding behavior) (Reyes, 1994)	No.
INSECT: Thysanoptera: Thripidae *Thrips flavus* Schrank	Lee et al., 2001	Veer, 1985	Flowers, leaves (Veer, 1985)	No.
INSECT: Thysanoptera: Thripidae *Thrips palmi* Karny	Cho et al., 2001; Goh et al., 2004; Jeong et al., 2018	Kajita et al., 1996; Rebijith et al., 2014	Flowers (Kajita et al., 1996), fruit (AQAS, 2025), leaves (Kajita et al., 1996)	No, see notes in section 2.2. Present in the continental United States (Florida), American Samoa, Hawaii, Guam, and U.S. Virgin Islands (EPPO, 2025).

Pest name	Presence in the Republic of Korea	Host association	Plant part(s) [2]	Considered further?[3]
BACTERIUM: '*Candidatus* Phytoplasma trifolii'-related strains (16SrVI-A)	Jung et al., 2012	Girsova et al., 2021	Entire plant (Girsova et al., 2021; Hiruki and Wang, 2004)	No, no evidence of seed transmission. Leafhopper vectors (Hiruki and Wang, 2004) would not be associated with the fruit. Reported in several states in the continental United States (CABI, 2025; UGA, 2025a).
VIRUS: Crinivirus Cucurbit chlorotic yellows virus (CCYV)	Cho et al., 2021	Mohammed et al., 2014	Entire plant (Mohammed et al., 2014)	No, criniviruses are whitefly-transmitted; whiteflies would feed on foliage, not fruit (Li et al., 2016a; Palumbo, 2013). Reported in Alabama, California, Florida, Georgia, and Texas (CABI, 2025).
VIRUS: *Tobamovirus viridimaculae* (Cucumber green mottle mosaic virus)	**Yoon et al., 2008**	**Dombrovsky et al., 2017**	**Entire plant [including seeds] (Dombrovsky et al., 2017)**	**Yes.** **CGMMV is considered transient and under official control in California (USDA APHIS, 2025).**

2.2. Notes on pests identified in the pest list

***Bactrocera depressa* (Shiraki); syn. *Zeugodacus depressus* Shiraki (Insect: Diptera: Tephritidae):** This fruit fly is present in the Republic of Korea (Mun et al., 2003). It infests the pulp of fruit of Cucurbitaceae, particularly pumpkin (Han et al., 2017; Han et al., 1994). Mun et al. (2003) states, "…*B. depressa* is currently a significant crop pest of cucurbitaceous plants, primarily *Cucurbita moschata* (winter squash, or pumpkin) and *C. maxima* (turban squash) (Takamatsu 1952; Shiraki 1968; Han *et al.* 1994; Kim *et al.* 1999)." Although the references cited by Mun et al. (2003) do not specifically list *Cucurbita maxima*, we believe Mun et al. (2003) was able to infer this host species from the use of "*Cucurbita* sp." and common names such as "pumpkin", or "squash" used in the references. Additionally, in Han et al. (2017), Figure 1-B shows a highly-infested pumpkin fruit that appears to be *C. maxima*. Lastly, there are numerous species of cucurbits that are hosts of *B. depressa* (Han et al., 2017; Han et al., 1994; Kang et al., 2008; Okadome, 1962; Takamatsu, 1952); therefore, we believe that it is highly likely that *C. maxima* is also a host, although we have some uncertainty.

***Chrysodeixis eriosoma* Doubleday (Insect: Lepidoptera: Noctuidae):** This species is present in the Republic of Korea (ESK, 1994; Ronkay, 1982). *Chrysodeixis eriosoma* is a polyphagous

species that feeds on leaves, flowers, and sometimes fruit of host plants (Roberts, 1979). It primarily feeds on plants in families Solanaceae and Asteraceae (Dugdale, 1998; Mau and Kessing, 1991). We only found evidence of *C. eriosoma* feeding on the fruit of watermelon (Schreiner and Nafus, 1990), tomato, or pods of green bean (Dugdale, 1998). Larvae primarily feed on the underside of leaves, while later instar larvae feed from leaf margins and chew holes through leaves (Dugdale, 1998; Mau and Kessing, 1991). We found associations between this species and turban squash (Waterhouse, 1993), but no information on the plant part being infested. Additionally, the external feeding of larvae is highly visible; therefore, we do not expect the insect to be associated with marketable fruit of *Cucurbita maxima*.

***Diaphania indica* (Saunders) (Insect: Lepidoptera: Crambidae):** This species is present in the Republic of Korea (Choi et al., 2009) and associated with turban squash leaves (Waterhouse, 1993). On other cucurbit hosts, however, larvae feed on fruit (Bourdouxhe, 1983; Choi et al., 2009; Jeon et al., 2006; Nair and Sehgal, 2023). Larvae feed externally on fruit, causing visible damage (Bhat et al., 2022; Shelke and Kunkalikar, 2021), and therefore, damaged fruit would be culled during harvest of post-harvest processing.

***Thrips palmi* Karny (Insect: Thysanoptera: Thripidae):** The melon thrips is distributed throughout tropical regions in Asia, Africa, South America, Oceania, and the Caribbean, as well as Florida (Seal, 2004), Hawaii (Hata et al., 1991), Guam (Schreiner and Nafus, 1986), American Samoa (Ali and Vargo, 1992), and Puerto Rico (Pantoja et al., 1988; Viteri et al., 2010). While melon thrips is an important greenhouse pest and may infest protected environments anywhere, researchers estimate that the outdoor establishment of permanent populations would be restricted to tropical regions (Capinera, 2023). Permanent populations have only been documented south of Orlando, Florida (Capinera, 2023). Initially detected in 1990 (Capinera, 2023), melon thrips are not under official control. Surveys conducted over the last thirty years indicate that melon thrips is likely established throughout the areas suitable for population development.

Additionally, we only found evidence of the melon thrips affecting flowers and leaves of turban squash (Kajita et al., 1996). While we found no direct evidence of fruit affected in the literature, we did find several records of interceptions associated with turban squash fruit (AQAS, 2025).

2.3. Pests considered but not included on the pest list

2.3.1. Organisms with non-quarantine status

We found evidence of organisms that are associated with turban squash and are present in the export area; however, they are not of quarantine significance for the PRA area (see Appendix).

Armored scales (Hemiptera: Diaspididae): These insects are highly unlikely to establish via the fruits or vegetables for consumption pathway due to their very limited ability to disperse to new host plants (Miller et al., 1985; PERAL, 2007). Also, diaspidids on fruits and vegetables for consumption are considered non-actionable at U.S. ports of entry (NIS, 2008). For these reasons, armored scales are included in the Appendix rather than Table 1, even if they are not present in the PRA area.

2.3.2. Quarantine pests considered but not included on the pest list

***Agrotis segetum* (Denis & Schiffermüller) (Insect: Lepidoptera: Noctuidae):** This moth is present in the Republic of Korea (Lim et al., 2012). The emerging seedlings of cucurbits (pumpkin, squash and watermelon) have been reported to be cut at the soil level by *A. segetum* larvae (Daiber, 1992), however, this report did not include direct host evidence. We did not find any references stating *C. maxima* is a host of *A. segetum* and therefore did not include it on the pest list.

***Haplothrips chinensis* Priesner (Insect: Thysanoptera: Phlaeothripidae):** This thrips is present in the Republic of Korea (Woo, 1988). It has been reported from *Cucurbita* (pumpkin) ((Woo, 1988)), however, we did not find direct evidence of *C. maxima* as a host and therefore did not include it on the pest list.

***Helicoverpa armigera* (Hübner) (Insect: Lepidoptera: Noctuidae):** This species is present in the Republic of Korea (Lim et al., 2012). *Helicoverpa armigera* is generally considered a pest on cucurbits (CABI, 2025). *Cucurbita maxima* has been listed as a host (EPPO, 2020), however, there was no direct evidence provided. We did not find any other references stating *C. maxima* is a host of *H. armigera* and therefore did not include it on the pest list.

***Mamestra brassicae* (Linnaeus) (Insect: Lepidoptera: Noctuidae):** This moth is present in the Republic of Korea (KNPQS, 2000). *Cucurbita maxima* has been listed as a host (Umeya and Okada, 2003), however, there was no direct evidence provided of *M. brassicae* on the host plant directly. We did not find any other references stating *C. maxima* is a host of *M. brassicae* and therefore did not include it on the pest list.

Tetranychus truncatus* Ehara (Mite: Trombidiformes: Tetranychidae*): This mite is present in the Republic of Korea (Lee et al., 1999). *Cucurbita maxima* was listed as a new host in the Phillipines in 1956 (Rimando, 1960). We did not find any other references stating *C. maxima* is a host of *T. truncatus* and therefore did not include it on the pest list.

***Lissachatina fulica* (Bowdich) (Mollusk: Stylommatophora: Achatinidae):** The snail is present in the Republic of Korea (Cho et al., 2019). *Cucurbita maxima* has been listed as an experimental host for the giant African land snail (Ramdwar et al., 2018); however, we were unable to find a primary source indicating the snail uses it as a host. Therefore, we did not include the snail on the pest list. Generally, the snail feeds on flowers, fruits, leaves, and stems (Raut and Barker, 2002). Should the snail feed on *C. maxima*, it is a large external feeder and is unlikely to remain with the fruit during the harvesting process. The snail is present in Hawaii (Heu, 2007), Guam, and the Northern Mariana Islands (Lange and Jr, 1950).

***Fusarium oxysporum* Schltdl.: Fr. (Fungus)**: This fungus is present in the Republic of Korea and is associated with *C. maxima* (CABI, 2025; Farr and Rossman, 2025). Reports of *F. oxysporum* in the Republic of Korea associated with disease in *C. maxima* are likely *forma specialis niveum* (CABI, 2025; Farr and Rossman, 2025) which is not a quarantine pathogen (see Appendix).

***Phytophthora citricola* Sawada (Chromistan):** There is a single record from 1989 of this pathogen associated with *C. maxima* in New Zealand (Farr and Rossman, 2025). While this pathogen is in the Republic of Korea (Farr and Rossman, 2025), we could not locate any further records of association with *C. maxima* in the Republic of Korea or elsewhere and therefore did not include it on the pest list.

***Phytophthora melonis* Katsura (Chromistan):** This pathogen is present in the Republic of Korea (Noh et al., 2014) and is associated with a stem blight, leaf blight, and fruit rot in various Cucurbitaceae hosts, including pumpkin (Erwin and Ribeiro, 1996). However, we could not determine specifically if *C. maxima* is a natural host or if Erwin and Ribeiro (1996) is referring to another species of "pumpkin" (e.g. *C. moschata*, *C. pepo*. Therefore, it is not included in Table 1. This pathogen is unlikely to follow the pathway as rotten or damaged fruit would not be harvested or culled and infested soil would not be present.

2.4. Pests selected for further analysis or already regulated

We identified 1 quarantine pests for further analysis (Table 2).

Table 2. Pests selected for further analysis

Pest type	Taxonomy	Species names
Insect	Diptera: Tephritidae	*Bactrocera depressa* (Shiraki)
Virus	Martellivirales: Virgaviridae	*Tobamovirus viridimaculae* (cucumber green mottle mosaic virus)

3. Assessing Pest Risk Potential

3.1. Introduction

Risk is described by the likelihood of introduction, the potential consequences, and the associated uncertainty. For each pest, we determined if an endangered area exists within the United States. The endangered area is defined as the portion of the PRA area where ecological factors favor the pest's establishment and where the pest's presence will likely result in economically important impacts. If a pest causes an unacceptable impact, that means it could adversely affect agricultural production by causing a yield loss of 10 percent or greater, by increasing U.S. production costs, by impacting an environmentally important host, or by impacting international trade. After the endangered area is defined, we assessed the pest's likelihood of introduction into that area via the imported commodity.

The likelihood of introduction is based on the potential entry and establishment of a pest. We qualitatively assessed this using the ratings: Low, Medium, and High. The elements comprising the likelihood of introduction are interdependent; therefore, the model is multiplicative rather than additive. We defined the ratings as follows:

> **High**: This outcome is highly likely to occur because the events required occur frequently.
> **Medium**: This outcome can occur; however, the combination of required events occurs only occasionally.

Low: This outcome is less likely because the exact combination of required events seldom occur or rarely align properly in time and space.

We addressed uncertainty associated with each element as follows:

Negligible: Additional or more reliable evidence is very unlikely to change the rating.
Low: Additional or more reliable evidence probably will not change rating.
Moderate: Additional or more reliable evidence may or may not change rating.
High: Reliable evidence is not available.

3.2. Assessment

3.2.1. *Bactrocera depressa* (Diptera: Tephritidae)

The pumpkin fruit fly infests the pulp of fruit of Cucurbitaceae, particularly pumpkin (Han et al., 2017; Han et al., 1994). Larval development leads to the rotting of fruit (Kang et al., 2008). Oviposition begins in the summer months and continues into the fall (Kang et al., 2008; Takamatsu, 1952). Nearly 30 eggs are laid per fruit at a depth of 4 to 10 mm (Kang et al., 2008; Takamatsu, 1952). Oviposition symptoms are difficult to detect, so infested fruit may be sold to customers at the market. Customers later find the fruit is rotting and are disgusted to find numerous larvae within the fruit (Kang et al., 2008). The pumpkin fruit fly overwinters as pupae and adults begin appearing again in May (Kang et al., 2008).

The endangered area for *Bactrocera depressa* within the United States

Geographic potential: *Bactrocera depressa* is present in **Asia:** China, Japan (Han et al., 2017), South Korea (Han et al., 1994), and Taiwan (Han et al., 2017).

The pumpkin fruit fly is primarily found at higher elevations (Han et al., 2017; Han et al., 1994; Takamatsu, 1952). The fruit fly is generally found at elevations over 200 meters (Han et al., 1994; Kang et al., 2008), although it has been found at an elevation as low as 157 meters (Kang et al., 2008). One authors states the fruit fly is most abundant between 300 to 399 meters (Han et al., 1994), while another author states it is most abundant between 600 to 1020 meters (Takamatsu, 1952). It has been collected in mountains numerous times (Han et al., 2017; Takamatsu, 1952), even at peaks up to 1240 meters (Han et al., 2017). Therefore, the fruit fly may be limited to areas of the United States at higher elevations.

These areas encompass Plant Hardiness Zones 5 to 10 (Takeuchi et al., 2018) that are of higher elevations.

Hosts in United States: The pumpkin fruit fly primarily infests fruit in family **Cucurbitaceae**; however, tomato, in the family **Solanaceae**, may also be affected.

Cucurbitaceae: *Citrullus lanatus* (watermelon) (Han et al., 1994; Okadome, 1962; Takamatsu, 1952), *Cucumis sativus* (cucumber) (Okadome, 1962; Takamatsu, 1952), *Cucurbita moschata* (squash) (Han et al., 2017; Okadome, 1962; Takamatsu, 1952)*, Cucurbita pepo* (acorn squash, pumpkin, and zucchini) (Han et al., 1994; Kang et al., 2008), *Lagenaria siceraria* (bottle gourd) (Okadome, 1962; Takamatsu, 1952), *Luffa aegyptiaca* (sponge gourd) (Takamatsu, 1952); and **Solanaceae:** *Solanum lycopersicum* (tomato) (Han et al., 1994; Okadome, 1962; Takamatsu, 1952)

Economically important hosts[4]*:* Economically important hosts include cucumber, pumpkin, squash, tomato, and watermelon (NASS, 2019).

Potential consequences on economically important hosts at risk: This pest is likely to cause unacceptable consequences because the larvae infest the pulp of host fruits, leading to the fruit rotting (Han et al., 2017; Han et al., 1994; Kang et al., 2008). High infestation rates, up to 43.5% of fruit, have been reported in pumpkin (Han et al., 1994). High numbers of larvae have been reported per pumpkin fruit, with averages ranging from 46 to 168 larvae per fruit (Han et al., 1994).

Endangered area: The endangered area includes Plant Hardiness Zones 5 to 10 (Takeuchi et al., 2018) of higher elevations where host plants are present.

[4] As defined by ISPM No. 5, potential economic importance applies to crops, the environment (ecosystems, habitats, or species), and to other specified values such as tourism, recreation and aesthetics (IPPC, 2022).

The likelihood of entry of *Bactrocera depressa* into the endangered area via turban squash imported from the Republic of Korea

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Pest prevalence on the harvested commodity	Low	Moderate	Fruit is the primary plant part infested (Han et al., 2017; Han et al., 1994; Okadome, 1962), which is the commodity to be imported. However, there are few reports of this fruit fly infesting *C. maxima* (Han et al., 2017; Mun et al., 2003) and this fruit fly is limited to infesting fruits at higher elevations (Han et al., 2017; Han et al., 1994; Takamatsu, 1952). Therefore, we have chosen a risk rating of Low.
Likelihood of surviving post-harvest processing before shipment	Low	Low	Eggs are oviposited into fruit at a depth of 4 to 10 mm (Kang et al., 2008; Takamatsu, 1952) and oviposition symptoms are difficult to detect (Kang et al., 2008). Removal of dirt, debris, and culling will not reduce the presence of fruit fly eggs oviposited within the fruit; therefore, we maintain a risk rating of Low.
Likelihood of surviving transport and storage conditions of the consignment	Low	n/a	Transport and storage conditions were not considered; therefore, we maintain a risk rating of Low.
Overall Likelihood of Entry	Low	n/a	n/a

The likelihood of establishment of *Bactrocera depressa* into the endangered area via turban squash imported from the Republic of Korea

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	Medium	Moderate	The pumpkin fruit fly is primarily found at higher elevations (Han et al., 2017; Han et al., 1994; Takamatsu, 1952). It has been collected in mountains numerous times (Han et al., 2017; Takamatsu, 1952). Therefore, the fruit fly may be limited to areas of the United States at higher elevations. Additionally, the pumpkin fruit fly has a narrow host range, limited primarily to Cucurbitaceae (Han et al., 2017; Han et al., 1994; Takamatsu, 1952); therefore, adult fruit flies may have difficulty in locating a new host to reproduce on. However, adult fruit flies are highly mobile (Takamatsu, 1952), enabling them to disperse easily and locate a new host. Additionally, tens of larvae develop within a single fruit (Han et al., 1994; Takamatsu, 1952), although several hundred have been reported in a single fruit (Han et al., 1994). The high number of larvae per fruit would enable the fruit fly to reproduce at a rapid rate once a host is found. Therefore, we chose a risk rating of Medium.
Overall Likelihood of Establishment	Medium	n/a	n/a

The likelihood of introduction (combined likelihoods of entry and establishment) of *Bactrocera depressa* into the endangered area via turban squash imported from the Republic of Korea is Medium.

3.2.2. *Tobamovirus viridimaculae*: Cucumber green mottle mosaic virus (Martellivirales: Virgaviridae)

Cucumber green mottle mosaic virus (CGMMV) is a virus in the genus *Tobamovirus* that causes a severe mosaic symptom on infected watermelon and cucumber (Yoon et al., 2008) and, like other tobamoviruses, has very stable viral particles (Dombrovsky et al., 2017). CGMMV is found in cucumber and squash fruits (Al-Tamimi et al., 2009; Van Dorst, 1988). The virus systemically infects cucurbit hosts (Moreno et al., 2004) and is seed-borne and seed-transmitted in several cucurbit species (Al-Tamimi et al., 2009; Liu et al., 2014; Yoon et al., 2008). The association of CGMMV with seed is likely to have contributed to its spread worldwide (Dombrovsky et al., 2017).

The endangered area for cucumber green mottle mosaic virus within the United States

Geographic potential: It was reported in **Africa**: Nigeria; **Asia**: China, Georgia, India, Iran, Israel, Japan, Jordan, Lebanon, Myanmar, Pakistan, Saudi Arabia, South Korea, Sri Lanka, Syria, Taiwan, Thailand, Turkey; **Europe**: Austria, Belgium, Bulgaria, Denmark, Finland, France, Germany, Greece, Hungary, Latvia, Lithuania, Moldova, Norway, Poland, Romania, Russia, Spain, Sweden, the Netherlands, the United Kingdom, Ukraine, Yugoslavia (former); **North America**: Canada; **Oceania**: Australia (CABI, 2025). CGMMV is considered transient and under official control in California (USDA APHIS, 2025).

Comparing the plant hardiness zones with known geographic distribution, we predict that the pest could establish in areas corresponding to Plant Hardiness Zones 3 to 13 (Takeuchi and Fowler, 2018).

Hosts in PRA area: CGMMV infects hosts in the Cucurbitaceae and Euphorbiaceae families (Dombrovsky et al., 2017). The main hosts in the PRA area are **Cucurbitaceae:** *Citrullus lanatus* (watermelon), *Cucumis sativus* (garden cucumber), *Cucumis melo* (melon, cantaloupe), *Cucurbita maxima* (turban squash), *Cucurbita maxima* x *moschata*, *Cucurbita moschata* (crookneck squash), *Cucurbita pepo* (field pumpkin, zucchini), *Lagenaria siceraria* (bottle gourd) and *Trichosanthes cucumerina* (snake gourd) (CABI, 2025; Dombrovsky et al., 2017; Formiga et al., 2019; NRCS, 2025; Shargil et al., 2017).

Economically important hosts[5]*:* Economically important hosts at risk include cucumber, melon, pumpkin, squash, and watermelon (Dombrovsky et al., 2017; Lecoq and Desbiez, 2012).

Potential consequences on economically important hosts at risk: This pest is likely to cause unacceptable consequences because it can affect the yield on infected plants (Liu et al., 2014; Reingold et al., 2015). Cucumber plants can be stunted, show mottling and mosaic on leaves and fruit distortions; early infections cause yield losses between 10 to 33 percent (Fletcher et al., 1969; Ling et al., 2014; Nilsson, 1977). In melon. mosaic symptoms present in young leaves can disappear from mature foliage; fruits show malformations and netting (Dombrovsky et al., 2017). Some melon cultivars are asymptomatic (Rajamony et al., 1990; Sugiyama et al., 2006). Watermelon fruits show deformity, spongy flesh, and yield losses can reach 48 percent (Dombrovsky et al., 2017; Zhou et al., 2008).

Endangered area: The area endangered by CGMMV includes areas in the United States within Plant Hardiness Zones 3 to 13 where cucurbits are grown (NRCS, 2025; Takeuchi and Fowler, 2018).

[5] As defined by ISPM No. 5, potential economic importance applies to crops, the environment (ecosystems, habitats, or species), and to other specified values such as tourism, recreation and aesthetics (IPPC, 2022).

The likelihood of entry of cucumber green mottle mosaic virus into the United States via turban squash fruit imported from the Republic of Korea

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Pest prevalence on the harvested commodity	Medium	High	We could not determine incidence of CGMMV in South Korean turban squash production. However, all fruit and seeds produced by infected plants will be infected (Dombrovsky et al., 2017; Li et al., 2016b). CGMMV infection is largely asymptomatic in turban squash fruit (Dombrovsky et al., 2017). As we do not know how common CGMMV infection is in turban squash in Korea, the risk rating is "Medium" with elevated uncertainty.
Likelihood of surviving post-harvest processing before shipment	Medium	High	Because infected turban squash fruits are generally asymptomatic (Dombrovsky et al., 2017), we did not change the previous risk rating.
Likelihood of surviving transport and storage conditions of the consignment	Medium	High	Transport and storage conditions were not considered in this analysis; therefore, we did not change the previous risk rating.
Overall Likelihood of Entry	Medium	n/a	n/a

The likelihood of establishment of cucumber green mottle mosaic virus into the United States via turban squash fruit imported from the Republic of Korea

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	Low	Moderate	CGMMV is physically very stable and can remain infectious for several months (Dombrovsky et al., 2017). Seed transmission rates are not known for *C. maxima* but are generally low in other cucurbit hosts (0% to 5%) (Dombrovsky et al., 2017; Li et al., 2016b; Pitman, 2015; Sui et al., 2019). Fruit is intended for consumption and is likely to be eaten or disposed of through normal disposal channels, limiting the opportunities for the infected fruit and seeds to contact hosts. CGMMV has a very low chance of being introduced into agricultural settings and is unlikely to establish from the fruit for consumption pathway. Based on this evidence, we rated this risk element "Low" with a "Moderate" uncertainty because of its ability to survive outside of its host.
Overall Likelihood of Establishment	Low	n/a	n/a

The likelihood of introduction (combined likelihoods of entry and establishment) of cucumber green mottle mosaic virus into the United States via turban squash fruit imported from the Republic of Korea is Low.

4. Summary

The following pest is considered quarantine significant for the United States. The pest has a reasonable likelihood of following the commodity pathway and would likely cause unacceptable consequences if introduced into the PRA area (Table 3). Thus, the pest is candidates for risk management.

Table 3. Summary of quarantine pests that are candidates for risk management

Pest type	Taxonomy	Scientific name	Likelihood of Introduction
Insect	Diptera: Tephritidae	*Bactrocera depressa* (Shiraki)	Medium
Virus	Martellivirales: Virgaviridae	*Tobamovirus viridimaculae* (cucumber green mottle mosaic virus)	Low

Our assessment of risk is contingent on the application of all components of the pathway as described in section 1.4. The detailed examination and choice of appropriate phytosanitary measures to mitigate pest risk are addressed in a separate document.

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6. Appendix: Pests with non-quarantine status

We found evidence that the organisms listed below are associated with *Cucurbita maxima* (turban squash) and are present in the Republic of Korea; however, none are of quarantine significance for the United States (ARM, 2024, or as defined by ISPM No. 5 (IPPC, 2024). Although we did not intensively evaluate the evidence, we provide references supporting each pest's potential presence in the Republic of Korea, presence in the United States (if applicable), and association with turban squash. If any of the organisms are **not** present in the United States, we also provided justification for their non-quarantine status. Unless otherwise noted, these organisms are non-actionable at U.S. ports of entry (ARM, 2024).

Organism	**In the Republic of Korea**	**In U.S.**	**Host Association**	**Notes**
INSECT: Diptera: Agromyzidae *Liriomyza sativae* Blanchard	iBOL, 2024	CABI, 2025	CABI, 2025; Maharjan et al., 2014	n/a
INSECT: Diptera: Agromyzidae *Liriomyza trifolii* (Burgess)	CABI, 2025	CABI, 2025	CABI, 2025; Tokumaru et al., 2007	n/a
INSECT: Hemiptera: Aleyrodidae *Bemisia tabaci* (B biotype) (Gennadius)	Hsieh et al., 2007; Lee et al., 2000	CABI, 2025	Hélène et al., 2015	n/a
INSECT: Hemiptera: Aleyrodidae *Bemisia tabaci* (Q biotype) (Gennadius)	Ahmed et al., 2009); Hsieh et al., 2007	CABI, 2025	Hélène et al., 2015; Hsieh et al., 2007	n/a
INSECT: Hemiptera: Aleyrodidae *Trialeurodes vaporariorum* (Westwood)	CABI, 2025	CABI, 2025	CABI, 2025	n/a
INSECT: Hemiptera: Aphididae *Aphis fabae* Scopoli	CABI, 2025	CABI, 2025	CABI, 2025; Maharani et al., 2018	n/a
INSECT: Hemiptera: Aphididae *Aphis gossypii* Glover	Goh et al., 2004; Koo et al., 2014; Lim et al., 2012	CABI, 2025	Basu and Patro, 2007; Singh et al., 1999	n/a
INSECT: Hemiptera: Aphididae *Myzus persicae* Sulzer	Choi et al., 2013; Goh et al., 2004; Lim et al., 2012	CABI, 2025	Leonard, 1972	n/a
INSECT: Hemiptera: Diaspididae *Pinnaspis strachani* (Cooley)	CABI, 2025	García Morales et al., 2016	CABI, 2025	n/a

Organism	**In the Republic of Korea**	**In U.S.**	**Host Association**	**Notes**
INSECT: Hemiptera: Pseudococcidae *Planococcus citri* (Risso)	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	n/a
INSECT: Lepidoptera: Noctuidae *Spodoptera frugiperda* (J.E. Smith)	Under eradicatio n (CABI, 2025)	CABI, 2025	CABI, 2025	n/a
INSECT: Lepidoptera: Noctuidae *Trichoplusia ni* (Hübner)	CABI, 2025	CABI, 2025	CABI, 2025	n/a
INSECT: Thysanoptera: Thripidae *Frankliniella occidentalis* (Pergande)	Goh et al., 2004; Jeong et al., 2018	CABI, 2025	CABI, 2025	n/a
INSECT: Thysanoptera: Thripidae *Thrips hawaiiensis* (Morgan)	CABI, 2025	CABI, 2025	Umeya and Okada, 2003	n/a
INSECT: Thysanoptera: Thripidae *Thrips tabaci* Lindeman	CABI, 2025	CABI, 2025	Leite et al., 2012	n/a
MITE: Trombidiformes: Tetranychidae *Panonychus ulmi* Koch	CABI, 2025	CABI, 2025	Bolland et al., 1998	n/a
MITE: Sarcoptiformes: Acaridae *Tyrophagus putrescentiae* (Schrank)	Kim et al., 2003	CABI, 2025	Umeya and Okada, 2003	n/a
MITE: Trombbidiformes: Tetranychidae *Tetranychus urticae* Koch	CABI, 2025	CABI, 2025	Lee et al., 2018	n/a
NEMATODE: *Meloidogyne arenaria* (Neal) Chitwood	CABI, 2025	CABI, 2025	CABI, 2025	n/a
NEMATODE: *Meloidogyne incognita* (Kofoid & White) Chitwood	CABI, 2025	CABI, 2025	CABI, 2025	n/a
NEMATODE: *Meloidogyne javanica* (Treub) Chitwood	CABI, 2025	CABI, 2025	Aydınlı et al., 2019	n/a
NEMATODE: *Paratrichodorus porosus* (Allen) Siddiqi	CABI, 2025	CABI, 2025	CABI, 2025	n/a
BACTERIUM: *Agrobacterium radiobacter* (Beijerinck & van Delden) Conn syn. *Rhizobium radiobacter* (Beijerinck & van Delden) Young et al.	CABI, 2025	CABI, 2025	CABI, 2025	n/a
BACTERIUM: *Agrobacterium rhizogenes* (Riker et al.) Conn syn. *Rhizobium rhizogenes* (Riker et al.) Young et al.	CABI, 2025	CABI, 2025	CABI, 2025	n/a

Organism	**In the Republic of Korea**	**In U.S.**	**Host Association**	**Notes**
BACTERIUM: *Erwinia tracheiphila* (Smith) Bergey et al. emend. Hauben et al.	CABI, 2025	UGA, 2025a	CABI, 2025	n/a
BACTERIUM: *Pectobacterium carotovorum* Portier et al.syn. *Erwinia carotovora* subsp. *carotovora* (Jones) Bergey et al.	CABI, 2025	CABI, 2025	Babadoost and Zitter, 2009; CABI, 2025	n/a
BACTERIUM: *Pseudomonas syringae* pv. *lachrymans* (Smith and Bryan) Young et al.	CABI, 2025	CABI, 2025; UGA, 2025a	Bradbury, 1986	n/a
BACTERIUM: *Pseudomonas syringae* pv. *syringae* van Hall	CABI, 2025	CABI, 2025	CABI, 2025	n/a
BACTERIUM: *Pseudomonas viridiflava* (Burkholder) Dowson	CABI, 2025	CABI, 2025; UGA, 2025a	CABI, 2025	n/a
BACTERIUM: *Ralstonia pseudosolanacearum* Safni et al.	CABI, 2025	CABI, 2025	Akarapisan et al., 2024	n/a
BACTERIUM: *Ralstonia solanacearum* (Smith) Yabuuchi et al. Race 2	CABI, 2025	CABI, 2025; Yu et al., 2003	CABI, 2025	n/a
CHROMISTAN: *Globisporangium debaryanum* (R. Hesse) Uzuhashi, Tojo & Kakish. syn. *Pythium debaryanum* R. Hesse	CABI, 2025	CABI, 2025	Farr and Rossman, 2025	n/a
CHROMISTAN: *Globisporangium irregulare* (Buisman) Uzuhashi, Tojo & Kakish. syn. *Pythium irregulare* Buisman	CABI, 2025	CABI, 2025	Farr and Rossman, 2025	n/a
CHROMISTAN: *Globisporangium spinosum* (Sawada) Uzuhashi, Tojo & Kakish. syn. *Pythium spinosum* Sawada	Farr and Rossman, 2025	Farr and Rossman, 2025	Farr and Rossman, 2025	n/a
CHROMISTAN: *Globisporangium sylvaticum* (W.A. Campb. & F.F.Hendrix) Uzuhashi, Tojo & Kakish. syn. *Pythium sylvaticum* W.A. Campb. & F.F. Hendrix	Farr and Rossman, 2025	Farr and Rossman, 2025	Farr and Rossman, 2025	n/a

Organism	**In the Republic of Korea**	**In U.S.**	**Host Association**	**Notes**
CHROMISTAN: *Globisporangium ultimum* (Trow) Uzuhashi, Tojo & Kakish. syn. *Pythium ultimum* Trow	Farr and Rossman, 2025	Farr and Rossman, 2025	Farr and Rossman, 2025	n/a
CHROMISTAN: *Phytophthora cactorum* (Lebert & Cohn) J. Schröt.	CABI, 2025	CABI, 2025	Farr and Rossman, 2025	n/a
CHROMISTAN: *Phytophthora capsici* Leonian	CABI, 2025	CABI, 2025	CABI, 2025	n/a
CHROMISTAN: *Phytophthora cryptogea* Pethybr. & Laff.	CABI, 2025	CABI, 2025	CABI, 2025	n/a
CHROMISTAN: *Phytophthora nicotianae* Breda de Haan syn. *Phytophthora parasitica* Dastur	Farr and Rossman, 2025	Farr and Rossman, 2025	Farr and Rossman, 2025	n/a
CHROMISTAN: *Pseudoperonospora cubensis* (Berk. & M.A. Curtis) Rostovzev	CABI, 2025	CABI, 2025	CABI, 2025	n/a
CHROMISTAN: *Pythium aphanidermatum* (Edson) Fitzp.	CABI, 2025	CABI, 2025	CABI, 2025	n/a
CHROMISTAN: *Pythium myriotylum* Drechsler	CABI, 2025	CABI, 2025	Farr and Rossman, 2025	n/a
FUNGUS: *Alternaria alternata* (Fr. : Fr.) Keissl.	CABI, 2025	CABI, 2025; UGA, 2025b	Farr and Rossman, 2025	n/a
FUNGUS: *Alternaria cucumerina* (Ellis & Everh.) J.A. Elliott	Farr and Rossman, 2025	Farr and Rossman, 2025; UGA, 2025b	Farr and Rossman, 2025	n/a
FUNGUS: *Athelia rolfsii* (Curzi) C.C. Tu & Kimbr. syn. *Sclerotium rolfsii* Sacc.	CABI, 2025	CABI, 2025	Farr and Rossman, 2025	n/a
FUNGUS: *Berkeleyomyces basicola* (Berk. & Broome) W.J. Nel, Z.W. de Beer, T.A. Duong & M.J. Wingf. syn. *Thielaviopsis basicola* (Berk. & Broome) Ferraris	Choi et al., 2016	CABI, 2025; UGA, 2025b	CABI, 2025	n/a
FUNGUS: *Boeremia exigua* var. *exigua* (Desm.) Aveskamp, Gruyter & Verkley	Farr and Rossman, 2025	Farr and Rossman, 2025	Farr and Rossman, 2025	n/a
FUNGUS: *Botrytis cinerea* Pers. : Fr.	Farr and Rossman, 2025	Farr and Rossman, 2025	Farr and Rossman, 2025	n/a

Organism	In the Republic of Korea	In U.S.	Host Association	Notes
FUNGUS: *Cercospora citrullina* Cooke	Farr and Rossman, 2025	Farr and Rossman, 2025	Farr and Rossman, 2025	n/a
FUNGUS: *Choanephora cucurbitarum* (Berk. & Ravenel) Thaxt.	CABI, 2025	CABI, 2025	CABI, 2025	n/a
FUNGUS: *Cladosporium cucumerinum* Ellis & Arthur	CABI, 2025	CABI, 2025	CABI, 2025	n/a
FUNGUS: *Colletotrichum gloeosporioides* (Penz.) Penz. & Sacc. syn. *Glomerella cingulata* (Stoneman) Spauld. & H. Schrenk	CABI, 2025	CABI, 2025	Farr and Rossman, 2025	n/a
FUNGUS: *Colletotrichum orbiculare* Damm, P.F. Cannon & Crous	CABI, 2025	CABI, 2025	CABI, 2025	n/a
FUNGUS: *Corynespora cassiicola* (Berk. & Curtis) Weir	CABI, 2025	CABI, 2025	CABI, 2025	n/a
FUNGUS: *Curvularia spicifera* (Bainier) Boedijn	Farr and Rossman, 2025	Farr and Rossman, 2025	Farr and Rossman, 2025	n/a
FUNGUS: *Fusarium acuminatum* Ellis & Everh.	Farr and Rossman, 2025	Farr and Rossman, 2025	Farr and Rossman, 2025	n/a
FUNGUS: *Fusarium culmorum* (W.G. Sm.) Sacc.	CABI, 2025	CABI, 2025; UGA, 2025b	CABI, 2025	n/a
FUNGUS: *Fusarium oxysporum* f. sp. *niveum* (E.F. Sm.) Snyder & H.N. Hansen	CABI, 2025	CABI, 2025	Farr and Rossman, 2025	n/a
FUNGUS: *Fusarium roseum* Link : Fr.	Farr and Rossman, 2025	Farr and Rossman, 2025	Farr and Rossman, 2025	n/a
FUNGUS: *Fusarium sambucinum* Fuckel	Farr and Rossman, 2025	Farr and Rossman, 2025; UGA, 2025b	Farr and Rossman, 2025	n/a
FUNGUS: *Fusarium solani* f. sp. *cucurbitae* Snyder & Hansen	Han et al., 2012	CABI, 2025	CABI, 2025	n/a
FUNGUS: *Golovinomyces cichoracearum* (Ehrenb.) Heluta syn. *Erysiphe cichoracearum* DC.	CABI, 2025	CABI, 2025	CABI, 2025	n/a
FUNGUS: *Golovinomyces orontii* (Castagne) Heluta	CABI, 2025	CABI, 2025	CABI, 2025	n/a

Organism	In the Republic of Korea	In U.S.	Host Association	Notes
FUNGUS: *Lasiodiplodia theobromae* (Pat.) Griffon & Maubl.	CABI, 2025	CABI, 2025	Farr and Rossman, 2025	n/a
FUNGUS: *Leveillula taurica* (Lév.) G. Arnaud	Farr and Rossman, 2025	Farr and Rossman, 2025	Farr and Rossman, 2025	n/a
FUNGUS: *Macrophomina phaseolina* (Tassi) Goid.	CABI, 2025	CABI, 2025	Farr and Rossman, 2025	n/a
FUNGUS: *Neocosmospora solani* (Mart.) L. Lombard & Crous syn. *Fusarium solani* (Mart.) Sacc.	CABI, 2025	CABI, 2025	Farr and Rossman, 2025	n/a
FUNGUS: *Paramyrothecium roridum* (Tode : Fr.) L. Lombard & Crous syn. *Myrothecium roridum* Tode : Fr.	CABI, 2025	CABI, 2025	Farr and Rossman, 2025	n/a
FUNGUS: *Plectosphaerella cucumerina* (Lindf.) W. Gams	Farr and Rossman, 2025	Farr and Rossman, 2025	Farr and Rossman, 2025	n/a
FUNGUS: *Podosphaera fusca* (Fr. : Fr.) U. Braun & S. Takam.	CABI, 2025	CABI, 2025	Farr and Rossman, 2025	n/a
FUNGUS: *Podosphaera xanthii* (Castagne) U. Braun & Shishkoff	CABI, 2025	CABI, 2025	CABI, 2025	n/a
FUNGUS: *Rhizoctonia solani* J.G. Kühn syn. *Thanatephorus cucumeris* (A.B. Frank) Donk	CABI, 2025	CABI, 2025	CABI, 2025	n/a
FUNGUS: *Rhizopus stolonifer* (Ehrenb. : Fr.) Vuill.	Farr and Rossman, 2025	Farr and Rossman, 2025	Farr and Rossman, 2025	n/a
FUNGUS: *Sclerotinia sclerotiorum* (Lib.) de Bary	CABI, 2025	CABI, 2025	CABI, 2025	n/a
FUNGUS: *Stagonosporopsis cucurbitacearum* (Fr. : Fr.) Aveskamp, Gruyter & Verkley syn. *Didymella bryoniae* (Auersw.) Rehm	CABI, 2025	CABI, 2025	CABI, 2025	n/a
FUNGUS: *Stemphylium vesicarium* (Wallr.) E.G. Simmons	Farr and Rossman, 2025	Farr and Rossman, 2025	Farr and Rossman, 2025	n/a
FUNGUS: *Trichothecium roseum* (Pers. : Fr.) Link	Farr and Rossman, 2025	Farr and Rossman, 2025	Farr and Rossman, 2025	n/a

Organism	In the Republic of Korea	In U.S.	Host Association	Notes
FUNGUS: *Verticillium albo-atrum* Reinke & Berthold	Farr and Rossman, 2025	Farr and Rossman, 2025	Farr and Rossman, 2025	n/a
FUNGUS: *Verticillium dahliae* Kleb.	CABI, 2025	CABI, 2025	Farr and Rossman, 2025	n/a
VIRUS: *Begomovirus coheni* (tomato yellow leaf curl virus)	CABI, 2025	CABI, 2025	Shahid et al., 2015	n/a
VIRUS: *Crinivirus pseudobetae* (beet pseudoyellows virus)	CABI, 2025	CABI, 2025	CABI, 2025	n/a
VIRUS: *Crinivirus cucurbitae* (cucurbit yellow stunting disorder virus)	CABI, 2025	CABI, 2025	CABI, 2025	n/a
VIRUS: *Cucumovirus CMV* (cucumber mosaic virus)	CABI, 2025	CABI, 2025	CABI, 2025	n/a
VIRUS: *Nepovirus nicotianae* (tobacco ringspot virus)	CABI, 2025	CABI, 2025	Abdalla et al., 2012	n/a
VIRUS: *Orthotospovirus tomatomaculae* (tomato spotted wilt virus)	CABI, 2025	CABI, 2025	Vučurović et al., 2012	n/a
VIRUS: *Polerovirus CABYV* (cucurbit aphid-borne yellows virus)	Lee et al., 2015	CABI, 2025	Mehle et al., 2020; Mnari-Hattab et al., 2009	n/a
VIRUS: *Potyvirus citrulli* (watermelon mosaic virus)	CABI, 2025	CABI, 2025	CABI, 2025	n/a
VIRUS: *Potyvirus cucurbitaflavitesselati* (zucchini yellow mosaic virus)	CABI, 2025	CABI, 2025	CABI, 2025	n/a
VIRUS: *Potyvirus papayanuli* (papaya ringspot virus)	Jin et al., 2009	CABI, 2025	CABI, 2025	n/a