Animal and Plant Health Inspection Service
U.S. DEPARTMENT OF AGRICULTURE

Importation of watermelon (*Citrullus lanatus*) from 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 watermelon, *Citrullus lanatus* (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 *Citrullus lanatus* (watermelon) 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 watermelon fruit produced under different conditions were not evaluated and may pose a different pest risk.

We used scientific literature and port-of-entry pest interception data, and information from the Republic of Korea government 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 watermelon (*Citrullus lanatus* (Thunb.) Matsum. & Nakai) 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 watermelon 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 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 watermelon does not need to be analyzed because it already enterable into the PRA area from other countries (ACIR, 2025) and is widely cultivated in the United States (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 *Citrullus lanatus* (watermelon), 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 *Citrullus lanatus* 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 *Citrullus lanatus*. 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 *Citrullus lanatus* 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)	KNAM-IN, 2021; Lee et al., 2005	Ojianwuna, 2019; Umeya and Okada, 2003	Larvae feed on roots (Lee et al., 2005; Umeya and Okada, 2003; Wang et al., 2020) Adults feed on flowers, fruit, and leaves (Ojianwuna, 2019; Umeya and Okada, 2003; Wang et al., 2020)	No, adult beetles feed externally on fruit, resulting in secondary infection on the fruit and unmarketability (CABI, 2025; Ojianwuna, 2019) (Umeya and Okada, 2003). Infested fruit will be culled due to visible damage. Present in Guam (UGIC, 2023), the Northern Mariana Islands, and American Samoa (CABI, 2025).
INSECT: Coleoptera: Curculionidae *Scepticus griseus* (Roelofs)	KNAM-IN, 2021	Umeya and Okada, 2003	Leaves (Umeya and Okada, 2003)	No.
INSECT: Diptera: Agromyzidae *Liriomyza bryoniae* Kaltenbach	Suh and Kwon, 1998	Shiao, 2004	Leaves (Umeya and Okada, 2003)	No.
INSECT: Diptera: Agromyzidae *Liriomyza huidobrensis* (Blanchard)	Maharjan et al., 2014	Echevarria et al., 1994; Foba et al., 2015	Leaves (Echevarria et al., 1994; 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., 1994; Okadome, 1962**	**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).**

[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: Hemiptera: Miridae *Apolygus spinolae* (Meyer-Dür)	Lee et al., 2002	Umeya and Okada, 2003	Buds, young shoots (Umeya and Okada, 2003)	No. The genus *Apolygus* is quarantine for the continental United States, Hawaii, and Puerto Rico (ARM, 2025).
INSECT: Lepidoptera: Crambidae *Diaphania indica* (Saunders); syn. *Palpita indica* (Saunders)	Choi et al., 2009	Nair and Sehgal, 2023; Schreiner and Nafus, 1990; Shelke and Kunkalikar, 2021; Umeya and Okada, 2003	Fruit (Choi et al., 2009; Nair and Sehgal, 2023; Schreiner and Nafus, 1990; Shelke and Kunkalikar, 2021), leaves (Choi et al., 2009; Nair and Sehgal, 2023), flowers, twigs (Nair and Sehgal, 2023), stems (Umeya and Okada, 2003)	No, larvae feed externally, scraping the skin of the watermelon leaving behind conspicuous light green or tan blotches (Shelke and Kunkalikar, 2021). Damaged fruit would be culled during harvest or post-harvest processing. Present in the continental United States (MEM, 2025), American Samoa (CABI, 2025), Guam (Schreiner, 1991), and the Northern Mariana Islands (EPPO, 2025).
INSECT: Lepidoptera: Noctuidae *Anadevidia peponis* (Fabricius)	ESK, 1994	Nair and Sehgal, 2023; Umeya and Okada, 2003	Leaves (Nair and Sehgal, 2023; Umeya and Okada, 2003), young fruit (Umeya and Okada, 2003)	No.

Pest name	**Presence in the Republic of Korea**	**Host association**	**Plant part(s)** [2]	**Considered further?**[3]
INSECT: Lepidoptera: Noctuidae *Chrysodeixis eriosoma* (Doubleday)	ESK, 1994	Schreiner and Nafus, 1990	Fruit, leaves (Schreiner and Nafus, 1990)	No, larvae feed externally by scraping the surface of watermelon fruits (Schreiner and Nafus, 1990). Damaged fruit would be culled during harvest or post-harvest processing. Present in Hawaii (UHIM, 2025) and Guam (Muniappan and Esguerra, 1999).
INSECT: Lepidoptera: Noctuidae *Helicoverpa armigera* (Hübner)	Kim et al., 2018	Scott et al., 2005; Umeya and Okada, 2003	Fruit, flowers, grain, leaves, developing seeds, (general feeding behavior) (Bharati et al., 2007; CABI, 2025; van den Berg et al., 2001)	No, see notes in section 2.2.
INSECT: Lepidoptera: Noctuidae *Spodoptera litura* (Fabricius)	ESK, 1994	Schreiner and Nafus, 1990	Fruit (Schreiner and Nafus, 1990)	No. Larvae feed externally by scraping the surface of watermelon fruits (Schreiner and Nafus, 1990). Present in Hawaii, Guam, the Northern Mariana Islands (EPPO, 2025) and American Samoa (CABI, 2025).
INSECT: Thysanoptera: Phlaeothripidae *Haplothrips chinensis* Priesner	Woo et al., 1991	Woo et al., 1991	Flowers, leaves (Ulitzka, 2024)	No.

Pest name	Presence in the Republic of Korea	Host association	Plant part(s) [2]	Considered further?[3]
INSECT: Thysanoptera: Thripidae *Frankliniella intonsa* (Trybom)	Woo et al., 1991	Barba-Alvarado et al., 2020; CABI, 2025; Woo et al., 1991	Buds (Barba-Alvarado et al., 2020), flowers (Umeya and Okada, 2003)	No.
INSECT: Thysanoptera: Thripidae *Thrips flavus* Schrank	Lee et al., 2001	Wen and Lee, 1982	Flowers, shoots (Wen and Lee, 1982)	No.
INSECT: Thysanoptera: Thripidae *Thrips palmi* Karny	Choi et al., 2013; Lee et al., 2001	Barba-Alvarado et al., 2020; Nair and Sehgal, 2023; Umeya and Okada, 2003	Buds (Barba-Alvarado et al., 2020; Nair and Sehgal, 2023; Umeya and Okada, 2003), fruit, leaves (Nair and Sehgal, 2023; Umeya and Okada, 2003)	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).
MITE: Trombidiformes: Tetranychidae *Tetranychus truncatus* Ehara	Lee et al., 1999	Jin et al., 2018	Leaves (CABI, 2025)	No.
NEMATODE *Meloidogyne mali* Ito, Oshima & Ichinohe	Kang et al., 2022	Toida, 1979	Roots (Toida, 1979)	No. Reported in New York (Eisenback et al., 2017).
BACTERIUM '*Candidatus* Phytoplasma trifolii'-related strains (16SrVI-A)	Jung et al., 2012	Çiftçi et al., 2024; Salehi et al., 2022	Entire plant (Çiftçi et al., 2024; Hiruki and Wang, 2004; Salehi et al., 2022)	No, no evidence of seed transmission. Leafhopper vectors (Hiruki and Wang, 2004) would not be associated with the fruit. Reported from several states in the continental United States (CABI, 2025; UGA, 2025a)
BACTERIUM: *Acidovorax valerianellae* Gardan et al.	Han et al., 2012	Han et al., 2012	Leaves (Han et al., 2012)	No, seed-transmitted in other hosts (Han et al., 2012), but there is no evidence this pathogen is associated with watermelon fruit.

Pest name	**Presence in the Republic of Korea**	**Host association**	**Plant part(s)** [2]	**Considered further?**[3]
CHROMISTAN: *Phytophthora melonis* Katsura	Noh et al., 2014	Noh et al., 2014	Fruit, leaves, stems, soil (Erwin and Ribeiro, 1996; Noh et al., 2014)	No, fruit is expected to be free of soil. Additionally, rotting or damaged fruit would be left unharvested or culled and would be unlikely to make it to market. Discarded, latently infected fruit would be highly unlikely to contact potential hosts. Quarantine at the genus level (ARM, 2025).
FUNGUS: *Alternaria gaisen* Nagano ex Bokura	Kwon et al., 2021	Kwon et al., 2021; Ma et al., 2021	Leaves (Kwon et al., 2021; Ma et al., 2021)	No.
FUNGUS: *Stagonosporopsis caricae* (Sydow & P. Sydow) Aveskamp, Gruyter & Verkley syn. *Phoma caricae-papayae* (Tarr) Punith.	Jeong et al., 2022	Jeong et al., 2022	Fruit, leaves, stems (Jeong et al., 2022; Stewart et al., 2015)	No, rotting or damaged fruit would be left unharvested or culled and would be unlikely to make it to market. Discarded, latently infected fruit would be highly unlikely to contact potential hosts.
VIRUS: Crinivirus cucurbit chlorotic yellows virus (CCYV)	Cho et al., 2021	Jailani et al., 2022	Entire plant (Jailani et al., 2022)	No, criniviruses are whitefly-transmitted; whiteflies would feed on foliage, not fruit (Li et al., 2016; Palumbo, 2013). Reported in Alabama, California, Florida, Georgia, and Texas (CABI, 2025)
VIRUS: *Polerovirus MABYV* (melon aphid-borne yellows virus)	Byun et al., 2022	Byun et al., 2022	Entire plant (Byun et al., 2022)	No, see notes in section 2.2.

Pest name	Presence in the Republic of Korea	Host association	Plant part(s) [2]	Considered further?[3]
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

Helicoverpa armigera **(Hübner) (INSECT: Lepidoptera: Noctuidae):** We were unable to find details on the specific watermelon plant parts damaged by the cotton bollworm. Due to the lack of information on watermelon, it is likely that watermelon is not a primary host of the cotton bollworm. Cotton bollworm larvae generally feeds on flowers, leaves, and developing seeds, grain, or fruit of host plants (Bharati et al., 2007; CABI, 2025; van den Berg et al., 2001), but not on mature fruit. The cotton bollworm feeds internally in some fruits, such as pepper or tomato (CABI, 2025; Kay, 2007), but not others. In zucchini, *Cucurbita pepo*, larvae prefer to feed on flowers and not fruit (Kay, 2007). Any incidental feeding on zucchini fruit occurs on very young fruit, resulting in bent fruit as it grows (Kay, 2007). Due to the lack of reports of the cotton bollworm on watermelon, and the general feeding behavior of the cotton bollworm on other hosts, it is unlikely that the cotton bollworm will be associated with mature watermelon fruit at harvest.

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 climate zones suitable for population development.

Additionally, feeding by melon thrips results in a silvery or bronzy appearance on the affected plant part (Nair and Sehgal, 2023). Affected watermelon fruit has poor growth, and the fruit core becomes brown and shrinks (Umeya and Okada, 2003). The fruit stalk and the bottom of the fruit become brown and scaly (Umeya and Okada, 2003) and affected fruits would not be marketable or harvested.

Polerovirus MABYV **(melon aphid-borne yellows virus):** MABYV, while not seed-borne, could potentially be present in imported watermelon fruit (Byun et al., 2022). It is unclear how this virus affects fruit production, but the congener Cucurbit aphid-borne yellows virus can cause yield losses of 40 to 50% when infection occurs in young melon and cucumber plants (Lecoq et al., 1992). Therefore, we expect the prevalence of MABYV in harvested watermelon fruit to be low. MABYV is aphid-vectored (Knierim et al., 2010; Xiang et al., 2008), and aphids can be associated with melon fruit (Lecoq et al., 2003). However, the likelihood of viruliferous aphids surviving transport and contacting hosts of MABYV in the United States is negligible in fruit for consumption.

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 watermelon 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, 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

***Phthorimaea absoluta* (Meyrick); syn. *Tuta absoluta* (Meyrick) (Lepidoptera: Gelechiidae):** Watermelon has been listed as a host for the tomato leafminer (CABI, 2025); however, the cited study (Mohamed et al., 2015) did not collect or observe the leafminer directly on watermelon. Rather, the leafminer was detected by pheromones traps placed in a watermelon field. We did not find any other references stating watermelon is a host of tomato leafminer. Therefore, we did not include the tomato leafminer on the pest list.

***Duponchelia fovealis* Zeller (Lepidoptera: Pyralidae):** Watermelon is a host of *D. fovealis* (Espinosa et al., 2014). The moth was found in greenhouses in 2015 and 2016 in the Republic of Korea, but was not found again after pesticide applications (Lee et al., 2018). We did not find any additional reports of the moth in the Republic of Korea; therefore, we did not include this moth on the pest list. *Duponchelia fovealis* is present in the continental United States (NAPIS). It is quarantine for Hawaii and Puerto Rico (ARM, 2025).

***Lissachatina fulica* (Bowdich) (Stylommatophora: Achatinidae):** The snail is present in the Republic of Korea (Cho et al., 2019; Lee et al., 2010). Watermelon has been listed as a host for the giant African land snail (CABI, 2025); however, we were unable to find a primary source indicating the snail uses watermelon 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 watermelon, it is an 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.**: This fungus is present in the Republic of Korea and is associated with *C. lanatus* (CABI, 2025; Farr and Rossman, 2025). Reports of *F. oxysporum* in the Republic of Korea associated with *C. lanatus* are likely *forma specialis niveum* (CABI, 2025; Farr and Rossman, 2025), which is not a quarantine pathogens (see Appendix).

Ralstonia pickettii **(Ralston et al.) Yabuuchi et al.:** This bacterium is tentatively associated (not molecularly confirmed) with a fruit disease of watermelon in the Republic of Korea; however, *R. pickettii* is not otherwise known to cause disease in plants (Jo et al., 1988).

Tobamovirus cucurbitae **(zucchini green mottle mosaic virus) and** ***Tobamovirus kyuri*** **(Kyuri green mottle mosaic virus):** These tobamoviruses are present in the Republic of Korea and have been successfully artificially inoculated into watermelon (Cho et al., 2007); however, we could not find evidence of natural infection in watermelon, and therefore, we do not expect this virus to be present in commercial production of watermelon.

2.4. Pests selected for further analysis or already regulated

We identified two 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.

The likelihood of entry of *Bactrocera depressa* into the endangered area via watermelon 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	Low	Fruit is the primary plant part infested (Han et al., 1994), which is the commodity to be imported. However, the fruit fly rarely infests watermelon, and only infests watermelon at higher elevations in the mountains (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

[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 establishment of *Bactrocera depressa* into the endangered area via watermelon 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 watermelon 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 melo* (melon, cantaloupe), *Cucumis sativus* (garden cucumber), *Cucurbita maxima* (winter squash, pumpkin), *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 watermelon 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	Moderate	Incidence of CGMMV in South Korean watermelon greenhouse production was between 1.6 to 38.5% in 2020 to 2021 (Han et al., 2023). All fruit and seeds produced by infected plants will be infected (Pitman, 2015). CGMMV infection can produce asymptomatic fruit, but reduced yields and unharvested, unmarketable fruit (Dombrovsky et al., 2017) will likely keep the prevalence of CGMMV at Medium with some uncertainty.
Likelihood of surviving post-harvest processing before shipment	Medium	Low	Some mildly symptomatic watermelon fruits are likely to be harvested and later culled, leading to a reduction in uncertainty. However, culling post-harvest would likely not significantly reduce the risk rating, especially with asymptomatic fruit still present in the pathway.
Likelihood of surviving transport and storage conditions of the consignment	Medium	n/a	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 watermelon 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); however, seed transmission rates are low (0% to 5%) (Komuro, 1971; Pitman, 2015; Sui et al., 2019; Wu et al., 2011). 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 watermelon fruit imported from the Republic of Korea is Low.

4. Summary

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

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

Pest type	Scientific name	Likelihood of Introduction
INSECT	*Bactrocera depressa* (Shiraki)	Medium
VIRUS	*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 watermelon and are present in the Republic of Korea; however, none are of quarantine significance for the United States (ARM, 2025), 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 watermelon. 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, 2025).

Organism	In the Republic of Korea	In U.S.	Host Association	Notes
INSECT: Diptera: Agromyzidae *Liriomyza trifolii* (Burgess)	CABI, 2025	CABI, 2025	Nair and Sehgal, 2023	n/a
INSECT: Diptera: Agromyzidae *Liriomyza sativae* Blanchard	iBOL, 2024	CABI, 2025	Tokumaru et al., 2007; Tran, 2009	n/a
INSECT: Diptera: Anthomyiidae *Delia platura* (Meigen); syn. *Hylemya platura* Meigen	CABI, 2025	CABI, 2025	Umeya and Okada, 2003	n/a
INSECT: Diptera: Sciaridae *Bradysia impatiens* (Johannsen); syn. *Bradysia agrestis* Sasakawa	Kim et al., 2000	iBOL, 2024	Kim et al., 2000	n/a
INSECT: Hemiptera: Aleyroidae *Trialeurodes vaporariorum* (Westwood)	Jeon et al., 2009	CABI, 2025	Smith et al., 2000	n/a
INSECT: Hemiptera: Aleyrodidae *Bemisia tabaci* (Gennadius)	CABI, 2025	CABI, 2025	Nair and Sehgal, 2023	n/a
INSECT: Hemiptera: Aphididae *Aphis fabae* Scopoli	CABI, 2025	CABI, 2025	Alaserhat et al., 2021	n/a
INSECT: Hemiptera: Aphididae *Aphis gossypii* Glover	Choi et al., 2013	CABI, 2025	Alaserhat et al., 2021; Nair and Sehgal, 2023	n/a
INSECT: Hemiptera: Aphididae *Myzus persicae* Sulzer	Choi et al., 2013	CABI, 2025	Alaserhat et al., 2021	n/a
INSECT: Hemiptera: Coccidae *Saissetia coffeae* (Walker)	Kwon et al., 2005	García Morales et al., 2016	García Morales et al., 2016	n/a
INSECT: Hemiptera: Diaspididae *Comstockaspis perniciosa* (Comstock)	Kwon et al., 2005	García Morales et al., 2016	García Morales et al., 2016	n/a
INSECT: Hemiptera: Diaspididae *Pseudaulacaspis pentagona* (Targioni Tozzetti)	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	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: Crambidae *Spoladea recurvalis* (Fabricius)	CABI, 2025	CABI, 2025	CABI, 2025	n/a
INSECT: Lepidoptera: Noctuidae *Agrotis ipsilon* (Hufnagel)	ESK, 1994	CABI, 2025	CABI, 2025	n/a
INSECT: Lepidoptera: Noctuidae *Peridroma saucia* (Hübner)	CABI, 2025	CABI, 2025	CABI, 2025	n/a
INSECT: Lepidoptera: Noctuidae *Spodoptera exigua* (Hübner)	CABI, 2025	CABI, 2025	CABI, 2025	n/a
INSECT: Lepidoptera: Noctuidae *Spodoptera frugiperda* Smith	under eradication (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)	CABI, 2025; Lee et al., 2001	CABI, 2025	CABI, 2025	n/a
INSECT: Thysanoptera: Thripidae *Scirtothrips dorsalis* Hood	Choi et al., 2013; Lee et al., 2001	CABI, 2025	CABI, 2025	n/a
INSECT: Thysanoptera: Thripidae *Thrips hawaiiensis* (Morgan)	ESK, 1994; Woo et al., 1991	EPPO, 2025	Umeya and Okada, 2003	n/a
INSECT: Thysanoptera: Thripidae *Thrips setosus* Moulton	ESK, 1994	CABI, 2025	Umeya and Okada, 2003	n/a
INSECT: Thysanoptera: Thripidae *Thrips tabaci* Lindeman	ESK, 1994; Lee et al., 2001; Woo et al., 1991	CABI, 2025	Woo et al., 1991	n/a
MITE: Sarcoptiformes: Acaridae *Tyrophagus putrescentiae* (Schrank)	CABI, 2025	CABI, 2025	Umeya and Okada, 2003	n/a
MITE: Trombidiformes: Tarsonemidae *Polyphagotarsonemus latus* (Banks)	CABI, 2025	Akyazi et al., 2021	Umeya and Okada, 2003	n/a

Organism	**In the Republic of Korea**	**In U.S.**	**Host Association**	**Notes**
MITE: Trombidiformes: Tarsonemidae *Tarsonemus bilobatus* Suski	CABI, 2025	Akyazi et al., 2021	Umeya and Okada, 2003	n/a
MITE: Trombidiformes: Tetranychidae *Tetranychus kanzawai* Kishida	Lee et al., 1999; Takafuji and Hinomoto, 2008	CABI, 2025	Nishimura et al., 2003	n/a
MITE: Trombidiformes: Tetranychidae *Tetranychus urticae* Koch; syn. *Tetranychus cinnabarinus* (Boisduval)	CABI, 2025; Shim et al., 2016	Akyazi et al., 2021	CABI, 2025; Umeya and Okada, 2003	n/a
NEMATODE: *Ditylenchus destructor* Thorne	CABI, 2025	CABI, 2025	CABI, 2025	n/a
NEMATODE: *Helicotylenchus dihystera* (Cobb) Sher	CABI, 2025	CABI, 2025	CABI, 2025	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	CABI, 2025	n/a
NEMATODE: *Merlinius brevidens* (Allen) Siddiqi	CABI, 2025	UGA, 2025c	CABI, 2025	n/a
NEMATODE: *Pratylenchus coffeae* (Zimmermann) Filipjev & Schuurmans Steckhoven	CABI, 2025	CABI, 2025	CABI, 2025	n/a
NEMATODE: *Pratylenchus penetrans* (Cobb) Filipjev & Schuurmans Stekhoven	CABI, 2025	CABI, 2025	CABI, 2025	n/a
NEMATODE: *Pratylenchus thornei* Sher & Allen	CABI, 2025	CABI, 2025	CABI, 2025	n/a
BACTERIUM: *Acidovoraxcitrulli* (Schaad et al.) Schaad et al.	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 brasiliense* Portier et al. syn. *Erwinia carotovora* subsp. *brasiliensis* Duarte et al.	CABI, 2025	CABI, 2025	CABI, 2025	n/a
BACTERIUM: *Pectobacterium carotovorum* Portier et al. syn. *Erwinia carotovora* subsp. *carotovora* (Jones) Bergey et al.	CABI, 2025	CABI, 2025	CABI, 2025	n/a
BACTERIUM: *Pseudomonas cichorii* (Swingle) Stapp	CABI, 2025	CABI, 2025	CABI, 2025	n/a
BACTERIUM: *Pseudomonas syringae* pv. *lachrymans* (Smith and Bryan) Young et al.	CABI, 2025	CABI, 2025; UGA, 2025a	CABI, 2025	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
CHROMISTAN: *Globisporangium debaryanum* (R. Hesse) Uzuhashi, Tojo & Kakish. syn. *Pythium debaryanum* R. Hesse	CABI, 2025	CABI, 2025	CABI, 2025	n/a
CHROMISTAN: *Globisporangium irregulare* (Buisman) Uzuhashi, Tojo & Kakish. syn. *Pythium irregulare* Buisman	CABI, 2025	CABI, 2025	CABI, 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 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	CABI, 2025	n/a
CHROMISTAN: *Phytophthora capsici* Leonian	CABI, 2025	CABI, 2025	CABI, 2025	n/a

Organism	**In the Republic of Korea**	**In U.S.**	**Host Association**	**Notes**
CHROMISTAN: *Phytophthora citrophthora* (R.H. Sm. & E. Sm.) Leonian	CABI, 2025	CABI, 2025	CABI, 2025	n/a
CHROMISTAN: *Phytophthora cryptogea* Pethybr. & Laff.	CABI, 2025	CABI, 2025	CABI, 2025	n/a
CHROMISTAN: *Phytophthora drechsleri* Tucker	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: *Phytophthora palmivora* (E.J. Butler) E.J. Butler	Farr and Rossman, 2025	Farr and Rossman, 2025	Farr and Rossman, 2025	n/a
CHROMISTAN: *Phytopythium vexans* (de Bary) Abad, de Cock, Bala, Robideau, Lodhi & Lévesque syn. *Pythium vexans* de Bary	CABI, 2025	CABI, 2025	CABI, 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	CABI, 2025	n/a
CHROMISTAN: *Pythium torulosum* Coker & P. Patt.	Kim and Park, 1997	Farr and Rossman, 2025	CABI, 2025	n/a
FUNGUS: *Alternaria alternata* (Fr. : Fr.) Keissl.	CABI, 2025	CABI, 2025; UGA, 2025b	CABI, 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: *Alternaria tenuissima* (Kunze) Wiltshire	CABI, 2025	CABI, 2025	CABI, 2025	n/a
FUNGUS: *Athelia rolfsii* (Curzi) C.C. Tu & Kimbr. syn. *Sclerotium rolfsii* Sacc.	CABI, 2025	CABI, 2025	CABI, 2025	n/a

Organism	In the Republic of Korea	In U.S.	Host Association	Notes
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: *Botrytis cinerea* Pers. : Fr.	Farr and Rossman, 2025	Farr and Rossman, 2025	Farr and Rossman, 2025	n/a
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: *Cladosporium tenuissimum* Cooke	CABI, 2025	Farr and Rossman, 2025	CABI, 2025	n/a
FUNGUS: *Colletotrichum gloeosporioides* (Penz.) Penz. & Sacc. syn. *Glomerella cingulata* (Stoneman) Spauld. & H. Schrenk	CABI, 2025	CABI, 2025	CABI, 2025	n/a
FUNGUS: *Colletotrichum orbiculare* Damm, P.F. Cannon & Crous	CABI, 2025	CABI, 2025	CABI, 2025	n/a
FUNGUS: *Curvularia lunata* (Wakker) Boedijn syn. *Cochliobolus lunatus* R.R. Nelson & F.A. Haasis	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 equiseti* (Corda) Sacc. syn. *Gibberella intricans* Wollenw.	CABI, 2025	CABI, 2025; Velez-Rodriguez and Rivera-Vargas, 1985	CABI, 2025	n/a
FUNGUS: *Fusarium oxysporum* f. sp. *niveum* (E.F. Sm.) Snyder & H.N. Hansen	CABI, 2025	CABI, 2025	CABI, 2025	n/a

Organism	**In the Republic of Korea**	**In U.S.**	**Host Association**	**Notes**
FUNGUS: *Fusarium roseum* Link : Fr.	Farr and Rossman, 2025	Farr and Rossman, 2025	Farr and Rossman, 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
FUNGUS: *Lasiodiplodia theobromae* (Pat.) Griffon & Maubl.	CABI, 2025	CABI, 2025	CABI, 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	CABI, 2025	n/a
FUNGUS: *Monosporascus cannonballus* Pollack & Uecker	Kwon et al., 2001	CABI, 2025	Beltrán et al., 2008	n/a
FUNGUS: *Neocosmospora haematococca* (Berk. & Broome) Samuels, Nalim & Geiser syn. *Haematonectria haematococca* (Berk. & Broome) Samuels & Rossman	CABI, 2025	CABI, 2025	CABI, 2025	n/a
FUNGUS: *Neocosmospora solani* (Mart.) L. Lombard & Crous syn. *Fusarium solani* (Mart.) Sacc.	CABI, 2025	CABI, 2025	CABI, 2025	n/a
FUNGUS: *Paramyrothecium roridum* (Tode : Fr.) L. Lombard & Crous syn. *Myrothecium roridum* Tode : Fr.	CABI, 2025	CABI, 2025	CABI, 2025	n/a
FUNGUS: *Penicillium oxalicum* Currie & Thom	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 arrhizus* A. Fisch.	CABI, 2025	CABI, 2025	CABI, 2025	n/a

Organism	In the Republic of Korea	In U.S.	Host Association	Notes
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 citrulli* M.T. Brewer & J.E. Stewart	Jeong et al., 2022	Stewart et al., 2015	Jeong et al., 2022	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 lycopersici* (Enjoji) W. Yamam.	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
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	CABI, 2025	n/a
VIRUS: *Begomovirus coheni* (tomato yellow leaf curl 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: *Crinivirus tomatichlorosis* (tomato chlorosis virus)	CABI, 2025	CABI, 2025	CABI, 2025	n/a
VIRUS: *Cucumovirus CMV* (cucumber mosaic virus)	CABI, 2025	CABI, 2025	CABI, 2025	n/a
VIRUS: *Gammacarmovirus melonis* (melon necrotic spot virus)	Kwak et al., 2015	CABI, 2025; UGA, 2025d	Kwak et al., 2015	n/a
VIRUS: *Nepovirus nicotianae* (tobacco ringspot virus)	CABI, 2025	CABI, 2025	CABI, 2025	n/a
VIRUS: *Orthotospovirus tomatomaculae* (tomato spotted wilt virus)	CABI, 2025	CABI, 2025	CABI, 2025	n/a
VIRUS: *Polerovirus CABYV* (cucurbit aphid-borne yellows virus)	Lee et al., 2015	CABI, 2025	Bananej and Vahdat, 2008	n/a

Organism	In the Republic of Korea	In U.S.	Host Association	Notes
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
VIRUS: *Tobamovirus tabaci* (tobacco mosaic virus)	CABI, 2025	CABI, 2025	CABI, 2025	n/a