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Hosta Virus X

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Introduction

Hostas are popular shade plants in the American landscape. Gardeners love these plants for their wide range of sizes, textures and colors. Hostas are usually easy to grow and historically have had few serious pests besides snails and slugs.

In 1996 a new and potentially serious virus was described on hosta (Currier and Lockhart). The virus belongs to the potexvirus group [named for the Potato X (potex) viruses] and was named *Hosta Virus X* (HVX).

Potexviruses are spread by any means that moves plant sap from infected plants to healthy plants. This sap transfer can happen by a variety of physical or mechanical methods including plant division, removing bloom scapes or leaves with contaminated hands or tools, or simply walking on plants. Activities that may result in passing the virus to large numbers of plants at one time include mechanical weeding in hosta production fields and power washing of bare-rooted hostas before shipping.

Home gardeners and some nurseries propagate hostas by simple division. This physical means of propagation and the failure to recognize *Hosta Virus X* symptoms on many hosta varieties have led to the rapid spread of the virus throughout the country. Virus symptoms such as unusual mottling and spotting were thought by many to be the result of a color mutation, and these odd plants were propagated and sold as new and highly prized varieties such as 'Leopard Frog', 'Blue Freckles', 'Lunacy', 'Eternal Father', 'Kiwi Watercolours' and 'Breakdance'. All of these varieties were derived from virus-infected stock and therefore should be removed from existing plantings.

Many gold-leafed varieties such as 'Sum and Substance', 'Golden Tiara' and 'Gold Standard' are highly susceptible to *Hosta Virus X*. Susceptibility to the virus should be considered before planting these varieties.

Researchers initially believed that some varieties were immune; however, recent evidence strongly suggests that hosta varieties originally reported as immune are at least somewhat susceptible. In order to reduce the incidence of this virus, gardeners and the nursery industry must carefully monitor their plants and destroy those plants with visible symptoms. See Table 1 for information on known or suspected reactions to *Hosta Virus X* among hosta varieties currently being sold. The table serves as a current guideline, and information may change with new discoveries.

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Symptoms

Symptoms vary widely depending on the variety and are of limited value in diagnosing *Hosta Virus X*. The most common symptom is bleeding of color along veins and blue or green mottling on the leaf surface (Figure 1). This is particularly striking on variegated

Figure 1. Blue-green mottling symptoms of *Hosta Virus X* on 'Sum and Substance'.

varieties where the unusual spotting and vein bleeding show up well on light-colored portions of the leaves (Figure 2). The virus may also cause the leaves to pucker, twist or develop mosaic ring spots, flecks or zipper marks (Figure 3). Necrotic (dead) spots are not uncommon, and very susceptible plants may lose entire leaves (Figure 4).

Figure 2. Vein bleeding symptoms of *Hosta Virus X*.

Figure 3. Twisted leaves, mottling and zipper marks symptoms of *Hosta Virus X*.

Other hostas may carry the virus but display no symptoms at all. Some infected plants will not develop symptoms for three to four years after becoming infected. These plants are still capable of transmitting the virus to healthy plants. *Hosta Virus X* is not usually fatal to the plant, unless the variety is highly susceptible. The presence of the virus can be confirmed using a sensitive antibody test (ELISA).

Spread of the Virus

Researchers do not currently believe that *Hosta Virus X* is spread by insects, nematodes or infected seed. Moving sap from an infected plant to an uninfected plant is the only known method of spreading the virus in nature.

Control

There is no practical cure for this virus. Infected plants may or may not consistently display symptoms, but they will still serve as a source for the

Figure 4. Necrotic spots and dying leaves symptoms of *Hosta Virus X*.

virus. The only way to minimize the current situation is to destroy known infected plants and start over with healthy plants (not infected).

Helpful tips include:

- Do not share, purchase or sell any hosta plants showing abnormal leaf spotting or mottling.
- If symptoms are noticed in a particular variety, then do not purchase (or sell) other plants in the same lot.
- Plants that display symptoms after planting should be dug up and destroyed. The virus is not known to be soilborne, so the site would be safe for replanting as long as all plant parts including all roots have been removed.
- Diseased plants should not be composted but should be removed from the property.
- Since symptoms may take years to show up, care should be taken when trimming, deadheading and dividing hostas. Tools should be dipped in a 10 percent bleach solution and hands washed thoroughly between working on each plant.
- Growers should submit plants with suspicious symptoms to the Plant Health Clinic for testing with ELISA (an antibody test). While ELISA tests for *Hosta Virus X* are not 100 percent accurate, they represent the most practical testing procedure currently available and will detect the virus in most infected plants. ELISA testing for this virus is conducted in the laboratory and requires special training and equipment.

Hosta Virus X is not the only virus that infects hostas. There are at least six other less common viruses that attack hostas. Therefore, a plant with symptoms that test negative for *Hosta Virus X* could still be infected with HVX or one of the following viruses: *Tomato Ringspot Virus, Impatiens Necrotic Spot Virus, Tobacco Rattle Virus, Cucumber Mosaic Virus* or several unidentified viruses. Regardless, hostas with virus symptoms, even if not confirmed to be *Hosta Virus X*, should be destroyed.

References

Currier, S., and B. E. L. Lockhart. 1996. Characterization of a Potexvirus Infecting *Hosta* spp. Plant Disease 80:1040-1043.

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Myer, B. 2006. *Hosta Virus X* – Spring 2006 Update. http://www.hostalibrary.org/firstlook/HVXUpdate1.htm

Wilson, C. 2005. *Hosta Virus X* – A Brief History of the Epidemic. http://www.perennialnursery.com/HVX/hostavirusxhistory.html

Table 1. Known or Suspected Varieties Susceptible to *Hosta Virus X*.*

Varieties determined to be highly susceptible to *Hosta Virus X*	Varieties considered somewhat susceptible to *Hosta Virus X*	Varieties infected by viruses (probably *Hosta Virus X*) and sold because of their unusual symptoms
Birchwood Parky's Gold	Abby	Blue Freckles (probable HVX)
Blue Cadet	Diamond Tiara	Breakdance (confirmed HVX)
Corona	El Nino	Dotted Fantasy (probable HVX)
Gold Edger	Ground Master	Eternal Father (confirmed HVX)
Gold Standard	Guacamole	Kiwi Dreadlocks (probable HVX)
Golden Tiara	Janet	Kiwi Watercolours (probable HVX)
Goldrush	June	Leopard Frog (confirmed HVX)
Honeybells	Katherine Lewis	Lunacy (confirmed virus)
Royal Standard	Krossa Regal**	Pamela Ann (probable HVX)
So Sweet	Minuteman	Parkish Gold (probable HVX)
Stiletto	Night Before Christmas	Strip Show (probable HVX)
Striptease	Pacific Blue Edger	Tye Dye (probable HVX)
Sweet Susan	Patriot	
Sum and Substance	Paradise Joyce	
Undulata Albomarginata	Regal Splendor**	
Ventricosa	Revolution	
Venucosa	Sagae	
	Sun Power	
	Sugar and Cream	
	Tardiva	
	Yellow Splash Rim	

*Table 1. Reaction of hosta varieties to *Hosta Virus X* and possibly other viruses causing similar symptoms, as reported in the literature. Reactions should be used as a general guide only and careful care and observation made of all varieties over time, since information may change with additional research or as viruses adapt to overcome resistance.
Myer, B. 2006. *Hosta Virus X* – Spring 2006 Update. http://www.hostalibrary.org/firstlook/HVXUpdate1.htm

**Possibly another virus in addition to *Hosta Virus X* infects these varieties.

PHOTOS BY: Sherrie Smith, University of Arkansas Division of Agriculture.

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