Tomato Brown Rugose Fruit Virus ToBRFV

by Beth Mattimore

A new virulent seed-borne tomato virus is striking tomatoes and peppers with tomatoes as primary hosts. This RNA virus, known as ToBRFV, threatens tomato production worldwide. It was first isolated by scientists in April 2015 from greenhouse tomatoes in Jordan. Today, it can be found in 35 countries across four continents, including Asia, Europe, North America, and Africa.

ToBRFV has overcome all known genetic resistances in tomato to other tobamoviruses. Additionally, ToBRFV is easily spread, has a long-term survival ability, and no current treatments or sprays will cure infected plants. Federal restrictions on imports from known countries where ToBRFV exists have been in place since November 2019. Nonetheless, it has now been found in the US this spring on the seeds of two tomato varieties - Sweet Prince and Brandywise, being sold to growers and gardeners.

ToBRFV transmission is mechanical, and the virus can be moved easily by workers handling plants in, for example, greenhouse settings. Handling infected plants, followed by handling a healthy host plant, is a transmission method. It can also be transmitted by pollinators and possibly in irrigation water. See Cornell's May 15, 2023, fact sheet link below.:
https://www.vegetables.cornell.edu/pest-management/disease-factsheets/tomato-brown-rugose-fruit-virus/

Symptoms resemble those caused by the related tobacco mosaic virus and include yellowing, bubbling, mosaic, and mottling, most often on upper leaves. Affected plants, which are often stunted, can produce fruits with brown discoloration symptoms. A symptom guide can be found at:
https://www.vegetables.cornell.edu/pest-management/disease-factsheets/tomato-brown-rugose-fruit-virus/.

Photographs are at ToBRFV-QA.pdf (betterseed.org) prepared by the American Seed trade Association; see also Tomato brown rugose fruit virus: An emerging and rapidly spreading plant RNA virus that threatens tomato production worldwide - PubMed (nih.gov)

Recommendations:
Cornell University School of Integrative Plant Science recommends selecting seeds that have been tested free from tobamoviruses, including ToBRFV. See:
https://www.vegetables.cornell.edu/pest-management/disease-factsheets/tomato-brown-rugose-fruit-virus/

Cornell Cooperative Extension | Pest Alert - Tomato Brown Rugose Fruit Virus in NYS lists recommendations and sanitation practices to take if you are notified by a seed company regarding infected ToBRFV seed. Notably, any seeds and plants grown from infected seeds must be destroyed, not composted.

Further information:
USDA APHIS | General Information about ToBRFV:
https://bit.ly/44rlcE9

ToBRFV-infected tomato leaves on left and healthy leaves on right (cf Kai-Shu Ling, USDA-ARS) Yellowing, bubbling, mosaic and mottling, fern leaf and leaf narrowing are all symptoms of ToBRFV on leaves. Photo: Cornell| CALS

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