

**Hosta Virus X (HVX)** is a member of the plant virus genus *Potexvirus*. Potexviruses characteristically become highly concentrated in infected plants and are very stable outside the plant cell. They are not spread by insects, mites, fungi, nematodes, seeds or pollen. Viruses like HVX are known to be spread only by vegetative propagation of infected mother plants or by infected plant sap that enters a healthy plant via non-lethal tissue damage (wounding). This mode of virus spread may possibly occur during normal gardening and commercial production, but there was no empirical evidence of its occurrence or probability. This research project was designed to provide research-based information.

#### Goals and Objectives

The study was designed by the AHS to address the hosta gardener's questions about Hosta Virus X. There are major concerns about this virus in both the home garden and in the ornamental horticultural industry. Our research project was designed to provide empirical data useful to the hosta gardener. An attempt is made in this study to clarify the method of HVX transmission and to understand the dynamics of Hosta Virus X spread, so steps can be taken to protect plants and gardens from the virus.



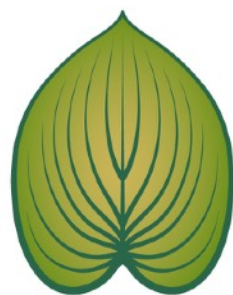
*H.* 'August Moon', *H. ventricosa* 'Aureomarginata',  
*H.* 'Gold Standard', *H.* 'So Sweet'.

## The American Hosta Society

[www.hosta.org](http://www.hosta.org)

The American Hosta Society is dedicated to the study and improvement of the genus *Hosta* and the dissemination of general and scientific knowledge about hostas. There are many benefits for the members that result from these efforts, both social and in the nursery trade.

The AHS Board of Directors works to define and balance the activities and focus of the Society. Most ongoing activities are delegated to specific committees that function under the guidance of the Committee Chair and report to the President and the Board of Directors at regular intervals. In addition, many committees report their progress at AHS meetings and publish their findings (particularly in the areas of basic science and nomenclature) in *The Hosta Journal* and *The Online Journal*.



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## The American Hosta Society

### Transmission of Hosta Virus X (HVX) Under Normal Conditions of Hosta Cultivation and Commercial Production - Phases One and Two



#### INTRODUCTION AND BACKGROUND OF RESEARCH

Hosta Virus X (HVX) was first identified and described at the University of Minnesota in 1996 (Currier and Lockhart, 1996). Since then, HVX has been found to occur widely in the U.S. as well as other countries throughout the world where hostas are grown. The danger posed by HVX to both hobby and commercial hosta cultivation has led to a need for a scientific study of the dynamics of HVX spread, to provide hosta growers and producers with the information needed to manage the disease.

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H. 'Gold Standard' with HVX.

**The best protection against HVX is knowing that the original sources of plants you buy test for HVX.** Your retail sources for hostas will know where its plants come from and if the original sources test for HVX. Wholesale vendors provide this information to their customers.

**HVX can be transmitted during normal cultivation.** In completed experiments, the virus was transmitted **via tools and in soil infected with HVX plant debris.**

**HVX can be transmitted to healthy replant hostas from residual HVX-infected plant material present in the soil.** However, this soil transmission is very slow and may be detected only after two or more years.

**High-pressure water washing** to remove soil from harvested hostas (roots plus crown) was highly effective in HVX transmission from infected to healthy plants.

**HVX will remain on tools and in the soil and be infective for more than two years. It is necessary to remove all infected live plant debris before reusing soil.** Broken roots and plant parts can infect new plants. Freshly infected plant material was always infective.

**In tested methods of decontamination of tools and hands,** household detergent (Dawn), 70% isopropyl alcohol or a 10% solution of household bleach proved effective in eliminating infectivity of the virus. The decontamination process included intense scrubbing and cleaning of tools, hands and pots to remove plant material, soil and sap. Viral material was visibly dislodged. It is not enough to simply dip tools in cleaning solution. Tools must be scrubbed free of all dirt and debris.

**We noted that the success of transmission** of 15 HVX isolates collected and mechanically transmitted was not only **dependent on mechanical injury** with new or old infection, but **also on the season** in which the contact occurred.

**HVX transmission was not dose-dependent (titer-dependent).** No difference in infectivity or speed of infectivity was related to the source or dose of the virus isolate. A significant difference in the rate of infectivity was dependent on the stage of plant growth. The virus was most easily transmitted **prior** to flowering and when the plant was rapidly growing in spring. **We were not able to transmit the virus while the plants were flowering in late summer/fall or when dormant.**



H. 'Sum and Substance' with HVX.

**Of 13 other shade perennials inoculated with HVX, only *Scilla* was found to be infected.** These HVX-positive plants tested positive only after two annual growth cycles.

**Transmission of HVX via seed from infected hostas was not observed** in a sample of 60 seeds collected and grown from 2 hosta cultivars.

**Interesting to note** that of eight different hosta cultivars tested for susceptibility to infection by foliar inoculation, there was significantly different reactions ranging from highly susceptible to seemingly immune. *H. 'Frances Williams', 'Elegans' and 'Great Arrival', could not* be infected with HVX during the study. It appears the higher the percentage of *H. sieboldiana* parentage, the higher the immunity.

**The best way for home growers and nurseries to test for HVX is ELISA testing** through Plant Disease Clinics and certified labs. The new **rapid test strips** (available through [www.Agdia.com](http://www.Agdia.com)) are reliable and portable. The strips can be used in the field or greenhouse and work with leaf or root material.