Tomato Brown Rugose Fruit Virus Federal Import Order FAQs

Last Modified:

The ToBRFV Import Federal Order applies to imports of tomato *(Solanum lycopersicum)* and pepper (*Capsicum* spp.) seed lots, including small lots of seeds, and transplants from all countries.

The Import Federal Order has been in effect since November 22, 2019. APHIS revised the Federal Order June 17, 2024 to remove import requirements for tomato and/or pepper fruit while continuing import requirements unchanged for propagative material. When new scientific information or interceptions of ToBRFV require a modification to import requirements for tomato and/or pepper propagative material, APHIS may modify the Federal Order and notify stakeholders.

Frequently Asked Questions

Importing Tomato and Pepper Propagative Material

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What are the requirements for importing tomato or pepper seeds or plants?

Shipments of tomato or pepper propagative plant materials (including seeds, obscured seeds, and other plants for planting) from all countries must be accompanied by a phytosanitary certificate or a re-export phytosanitary certificate with an additional declaration certifying that the lots fulfill the following requirements prior to importation into the United States and territories:

- The [insert here *Solanum lycopersicum* seeds, *Capsicum* spp. seeds, *Solanum lycopersicum* plants for planting, or *Capsicum* spp. plants for planting] originated from a country certified free from Tomato brown rugose fruit virus, as established by the national plant protection organization of that country.

OR

- A representative sample of the [insert here *Solanum lycopersicum* seed lot, *Capsicum* spp. seed lot, *Solanum lycopersicum* plants for planting, or *Capsicum* spp. plants for planting] has been tested and found free of Tomato brown rugose fruit virus.

What will happen if tomato and/or pepper seed or plant shipments do not have a phytosanitary certificate with the required statement, as required by the Import Federal Order?

Shipments of tomato or pepper seeds or propagative plant material without the required documentation will be refused entry into the United States. Shipments that left the exporting country before the publication of the Import Federal Order will be evaluated upon arrival in the United States and samples may be taken to ensure they are free of the virus.

What if I want to import small lots of tomato or pepper seeds?

Small lots of tomato and pepper seed originating from a single mother plant or a single breeder line intended for breeding purposes and not for immediate commercial sale may be imported from all countries with a phytosanitary certificate or a re-export phytosanitary certificate with the following additional declaration:

- All mother plants of [insert here *Solanum lycopersicum* or *Capsicum* spp.] from which the seed lot originated have been tested no more than 10 days prior to fruit harvest and found free of Tomato brown rugose fruit virus.

APHIS defines small lots of seed as a maximum of 50 seeds of 1 taxon (such as a genus, species, or cultivar) per seed packet or a maximum weight not to exceed 10 grams of seed of 1 taxon per seed packet. There may be a maximum of 50 seed packets per shipment.

Small lots may also be imported under a PPQ-588 Controlled Import Permit. For more information, see APHIS' How To Import Plants and Plant Products into the United States web page.

Can I ship tomato or pepper plants using an export label from the U.S.- Canada Greenhouse Certification Program (GCP) instead of a Phytosanitary Certificate? What about the U.S. GCP (USCGP) or the Canada (CGCP)?

No, a phytosanitary certificate is required. This Import Federal Order imposes new regulatory requirements on all tomato and pepper propagative material, including plants grown in approved GCP facilities.

Will APHIS accept third party laboratory testing?

APHIS requires an official phytosanitary certificate issued by the National Plant Protection Organization (NPPO) of the exporting country. The certificate must include a statement indicating the materials are free from ToBRFV, as stated in the Import Federal Order. APHIS will not accept third party laboratory testing for ToBRFV in lieu

of a phytosanitary certificate with the required statement from the exporting country. Please contact the NPPO of the exporting country to determine their requirements for issuing the phytosanitary certificate with the required statement.

Do commercial shipments of tomato and pepper seeds require a permit?

Commercial consignments of tomato and/or pepper seeds do not need a permit. They must be accompanied by an official phytosanitary certificate with the required statement issued by the exporting country’s NPPO, as stated in the Import Federal Order.

Can I ship tomato or pepper seeds using a Seed Export Label (CFIA 5309) or a Seed Analysis Certificate (SAC: PPQ 925 or CFIA 5289) without a phytosanitary certificate?

No, a phytosanitary certificate is required. This Import Federal Order imposes new regulatory requirements on all tomato and pepper seed. However, a Seed Analysis Certificate or Seed Export Label may still be required to certify the seed lot has been sampled for Federal Noxious Weed seeds according to the U.S. Federal Seeds Act (FSA, 7 CFR 319.61).

What is a representative sample?

"Representative sample" will be determined by the NPPO and will be based on the testing method used.

Is there a recommended testing protocol for seed?

As noted elsewhere, the National Plant Protection Organization (NPPO) of the exporting country must determine how they wish to satisfy the testing requirement for the phytosanitary certificate. APHIS has evaluated several PCR-based protocols to detect ToBRFV in seeds. In our lab and other laboratories, these protocols have successfully detected ToBRFV in seeds.

Primers / Reference	**Comment**
One-step duplex real-time RT-PCR. Targets the movement-protein and the coat-protein encoding genes. ToBRFV MP CaTa28 Fw 5' - GGT GGT GTC AGT GTC TGT TT - 3' CaTa28 Rv 5' - GCG TCC TTG GTA GTG ATG TT - 3' CaTa28 Pr 5' - 6FAM - AGA GAA TGG AGA GAG CGG ACG AGG- BHQ1 - 3' ToBRFV CP CSP1325* Fw 5' - CAT TTG AAA GTG CAT CCG GTT T - 3' CSP1325 Rv 5' – GTA CCA CGT GTG TTT GCA GAC A - 3' CSP1325 Pr 5' - VIC – ATG GTC CTC TGC ACC TGC ATC TTG AGA - BHQ1 3' *The name CSPtbrfv101 is also used for the primer sequence ISF ISHI-Veg. 2024. https://worldseed.org/wp-content/uploads/2022/06/2024_April_Protocol-TomatoPepper_ToBRFV_1.6_FINAL.pdf	Evaluated by Mavrodieva et al., 2025. This protocol exhibited optimal performance, providing accurate, reproducible, and accessible detection. It also performed the best in both NAPPO and EPPO studies, which may aid in seed testing harmonization among members of these organizations. Mavrodieva, V., Dennis, G., Xoconostle-Cázares, B., Ong, K., Zale, B., Nickerson, J., ... & Bloem, S. (2025). Pilot for harmonization of diagnostic protocols for tomato brown rugose fruit virus (ToBRFV) in tomato and pepper seeds. PhytoFrontiers™, 5(2), 187-196.

One-step, real-time RT-PCR. Targets the movement-protein encoding gene.	ToBRFV Fw 5' – GCC CAT GGA ACT ATC AGA AGA A - 3' ToBRFV Rv 5' – TTC CGG TCT TCG AAC GAA AT - 3' ToBRFV Pr 5' - FAM – AGT CCC GAT GTC TGT AAG GCT TGC – TAMRA 3'	Evaluated by Mavrodieva et al., 2025. This protocol exhibited optimal performance, providing accurate, reproducible, and accessible detection.
	Chanda, B., Gilliard, A., Jaiswal, N., and Ling, K.-S. 2021. Comparative analysis of host range, ability to infect tomato cultivars with *Tm-22* gene, and real-time reverse transcription PCR detection of tomato brown rugose fruit virus. Plant Dis. 105:3643-3652.	
One-step, end-point RT-PCR. Targets the coat-protein encoding gene.	DPI-782 5’ – TAG CGA AGT GTG GAA ACC TG -3’ DPI-783 5’ – GGT GCA GAG GAC CAT TGT AA -3’	Evaluated by Mavrodieva et al., 2025. Lacks an internal control that may limit its applicability for the detection of ToBRFV; however, it may be used as a follow-up of real-time protocol to confirm the presence of ToBRFV with a different genomic target or serve as a cost-effective option for laboratories without real-time PCR equipment.
	Dey, K. K., Velez-Climent, M., Soria, P., Batuman, O., Mavrodieva, V.,Wei, G., Zhou, J., Adkins, S., and McVay, J. 2021. First report of Tomato brown rugose fruit virus infecting tomato in Florida, USA. New Dis. Rep. 44:e12028.	

One-step, end-point RT-PCR.

ToBRFV-F, 5’ – GAA GTC CCG ATG TCT GTA AGG-3’
ToBRFV-R, 5’ – GTG CCT ACG GAT GTG TAT GA-3’

Reference:
K.S. Ling, et al. 2019 First Report of Tomato brown rugose fruit virus infecting greenhouse tomato in the U.S. and Mexico.
https://doi.org/10.1094/PDIS-11-18-1959-PDN

APHIS has evaluated this protocol (end-point RT-PCR) and has used it successfully for virus detection in seeds, plant and fruit samples. PCR product size: 842bp. Product can be used for direct sequencing for confirmatory diagnostics.

If seed originated from a country infested by ToBRFV but is now located in another country, what documentation do I need to send the seed to the United States?

The country where the seed is located will need to issue a re-export certificate with the required additional declaration after testing the propagative material.

Do I need a permit to import tomato or pepper seeds for diagnostic purposes? Do I also need a phytosanitary certificate per the Import Federal Order?

Tomato or pepper seed imported for diagnostic purposes that do not meet Federal Order requirements (i.e., the shipment is not accompanied by a phytosanitary certificate with the required Additional Declarations) will require a PPQ-526 permit “Application and Permit to Move Live Plant Pests or Noxious Weeds.” A phytosanitary certificate is not required for seed imported under a PPQ-526 permit. For more information, see APHIS’ Organism and Pest Permits Page.

Do I need a permit to import tomato or pepper seeds for research, developmental, or therapeutic purposes? Do I

also need a phytosanitary certificate per the Import Federal Order?

Shipments of tomato or pepper seeds imported for research, developmental, or therapeutic purposes (for example, seeds imported for germination tests or variety trials) that do not meet Federal Order requirements (i.e., the shipment is not accompanied by a phytosanitary certificate with required Additional Declarations) will require a PPQ-588 Controlled Import Permit. A phytosanitary certificate is not required for seed imported under a PPQ-588 permit.

Can I continue to import obscured seeds of tomato or pepper seeds?

Yes, you can continue to use “PPQ 587 Obscured Seed Permit” to import obscured tomato or pepper seed. However, you must still fulfill the requirements outlined in the Import Federal Order by accompanying the permit with a phytosanitary certificate that includes an additional declaration as stated in the Import Federal Order.

Can APHIS test tomato or pepper seed or plant shipments for ToBRFV if I do not have a phytosanitary certificate with the required statement?

No. Shipments must be accompanied by a phytosanitary certificate that includes the required statement upon arrival at the port of entry.

Does APHIS recommend that importers separate tomato or pepper seed shipments from other seed shipments?

To avoid potential delays and/or refusal, APHIS recommends that tomato or pepper seed shipments are separated from other species of seeds.

General Information about ToBRFV

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What sort of damage does ToBRFV cause?

ToBRFV can cause severe fruit loss in tomatoes and peppers. On pepper, it causes bubbling and mosaic patterns on leaves, while on tomato foliage it causes mosaic patterns and a “fern leaf” symptom. Infected fruits of both hosts are smaller, discolored, and may have rough, dead patches on the surface (see photos). Infected tomato fruits can be unmarketable or reduced in quality. Necrosis can occur on susceptible pepper fruit.



(Figures 1 and 2: Luria, et al., 2017 https://doi.org/10.1371/journal.pone.0170429.g001); Figure 3: Alkowni, et al., 2019 https://www.researchgate.net/publication/330722102)

How is ToBRFV spread?

ToBRFV is transmitted through infected propagative plant parts (seeds, plants for planting, grafts, and cuttings), and spreads locally by contact (direct plant to plant contact, contaminated tools, hands, or clothing). ToBRFV can remain viable in seeds,

plants debris and contaminated soil for months.

Is ToBRFV-infected tomato or pepper fruit harmful to people or animals?

No, ToBRFV does not pose a health risk to people or animals.

What should I do if the tomato or pepper fruit in my refrigerator looks symptomatic?

ToBRFV-infected fruit is safe to eat. However, if you discard the fruit, throw it in the garbage. Do not put suspicious fruit in your backyard compost pile as seeds in the fruit could sprout into an infected plant.

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