



PLANT GEEK SERIES

# GOING VIRAL

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Welcome to part two of four in this Plant Geek series focusing on some niche horticultural topics that I think are fascinating. I hope you do to! This newsletter we're talking plant viruses, and down the road, we'll cover Latin nomenclature, and fasciation and reversion. Buckle up. We're about to get really geeky!

Between Coronavirus, Norovirus, and Influenza, I think most people have gained a better understanding of viruses and how they work in recent years. There are countless viruses that can infect humans and other animals. But did you know that there are also many viruses that infect plants? In our previous newsletter, I discussed the four types of variegation in plants, which included variegation caused by viruses. When certain viruses infect plants, they cause chlorotic patches of tissue (areas lacking chlorophyll), which create visible patterns on foliage, flowers, and fruit. Viral variegation can be detrimental because it often causes contorted growth and the infected tissues often become necrotic. Some viruses, however, add ornamental value to plants. Let's explore a few of the most common plant viruses you may encounter in your garden.

One of the most well-known plant viruses is tobacco mosaic virus (TMV). It affects tobacco, pepper, tomato, petunia (Photo 1), nicotiana, calibrachoa, verbena, and more. It causes mottled yellow patches on flowers, leaves, or fruit. It can stunt a plant's growth, but is not usually fatal. TMV can be spread from the hands of a tobacco smoker, or via virus-contaminated hands, clothing, or tools.



Photo 1. Credit: OSU Plant Clinic

Hosta Virus X (HVX) causes mottled foliage that often becomes necrotic, as well as lumpy or twisted leaves (Photo 2). There are some Hosta cultivars known to be infected with HVX including 'Leopard Frog' (Photo 3), 'Lunacy', 'Eternal Father', 'Kiwi Watercolours', 'Breakdance', and 'Parkish Gold'. These varieties were originally thought to be new cultivars, but were actually just HVX-infected specimens of existing cultivars. Infected plants can spread HVX to unintended hosts, as can infected garden tools.



Photo 2. Credit: missouribotanicalgarden.org

Canna lilies are susceptible to a number of viruses that all cause streaky chlorotic patterns, and necrosis between veins (Photo 4). I simply refer to the infection as "Canna virus", but in addition to two canna-specific viruses, there is actually a bean, a cucumber, and a tomato virus that can cause similar symptoms. Many canna cultivars have streaky foliage on purpose, so it can be difficult to identify. Do not save the tubers from infected plants- the virus does not simply "go away" during winter storage. Infected plants should be destroyed. Seed-propagated cannas are becoming more common because the virus cannot be transmitted through seeds.



Photo 3. Credit: hostalibrary.org

Rose rosette virus (RRV) results in red or yellow mottling on rose foliage and contorted new growth resembling a witches-broom (photo 5). We had a number of roses removed from the gardens years ago because of suspected RRV infection. The virus is transmitted by mites feeding on the plant and may only affect individual canes or section of the plant. These mites can be blown around by the wind or transferred to other plants on gloves, clothing, or tools.



Photo 4

On a happier note, there are some viruses that add ornamental value to plants. Abutilon Mosaic Virus causes showy yellow stippling on Abutilon (flowering maple) foliage. Clerodendron Golden Mosaic Virus creates the heavily variegated golden foliage in Salvia 'Dancing Flame' (Photo 6). Perhaps the most well-known example of ornamental viral infection is with Tulip Breaking Virus (TBV). TBV is spread via aphids and causes flashy "broken" colors on tulip flowers (similar to Rembrandt and Parrot tulips, Photo 7). Tulips (and especially rare viral tulips) led to "Tulip Mania" during the mid-1630s in the Netherlands. Many Dutch families risked it all to purchase tulips to resell for profit. You could almost say that viral tulips "went viral." Eventually this tulip inflation resulted in an economic crash in 1637, putting many in financial ruin. Well, I guess this didn't actually end on a happier note, but do take comfort that modern "broken" tulip varieties were produced through traditional breeding and are virus-free.



Photo 5. Credit: provenwinners.com



Photo 7



Photo 6. Credit: msstate.edu