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# Tomato Brown Rugose Fruit Virus

## Federal Import Order FAQs

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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. All imports of fresh tomato and pepper fruit entering the United States from all countries must arrive in commercial consignments, and tomato and pepper fruit from Canada, the Dominican Republic, France, Israel, Mexico, the Netherlands, and Spain are also subject to certification requirements detailed in the Federal Order.

The Import Federal Order has been in effect since November 22, 2019. APHIS may revise the Federal Order, such as the update on June 5, to modify import requirements for tomato and/or pepper fruit or propagative material when new scientific information or interceptions of ToBRFV require a modification to import requirements for tomato and/or pepper fruit or propagative material.

## Frequently Asked Questions

### Importing Tomato and Pepper Fruit

What are the requirements for bringing tomato and pepper fruit into the United States?

Only commercial shipments of tomato and pepper fruit may be imported into the United States.

Commercial consignments of tomato and/or pepper fruit entering from Canada, the Dominican Republic, France, Israel, Mexico, the Netherlands, and Spain are subject to all applicable current requirements for the country of origin, and must be:

- Accompanied by a phytosanitary certificate issued by a National Plant Protection Organization of the country of origin containing the following additional declaration: “The *Solanum lycopersicum* and/or *Capsicum* spp. fruit have been inspected and been found to be free of symptoms of *Tomato brown rugose fruit virus*.”

APHIS will also allow exporters of commercial consignments of pepper fruit from the Dominican Republic, and tomato and/or pepper fruit from Canada or Mexico to use an “inspection certification document” in lieu of a phytosanitary certificate, with the following language:

- “The *Solanum lycopersicum* and/or *Capsicum* spp. fruit have been inspected and been found free of symptoms of *Tomato brown rugose fruit virus*.”

The inspection certificate must also include the date of the inspection, the name, title, office, and address of the person issuing the inspection certificate, as well as the names and addresses of the grower and packinghouse.

Any consignment of fresh tomato and pepper fruit arriving at a port of entry without one of these documents, as required above, will be refused entry and subject to re-export or destruction. Tomato and pepper fruits that are found in personal baggage will be confiscated and destroyed.

Is an industry inspection certification document required if a Phytosanitary Certificate accompanies the commercial shipment?

Only one document per consignment is required to attest that the fruit was inspected and found free of symptoms of ToBRFV. Only Canada, the Dominican Republic and Mexico may use either a phytosanitary certificate OR an industry inspection certification document. All other countries where ToBRFV is reported and that are exporting commercial tomato and pepper consignments to the United States must issue a phytosanitary certificate for each shipment.

What are the import requirements for Mexico peppers?

Commercial consignments of peppers from Mexico must be accompanied by a phytosanitary certificate OR an industry inspection certification document indicating that the fruit was inspected and found free of symptoms of ToBRFV. Additionally, Manzano peppers must be irradiated. The Import requirements for peppers from Mexico are available in [Agricultural Commodity Import Requirements \(ACIR\)](#) database.

Are cut, sliced, or diced tomato or pepper fruit exempt for the Import Federal Order requirements?

No. Fresh cut fruit of tomato or pepper from any country is subject to the same import requirements as whole fruit.

Who can complete the industry inspection certification document? What qualifications are required?

Any industry representative at the grower or packinghouse can complete the inspection certificate. The certificate needs to include all of the information listed [here](#).

Is there a template for the industry inspection certification document?

Please see the required information [here](#).

When must the fruit inspection and certification take place?

The inspection has to occur between harvest and entry into the United States. If the fruit originated from a third country, then inspection certification document from the originating country is also required.

Are electronic signatures allowed for the inspection certification document?

Yes.

Is the importer required to keep a copy of the inspection certification document?

No. Required documentation will be retained by Customs and Border Protection.

Where does the fruit need to be inspected?

The fruit can be inspected in the field, greenhouse or packinghouse. The inspection certification document must include who inspected the fruit and their affiliation.

If there are symptoms of ToBRFV found in a load of tomatoes and/or peppers during inspection for certification, can the diseased fruit be discarded and the remaining load allowed into the United States?

Yes, culling symptomatic fruit prior to certifying a shipment is allowed.

If a shipment has fruit from multiple growers or packing houses, can they come in under one inspection certification document?

Yes if the fruit in the load was inspected by the same person.

Can one inspection certification document cover more than one shipment?

No, each load must have its own industry inspection certification document or phytosanitary certificate.

If you take part of a load off an overweight truck and put it on another truck, does each truck need its own certificate?

Each entry into the United States must be accompanied by its own industry inspection certification document or phytosanitary certificate.

Will Mexican fruit transiting the United States destined for Canada be inspected?

No, if the fruit is traveling under a transit permit, the fruit does not make entry into the United States and will not be inspected.

Is inspection documentation required for U.S. tomato and pepper fruit returning from Mexico or Canada?

U.S. tomato and pepper fruit returning from Canada or Mexico that remains in its original packaging does not need inspection documentation. U.S. tomato and pepper fruit that has been repackaged or otherwise handled in Canada or Mexico must have an inspection certification document or phytosanitary certificate from the country where it was repackaged or otherwise handled.

What are the requirements for fruit that is shipped in bulk from Mexico to Canada for packing, then sent to the United States?

The packer in Canada can issue an industry inspection certification document signed by a Canadian industry representative. The document should list the packer in Canada as well as the Mexican growers.

What are the requirements for packed fruit that is shipped to Canada and then used to supplement an order to the United States?

If boxes packed in Mexico are co-mingled with boxes packed in Canada, two certificates are required. One certificate would be issued and signed by a Mexican industry representative for the fruit grown AND packed in Mexico. A second certificate would be issued and signed by a Canadian industry representative for the fruit grown AND packed in Canada.

What will be the next steps if symptomatic fruit is found?

The shipment will be held while confirmation is obtained from an APHIS identifier. The shipper will have the option to re-export in lieu of an identification, destroy, or remain on hold pending confirmation.

What is the testing protocol for tomato and pepper fruit at ports of entry?

We are using immunostrips at the ports of entry to test symptomatic tomato and pepper fruit for the genus Tobamovirus, which is actionable in the United States. Fruit that tests positive will be denied entry into the United States.

How will U.S. Customs and Border Protection (CBP) dispose of symptomatic fruit?

CBP will dispose of fruit via deep burial, steam sterilization, incineration, or grinding into an approved sewage system.

If tomato or pepper fruit enter with other commodities, will the produce be allowed to be separated?

No. Fruit found to be positive for ToBRFV after inspection will not be enterable and must be returned to origin.

If returned, can the load be broken down, symptomatic fruit removed, and reshipped back into the United States?

No. Fruit found to be positive for ToBRFV after inspection will not be enterable and must be returned to origin.

During the testing period will the truck be sealed and allowed to re-enter the United States without another inspection if it's non-positive?

The product will not be allowed entry into the United States until APHIS identifies the pathogen and issues a regulatory decision on the shipment. Importers may choose to wait for a regulatory decision or return to origin.

Can digital imaging be used as a means to screen symptomatic fruit?

No.

## Importing Tomato and Pepper Propagative Material

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

Shipments of tomato or pepper seeds or propagative plant materials (including plants for planting, seeds, obscured seed, and cuttings) 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 *Solanum lycopersicum* and/or *Capsicum spp.* plants for planting or seeds originated from a country certified free from *Tomato brown rugose fruit virus*, as established by the national plant protection organizations of that country;

OR

A representative sample of the *Solanum lycopersicum* and/or *Capsicum spp.* plants for planting or seed lot has been officially 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 with the following additional declaration:

- All mother plants of *Solanum lycopersicum* and/or *Capsicum* spp. from which the seed lot originated have been officially 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 or is evaluating 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**



## Primers / Reference

## Comment

ToBRFV-F, **5'-GAAGTCCCGATGTCTGTAAGG-3'**  
ToBRFV-R, **5'-GTGCCTACGGATGTGTATGA-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>

ToBRFV-F **5'-AATGTCCATGTTTGTTACGCC-3'**

ToBRFV-R **5'-**

**CGAATGTGATTAAACTGTGAAT-3'**

### Reference:

Alkowni, A., et al. 2019. Molecular identification of tomato brown rugose fruit virus in tomato in Palestine. Journal of Plant Pathology.

<https://doi.org/10.1007/s42161-019-00240-7>

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.

Upon further evaluation, PPQ has determined that this RT-PCR is less sensitive than coat protein (CP) gene based assays. Therefore APHIS is not recommending this protocol for ToBRFV detection.

CaTa28 Fw **5' -GGTGGTGTCTAGTGTCTGTTT- 3'**

CaTa28 Pr **5' 6FAM -**

**AGAGAATGGAGAGAGCGGACGAGG- BHQ1 3'**

CaTa28 Rv **5' -GCGTCCTTGGTAGTGATGTT -3'**

### Reference:

ISHI-Veg 2019. Detection of Infectious Tomato brown rugose fruit virus (ToBRFV) in Tomato and Pepper Seed.

[https://www.worldseed.org/wp-content/uploads/2019/09/Tomato-ToBRFV\\_2019.09.pdf](https://www.worldseed.org/wp-content/uploads/2019/09/Tomato-ToBRFV_2019.09.pdf)

APHIS is currently evaluating this protocol.

## Primers / Reference

## Comment

CSPtbrfv101 Fw 5' -

**CATTGAAAGTGCATCCGGTT T - 3'**

CSPtbrfv101 Pr 5' VIC -

**ATGGTCCTCTGCACCTGCATCTTGAGA - BHQ1**

**3'**

CSPtbrfv101 Rv 5' -

**GTACCACGTGTGTTTGCAGAC A - 3'**

APHIS is currently evaluating this protocol.

### Reference:

ISHI-Veg 2019. Detection of Infectious Tomato brown rugose fruit virus (ToBRFV) in Tomato and Pepper Seed.

[https://www.worldseed.org/wp-content/uploads/2019/09/Tomato-ToBRFV\\_2019.09.pdf](https://www.worldseed.org/wp-content/uploads/2019/09/Tomato-ToBRFV_2019.09.pdf)

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 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) require a PPQ-588 Controlled Import Permit. A phytosanitary certificate is not required for seed imported under a PPQ-588 permit. For more information, see [APHIS' How to Import Plant and Plant Products web page](#).

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**

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>)

What countries are considered to have ToBRFV?

China, the Dominican Republic, France, Germany (eradicated), Greece, Italy, Jordan, Mexico, the Netherlands, Palestine, Spain, Turkey, and the United Kingdom

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.